



Journal of Effective Teaching Methods

OCTOBER-DECEMBER 24















ISSN 2755-399X



Volume 2, Issue 4

www.eikpub.com




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Forewords

Dear readers,

As education continues to evolve in response to societal changes, the pursuit of innovative, adaptable, and effective teaching practices becomes ever more essential. In this issue, we delve into critical topics that challenge and inspire educators, researchers, and practitioners to rethink conventional approaches and embrace new horizons in pedagogy.

The interplay between tradition and innovation remains a defining theme in education. From exploring equitable practices to leveraging emerging technologies, this issue reflects our commitment to addressing pressing challenges and fostering meaningful progress. It is through these shared explorations that we advance the understanding of how education can better serve diverse communities and inspire lifelong learning.

We invite readers to immerse themselves in these discussions, considering how the insights presented here can enrich their own work and perspectives. Collaboration and knowledge-sharing are the cornerstones of educational progress, and your engagement is vital in shaping a future that empowers both educators and learners.

Thank you for joining us in this ongoing journey of discovery and transformation.

Warm regards,

Nataliya Bhinder

Editor-in-Chief

Doctor of Pedagogical Sciences, Professor

Critical Review

The Qualifications of a High School Physics Teacher Have

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Abstract: This study critically examines at the requirements for physics teachers in secondary schools. This study intends to shed light on the topic and offer insightful information for educators, policy-makers, and other stakeholders in the field of education by examining the many abilities, know-how, and experiences that go into good physics instruction at the high school level. This essay will demonstrate the necessary credentials that high school physics teachers should have in order to successfully engage students, improve learning outcomes, and support the success of science education in secondary schools through a thorough analysis of current research, educational standards, and best practices. The study aims to provide light on this important subject in order to contribute to current debates and decision-making processes concerning the hiring, preparation, and advancement of high school physics instructors. The ultimate objective of this research is to enhance physics education for the benefit of both society and students.

Keywords: high school; physics teacher; qualifications, physics education

1. Introduction

Critical thinking abilities and pupils' comprehension of the world around them are greatly enhanced by physics education (Banda & Nzabahimana, 2021). According to Costa et al. (2024), textbooks are a fundamental teaching resource that emphasize the interdisciplinary links between physics and other courses, such as history, as well as the historical development of physics. Moreover, Vörös (2020) emphasizes how important it is to include environmental physics in the curriculum in order to raise students' understanding of environmental issues and encourage environmentally friendly conduct. These results demonstrate how physics education is multifaceted, combining environmental factors, practical applications, and theoretical principles. Teachers can give pupils a comprehensive and memorable education by examining the historical background of physics and highlighting its application to the environment (DeBoer, 2000). Therefore, comprehending scientific principles and understanding their historical development and contemporary applications are essential to a thorough grasp of physics education (Wieman & Perkins, 2005).

It is impossible to overestimate the importance of having certified physics professors in high schools. These instructors give their pupils a solid grounding in the fundamentals of physics, which is crucial for pursuing higher education in science and engineering. Students' curiosity and critical thinking abilities can be stimulated, and a lifetime love of learning can be fostered by a teacher with a thorough understanding of physics principles and pedagogical techniques. Studies have indicated that pupils instructed by highly skilled educators typically attain superior academic results (Rivkin et al., 2005) and are more inclined to seek postsecondary education in STEM domains (Lee & Mamerow, 2019). Furthermore, competent physics instructors can foster a supportive learning atmosphere where students are inspired to realize their full potential (Nielsen et al., 2016). By ensuring that high school physics teachers have the required credentials, schools can assist in preparing the future generation of scientists, engineers, and innovators (Soricone & Barbosa, 2020).

High school physics teachers must have a combination of subject knowledge, teaching experience, and educational credentials. First and foremost, completion of a teacher education program and a bachelor's degree in physics or a comparable discipline are usually prerequisites. Furthermore, in certain nations, a state certification or license is required to lawfully teach in public schools (Goldhaber & Brewer, 2000). Relevant teaching experiences,

Received: August 16, 2024

Accepted: October 1, 2024

Published: October 15, 2024



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such as tutoring or student teaching, can supplement formal education and improve a candidate's qualifications (Darling-Hammond et al., 2005). To effectively teach physics to pupils, one must possess subject expertise, including a thorough comprehension of concepts and principles. Opportunities for professional development, such as workshops or continuing education classes, can also show a teacher's dedication to lifelong learning and development. In conclusion, to properly instruct pupils in this challenging subject, a high school physics teacher must have a combination of education, experience, and expertise (Assem et al., 2023).

A high school physics teacher should be well-versed in pedagogical techniques and pedagogy and hold graduate degrees in physics or a similar discipline (Halim et al., 2002). This is crucial for engaging and comprehensibly teaching high school students about complex scientific subjects. A high school physics teacher should also be able to provide an inclusive and supportive learning environment and have experience working with teenagers. Studies have indicated that educators possessing strong pedagogical abilities and subject matter competence can better assist pupils in achieving academic achievement (Liakopoulou, 2011). Furthermore, for high school physics teachers to continuously enhance their instructional strategies and give their students access to the most recent data and resources, they must stay current on physics developments and take advantage of professional development opportunities (McLoughlin & Van Kampen, 2019).

2. Educational Background

Higher education is a prerequisite for high school physics teachers and a bachelor's degree in physics or a comparable discipline. Completing a teacher education program emphasizing pedagogy, instructional strategies, and classroom management is usually required (Liakopoulou, 2011b). A teacher's skills and competence in the subject can be further enhanced by pursuing advanced degrees, such as a master's or doctorate. According to research, higher-educated teachers are more successful in raising student achievement (Burroughs et al., 2019). For high school physics instructors to stay current on the newest developments in the field and instructional techniques, they should take advantage of professional development opportunities, workshops, and conferences (Hodapp et al., 2009). High school physics teachers must possess a thorough educational background to instruct and motivate their pupils in the subject properly.

A bachelor's degree in physics or a closely related discipline is necessary to work as a high school physics teacher. With this degree, aspiring teachers will have a solid foundation in physics' core ideas and the quantitative abilities needed to instruct high school pupils in the field. Furthermore, a bachelor's degree in physics or a closely related discipline shows prospective employers that a candidate is dedicated to the topic and capable of meeting the demanding requirements of high school physics instruction. It is said that people with a background in physics are better suited to communicate complicated scientific concepts in a way that pupils can understand (Redish & Burciaga, 2003). Additionally, a bachelor's degree in physics or a similar discipline guarantees that teachers have the subject matter expertise to develop exciting and educational lesson plans (Carlson & Carlson, 2015).

One's ability to teach and topic knowledge can be significantly impacted by selecting between a master's degree in physics or education, considering the requirements for a high school physics teacher. A master's degree in physics provides a deeper comprehension of the subject matter. In contrast, a master's degree in education might offer insightful pedagogical knowledge and teaching tactics specific to the classroom. It can improve one's capacity to impart complicated scientific ideas efficiently. Studies have shown that instructors who possess an in-depth understanding of the subject matter can better hold students' attention and encourage learning objectives (Gore & Rosser, 2020). Consequently, a person's job objectives and preferred teaching style will ultimately determine whether to pursue a master's degree in Physics or Education.

High school physics teachers must have the appropriate teaching certification to guarantee their proficiency and efficacy in the classroom, as they significantly influence how pupils perceive scientific concepts. According to Sudarmono et al. (2021), teacher certification strongly emphasizes the value of academic credentials, competency, and the capacity to support national educational goals. Furthermore, the changing nature of education emphasizes the need for ongoing professional development and adherence to certification standards to improve teaching quality. This is demonstrated by China's emphasis on talent training and curriculum reform in college physics teaching (Gao, 2020). Institutions can ensure that high school physics teachers have the information, abilities, and pedagogical

tactics needed to create memorable and captivating courses that pique students' interest and deepen their comprehension of the topic by maintaining strict requirements for teacher certification.

Moreover, to stay current with the latest developments in the field, high school physics teachers must pursue continuing education in the subject (Amtu et al., 2020). Professional development opportunities, such as attending conferences and seminars or obtaining postgraduate degrees, can help educators gain a deeper knowledge of complicated subjects and approaches. Studies have demonstrated the beneficial effects of continuous professional development on student learning outcomes and the quality of instruction (Kunter et al., 2013). Some other studies reported that Physics department students have misconceptions about basic physics concepts (Stylos et al., 2008; Stylos et al., 2021) or modern physics (Gavrilas & Kotsis, 2023; Migdanalevros & Kotsis, 2021). Teachers can improve instructional strategies and integrate cutting-edge teaching practices with ongoing education (Didion et al., 2019). Additionally, teachers can modify their curricula to reflect the most recent developments in physics education by keeping up with new research findings and developing technology (Tarling & Ng'ambi, 2016). Putting money into continuing education allows high school physics teachers to give pupils a challenging and modern curriculum.

Teachers in high school physics need to be experts in their subjects and have had specific training in efficient teaching techniques (Demchenko et al., 2021). This entails being aware of educational approaches that address the various needs of learners and modifying teaching tactics for various classroom settings. According to Slavin's (2019) research, educators who undergo training in evidence-based teaching approaches are more capable of fostering student engagement and effectively facilitating learning. Additionally, specific training in instructional strategies can improve teachers' capacity to evaluate students' progress, offer insightful criticism, and establish a nurturing learning environment that promotes academic development (Munna & Kalam, 2021). Teachers may ensure they can motivate and excite the next generation of scientists and critical thinkers by investing in ongoing professional development in high school physics and teaching approaches.

3. Content Knowledge

Beyond just being an expert in the field, high school physics teachers must also possess the critical integration of pedagogical knowledge and technology skills. The importance of Technological Pedagogical Content Knowledge (TPACK) in educational research was highlighted in a content analysis study (Saputra & Chaeruman, 2022), which also highlighted the crucial synergy of professional skills, pedagogy, and technology in maximizing learning outcomes. Furthermore, a study on the Pedagogical Content Knowledge (PCK) of biology teachers (Mapulanga et al., 2022) highlighted the significant influence that teachers' perceived application of PCK had on student accomplishment. This study found that some aspects of PCK, like recognizing students' past knowledge and clearing up misconceptions, are essential for efficient instruction. These findings highlight the significance of ongoing professional development and the diverse content knowledge that high school physics teachers must possess. This knowledge includes subject matter competence and pedagogical and technical competencies (Masrifah et al., 2019).

To effectively teach high school physics, educators need to thoroughly understand fundamental physics topics (Fischer & Neumann, 2023). This competence is the cornerstone for developing thorough explanations and captivating teaching (Bao & Koenig, 2019). Teachers with a solid understanding of foundational concepts like electromagnetism, thermodynamics, mechanics, and quantum mechanics can better explain difficult concepts to their pupils understandably and effectively. Teachers are better equipped to correct misconceptions and provide appropriate answers when they understand these ideas (Chen et al., 2020). It gives students more realistic and engaging examples and applications from real-world situations, which increases their interest in the subject. Furthermore, mastery of fundamental physics concepts enables teachers to modify their pedagogical approaches to accommodate diverse learners' styles and aptitudes in the classroom, thus fostering a more inclusive and helpful learning environment for every student.

Furthermore, a thorough comprehension of the curriculum standards is necessary for high school physics instructors. Curriculum standards guarantee that pupils receive a thorough education in the subject matter by providing a framework for creating and delivering instruction (Harlow et al., 2020). Physics teachers can adapt their lesson plans to fulfill these unique criteria by being familiar with the curriculum standards established by state and

national education bodies (Iqbal et al., 2021). This guarantees that students encounter the required material and supports educators in upholding the quality of their teaching. Additionally, having a solid understanding of curriculum standards enables teachers to make well-informed judgments about instructional tactics and effectively assess student development (Gouédard et al., 2020). According to research, educators are more successful in fostering student learning outcomes when they base their instruction on recognized curricular standards (Pak et al., 2020). Thus, an essential requirement for high school physics teachers is a strong grasp of curriculum standards (Martinez, 2022).

Moreover, a high school physics instructor must be proficient in incorporating technology into their lesson plans (Ramma et al., 2017). Using interactive simulations, virtual laboratories, and multimedia materials that accommodate different learning preferences, technology can improve the educational process. It is possible to increase students' engagement and accessibility with abstract topics using intelligent boards, educational software, and online platforms. Studies have indicated that incorporating technology in the classroom can enhance student performance, involvement, and critical thinking abilities (Niess, 2005). Consequently, a physics teacher's technological competency improves teaching strategies and gives students the fundamental digital literacy abilities they need for the twenty-first-century workplace (Nazifah & Asrizal, 2022). A crucial skill for instructors of high school physics is the ability to incorporate technology into their lessons.

When examining the necessary body of knowledge for high school physics teachers, a thorough grasp of the most recent findings is crucial. According to (Ilukena et al., 2017), a teacher's pedagogical abilities and topic competence can significantly improve with extra qualifications and specialized training in subjects like physics. This, in turn, can positively impact students' learning outcomes in mathematics and the natural sciences. Additionally, (McConney & Price, 2009) highlight the frequency of teaching outside of one's field in educational settings, especially in essential subjects like science and mathematics, emphasizing the significance of ensuring high school physics teachers have the training and experience to teach the curriculum effectively. This study's finding is consistent with the larger conversation about how teachers' quality affects students' performance in physics and related fields. It highlights the importance of high school teachers' subject-specific training and continuous professional development in creating a positive learning environment (Darling-Hammond, 2000).

To guarantee that students obtain a thorough and demanding education in physics, high school physics teachers need to be very competent in teaching advanced physics topics. Proficiency in instructing advanced physics subjects entails a thorough comprehension of the subject matter and the capacity to proficiently convey intricate ideas, stimulate captivating dialogues, and offer demanding possibilities for pupils to solve problems. In order to satisfy the various learning demands of their pupils, teachers must be current on industry developments and possess the flexibility to modify their pedagogical approaches (Teo et al., 2021). Furthermore, to effectively teach advanced physics topics, teachers must be passionate about the subject, have excellent critical thinking abilities, and encourage students to go deeper. Students can be successfully prepared for postsecondary education and careers in STEM sectors by high school physics teachers who possess a high degree of proficiency in teaching advanced physics courses (Felder & Brent, 2024).

4. Pedagogical Skills

It is impossible to overstate the crucial influence of instructional abilities on high school physics instructors' success. Successful educational outcomes depend on integrating professional skills, pedagogical abilities, and technology in learning, as highlighted in the research findings (Saputra & Chaeruman, 2022). The study emphasizes how important it is for educators to be able to integrate into their teaching practices. It stresses the necessity for a variety of research methodologies to support this focus. Furthermore, as the community service initiative (Fernandez, 2024) highlights, the investigation of teacher productivity in scientific article writing emphasizes the significance of ongoing professional development for educators. Physics teachers can improve student learning experiences by participating in activities that advance their scholarly output and pedagogical competencies. This will also boost their professionalism, self-assurance, and teaching efficacy (Gondwe, 2021).

To be a competent high school physics teacher, one must possess strong classroom management abilities (Özen & Yildirim, 2020). Setting clear goals, creating a supportive learning environment, and implementing behavior control techniques are all essential

components of effective classroom management. From the start of the school year, teachers can provide a disciplined environment where students know exactly what is expected of them by setting clear expectations. Creating a supportive learning atmosphere encourages student enthusiasm and engagement, which improves academic performance. Furthermore, teachers may manage disturbances quickly and effectively when they have techniques to deal with student behavior issues, ensuring that all students are in a productive learning environment (Weinstein, 2007). Effective classroom management is essential for high school physics teachers to foster a positive learning atmosphere where students can succeed academically.

Differentiated instruction strategies have great potential to improve student learning outcomes and promote a deeper comprehension of difficult scientific concepts in high school physics education. Innovative pedagogical tactics like Vee diagrams can effectively involve students in the structure and interplay of knowledge, promoting a more dynamic and constructivist learning environment, as demonstrated by the study that used the Vee Heuristic Teaching Approach (VHTA) (Njue et al., 2018). Moreover, incorporating natural science webbed handouts into science education (Sukariasih, 2017) emphasizes the significance of customized learning resources that accommodate a range of learning preferences and skill levels. High school physics teachers can create a welcoming and inclusive learning environment that supports students' academic achievement and increases their engagement with the complexities of physics ideas by adopting a range of teaching modalities and customizing material delivery to match the requirements of each student.

Examining high school physics teachers' evaluation and feedback techniques is crucial when analyzing the credentials needed for these positions. Evaluating students' comprehension of physics topics and advancement depends heavily on assessment (Assem et al., 2023). For high school physics teachers to effectively assess their students' knowledge and skills, they must be skilled in creating various assessment forms, including quizzes, exams, and projects. Furthermore, prompt and helpful feedback is essential for assisting students in raising their level of performance and developing a deeper comprehension of physics concepts. Teachers can help students succeed academically by providing targeted feedback highlighting areas for growth and the good parts of their work. High school physics teachers can effectively support their students' learning and progress in the subject by using appropriate procedures for assessment and feedback (Mestre & Docktor, 2020).

Encouraging high school pupils to think critically and solve problems is essential to their success in physics in the future (Wider & Wider, 2023). Encouraging students to critically evaluate information, challenge presumptions, and use their imaginations can improve their capacity to take on challenging issues and develop original solutions. By including practical experiments, group debates, and real-world applications in the curriculum, teachers can help their students develop a culture of inquiry and curiosity (Kibga et al., 2021). Allowing students to work on complex assignments and conduct research will help them advance their critical thinking and analytical abilities (Fitria & Suminah, 2020). Instructors are essential in helping students develop into self-sufficient thinkers and problem solvers and equipping them with the skills needed to succeed in the classroom and beyond.

Given the changing nature of educational methods, it is essential to include interactive and engaging components in high school physics classes to encourage student involvement and in-depth comprehension. Learning progressions are a structured method of formative assessment procedures that can help teachers explain objectives, interpret student comprehension, and modify instruction based on their findings (Zhai et al., 2018). Moreover, as Gould et al. (2014) emphasized, students are encouraged to take an active role in their education by delving into the intricacies of real-world events through experiential learning with messy data, like that of the ExoLab project. Teachers may create a dynamic learning environment that develops students' critical thinking abilities and data literacy in high school physics by embracing real-world applications and letting them work with real, complicated data sets. By incorporating these evidence-based practices into lesson planning, high school physics instruction can be more successful and of higher quality overall.

5. Discussion

It should be noted that a high school physics teacher must possess a variety of skills to teach this specialized subject effectively. A competent physics teacher needs to be well-versed in physics subjects, have strong teaching abilities, and be able to explain difficult concepts to students with different learning preferences. A high school physics teacher should also be passionate about the subject to pique students' interest and encourage participation. Teachers

must possess the relevant teaching certification and an educational background, such as a bachelor's degree in physics or a similar discipline, to guarantee they have the material knowledge and instructional abilities to teach students effectively. Furthermore, maintaining up-to-date with physics developments and engaging in continual professional development is essential for consistently enhancing teaching methodologies and student learning results. To sum up, essential skills for high school physics teachers include subject matter understanding, instructional proficiency, and a commitment to professional development.

A critical factor in determining how pupils' futures are shaped in high school is the presence of qualified physics professors. These educators are the cornerstones for pupils acquiring scientific information and critical thinking abilities. Qualified physics teachers can effectively engage pupils under challenging ideas and provide a strong comprehension of the subject matter because of their competence and experience. Studies have indicated that pupils who receive instruction from certified physics teachers typically score higher on standardized assessments and are more inclined to continue their education or pursue employment in the field. By maintaining high standards of instruction and fostering a positive learning environment, qualified physics teachers significantly contribute to the overall academic performance of their students as well as the growth of scientific knowledge in society.

A solid educational foundation in physics or a closely connected topic, such as a master's or doctoral degree in physics or science education, is one of the essential qualifications for high school physics teachers that have been discussed. Furthermore, a minimum of two years of high school teaching experience and a track record of successfully igniting students' interest in the topic are necessary. Another essential qualification is using technology and creative teaching techniques to improve student learning outcomes. One must possess practical written and vocal communication abilities to effectively and concisely convey complicated scientific concepts. High school physics teachers must possess academic expertise, teaching experience, tech-nology competency, and excellent communication skills to effectively educate and inspire the next generation of scientists and innovators.

A call to action to increase the qualifications of physics teachers is necessary to address the urgent need for better physics instruction in high schools. Studies have indicated that one of the most important variables influencing student performance is the caliber of the teacher, especially in STEM fields like physics. Thus, it is imperative to support physics educators' professional development to guarantee that students obtain a top-notch education in this important subject. Allowing teachers to advance their pedagogical knowledge, subject-matter expertise, and classroom management strategies can raise student engagement and learning outcomes in physics classes. Furthermore, encouraging higher education in physics through degrees and certificates will draw in more competent people, which will eventually help students and the more significant STEM labor force (McLoughlin & Van Kampen, 2019).

Physics education in the future will have to change to keep up with the quick changes in science and technology. To improve student learning, educators must be ready to incorporate the growing usage of virtual laboratories, interactive simulations, and internet resources into their lesson plans. Furthermore, as physics develops into specialized fields like quantum physics and astrophysics, high school physics teachers must thoroughly understand these disciplines to teach their pupils difficult topics properly. It will be crucial for educators to have access to professional development opportunities and continuous assistance to stay current with research and teaching methodologies. To guarantee that students have the information and abilities necessary to thrive in a society that is becoming more and more physics-driven, the future of physics education must cultivate a culture of ongoing learning and innovation. As a result, in addition to having a solid theoretical and applied physics background, high school physics teachers must be passionate about encouraging the next wave of scientists and intellectuals.

6. Conclusions

In conclusion, various requirements are needed for a high school physics teacher, including pedagogical and subject-matter expertise. A bachelor's degree in physics or a closely related discipline is preferred, although a teaching credential or certification will also be considered. The candidate should have a solid background in physics. Furthermore, having prior teaching experience—whether from student teaching or paid employment—is crucial for successfully enabling a candidate to explain difficult physics concepts to high school pupils. Moreover, retaining efficiency in the classroom requires continuing professional development and keeping up with the latest developments in education. Consequently, it is imperative for

a high school physics teacher to consistently work towards improving their abilities and expertise, showcasing a dedication to lifetime learning and professional development. Ultimately, an excellent high school physics teacher is skilled at motivating and involving their pupils in learning and is informed about the subject matter.

Funding: This research received no external funding.

Institutional Review Board Statement: The study did not require ethical or other kinds of approval.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Amtu, O., Makulua, K., Matital, J., & Pattiruhu, C. M. (2020). Improving student learning outcomes through school culture, work motivation, and teacher performance. *International Journal of Instruction*, 13(4), 885-902. <https://eric.ed.gov/?id=EJ1270837>
- Assem, H. D., Nartey, L., Appiah, E., & Aidoo, J. K. (2023). A Review of Students' Academic Performance in Physics: Attitude, Instructional Methods, Misconceptions and Teachers Qualification. *European Journal of Education and Pedagogy*, 4(1), 84-92. <https://doi.org/10.24018/ejedu.2023.4.1.551>
- Banda, H. J., & Nzabahimana, J. (2021). Effect of integrating physics education technology simulations on students' conceptual understanding in physics: A review of literature. *Physical Review Physics Education Research*, 17(2), 023108. <https://doi.org/10.1103/PhysRevPhysEducRes.17.023108>
- Bao, L., & Koenig, K. (2019). Physics education research for 21st century learning. *Disciplinary and Interdisciplinary Science Education Research*, 1(1), 2. <https://doi.org/10.1186/s43031-019-0007-8>
- Burroughs, N., Gardner, J., Lee, Y., Guo, S., Touitou, I., Jansen, K., ... & Schmidt, W. (2019). A review of the literature on teacher effectiveness and student outcomes. In *Teaching for excellence and equity: Analyzing teacher characteristics, behaviors and student outcomes with TIMSS* (pp. 7-17). https://doi.org/10.1007/978-3-030-16151-4_2
- Carlson, J., & Carlson, R. L. (2015). *101 careers in education*. Springer Publishing Company.
- Chen, C., Sonnert, G., Sadler, P. M., & Sunbury, S. (2020). The impact of high school life science teachers' subject matter knowledge and knowledge of student misconceptions on students' learning. *CBE – Life Sciences Education*, 19(1), ar9. <https://doi.org/10.1187/cbe.19-08-0164>
- Costa, J. P. de C., Souza, S. A. de F., Santos, A. K. de M., & Souza, A. M. S. (2024). Categorization of the texts present in the Physics textbooks of the PNLEM 2018, adopted at CEFET-MG: connections with the history of Physics. *Observatório de La Economia Latinoamericana*, 22(2), e3100. <https://doi.org/10.55905/oelv22n2-017>
- Darling-Hammond, L. (2000). Teacher Quality and Student Achievement. *Education Policy Analysis Archives*, 8(1). <https://doi.org/10.14507/epaa.v8n1.2000>
- Darling-Hammond, L., Holtzman, D. J., Gatlin, S. J., & Vasquez Heilig, J. (2005). Does Teacher Preparation Matter? Evidence about Teacher Certification, Teach for America, and Teacher Effectiveness. *Education Policy Analysis Archives*, 13, 1-48. <https://www.redalyc.org/articulo.oa?id=275020513042>
- DeBoer, G. E. (2000). Scientific literacy: Another look at its historical and contemporary meanings and its relationship to science education reform. *Journal of Research in Science Teaching*, 37(6), 582-601. [https://doi.org/10.1002/1098-2736\(200008\)37:6<582::AID-TEA5>3.0.CO;2-L](https://doi.org/10.1002/1098-2736(200008)37:6<582::AID-TEA5>3.0.CO;2-L)
- Demchenko, I., Maksymchuk, B., Bilan, V., Maksymchuk, I., & Kalynovska, I. (2021). Training Future Physical Education Teachers for Professional Activities under the Conditions of Inclusive Education. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 12(3), 191-213. <https://doi.org/10.18662/brain/12.3/227>
- Didion, L., Toste, J. R., & Filderman, M. J. (2019). Teacher Professional Development and Student Reading Achievement: A Meta-Analytic Review of the Effects. *Journal of Research on Educational Effectiveness*, 13(1), 29-66. <https://doi.org/10.1080/19345747.2019.1670884>
- Felder, R. M., & Brent, R. (2024). *Teaching and learning STEM: A practical guide*. John Wiley & Sons.
- Fernandez, E. (2024). Continuing Professional Development of Teachers: A Reflection of Experiences. *Nexus International Journal of Science and Education*, 1(2). <https://doi.org/10.5281/>
- Fischer, H. E., & Neumann, K. (2023). Teaching Physics. In *Handbook of Research on Science Education* (pp. 619-656). Routledge.
- Fitria, H., & Suminah, S. (2020). Role of Teachers in Digital Instructional Era. *Journal of Social Work and Science Education*, 1(1), 70-77. <https://doi.org/10.52690/jswse.v1i1.11>
- Gao, L. (2020). Research on the Teaching Reform of College Physics under the Training Model of Applied Talent. In *Proceedings of International Conference on Educational Science (ICES2020)*. <https://doi.org/10.38007/Proceedings.0000321>
- Gavrilas, L., & Kotsis, K. T. (2023). Assessing elementary understanding of electromagnetic radiation and its implementation in wireless technologies among pre-service teachers. *International Journal of Professional Development, Learners, and Learning*, 5(2), ep2309. <https://doi.org/10.30935/ijpdll/13191>
- Goldhaber, D. D., & Brewer, D. J. (2000). Does Teacher Certification Matter? High School Teacher Certification Status and Student Achievement. *Educational Evaluation and Policy Analysis*. <https://doi.org/10.3102/01623737022002129>
- Gondwe, F. (2021). Technology professional development for teacher educators: A literature review and proposal for further re-search. *SN Social Sciences*, 1(8), 200. <https://doi.org/10.1007/s43545-021-00184-9>
- Gore, J., & Rosser, B. (2020). Beyond content-focused professional development: powerful professional learning through genuine learning communities across grades and subjects. *Professional Development in Education*, 48(2), 218-232. <https://doi.org/10.1080/19415257.2020.1725904>

- Gouëdard, P., Pont, B., Hyttinen, S., & Huang, P. (2020). *Curriculum reform: A literature review to support effective implementation*. OECD Working Paper No. 239. Paris: Organisation for Economic Co-operation and Development, <https://doi.org/10.1787/efe8a48c-en>
- Gould, R., Sunbury, S., & Dussault, M. (2014). In praise of messy data: lessons from the search for alien worlds. *The Science Teacher*, 81(8), 31-36. <https://link.gale.com/apps/doc/A495841944/AONE?u=anon~8f2b1b1d&sid=googleScholar&xid=72724786>
- Halim, L., & Meerah, S. Mohd. Mohd. (2002). Science Trainee Teachers' Pedagogical Content Knowledge and its Influence on Physics Teaching. *Research in Science & Technological Education*, 20(2), 215-225. <https://doi.org/10.1080/0263514022000030462>
- Harlow, D. B., Otero, V. K., Leak, A. E., Robinson, S., Price, E., & Goldberg, F. (2020). Learning about teaching and learning while learning physics: An analysis of 15 years of responsive curriculum development. *Physical Review Physics Education Research*, 16(2), 020155. <https://doi.org/10.1103/PhysRevPhysEducRes.16.020155>
- Hodapp, T., Hehn, J., & Hein, W. (2009). Preparing high-school physics teachers. *Physics Today*, 62(2), 40-45. <https://doi.org/10.1063/1.3086101>
- Ilukena, A.M., Utete, C., & Sirinji, R. (2017). An analysis on why the mathematics and integrated Natural Sciences basic education teachers diploma (BETD) graduates opted further studies in their areas of specialisation at the Rundu campus, University of Namibia. *Journal for Studies in Humanities and Social Sciences*, 6(1), 170-179. <http://hdl.handle.net/11070/2005>
- Iqbal, M. H., Siddiqie, S. A., & Mazid, M. A. (2021). Rethinking theories of lesson plan for effective teaching and learning. *Social Sciences & Humanities Open*, 4(1), 100172. <https://doi.org/10.1016/j.ssaho.2021.100172>
- Kibga, E., Gakuba, E., Sentongo, J. (2021). Developing Students' Curiosity Through Chemistry Hands-on Activities: A Case of Selected Community Secondary Schools in Dar es Salaam, Tanzania. *EURASIA Journal of Mathematics, Science and Technology Education*, 17(5), 1-17. <https://doi.org/10.29333/ejmste/10856>
- Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: effects on instructional quality and student development. *Journal of educational psychology*, 105(3), 805.
- Lee, S. W., & Mamerow, G. (2019). Understanding the role cumulative exposure to highly qualified science teachers plays in students' educational pathways. *Journal of Research in Science Teaching*, 56(10), 1362-1383. <https://doi.org/10.1002/tea.21558>
- Liakopoulou, M. (2011a). The Professional Competence of Teachers: Which qualities, attitudes, skills and knowledge contribute to a teacher's effectiveness. *International Journal of Humanities and Social Science*, 1(21), 66-78.
- Liakopoulou, M. (2011b). Teachers' Pedagogical Competence as a Prerequisite for Entering the Profession. *European Journal of Education*, 46(4), 474-488. <https://doi.org/10.1111/j.1465-3435.2011.01495.x>
- Mapulanga, T., Nshogoza, G., & Yaw, A. (2022). Teachers' Perceived Enacted Pedagogical Content Knowledge in Biology at Selected Secondary Schools in Lusaka. *International Journal of Learning, Teaching and Educational Research*. <https://doi.org/10.26803/ijlter.21.10.23>
- Martinez, C. (2022). Developing 21st century teaching skills: A case study of teaching and learning through project-based curriculum. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2021.2024936>
- Masrifah, M., Setiawan, A., Sinaga, P., & Setiawan, W. (2019). The content quality of teacher's pedagogical and professional competence standards of senior high school physics teacher guidebooks. *Journal of Physics: Conference Series*, 1157(3), 032037. <https://doi.org/10.1088/1742-6596/1157/3/032037>
- McConney, A., & Price, A. E. (2009). *An Assessment of the Phenomenon of "teaching-out-of-field" in WA Schools*. Murdoch University.
- McLoughlin, E., & Van Kampen, P. (Eds.). (2019). *Concepts, Strategies and Models to Enhance Physics Teaching and Learning*. Springer.
- Mestre, J., & Docktor, J. (2020). *Science Of Learning Physics, The Cognitive Strategies for Improving Instruction*. World Scientific.
- Migdanalevros, I., & Kotsis K. T., (2021). Literacy of students of the Physics Department regarding the greenhouse effect and the ozone hole. *International Journal of Educational Innovation*, 3(4), 74-85. <https://journal.epek.gr/manuscript/eggrammatismos-foititon-tmimatos-fysikis-schetika-me-to-fainomeno-toy-thermokipioy-kai-i-trypa-toy-ozontosYZvSikwdJc>
- Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness: a literature review. *International Journal of Humanities and Innovation*, 4(1), 1-4. <https://doi.org/10.33750/ijhi.v4i1.102>
- Nazifah, N., & Asrizal, A. (2022). Development of STEM Integrated Physics E-Modules to Improve 21st Century Skills of Students. *Jurnal Penelitian Pendidikan IPA*, 8(4), 1783-1789. <https://doi.org/10.29303/jppipa.v8i4.1820>
- Nielsen, N., Schweingruber, H., & Wilson, S. (Eds.). (2016). *Science teachers' learning: Enhancing opportunities, creating supportive contexts*. National Academies Press.
- Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and teacher education*, 21(5), 509-523. <https://doi.org/10.1016/j.tate.2005.03.006>
- Njue, A. K., Kamau, L. M., & Mwanja, J. (2018). Effects of Vee heuristic teaching approach on secondary school students' attitudes towards Biology in Kenya. *International Organization of Scientific Research Journal of Research and Method in Education*, 8(1), 18-23.
- Özen, H., & Yildirim, R. (2020). Teacher perspectives on classroom management. *International Journal of Contemporary Educational Research*, 7(1), 99-113. <https://doi.org/10.33200/ijcer.645818>
- Pak, K., Polikoff, M. S., Desimone, L. M., & Saldívar García, E. (2020). The Adaptive Challenges of Curriculum Implementation: Insights for Educational Leaders Driving Standards-Based Reform. *AERA Open*, 6(2). <https://doi.org/10.1177/2332858420932828>
- Ramma, Y., Bhoola, A., Watts, M., & Nadal, P. S. (2017). Teaching and learning physics using technology: Making a case for the affective domain. *Education Inquiry*, 9(2), 210-236. <https://doi.org/10.1080/20004508.2017.1343606>
- Redish, E. F., & Burciaga, J. R. (2003). *Teaching physics: with the physics suite*. Hoboken, NJ: John Wiley & Sons.
- Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, Schools, and Academic Achievement. *Econometrica*, 73(2), 417-458. <https://doi.org/10.1111/j.1468-0262.2005.00584.x>
- Saputra, B., & Chaeruman, U. A. (2022). Technological pedagogical and content knowledge (TPACK): Analysis in design selection and data analysis techniques in high school. *International Journal of Instruction*, 15(4), 777-796. <https://doi.org/10.29333/iji.2022.15442a>
- Slavin, R. E. (2019). How evidence-based reform will transform research and practice in education. *Educational Psychologist*, 55(1), 21-31. <https://doi.org/10.1080/00461520.2019.1611432>
- Soricone, L., & Barbosa, R. (2020). Breaking Ground: A First Look at American High School Skilled Trades Education. *Jobs for the Future*. <https://www.jff.org/idea/breaking-ground-first-look-american-high-school-skilled-trades-education/>

- Stylos, G., Evangelakis G. A., & Kotsis, K.T., (2008). Misconceptions on classical mechanics by freshman university students: A case study in a Physics Department in Greece. *Themes in Science and Technology Education*, 1(2), 157-177.
- Stylos G., Sargioti A., Mavridis D., & Kotsis K. T., (2021). Validation of the thermal concept evaluation test for Greek university students' misconceptions of thermal concepts. *International Journal of Science Education*, 43(2), 247-273. <https://doi.org/10.1080/09500693.2020.1865587>
- Sudarmono, S., Maisah, M., Fikri, A., & Hasanah, N. (2021). The impact of teacher certification on teacher performance in school. *Dinasti International Journal of Education Management and Social Science*, 2(3), 535–553. <https://doi.org/10.31933/dijemss.v2i3.764>
- Sukariasih, L. (2017). Development of Integrated Natural Science Teaching Materials Webbed Type with Applying Discourse Analysis on Students Grade VIII in Physics Class. *Journal of Physics: Conference Series*, 846. <https://doi.org/10.1088/1742-6596/846/1/012028>
- Tarling, I., & Ng'ambi, D. (2016). Teachers pedagogical change framework: a diagnostic tool for changing teachers' uses of emerging technologies. *British Journal of Educational Technology*, 47(3), 554-572. <https://doi.org/10.1111/bjet.12454>
- Teo, T., Unwin, S., Scherer, R., & Gardiner, V. (2021). Initial teacher training for twenty-first century skills in the Fourth Industrial Revolution (IR 4.0): A scoping review. *Computers & Education*, 170, 104223. <https://doi.org/10.1016/j.compedu.2021.104223>
- Vörös, A. I. V. (2020). Outcomes of an optional environmental physics course in high school. In *AIP Conference Proceedings*. AIP Publishing. <https://doi.org/10.1063/5.0001748>
- Weinstein, C. S. (2007). *Middle and secondary classroom management: Lessons from research and practice*. McGraw-Hill.
- Wider, C., & Wider, W. (2023). Effects of Metacognitive Skills on Physics Problem-Solving Skills among Form Four Secondary School Students. *Journal of Baltic Science Education*, 22(2), 357-369. <https://doi.org/10.33225/jbse/23.22.257>
- Wieman, C., & Perkins, K. (2005). Transforming physics education. *Physics Today*, 58(11), 36-41. <https://doi.org/10.1063/1.2155756>
- Zhai, X., Li, M., & Guo, Y. (2018). Teachers' use of learning progression-based formative assessment to inform teachers' instructional adjustment: a case study of two physics teachers' instruction. *International Journal of Science Education*, 40(15), 1832–1856. <https://doi.org/10.1080/09500693.2018.1512772>

Research Article

Using iPad Making Comics for Teaching the “Fire and the Cave Men” for K-10 Students

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<https://doi.org/eiki/10.59652/jetm.v2i4.280>

Abstract: This work explores the potential of iPads in creating educational comics to teach K–10 students the philosophical topics of “The Fire and the Cave Men”. The visual and interactive features of the iPad can assist educators in crafting captivating stories from intricate philosophical materials, thereby enhancing student understanding and engagement. The study highlights the iPad’s ability to demystify abstract ideas, foster innovation, and promote student collaboration through instructional comics. Incorporating visual arts and narrative also aids in establishing a deeper connection to environmental and historical topics, fostering an ecological attitude and viewpoint. The article concludes that iPads offer a versatile platform for enhancing educational outcomes through creative expression, with practical implications for educators and students alike.

Keywords: educational comics; iPad integration; interdisciplinary learning; storytelling in education

1. Introduction

Renowned teaching narrative “The Fire and the Cave Men” is a potent metaphor for moral direction and historical change. The story began in prehistoric times when cavemen roamed the planet, and people survived on fire. Teachers find great motivation in the core topic of the story – the transforming power of knowledge – which emphasizes the possible influence on the learning process for their students. Equally crucial is the narrative’s focus on social sharing in human development, which may inspire teachers and help them to feel linked and part of a greater purpose. While the Cave Men reflect primitive impulses and the fight for existence in a hostile environment, the symbolic character of fire in the narrative marks enlightenment and the progress of civilization. By contrasting these components, students can understand the complexity of human nature and society’s evolution. Using technology like the iPad to generate visual representations of the story helps teachers improve student involvement and understanding of these basic subjects.

Given their fundamental understanding of human history, technological development, and environmental interaction, teaching the ideas of “Fire and Cave Men” to K-10 students has great instructional value. Including these subjects in the course will help students better grasp human growth and society’s progression. First, the discovery and application of fire represents a turning point in human history and a major technical development. Early humans could boil food, which enhanced nutrition and health and offered warmth and protection. This helped migration to colder climes by enabling the cooking of food. Using instruction, students might value technology’s role in human survival and growth (Marquette, 2023). Moreover, knowing the usage of fire can promote conversations about energy sources and their environmental effects, therefore tying previous achievements to present world issues (Restaino et al., 2024). Early human history, or Cave Men, explains how civilizations and cultures developed. It sets the stage for discussing the evolution of tools, language, and social systems. Learning about Cave Men can help students investigate the roots of human creativity and problem-solving, which are vital abilities in modern society (Hermanto et al., 2019). As students contemplate the difficulties early people experience and the creativity needed to solve them, this historical viewpoint can help encourage critical thinking and empathy (Lidstone, 2006). Moreover, including these subjects within the K–10 course would improve

Received: September 5, 2024

Accepted: September 30, 2024

Published: October 15, 2024



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multidisciplinary education. For example, lessons on “Fire and Cave Men” may be combined with geography, science, and history to give a complete educational experience that motivates students to link several knowledge domains (Restaino et al., 2024). To be thoroughly aware of human history and technical advancement, teaching the “Fire and Cave Men” to K–10 students is vital. It sharpens critical thinking and problem-solving abilities, enhancing students’ knowledge and arming them for following challenges. This strategy conforms with the educational objectives of producing educated and intelligent people who can value the complexity of human growth and its effects on the planet.

2. Utilizing iPad for Educational Comics

Different studies show the importance of the iPad features in creating instructional comics (Sinha et al., 2011; Amer & Ibrahim, 2014). These benefits cover improved educational efficacy, engagement, accessibility, and creativity. First of all, iPads provide kids with a dynamic and exciting platform. iPads touch interface and multimedia features provide a more immersive experience than conventional comic production techniques. Students may immediately alter graphics, text, and other components straight on the screen, transforming the learning process and increasing student motivation and involvement (Borg, 2019; Sakr, 2019). Such multimedia components as audio and video enhance narrative even more and offer a more complete teaching experience (Araya et al., 2021). iPads also provide significant accessibility advantages. Their portable and user-friendly nature qualifies them for several learning situations, from classrooms to remote learning environments. This mobility guarantees that students may work on their projects anywhere and at any time, promoting ongoing education and creativity (Deaton et al., 2013). iPads also support several apps meant especially for comic production, accommodating varied learning environments and demands, including those of children with impairments (Axford et al., 2018). One other significant benefit of utilizing iPads for instructional comics is creativity. The variety of accessible applications lets students try several artistic approaches and techniques, encouraging innovation and creativity. Drawing, coloring, and layout design are among the techniques that frequently assist students in developing their artistic abilities and learning to transmit complex concepts through visual storytelling (Doak, 2023). Easy editing and iteration made possible by the digital format also inspire students to improve their work and investigate new ideas free from the restrictions of conventional media (Hess & Jung, 2012). From a pedagogical standpoint, including comics in several disciplines helps iPads improve learning. Educational comics help students clarify complex ideas so they may be more readily understood (Amer & Ibrahim, 2014). This graphic method can be effective in disciplines like physics and history, where visual representation can help to understand abstract or detailed knowledge (Reeves et al., 2017). Moreover, the collaborative tools of iPads help students to collaborate on projects, thus fostering communication skills and collaboration (Dashti & Habeeb, 2020). Nonetheless, it is important to recognize some restrictions and difficulties in utilizing iPads for instructional comics. For certain educational institutions, the first cost of iPads and the necessity of technical assistance might be obstacles. Learning the tools and apps accessible for comic production might be linked with mastery of several aspects (Deaton et al., 2013). Notwithstanding these difficulties, adopting iPads in this context has significant advantages as it provides a flexible and efficient instrument for improving educational results using artistic expression. Ultimately, iPads give a strong platform for producing instructional comics and benefits in engagement, accessibility, originality, and pedagogical efficacy. Teachers may improve the learning process by using the special features of iPads, increasing the interactive, inclusive, and efficient nature of education in different settings.

3. Teaching “The Fire and the Cave Men” Through Comics

Storytelling in the classroom has been found to have several advantages, improving emotional and cognitive learning results. Research by Nimatul Khayati shows that by giving contextualized language exposure and exciting narratives that help to acquire vocabulary and understanding, storytelling may significantly improve students’ language skills – especially in non-native speakers – which this is consistent with research by Tan et al., who underlines that narrative creates a more exciting and participatory learning environment that can result in higher student motivation and involvement (Tan et al., 2024). Tyler and Moore discuss how the narrative could help kids develop critical thinking and empathy. By interacting with several stories, students are urged to consider several points of view, thus improving their capacity

to evaluate and relate to them (Tyler & Moore, 2024). Irwin's studies corroborate this as they show that since it lets students emotionally engage with the content, enhancing retention and understanding of storytelling may be an excellent method for teaching complex topics (Irwin, 2024). Mamaeva's research emphasizes how storytelling may help overcome cultural divides, therefore supporting the incorporation of storytelling into education. Storytelling may expose students to cultural settings and beliefs, fostering cultural knowledge and sensitivity (Mamaeva, 2024). This is especially vital in increasingly varied classrooms, where knowledge of and respect for cultural variations is vital. Though the advantages of narrative are well-documented, one should also take certain constraints into account. For example, the topic matter and the learner's age group might affect how well storytelling works. Teachers must also be adept at choosing suitable tales and guiding conversations to optimize the learning value. Narrative is a flexible teaching technique that may improve critical thinking, linguistic ability, empathy, and cultural knowledge. Its effective inclusion into the curriculum calls for a thorough evaluation of the stories used and the setting in which they are presented to guarantee their relevance and appeal to the students.

Long understood as a great teaching technique, storytelling improves engagement, memory, and general learning results. Educators may design immersive and engaging events that inspire students' imagination and critical thinking ability by including storytelling in their teaching. As underlined, the INTERACT Conferences stress the need for inclusive and varied contacts in disciplines, including human-computer interaction, thereby reflecting the cooperative and interdisciplinary character of education as stressed by storytelling. Comparably, the dissertation New Press – discussed by Roberts et al. (2019) – emphasizes the need for invention and ongoing renewal in creating new publishing houses. This idea can help educational environments by trying to include narrative techniques. Teachers may continuously improve their storytelling methods to meet students' evolving needs and interests, thus creating a dynamic and rich learning environment like New Press's approach, which entails beginning afresh with various projects and individuals.

Integrating interactive materials can potentially involve K-10 students in learning environments. Teachers can provide dynamic learning opportunities that fit the digital literacy abilities of modern students by using mobile communication devices interwoven with cognitive language traits (Calzà et al., 2020). These instruments improve knowledge using metaphorical, metonymical, and analogical representations and help interaction with several mobile devices. Furthermore, examining emoticons and emojis emphasizes the need for visual communication in text-based interactions, especially when presenting complex ideas to younger students. Moreover, the development of selfie culture as a means of self-representation (Leishman, 2019) might guide the development of individualized and relevant instructional materials in line with students' inclination for interactive and visual learning environments. Finally, deliberately including these technology developments will improve student involvement and support efficient learning results in K-10 education.

4. Designing Educational Comics with iPad

Creating instructional comics on iPads uses the extraordinary powers of digital media to improve learning environments. Integration of iPads in learning environments has been investigated in several situations, pointing to both possibilities and difficulties. First, iPads capacity to allow interactive and multimodal learning helps justify classroom usage. An instructional iPad app meant for patients with Chronic Hepatitis B, for example, showed notable increases in patient knowledge through interactive images, audio, and text, implying that similar tactics may be pragmatic in educational comics (Ha et al., 2019). This is consistent with studies on instructional comics, which underline how multimodal literacy improves knowledge retention and understanding (Rosas-Blum et al., 2018). Comics are appropriate for iPad applications that can enhance the learning process via interaction and multimedia as they naturally integrate visual and linguistic aspects. iPads have been demonstrated to complement conventional instruments in art and design education as they provide fresh means of expression and creativity. iPads offer a digital palette that fosters creativity and output, improving teaching and learning (Souleles, 2017). This implies that the ability of iPads to combine design and sketching applications might help instructional comics on the device provide dynamic and exciting material (Borg, 2019; Souleles et al., 2015). There are difficulties, nevertheless, in including iPads in classroom environments. Research reveals challenges in incorporating iPads into art and design courses, bringing out a need for careful thought of teaching tactics and the digital-analog balance (Souleles et al., 2015; Souleles et al., 2017).

Teachers' integration of iPads calls for careful digital didactical designs with an eye on productivity, creativity, and teamwork (Jahnke & Kumar, 2014). Designing instructional comics using iPads should thus entail cooperative efforts among teachers, technologists, and students to guarantee that the content is pedagogically sound and exciting. Creating instructional comics should take target audience demands and habits into account. Designing a health education comic book, for instance, required knowledge of parents' coping strategies, emphasizing the need for audience research in producing successful teaching resources (Araya et al., 2021). Likewise, instructional comics on iPads should cater to the intended audience's particular learning requirements and preferences – that of adults, children, or students respectively. Ultimately, creating instructional comics with iPads presents a viable method to improve learning using interactive, multimodal materials. The success of such programs hinges on using the iPad's potential for creativity and engagement, overcoming pedagogical problems, and customizing material to the audience's requirements. Combining ideas from several educational environments can help teachers and designers produce successful and attractive instructional comics that leverage the advantages of digital media.

Customizing characters and locations to effectively engage young learners is essential in improving the educational experience for K-10 children using comics created on iPads teaching “The Fire and the Cave Men.” As underlined in (Jean et al., 2023), the need for inclusive design in presenting health data by wearable devices highlights the need for customizing user feedback to guarantee accessibility and involvement. HCI also underlines the need for inclusivity and diversity, implying that a rich interdisciplinary environment results from different backgrounds and interests. By combining these ideas, teachers may understand the requirement of multiple representations and feedback systems in instructional resources, including comics, to handle several learning styles and capacities. Customizing characters and environments in these comics can help improve understanding and recall of the narrative, thereby enabling more effective instruction of “The Fire and the Cave Men” for a broad spectrum of students.

5. Method and Results

Epigrammatically, the research method employed in this study involves a practical educational project with Grade 4 students. The students, who had prior knowledge from Grade 3 about the Paleolithic Age, engaged in creating comics using iPads and the Pages app. This method integrates individual and group work over a school year, allowing students to explore the theme “Fire & the people of the Caves” through visual storytelling. The approach emphasizes using technology, creativity, and environmental education to foster a comprehensive learning experience.

The 25 students of the 4th Grade, having already been taught in the History of the 3rd Grade the course “Paleolithic Age” about “Fire & Cave Men” and on the occasion of the course “Nature is our home: Natural Environment and Protection” in Environmental Study of the 4th Grade, they dealt with the theme “Fire & the people of the Caves”. Students have been working individually and in groups for a school year and have been taught a variety of topics using iPads one to one. Using Apple's Pages app, using color paintings (Korinth, 2024), create their comics with the characters and the text they like (Figure 1).

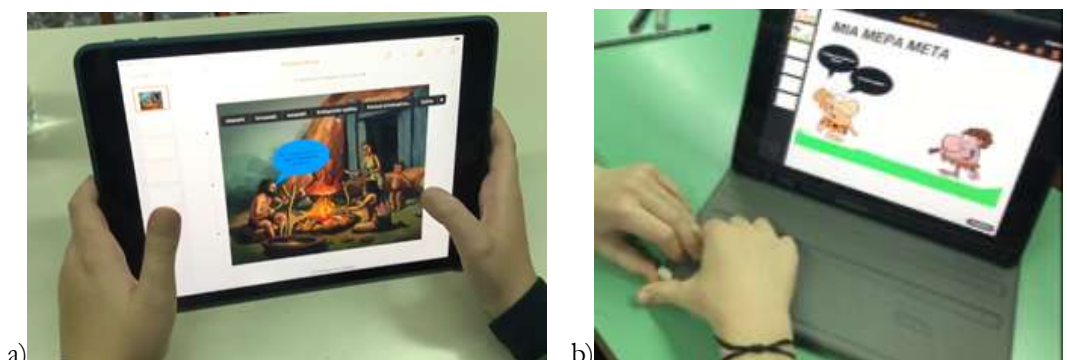


Figure 1. Choosing characters for the comic for iPad.

Source: Authors' own development.

Having their texts and dictation helped them quickly and correctly write the text they

wanted on Pages (Figures 3 & 4). Thus, everyone created their comic on the theme “Fire & Cave Men,” and each presented it to the plenary.



Figure 2. Dictate the text with the help of Pages.
Source: Authors’ own development.

The fourth-grade kids’ comic book creation on “Fire and Cave Men” utilizing iPads and the Pages tool fits numerous instructional approaches emphasized in the given study environments. This method combines environmental education, innovation, and technology to provide a complete learning environment. First of all, the results of Wu & Chen (2020), which underline the advantages of including digital resources in education, match employing digital tools like iPads and the Pages application for producing comics.

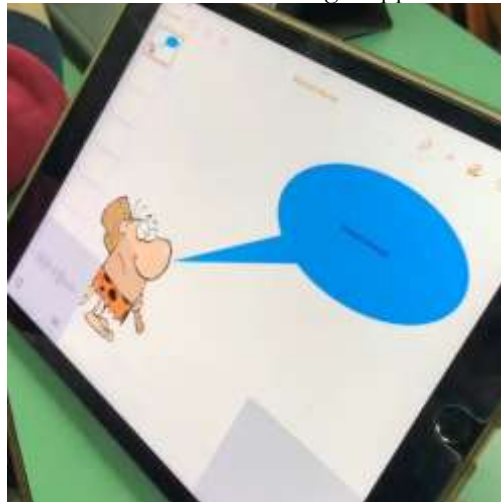


Figure 3. The voice message is written.
Source: Authors’ own development.

Making podcasts in a history course lets students interact creatively and hone technological abilities; the comic book project lets students share their knowledge of historical and environmental issues via contemporary media (Burd, 2023). This approach improves participation and enables students to acquire multiliteracies—qualities vital in the digital age. Furthermore, the initiative captures, as covered by (Wu & Chen, 2020), the educational worth of the narrative.

Whether via podcasts or comics, narrative is an excellent technique for tying students into historical and environmental tales and developing a closer awareness of the subject matter (Burd, 2023). By creating tales about Fire and Cavemen, students will become closer to the content and improve their recall and comprehension. As Korinth (2024) reports, the incorporation of art in environmental education promotes the method of the project even more.

Using art to express environmental issues can help students develop their connection to nature and inspire pro-environmental attitudes (Ison & Bramwell-Lalor, 2023). In the comic

book project, students utilized visual storytelling to investigate the link between humans and fire, an essential part of nature that may inspire more respect for natural processes and historical settings. Furthermore, in line with the results of (Kuo et al., 2019), which underline the need to experience learning in natural surroundings, the project Though the comic book project is digital, it motivates students to consider natural aspects and historical human relationships with the environment, therefore fostering an ecological perspective (Patel & Ehrenzeller, 2023).

Understanding the interdependence of human activities and environmental effects will enable students to grow in stewardship and relational justice as advised by Hindhede and Saavedra (2024).

Nonetheless, as advised by (To & Grierson, 2024), which underlines the need for multi-sensory experiences in connecting children with nature, the initiative might profit by including more direct encounters with the environment. Although the digital format gives creative flexibility, adding outside activities to complement it might help students appreciate and comprehend natural surroundings better. Finally, the comic book project creates a learning experience by skillfully combining digital literacy, narrative, and environmental education. Combining innovation and technology fits modern teaching approaches stressing interaction, critical thinking, and a connection to nature. Direct natural encounters might help future projects to improve the educational value.

Based on the Focus Group approach questions (Rabiee, 2004), it became clear that every student prefers to be taught this way. Many students wanted to apply this teaching approach in other disciplines, including language, history, and courses in skills development. Apart from concerns about working with their classmate and splitting them into groups, the students also mentioned that it was a means of cooperation with their peers, sharing ideas, and reaching decisions. The way the group's results are presented in the plenary impresses the students; nonetheless, other students who want to speak, display their knowledge, and develop their points of view are evident. Most students requested another time for the current instruction about whether the hour was sufficient. Regarding the last question on contrasting iPad and conventional instruction, every student favored iPad instruction.

6. Conclusions

Including iPads for making educational comics offers a fresh and creative way to teach complex ideas like “The Fire and the Cave Men” to K-10 students. Students’ creativity and storytelling abilities will improve if they directly dictate their ideas and dialogues using an iPad as a voice assistant. This interactive technique encourages involvement and helps to provide a more customized learning environment. Including instructional comics in the syllabus also provides a visually appealing means of efficiently delivering knowledge to students of all ages and learning backgrounds. Studies have indicated that visual aids help to increase understanding and memory of content. Hence, the iPad is an excellent tool for teachers to change their approaches. Moreover, mixing technology with conventional narrative helps students to develop their critical thinking, solve problems, and work creatively, thus promoting a closer knowledge of the topic.

Studies have shown the significant influence of including comics in curricula, especially when talking with K-10 kids on complex subjects like the philosophical ramifications of Plato’s “The Fire and the Cave Men.” Comics have the unique power to graphically depict abstract ideas interestingly and understandably for readers of different backgrounds. By turning thick philosophical books into visually appealing stories, teachers may grab students’ interest and help them to have a closer knowledge of the content. Comics have also been demonstrated to improve student’s critical thinking abilities as they force them to examine and understand written and visual material concurrently. Comics in the classroom may also help students remember material. Hence, they are a great medium for introducing difficult philosophical ideas to younger students.

Rapid technological development will have significant future consequences on how education incorporates it. Research results (Neiffer, 2018) on using intelligent personal assistants in school science classrooms help clarify the possible advantages and difficulties of using such instruments to improve student involvement. Knowing how Grades 3–8 children naturally incorporate technology into their lives gives teachers who want to use these digital habits great insight into how best to guide their teaching. Teachers may design creative lessons that fit the several learning styles of today’s tech-savvy youth by realizing and using students’ digital integration. Parents and teachers must welcome student-owned technology in the

classroom and create a learning environment that supports project-based learning chances and teamwork, so arming children with the tools they need to flourish in a world going more and more digital.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.


References

- Amer, H., & Ibrahim, W. (2014). Using the iPad as a pedagogical tool to enhance the learning experience for novice programming students. In *2014 IEEE Global Engineering Education Conference (EDUCON)* (pp. 178-183). <https://doi.org/10.1109/EDUCON.2014.6826087>
- Araya, B., Pena, P., & Leiner, M. (2021). Developing a health education comic book: the advantages of learning the behaviours of a target audience. *Journal of Visual Communication in Medicine*, *44*(3), 87–96. <https://doi.org/10.1080/17453054.2021.1924639>
- Axford, C., Joosten, A. V., & Harris, C. (2018). iPad applications that required a range of motor skills promoted motor coordination in children commencing primary school. *Australian Occupational Therapy Journal*, *65*(2), 146-155. <https://doi.org/10.1111/1440-1630.12450>
- Borg, M. (2019). It's Not For Real: The Tablet as Palette in Early Childhood Education. *International Journal of Education & the Arts*, *20*(14). <http://doi.org/10.26209/ijea20n14>
- Burd, C. (2023). The Nature of Illinois: Storytelling, Podcasts, and the Classroom. *Agricultural History*, *97*(4), 662-666. <https://doi.org/10.1215/00021482-10795975>
- Calzà, L., Gagliardi, G., Rossini Favretti, R., & Tamburini, F. (2020). Linguistic features and automatic classifiers for identifying mild cognitive impairment and dementia. *Computer Speech & Language*, *65*, 101113. <https://doi.org/10.1016/j.csl.2020.101113>
- Dashti, F. A., Habeeb, K. M. (2020). Impact of Shared iPads on Kindergarten Students' Collaboration and Engagement in Visual Storytelling Activities. *Early Childhood Education Journal*, *48*, 521–531. <https://doi.org/10.1007/s10643-020-01018-8>
- Deaton, C. C. M., Deaton, B. E., Ivankovic, D., & Norris, F. A. (2013). Creating Stop-Motion Videos with iPads to Support Students' Understanding of Cell Processes: 'Because You Have to Know What You're Talking about to Be Able to Do It?'. *Journal of Digital Learning in Teacher Education*, *30*(2), 67–73. <https://doi.org/10.1080/21532974.2013.10784729>
- Doak, L. (2023). Rethinking the contributions of young people with learning disabilities to iPad storymaking: A new model of distributed authorship. *Literacy*, *57*(3), 315–326. <https://doi.org/10.1111/lit.12317>
- Ha, P., Hean, R., Tang, P., Choy, A., Thakur, U., & Dev, A. (2019). Implementation of an Educational iPad Application for Patients With Chronic Hepatitis B. *Frontiers in Public Health*, *7*, 498052. <https://doi.org/10.3389/fpubh.2019.00372>
- Hermanto, I. M., Muslim, M., Samsudin, A., & Maknun, J. (2019). K-10 students' conceptual understanding on Newton's laws: current and future directions. *Journal of Physics: Conference Series*, *1280*(5), 052059. <https://doi.org/10.1088/1742-6596/1280/5/052059>
- Hess, S., & Jung, J. (2012). Does the iPad add value to business environments? In *Chi'12 extended abstracts on human factors in computing systems* (pp. 335-350). <https://doi.org/10.1145/2212776.2212813>
- Hindhede, K. M., & Saavedra, A. R. (2024). We all need to be water protectors: diversity, the environment, and social and environmental justice picturebook themes and portrayals. *Environmental Education Research*, *30*(7), 1093–1114. <https://doi.org/10.1080/13504622.2023.2297156>
- Irwin, B. (2024). Smartphones as pedagogical tools: Transforming analog classrooms through digital storytelling. In *Smartphones as pedagogical tools* (pp. 32-41). <https://jaltcall.org/wp-content/uploads/2024/04/4-Irwin.pdf>
- Ison, M., & Bramwell-Lalor, S. (2023). The arts in environmental education: connecting learners with their talents and nature. *Environmental Education Research*, *29*(7), 964–979. <https://doi.org/10.1080/13504622.2023.2205062>
- Jahnke, I., & Kumar, S. (2014). Digital Didactical Designs: Teachers' Integration of iPads for Learning-Centered Processes. *Journal of Digital Learning in Teacher Education*, *30*(3), 81–88. <https://doi.org/10.1080/21532974.2014.891876>
- Jean, P., Murphy, E., Bates, E. (2023). Accessibility of Health Data Representations for Older Adults: Challenges and Opportunities for Design. In C. Stephanidis, M. Antona, S. Ntoa, G. Salvendy (eds) *HCI 2023. Communications in Computer and Information Science*, vol 1833. (pp. 486-493) Springer, Cham. https://doi.org/10.1007/978-3-031-35992-7_65
- Korinth, B. (2024). Using paintings to teach about the impact of environmental hazards. *Environmental Hazards*, 1–13. <https://doi.org/10.1080/17477891.2024.2358043>
- Kuo, M., Barnes, M., & Jordan, C. (2019). Do Experiences With Nature Promote Learning? Converging Evidence of a Cause-and-Effect Relationship. *Frontiers in psychology*, *10*, 305. <https://doi.org/10.3389/fpsyg.2019.00305>
- Leishman, D. (2019). Perceptual fail: Female power, mobile technologies and images of self. In *ELO 2019: Peripheries Conference and Media Arts Festival*, 15-17th July 2019, University College Cork, Cork. <https://cora.ucc.ie/handle/10468/8128>
- Lidstone, J. (2006). Blazer to the Rescue! The Role of Puppetry in Enhancing Fire Prevention and Preparedness for Young Children. *Australian Journal of Emergency Management*, *21*(2), 17-28.
- Mamaeva, K. U. (2024). Transmedia storytelling in education. In *Education, innovation, research as a resource for community development* (pp. 22-25). Cheboksary: PH "Sreda". <https://doi.org/10.31483/r-112269>
- Marquette, D. (2023). Integrating Climate and Wildfire Education in the Classroom: Development and Implementation of K-12 Place-Based Wildfire Educational Modules. Boise State University Theses and Dissertations. <https://doi.org/10.18122/td.2117.boisestate>
- Neiffer, J. P., (2018). Intelligent personal assistants in the classroom: Impact on student engagement. Graduate Student Theses, Dissertations, & Professional Papers. <https://scholarworks.umt.edu/etd/11241>
- Patel, J., & Ehrenzeller, C. (2023). Nature as a peace educator: Toward inner peace through learning and being in natural environments. *The Journal of Environmental Education*, *54*(5), 294–305. <https://doi.org/10.1080/00958964.2023.2261389>

- Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society*, 63(4), 655–660. <https://doi.org/10.1079/PNS2004399>
- Reeves, J. L., Gunter, G. A., & Lacey, C. (2017). Mobile learning in pre-kindergarten: Using student feedback to inform practice. *Journal of Educational Technology & Society*, 20(1), 37–44. <http://www.jstor.org/stable/jeductechsoci.20.1.37>
- Restaino, C., Eusden, S., & Kay, M. (2024). Taking the next step in wildfire education: Integrating multiple knowledge forms into co-produced high school fire science curricula. *Fire Ecology*, 20(1), 1-12. <https://doi.org/10.1186/s42408-024-00296-6>
- Rosas-Blum, D. E., Granados, H. M., Mills, B. W., & Leiner, M. (2018). Comics as a Medium for Parent Health Education: Improving Understanding of Normal 9-Month-Old Developmental Milestones. *Frontiers in Pediatrics*, 6, 395001. <https://doi.org/10.3389/fped.2018.00203>
- Sakr, M. (2019). Young children drawing together on the iPad versus paper: How collaborative creativity is shaped by different semiotic resources. *International Journal of Education & the Arts*, 20(20). Retrieved from <http://doi.org/10.26209/ijea20n20>
- Sinha, I., Patel, A., Kim, F. S., MacCorkle, M. L., & Watkins, J. F. (2011). Comic Books Can Educate Children About Burn Safety in Developing Countries. *Journal of Burn Care & Research*, 32(4), e112-e117. <https://doi.org/10.1097/BCR.0b013e3182223c6f>
- Souleles, N. (2017). iPad versus traditional tools in art and design: A complementary association. *British Journal of Educational Technology*, 48(2), 586–597. <https://doi.org/10.1111/bjet.12446>
- Souleles, N., Savva, S., Watters, H., & Annesley, A. (2017). Perceptions of art and design faculty on the instructional value of iPads. *Technology, Pedagogy and Education*, 26(2), 211–223. <https://doi.org/10.1080/1475939X.2016.1199390>
- Souleles, N., Savva, S., Watters, H., Annesley, A., & Bull, B. (2015). A phenomenographic investigation on the use of iPad s among undergraduate art and design students. *British Journal of Educational Technology*, 46(1), 131–141. <https://doi.org/10.1111/bjet.12132>
- Tan, K. H., Ngoi, S., Yunos, N., Alias, J., & Mat, N. (2024). Tales in tech: Understanding educational impact and challenges of digital storytelling. *Conhecimento & Diversidade*, 16(42), 617-642. <https://doi.org/10.18316/rcd.v16i42.11779>
- To, P. T. & Grierson, D. (2024), A study on children’s multi-sensorial experiences of nature: design approaches and preferences for primary school architecture case studies in Glasgow, Scotland, UK. *International Journal of Architectural Research*, 18(2), 225-246. <https://doi.org/10.1108/ARCH-02-2023-0053>
- Tyler, C., & Moore, S. (2024). Storytelling to ignite learning. *Journal of Yuriy Fedkovych Chernivtsi National University. Germanic Philology*, 848, 149-161. <https://doi.org/10.31861/gph2024.848.149-161>
- Wu, J., & Chen, D. V. (2020). A systematic review of educational digital storytelling. *Computers & Education*, 147, 103786. <https://doi.org/10.1016/j.compedu.2019.103786>

Opinion Article

ChatGPT as Teacher Assistant for Physics Teaching

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Abstract: This study explores the integration of ChatGPT as a teaching assistant in physics education, emphasizing its potential to transform traditional pedagogical approaches. ChatGPT facilitates interactive and inquiry-based learning grounded in constructivist learning theory, allowing students to engage actively in experiments and better grasp abstract concepts through hands-on activities. The AI's adaptive dialogue systems promote socio-constructivist learning by encouraging social inter-action and personalized feedback, which is essential for addressing individual learning gaps and enhancing student engagement. The ability of ChatGPT to simulate real-world physics problems and provide immediate feedback fosters experiential learning, making complex concepts more accessible and promoting critical thinking skills. By offering tailored interventions and adapting to individual learning paces, ChatGPT supports a personalized educational experience that caters to the unique needs of each student. This adaptability is particularly beneficial in physics education, where students often struggle with abstract concepts and require immediate clarification to progress effectively. The paper concludes that the synthesis of generative AI and pedagogy has the potential to reshape science education, fostering deeper understanding and curiosity among students. By leveraging innovative methodologies and augmented data, ChatGPT enriches teacher-student interactions, creating a comprehensive educational experience that promotes a culture of curiosity and exploration, thereby nurturing future scientists and engineers. Ultimately, the integration of ChatGPT into physics education offers a valuable opportunity to enhance student engagement and understanding of scientific concepts through interactive and personalized support.

Keywords: ChatGPT; physics education; interactive learning; AI integration

1. Introduction

Integrating technology into teaching practices has become increasingly vital in contemporary educational contexts, particularly science education. One innovative approach harnesses the capabilities of artificial intelligence, specifically ChatGPT, to serve as a teaching assistant in physics classrooms. This utilization enhances student engagement through interactive experiments and bridges the gap between abstract theoretical concepts and tangible, hands-on learning experiences. By employing ChatGPT, educators can provide personalized guidance and support tailored to the unique learning styles of individual students, fostering a more inclusive educational environment. The immediate feedback mechanism can stimulate inquiry-based learning (Pishtari et al., 2023), encouraging students to explore, question, and experiment beyond the traditional curriculum boundaries. Thus, the potential of ChatGPT transcends mere information delivery, positioning it as a dynamic facilitator of experiential learning in science education.

Integrating ChatGPT into educational environments, particularly as a teaching assistant for physics, presents a promising avenue for enhancing student engagement and learning outcomes. By leveraging advanced natural language processing capabilities, ChatGPT can interact with students in real-time, offering clarification, responding to queries, and providing tailored feedback on experiments conducted in the classroom (Samara & Kotsis, 2024). This interactive element democratizes access to information and fosters a collaborative learning atmosphere, encouraging students to explore physics concepts inquisitively. The adaptability of ChatGPT allows it to cater to diverse learning styles and paces, ensuring that all students can benefit from its support. While the potential advantages are significant, it is essential to

Received: September 5, 2024

Accepted: October 5, 2024

Published: October 15, 2024



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address inherent limitations, such as the risk of providing misleading information or inadvertently stifling critical thinking skills. These concerns necessitate careful consideration and strategic implementation (Sidiropoulos & Anagnostopoulos, 2024).

Understanding the theoretical framework within which ChatGPT operates as a physics teaching assistant is pivotal for evaluating its efficacy in engaging students. Central to this framework is constructivist learning theory (Bada & Olusegun, 2015), which posits that knowledge is constructed through interactive experiences rather than passively received through traditional instruction. ChatGPT adaptive dialogue systems facilitate this interaction by encouraging students to participate actively in experiments, reflecting that learners better grasp abstract concepts through hands-on activities and inquiry-based learning (Trnova & Trna, 2017). Additionally, socio-constructivist elements within this framework emphasize the importance of social interaction in learning (Ibañez & Pentang, 2021). ChatGPT can simulate peer-to-peer engagement through its conversational capabilities, thus fostering a collaborative learning environment that enhances comprehension and retention (Redish & Vicentini, 2004). Ultimately, grounding the utilization of ChatGPT in these educational theories provides a robust rationale for its integration into physics teaching, highlighting its potential to offer personalized and engaging learning experiences for young students.

This study's research method is a critical review of the existing literature, which includes suggesting uses of ChatGPT in physics teaching. It also discusses the integration of ChatGPT in educational settings, suggesting an exploratory approach to understanding its impact on physics teaching. The focus is leveraging ChatGPT's capabilities to enhance student engagement and understanding through interactive and personalized learning experiences.

2. Capabilities of ChatGPT as a Teaching Assistant

Leveraging ChatGPT as a teaching assistant introduces a transformative approach to pedagogy, especially in science education. By facilitating personalized learning experiences, ChatGPT can adapt its responses to cater to diverse student needs, promoting engagement through interactive dialogues (Abas et al., 2023). This adaptability is critical in maintaining interest in complex subjects such as physics, which often challenges young learners. Furthermore, ChatGPT can assist in designing and executing simple experiments, providing clear, step-by-step instructions that align with age-appropriate learning objectives (Kotsis, 2024a). The immediacy of feedback offered through this technology fosters a dynamic learning environment, enabling students to ask questions and receive answers in real-time. By cultivating inquiry-based learning, ChatGPT supports the development of scientific reasoning skills, ultimately encouraging students to explore and understand fundamental physics concepts in a meaningful context (Kotsis, 2024b). In addition to enhancing student engagement, ChatGPT is a resource for educators, streamlining lesson planning and facilitating differentiated instruction. Teachers can utilize ChatGPT to generate creative experiment ideas that align with curriculum standards, saving valuable time and ensuring that student needs are met effectively. Furthermore, the AI can offer supplementary materials, such as quizzes or discussion prompts, which help to reinforce learned concepts and assess student comprehension (Chen et al., 2023). The potential for ChatGPT to serve as a collaborative partner in the educational process not only supports teachers in fostering curiosity and creativity among students but empowers them to adopt more innovative teaching methods. Thus, ChatGPT contributes significantly to the educational ecosystem by bridging the gap between technology and pedagogy, ultimately enriching the learning experience for both teachers and students (Farley, 2004). The integration of ChatGPT into education stands to reshape how students approach subjects such as physics, instilling a sense of wonder and inquiry from an early age. It invites students to experiment with ideas as an interactive platform, fostering an environment where exploration and creativity are paramount. This ability to stimulate curiosity is essential in physics, which can seem distant or intimidating to young learners. By utilizing ChatGPT to demystify scientific principles through relatable experiments and engaging discussions, educators can cultivate a more profound appreciation for the subject matter (Kotsis, 2024a). Ultimately, the incorporation of ChatGPT as a teaching assistant reflects a commitment to enhancing educational opportunities by leveraging technology to create interactive, supportive, and innovative learning experiences that resonate with the interests and capabilities of students.

The potential for customization in educational contexts has gained substantial traction, mainly through interactive dialogue, which can significantly enhance student engagement and learning outcomes. By utilizing AI-driven dialogue systems like ChatGPT, educators can tailor

learning experiences to individual student's unique needs and interests, fostering an adaptive learning environment (Kotsis, 2024c). This approach mirrors findings from research that underscore the role of dialogic interactions in concept acquisition, whereby adults facilitate learning by engaging with children's interests even when their verbal contributions are limited (Myklebust & Fagerbakke, 2024). Such customization supports higher engagement and cultivates a sense of agency among learners. Furthermore, humor and empathy incorporated into dialogues can make learning more relatable and enjoyable, addressing the emotional dimensions of education, which are often overlooked (Zhai et al., 2024). Thus, integrating interactive dialogue into learning experiences personalizes education and actively motivates students, positioning them as key participants in their learning journeys.

The immediacy of real-time feedback during experiments is essential in enhancing students' learning experience (Alrashidi et al., 2017). By utilizing advanced technologies, such as ChatGPT, educators can offer instant insights that guide students through their exploratory physics experiments. This interactive support facilitates a deeper understanding of complex concepts by allowing learners to address misconceptions as they arise rather than waiting for post-experiment evaluations. For instance, when students observe an unexpected result, immediate feedback can help them analyze their hypothesis and experimental setup effectively, fostering critical thinking skills essential in scientific inquiry. Furthermore, persistent support promotes engagement and reduces frustration, allowing students to develop resilience in overcoming experimental challenges. By merging real-time assistance with hands-on experiments, students not only grasp theoretical concepts more firmly but also cultivate a genuine interest in the scientific process itself, underscoring the transformative potential of technology in education (Walker, 2024).

3. Benefits of the ChatGPT as Teacher Assistant for Physics Education

When the Physics teacher uses the ChatGPT during his teaching, there are several benefits. The following paragraphs describe them.

3.1. ChatGPT Integrates with Hands-on Experiments

Integrating ChatGPT with hands-on experiments in physics education can significantly enhance students' understanding of complex concepts by combining interactive digital tools with experiential learning. This approach leverages artificial intelligence's (AI) strengths in providing personalized, immediate feedback and explanations while maintaining the tangible benefits of hands-on experimentation. Firstly, ChatGPT can serve as an interactive tutor that complements physical experiments (Wang, Burkholder et al., 2024). It can provide real-time explanations and answer students' questions while conducting experiments, helping them understand the underlying physics principles. For instance, when students experiment on gravity, ChatGPT can explain the concept of gravitational force and its effects on different objects, thus reinforcing theoretical knowledge with practical experience (Liang et al., 2023). ChatGPT can facilitate a deeper engagement with the material by encouraging inquiry-based learning. It can prompt students to make predictions, hypothesize outcomes, and reflect on their observations during experiments (Santos, 2023). This aligns with the constructivist approach to learning, where students build knowledge through active exploration and reflection (Lee & Zhai, 2024). ChatGPT can guide students to discover answers independently by asking probing questions and providing hints, fostering critical thinking and problem-solving skills (Kieser et al., 2024). Additionally, ChatGPT can be integrated into the classroom as a tool for differentiated instruction (Kotsis, 2024a). It can adapt its responses based on the individual student's level of understanding, offering more detailed explanations or simplified concepts as needed. This personalized approach ensures that all students can grasp complex physics concepts effectively, regardless of their initial proficiency (Bruneau et al., 2023). The integration of ChatGPT with hands-on experiments can enhance collaborative learning. Students can work in groups to conduct experiments and use ChatGPT to discuss their findings and interpretations. This collaborative environment encourages peer learning and communication skills as students articulate their understanding and challenge each other's ideas with the support of AI (Bitzenbauer, 2023). However, there are challenges and limitations to consider. The effectiveness of ChatGPT in educational settings depends on the quality of its training data and its ability to provide accurate and contextually appropriate responses. Teachers must ensure that AI is used as a supplementary tool rather than a replacement for human instruction, maintaining a balance between digital and traditional

teaching methods (Kotsis, 2024b; Wang, Burkholder et al., 2024a). In conclusion, integrating ChatGPT with hands-on experiments offers a promising approach to enhancing students' understanding of physics concepts. By providing real-time support, fostering inquiry-based learning, and enabling personalized instruction, ChatGPT can significantly enrich the educational experience. However, careful implementation and ongoing evaluation are essential to maximize its benefits and address potential limitations. This integration supports the development of scientific literacy and prepares students for a future where digital literacy is increasingly important.

3.2. ChatGPT Simulates Virtual Physics Experiments

To effectively simulate virtual physics experiments, ChatGPT can leverage several strategies based on insights from the provided research abstracts. Integrating advanced natural language processing (NLP) capabilities with physics simulation frameworks is crucial. ChatGPT can utilize its NLP strengths to interpret user queries and provide detailed explanations of physics concepts, which is essential for setting up and understanding virtual experiments (Kotsis, 2024a). One approach is incorporating existing physics engines and simulation software into the ChatGPT framework. This integration allows ChatGPT to describe and execute simulations, providing users with interactive and visual representations of physical phenomena. Such a system can enhance learning by allowing users to manipulate variables and observe outcomes in real time, thereby deepening their understanding of complex concepts (Kotsis, 2024b). Moreover, ChatGPT can be programmed to simulate a wide range of physics experiments by accessing a database of pre-defined scenarios and parameters. This capability can be expanded by using machine learning algorithms to predict outcomes based on historical data and user inputs, thus offering personalized and adaptive learning experiences (Hettiarachchilagea & Haldolaarachchige, 2023). Virtual reality (VR) and augmented reality (AR) technologies can further enhance the simulation experience. By integrating these technologies, ChatGPT can provide immersive environments where users can interact with virtual objects and experiments as if they are real, thereby increasing engagement and retention of information (Hettiarachchilagea & Haldolaarachchige, 2023). However, there are limitations to consider. The accuracy of simulations depends heavily on the quality of the underlying physics models and data. Ensuring that these models are up-to-date and validated is essential for reliable simulations. Additionally, the computational resources required for real-time simulations can be significant, necessitating efficient algorithms and cloud-based solutions to manage the load (West, 2023). ChatGPT can effectively simulate virtual physics experiments by integrating NLP with physics engines, utilizing machine learning for adaptive learning, and incorporating VR/AR for immersive experiences. These strategies, while promising, require careful consideration of model accuracy and computational efficiency to ensure effective and reliable simulations.

3.3. The Interactive Features of ChatGPT in Physics Education

ChatGPT can offer a range of interactive features for physics education, enhancing both engagement and understanding among students. One of the primary features is the ability to simulate physics experiments and phenomena, allowing students to visualize complex concepts dynamically and interactively. This capability is highlighted by Kotsis, who emphasizes the potential of AI-driven platforms to create immersive learning environments that can adapt to individual learning paces and styles (Kotsis, 2024b; Kotsis, 2024c). Furthermore, ChatGPT can facilitate personalized learning experiences by providing tailored feedback and explanations based on students' specific queries and misconceptions. This adaptability is crucial in physics education, where students often struggle with abstract concepts and require immediate clarification to progress effectively (Liang et al., 2023). Liang et al. (2023) discuss how AI can identify learning gaps and offer targeted interventions, enhancing learning. Another interactive feature is the integration of problem-solving exercises that can be adjusted in real-time based on student performance. This feature helps reinforce theoretical knowledge and develop critical thinking and problem-solving skills, essential in physics (Santos, 2023). Santos' research (2023) supports using AI in creating adaptive learning paths that respond to student inputs, ensuring that learners remain engaged and challenged at appropriate levels. Moreover, ChatGPT can support collaborative learning by facilitating discussions and group problem-solving activities. This is particularly beneficial in physics education, where peer interaction can lead to deeper understanding and retention of concepts. Bruneau et al. highlight the role of AI in fostering collaborative environments that encourage students to share ideas and solutions, thus promoting a more interactive and

participatory learning experience (Bruneau et al., 2023). ChatGPT can significantly enhance physics education through interactive simulations, personalized feedback, adaptive problem-solving exercises, and collaborative learning opportunities. These features make learning more engaging and cater to diverse learning needs, ultimately improving educational outcomes in physics.

3.4. The Enhancement of ChatGPT to the Interactive Understanding of Physics Concepts

ChatGPT enhances the understanding of physics concepts interactively by providing a dynamic and engaging learning environment that leverages its natural language processing capabilities. According to Kotsis, ChatGPT can simulate interactive dialogues that allow students to explore physics concepts through question-and-answer sessions, which can help clarify complex ideas and promote deeper understanding (Kotsis, 2024a). This interactive approach is particularly beneficial in physics education, where conceptual understanding is often challenging due to the abstract nature of the subject matter. Furthermore, Mustofa et al. highlight that ChatGPT can serve as a virtual tutor, offering personalized feedback and explanations tailored to the learner's level of understanding (Mustofa et al., 2024). This adaptability ensures that students receive the appropriate level of challenge and support, which is crucial for effective learning. ChatGPT's ability to provide instant feedback and alternative explanations can help students overcome misconceptions and reinforce correct understanding. Kotsis also notes that ChatGPT's interactive capabilities can be integrated into existing educational platforms, enhancing traditional teaching methods with AI-driven interactivity (Kotsis, 2024c). This integration allows for a blended learning experience where students can benefit from human instruction and AI assistance, potentially leading to improved educational outcomes. Kazi and Sayyad's research suggests that using AI tools like ChatGPT in education can increase student engagement and motivation by making learning more interactive and less intimidating (Kazi & Sayyad, 2024). The conversational nature of ChatGPT can reduce the fear of making mistakes, encouraging students to explore and experiment with physics concepts without the pressure of formal assessment. However, Kay points out potential limitations, such as the need for careful moderation to ensure that the information provided by ChatGPT is accurate and aligned with educational standards (Santos, 2023). While ChatGPT can enhance learning, it is essential to complement its use with human oversight to address inaccuracies and provide context-specific guidance. ChatGPT enhances the understanding of physics concepts interactively by offering personalized, engaging, and adaptive learning experiences. Its integration into educational settings can complement traditional teaching methods, although it requires careful implementation to ensure accuracy and effectiveness.

3.5. ChatGPT Creates Personalized Physics Learning Experiences

ChatGPT can potentially create personalized physics learning experiences for students, as evidenced by several research findings. The ability of AI models like ChatGPT to tailor educational content is supported by their capacity to process and generate human-like text, which can be adapted to individual learning needs and preferences. Firstly, the adaptability of AI in educational settings is highlighted by Gouia-Zarrad and Gunn, who discuss the potential of AI to enhance learning by providing personalized feedback and adapting to the learner's pace and style (Gouia-Zarrad & Gunn, 2024). This adaptability is crucial in physics education, where students often require tailored explanations and problem-solving strategies to grasp complex concepts. Moreover, Kotsis emphasizes the role of AI in facilitating interactive learning environments. AI can simulate real-world physics problems, allowing students to engage in experiential learning, a key component of personalized education (Kotsis, 2024b). This inter-active capability can help students understand abstract physics concepts through practical application, enhancing their learning experience. Achour et al. (2024) further support the use of AI in education by highlighting its ability to analyze student performance data to identify learning gaps and provide targeted interventions. This data-driven approach enables ChatGPT to offer personalized learning paths, ensuring that students receive the support they need to overcome specific challenges in physics. However, there are limitations to consider. Adel et al. point out that while AI can offer personalized content, it may lack the nuanced understanding of human educators, particularly in addressing the emotional and motivational aspects of learning (Adel et al., 2024). This limitation suggests that while ChatGPT can enhance personalized learning, it should ideally be used with human educators to provide a comprehensive educational experience. Also, Kotsis notes the importance of continuous updates and improvements to AI models to ensure they remain practical and relevant in

educational contexts (Kotsis, 2024a). This ongoing development is essential for maintaining the quality and personalization of learning experiences provided by ChatGPT. In conclusion, ChatGPT can create personalized physics learning experiences by leveraging its adaptability, interactive capabilities, and data-driven insights. However, its effectiveness is maximized when used alongside human educators and with regular updates to its algorithms.

3.6. ChatGPT Provides Real-time Feedback during Experiments

ChatGPT can provide real-time feedback during experiments in several ways, leveraging its natural language processing and data analysis capabilities. According to Tyni et al., ChatGPT can be integrated into experimental setups to offer immediate responses to user queries, helping researchers troubleshoot issues as they arise. This real-time interaction can enhance the efficiency of experiments by reducing downtime and facilitating a smoother workflow (Tyni et al., 2024). Kotsis highlights that ChatGPT's ability to process and analyze large datasets quickly allows it to offer insights and suggestions based on the data generated during experiments. This capability can be instrumental in identifying patterns or anomalies that may not be immediately apparent to human researchers, thus providing valuable feedback that can guide the direction of ongoing experiments (Kotsis, 2024b). Speer et al. discuss the potential of ChatGPT to assist in hypothesis testing by providing real-time feedback on experimental design and methodology. By evaluating the experimental setup against existing literature and data, ChatGPT can suggest modifications or improvements that could enhance the validity and reliability of the results. This proactive feedback mechanism can be crucial in refining experimental approaches and ensuring robust outcomes (Speer et al., 2024). Zhang et al. emphasize the role of ChatGPT in facilitating collaborative research environments. By acting as a mediator in discussions, ChatGPT can provide real-time feedback that synthesizes input from multiple researchers, helping to align experimental goals and methodologies. This collaborative feedback can lead to more cohesive and coordinated experimental efforts (Zhang et al., 2024). Finally, Cao and Zhong note that ChatGPT can be programmed to monitor experimental parameters continuously, alerting researchers to deviations from expected outcomes. This real-time monitoring and feedback can prevent potential errors and ensure that experiments remain on track, thereby improving the overall quality and reliability of the research process (Cao & Zhong, 2023). ChatGPT's ability to provide real-time feedback during experiments is multifaceted, encompassing troubleshooting, data analysis, hypothesis testing, collaborative facilitation, and continuous monitoring. These capabilities can significantly enhance experimental research's efficiency, accuracy, and collaboration.

3.7. The role of ChatGPT in Facilitating Group Experiments

ChatGPT can significantly facilitate group experiments by enhancing communication, providing real-time data analysis, and supporting collaborative learning environments. According to Kim and Moon, ChatGPT can serve as an interactive tool that aids in the clarification of complex concepts and procedures during group experiments, thereby improving the overall understanding and efficiency of the group's work (Kim & Moon, 2024). This capability is particularly beneficial in educational settings where students may need additional support to grasp experimental methodologies. Cajo-Torres et al. highlight that ChatGPT can be utilized to simulate experimental scenarios, allowing groups to explore various outcomes without needing physical resources. This virtual experimentation can lead to a deeper understanding of the subject matter and foster innovative thinking among participants (Cajo-Torres et al., 2024). The ability to simulate experiments also provides a cost-effective solution for educational institutions with limited resources. Alanezi's research suggests that ChatGPT can facilitate group experiments by mediating discussions and ensuring all group members are engaged and contributing to the experiment. This function helps maintain a balanced dialogue and encourages the sharing of diverse perspectives, which is crucial for the success of collaborative experiments (Alanezi, 2024). Additionally, Kipp et al. emphasize the role of ChatGPT in data management and analysis. The AI can assist groups in organizing and interpreting experimental data, providing insights that human participants might overlook. This capability not only speeds up the experimental process but also enhances the accuracy of the results (Kipp et al., 2024). However, Ammu et al. caution that while ChatGPT offers numerous advantages, it is essential to consider the limitations of AI, such as potential biases in data interpretation and the need for human oversight to ensure ethical standards are maintained during experiments (Ammu et al., 2024). Therefore, while ChatGPT can significantly enhance group experiments, it should be used as a complementary tool alongside human expertise to maximize its benefits.

4. Discussion

As we venture into an era increasingly dominated by digital innovation, the transformative potential of technology in education becomes ever more apparent. Integrating artificial intelligence, such as ChatGPT, into the classroom can redefine pedagogical approaches, particularly in subjects like physics, which often pose significant challenges for young learners. By utilizing interactive AI-driven platforms, educators can create a more personalized learning environment that caters to the unique needs of each student, enhancing engagement and understanding. Such technologies enable hands-on experimentation and simulation, allowing students to visualize complex concepts and apply theoretical knowledge to practical scenarios. However, this shift necessitates careful consideration of the implications for teacher training and curriculum development, as educators must be equipped with the skills to effectively incorporate these tools into their teaching strategies. Embracing this technological evolution is crucial for fostering a generation of learners with critical thinking and problem-solving skills essential for future scientific endeavors.

ChatGPT can effectively assist in teaching complex physics concepts to students by leveraging its capabilities as a large language model to enhance engagement, provide personalized feedback, and facilitate a deeper understanding of the subject matter. The integration of ChatGPT in educational settings has shown promising results in improving academic performance and motivation among students, as evidenced by studies where students using ChatGPT and gamification in a physics course outperformed those in a control group, demonstrating increased interest, usefulness, self-efficacy, and active participation (Beltozar-Clemente & Díaz, 2024). ChatGPT's ability to offer real-time assistance, personalized feedback, and dynamic content generation has been highlighted as beneficial in foundational engineering courses. However, caution is advised due to occasional inaccuracies in the results (Rezvani-Rad & Davis, 2024). ChatGPT can help correct students' misconceptions about physics by facilitating experiment-designing activities, which promote critical thinking and a deeper understanding of scientific processes (Kotsis, 2024b). The systematic review of ChatGPT's use in education underscores its potential to improve student engagement and accessibility while addressing challenges such as response quality and bias (Ali et al., 2024). ChatGPT's applications in education include personalized tutoring and research assistance, which have positively impacted various educational audiences (Wang, Li et al., 2024). In physics education specifically, ChatGPT has demonstrated the ability to solve calculation problems, explain solutions, and generate new exercises, thus supporting the learning process at a human level (Liang et al., 2023). ChatGPT has been explored in high school settings for its potential to respond to physics topics effectively, offering insights from both teacher and student perspectives (Bessas et al., 2023). ChatGPT's integration with student-centered pedagogies and ICT has been examined in Vietnamese high schools, highlighting its role in enhancing physics education (Bruneau et al., 2023). Comparative studies of AI-powered chatbots, including ChatGPT, have shown that these tools can foster critical thinking and problem-solving skills. However, human intervention remains necessary to address inconsistencies and ensure effective learning (Santos, 2023). Finally, the development of online physics courses utilizing ChatGPT emphasizes personalized learning experiences, effective feedback, and real-life applications, which contribute to a positive learning environment and improved student performance (Hettiarachchilagea & Haldolaarachchige, 2023). Overall, the most effective strategies for using ChatGPT in teaching complex physics concepts include incorporating it as a personalized learning tool, designing interactive and engaging activities, and combining it with human oversight to ensure accuracy and foster critical thinking.

In advancing the integration of ChatGPT as a physics teaching assistant, further research must prioritize longitudinal studies assessing its impact on student engagement and comprehension over extended periods. Such investigations should examine academic performance and psychological indicators of motivation and curiosity toward physics. Additionally, implementation strategies should emphasize professional development for educators, equipping them with the skills to effectively incorporate AI into their teaching methodologies. This professional training should focus on developing lesson plans strategically by integrating ChatGPT and ensuring that teachers remain learning facilitators rather than mere technology operators. Continuous feedback loops involving educators and students will be crucial in re-fining these strategies, allowing for iterative improvements based on classroom experiences. Ultimately, this approach will foster an educational environment where AI enriches the learning experience, promoting deeper understanding and lasting

enthusiasm for physics among students.

5. Conclusions

In conclusion, integrating ChatGPT as a physics teaching assistant presents a valuable opportunity to enhance student engagement and understanding of scientific concepts through hands-on experiments. The findings suggest that emergent technologies, such as generative AI, can provide unique pedagogical advantages by allowing students to explore fundamental principles in an interactive environment. For example, traditional learning models often rely on static datasets, which may not fully capture the dynamic nature of student reasoning. By leveraging innovative methodologies such as those detailed in (Martin & Graulich, 2024), where teacher-student interactions are enriched through augmented data, we can create a more comprehensive educational experience. Additionally, as noted by (Riemer & Peter, 2024), viewing generative AI through a lens of style rather than strict computation allows for greater creativity in presenting physics concepts. Ultimately, this synthesis of technology and pedagogy has the potential to reshape how science education is delivered, fostering deeper understanding and curiosity.

Incorporating ChatGPT into physics education can significantly enhance the learning experience for students by providing interactive and personalized support. This advanced AI tool facilitates real-time dialogue, allowing students to ask questions and receive immediate feedback on their understanding of complex concepts, such as Newton's laws or the principles of energy transfer. Such immediacy can promote a deeper conceptual grasp, especially for young learners who struggle with traditional instructional methods. Furthermore, ChatGPT can assist in designing experiments tailored to individual student interests, making physics more engaging and approachable. By simulating various experimental scenarios, students can visualize outcomes and better comprehend theoretical concepts, which fosters an inquiry-based learning environment. Ultimately, leveraging ChatGPT enriches the educational framework and pro-motes a culture of curiosity and exploration in physics, essential for nurturing future scientists and engineers.

Funding: This research received no external funding.

Institutional Review Board Statement: The study did not require ethical or other kinds of approval.

Conflicts of Interest: The author declares no conflict of interest.

References



- Abas, M. A., Arumugam, S. E., Yunus, M. M., & Rafiq, K. R. M. (2023). ChatGPT and personalized learning: Opportunities and challenges in higher education. *International Journal of Academic Research in Business and Social Sciences*, 13(12). <http://dx.doi.org/10.6007/IJARBS/v13-i12/20240>
- Achour, K., Laanoui, M. D., & Ourahay, M. (2024). The impact of ChatGPT in education: A comprehensive overview. In *2024 International Conference on Global Aeronautical Engineering and Satellite Technology (GAST)* (pp. 1-10). <https://doi.org/10.1109/GAST60528.2024.10520810>
- Adel, A., Ahsan, A., & Davison, C. (2024). ChatGPT Promises and Challenges in Education: Computational and Ethical Perspectives. *Education Sciences*, 14(8), 814. <https://doi.org/10.3390/educsci14080814>
- Alanezi, F. (2024). Examining the role of ChatGPT in promoting health behaviors and lifestyle changes among cancer patients. *Nutrition and Health*, 2601060241244563. <https://doi.org/10.1177/02601060241244563>
- Ali, D., Fatemi, Y., Boskabadi, E., Nikfar, M., Ugwuoke, J., & Ali, H. (2024). ChatGPT in Teaching and Learning: A Systematic Review. *Education Sciences*, 14(6), 643. <https://doi.org/10.3390/educsci14060643>
- Alrashidi, M., Almohammadi, K., Gardner, M., Callaghan, V. (2017). Making the Invisible Visible: Real-Time Feedback for Embedded Computing Learning Activity Using Pedagogical Virtual Machine with Augmented Reality. In L. De Paolis, P. Bourdot, A. Mongelli (eds) *Augmented Reality, Virtual Reality, and Computer Graphics. AVR 2017. Lecture Notes in Computer Science*, vol 10324. Springer, Cham. https://doi.org/10.1007/978-3-319-60922-5_27
- Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, 5(6), 66-70.
- Beltzar-Clemente, S., & Díaz-Vega, E. (2024). Physics XP: Integration of ChatGPT and Gamification to Improve Academic Performance and Motivation in Physics 1 Course. *International Journal of Engineering Pedagogy (IJEP)*, 14(6), pp. 82–92. <https://doi.org/10.3991/ijep.v14i6.47127>
- Bessas, N., Tzanaki, E., Vavougiou, D., & Plagianakos, V. P. (2023). Implementing AI in physics lessons in the high school. In *2023 International Conference on Computational Science and Computational Intelligence (CSCI)* (pp. 1775-1779). <https://doi.org/10.1109/CSCI62032.2023.00293>

- Bitzenbauer, P. (2023). ChatGPT in physics education: A pilot study on easy-to-implement activities. *Contemporary Educational Technology*, 15(3), ep430. <https://doi.org/10.30935/cedtech/13176>
- Bruneau, P., Wang, J., Cao, L., & Truong, H. (2023, July 12). The Potential of ChatGPT to Enhance Physics Education in Vietnamese High Schools. <https://doi.org/10.35542/osf.io/36qw9>
- Cajo-Torres, M., Ochoa-Icaza, S., Marín-Figuera, M., & Yáñez Cando, X. O. (2024). ChatGPT as a pedagogical tool in the Project Based Learning methodology. *593 Digital Publisher CEIT*, 9(4), 197-209. <https://doi.org/10.33386/593dp.2024.4.2493>
- Cao, S., & Zhong, L. (2023). Exploring the effectiveness of ChatGPT-based feedback compared with teacher feedback and self-feedback: Evidence from Chinese to English translation. *ArXiv*. /abs/2309.01645. <https://doi.org/10.48550/arXiv.2309.01645>
- Chen, Y., Jensen, S., Albert, L. J., Gupta, S., & Lee, T. (2023). Artificial Intelligence (AI) Student Assistants in the Classroom: Designing Chatbots to Support Student Success. *Information Systems Frontiers*, 25, 161–182. <https://doi.org/10.1007/s10796-022-10291-4>
- Farley, R. F. (2004). *School physics experiments: a collection of tried and tested experiments for use in schools*. Association for Science Education.
- Gouia-Zarrad, R., & Gunn, C. (2024). Enhancing students' learning experience in mathematics class through ChatGPT. *International Electronic Journal of Mathematics Education*, 19(3), em0781. <https://doi.org/10.29333/iejme/14614>
- Hettiarachchilagea, K., & Haldolaarachchige, N. (2023). Effective Model with Personalized Online Teaching and Learning Science in the Era of ChatGPT. *ArXiv*. /abs/2306.09545. <https://doi.org/10.48550/arXiv.2306.09545>
- Ibañez, E. D., & Pentang, J. (2021). Socio-constructivist learning and teacher education students' conceptual understanding and attitude toward fractions. *Indonesian Research Journal in Education*, 5(1), 23-44. <https://ssrn.com/abstract=3974721>
- Kazi, L., & Sayyad, K. (2024). ChatGPT: An Automated Teacher's Guide to Learning. In R. Bansal, A. Chakir, A. Hafaz Ngah, F. Rabby, & A. Jain (Eds.), *AI Algorithms and ChatGPT for Student Engagement in Online Learning* (pp. 1-20). IGI Global. <https://doi.org/10.4018/979-8-3693-4268-8.ch001>
- Kieser, F., Wulff, P., Kuhn, J., & Küchemann, S. (2023). Educational data augmentation in physics education research using ChatGPT. *Physical Review Physics Education Research*, 19(2), 020150. <https://doi.org/10.1103/PhysRevPhysEducRes.19.020150>
- Kim, D. G., & Moon, A. (2024). From helping hand to stumbling block: the ChatGPT paradox in competency experiment. *Applied Economics Letters*, 1–5. <https://doi.org/10.1080/13504851.2024.2337330>
- Kipp, A., Hawk, N., & Perez, G. (2024). Generating Opportunities: Strategies to Elevate Science and Engineering Practices Using ChatGPT. *The Science Teacher*, 91(2), 43–47. <https://doi.org/10.1080/00368555.2024.2308319>
- Kotsis, K. T. (2024a). ChatGPT Develops Physics Experiment Worksheets for Primary Education Teachers. *European Journal of Education Studies*, 11(5), 1-20. <http://dx.doi.org/10.46827/ejes.v11i5.5274>
- Kotsis, K. T. (2024b). Correcting Students' Misconceptions in Physics Using Experiments Designed by ChatGPT. *European Journal of Contemporary Education and E-Learning*, 2(2), 83-100. [https://doi.org/10.59324/ejceel.2024.2\(2\).07](https://doi.org/10.59324/ejceel.2024.2(2).07)
- Kotsis, K. T. (2024c). Integration of Artificial Intelligence in Science Teaching in Primary Education: Applications for Teachers. *European Journal of Contemporary Education and E-Learning*, 2(3), 27-43. [https://doi.org/10.59324/ejceel.2024.2\(3\).04](https://doi.org/10.59324/ejceel.2024.2(3).04)
- Lee, G., & Zhai, X. (2024). Using ChatGPT for Science Learning: A Study on Pre-service Teachers' Lesson Planning. *ArXiv*. /abs/2402.01674. <https://doi.org/10.48550/arXiv.2402.01674>
- Liang, Y., Zou, D., Xie, H., & Wang, F. L. (2023). Exploring the potential of using ChatGPT in physics education. *Smart Learning Environments*, 10(1), 1-19. <https://doi.org/10.1186/s40561-023-00273-7>
- Martin, P. P., & Graulich, N. (2024). Navigating the data frontier in science assessment: Advancing data augmentation strategies for machine learning applications with generative artificial intelligence. *Computers and Education: Artificial Intelligence*, 7, 100265. <https://doi.org/10.1016/j.caeai.2024.100265>
- Mustofa, H., Bilad, M., & Grendis, N. (2024). Utilizing AI for Physics Problem Solving: A Literature Review and ChatGPT Experience. *Lensa: Jurnal Pendidikan Fisika*, 12(1), 78-97. <https://doi.org/10.33394/j-lkf.v12i1.11748>
- Myklebust, H., & Fagerbakke, I. M. (2024). Taking a dialogic stance in interaction with the youngest children – Supporting concept learning and child agency. *Learning, Culture and Social Interaction*, 47, 100825. <https://doi.org/10.1016/j.lcsi.2024.100825>
- Pishtari, G., Sarmiento-Márquez, E.M., Rodríguez-Triana, M.J., Wagner, M., Ley, T. (2023). Evaluating the Impact and Usability of an AI-Driven Feedback System for Learning Design. In O. Viberg, I. Jivet, P. Muñoz-Merino, M. Perifanou, T. Paphoma, T. (eds) *Responsive and Sustainable Educational Futures. EC-TEL 2023. Lecture Notes in Computer Science*, vol 14200. Springer, Cham. https://doi.org/10.1007/978-3-031-42682-7_22
- Redish, E. F., & Vicentini, M. (2004). *Research on physics education* (Vol. 156). IOS Press.
- Rezvani-Rad, M., & Davis, J. L. (2024). Exploring Student Perceptions of Learning Experience in Fundamental Mechanics Courses Enhanced by ChatGPT Paper presented at 2024 ASEE Annual Conference & Exposition, Portland, Oregon. <https://doi.org/10.18260/1-2--47426>
- Riemer, K., & Peter, S. (2024). Conceptualizing generative AI as style engines: Application archetypes and implications. *International Journal of Information Management*, 79, 102824. <https://doi.org/10.1016/j.ijinfomgt.2024.102824>
- Samara, V., & Kotsis, K. T. (2024). Use of the artificial intelligence in teaching the concept of magnetism in preschool education. *Journal of Digital Educational Technology*, 4(2), ep2419. <https://doi.org/10.30935/jdet/14864>
- Santos, R. P. (2023). Enhancing Physics Learning with ChatGPT, Bing Chat, and Bard as Agents-to-Think-With: A Comparative Case Study. *ArXiv*. /abs/2306.00724. <https://doi.org/10.48550/arXiv.2306.00724>
- Sidiropoulos, D., & Anagnostopoulos, C. N. (2024). Applications, Challenges and Early Assessment of AI and ChatGPT in Education. In A. Basiouni, C. Frasson (eds) *Breaking Barriers with Generative Intelligence. Using GI to Improve Human Education and Well-Being*. BGI 2024. *Communications in Computer and Information Science*, vol 2162. Springer, Cham. https://doi.org/10.1007/978-3-031-65996-6_1
- Speer, J. E., Parker, S. M., & Williams, B. L. (2024). Interactive Learning with ChatGPT: Hands-On Practice and Real-Time Feedback in Health Sciences Education for SMART Goal Writing. *medRxiv*, 2024-06. <https://doi.org/10.1101/2024.06.11.24308786>
- Trnova, E., & Trna, J. (2017). Hands-on Experimental Activities in Inquiry-Based Science Education. In *Selected papers on hands-on science II* (pp. 453-460). Universidade de Vigo.
- Tyni, J., Turunen, A., Kahila, J., Bednarik, R., & Tedre, M. (2024). Can ChatGPT Match the Experts? A Feedback Comparison for Serious Game Development. *International Journal of Serious Games*, 11(2), 87-106. <https://doi.org/10.17083/ijsg.v11i2.744>

- Walker, R. (2024). *ChatGPT in the classroom for harnessing AI to revolutionize elementary, middle, and high school education: Innovative strategies for teachers to enhance learning and curriculum with hundreds of artificial intelligence prompts*. Legendary Editions.
- Wang, K. D., Burkholder, E., Wieman, C., Salehi, S., & Haber, N. (2024). Examining the potential and pitfalls of ChatGPT in science and engineering problem-solving. *Frontiers in Education*, 8, 1330486. <https://doi.org/10.3389/feduc.2023.1330486>
- Wang, B., Li, S., Dong, Y., & Zhang, H. (2024). ChatGPT-Aided Education Teaching. In *2024 6th International Conference on Computer Science and Technologies in Education (CSTE)* (pp. 141-145). IEEE. <https://doi.org/10.1109/CSTE62025.2024.00033>
- West, C. G. (2023). Advances in apparent conceptual physics reasoning in GPT-4. ArXiv. /abs/2303.17012. <https://doi.org/10.48550/arXiv.2303.17012>
- Zhai, C., Wibowo, S., & Li, L. D. (2024). Evaluating the AI dialogue System's intercultural, humorous, and empathetic dimensions in English language learning: A case study. *Computers and Education: Artificial Intelligence*, 7, 100262. <https://doi.org/10.1016/j.caeai.2024.100262>
- Zhang, D., Boey, M., Tan, Y. Y., & Jia, A. H. S. (2024). Is ChatGPT Effective in Providing Educational Feedback? A Quantitative Analysis of Summative Feedback. <https://doi.org/10.31234/osf.io/zrmhs>

Literature Review

A Systematic Review of the Effect of Financial Management Practices on Service Delivery in Secondary Schools

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<https://doi.org/eiki/10.59652/jetm.v2i4.296>

Abstract: In this systematic review analysis design, we explore the available peer-reviewed literature on the effect of financial management practices on service delivery in African secondary schools. Specifically, we reviewed the effect of budgeting, auditing and financial internal control on the service delivery in secondary schools. Study findings reveal that budgeting ensures effective implementation of education programs. In addition, the activities in the secondary school system are adequately planned and allocate resources apportioned to ensure effective execution and implementation. Besides, audits of school accounts result in good financial management and effective control mechanism that ensures overall operational efficiency. From the results of this review, we hereby suggest that Head teachers need to manage financial resources more responsibly for effective performance and fulfilling of institutional needs, those of the teachers, students and other stakeholders of respective secondary schools. It is very crucial for school administrators and support staff in charge of finances and resource mobilization to regularly attend professional development course in order to acquire relevant financial skills and competencies required for effective management of resources in the school so as to tremendously improve on the quality of secondary schools' service delivery.

Keywords: financial management; budgeting, auditing; financial internal controls; service delivery

1. Introduction

Management of financial resources of an individual entity or organization should lead to visible results in form of either tangible goods or services which is the service delivery. Service delivery involves the actual production or provision of goods and services to the community. The goal of service delivery is to ensure that customers who in this case include students and staff are satisfied with the services they receive and that they are delivered in a timely and efficient manner. This needs to be done in accordance with plans and within the allocated budgetary funds (Andrews & Entwistle, 2013). In the same vein, effectiveness of any educational institution can largely be defined by the capacity of school Heads to effectively manage financial resources at their disposal for smooth implementation of school programs (Akporehe et al., 2024). This can be done by doing proper budgeting, auditing and financial internal controls of all the financial resources. Proper financial management also ensures that an organizational expenditure is planned according to the established organizational priorities as expressed in the budget (Robina, et al., 2018). Efficient management practices take appropriate steps to prevent the under-collection of fees, unauthorized, irregular and wasteful expenditures (Mafugu et al., 2022).

Financial management requires internal controls or checks and balances, to manage risks and protect the assets of an organization. Effective financial practices are essential in enhancing transparency, efficiency and accuracy, accountability and achieving organizational objectives (Nurfadila, 2024)

The school heads efficient and effective management of financial resources is considered one significant factor in the attainment of institutional objectives. On the other hand, inappropriate and inconsistent exercise of financial management may cause failure in service delivery. In the end, an excellent and improved performance is the ultimate aim of every organization/institution. The aim of this systematic review therefore is to find out what effect do the financial management practices of budgeting, auditing and financial control have on

Received: September 5, 2024

Accepted: October 3, 2024

Published: October 15, 2024



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service delivery in secondary schools in Africa.

Research aim

To establish the effect of financial management practices on service delivery in government secondary schools of Bugabula county in Kamuli District.

Research objectives

1. To determine the effect of budgeting on service delivery in Government secondary schools in Bugabula county, Kamuli District
2. To examine the effect of auditing on service delivery in Government secondary schools in Bugabula county, Kamuli district
3. To examine the effect of controlling practices on service delivery; in government secondary schools of Bugabula county in Kamuli district.

2. Materials and Methods

This study employed a systematic review analysis design. A systematic review analysis design is a scholarly synthesis of the evidence on a clearly presented topic using critical methods to identify, define and assess research on the topic (Sauer & Seuring, 2023). A systematic review extracts and interprets data from published studies on the topic then analyses, describes, critically appraises and summarizes interpretation into refined evidence based on conclusion (Sauer & Seuring, 2023) One of the most important reasons for a high-quality review is that it follows a pre-determined methodology (Gough et al., 2017). This review was carried out using the PRISMA reporting checklist. PRISMA stands for the preferred reporting item for systematic review and meta-analyses. PRISMA is a set of guidelines designed to help authors improve the reporting of systematic reviews and meta – analyses, ensuring and clarity and transparency in the presentation of research. It was chosen because it promotes thorough literature search and systematic data collection methods, reducing the risk of selection and publication bias which leads to more accurate and reliable conclusion.

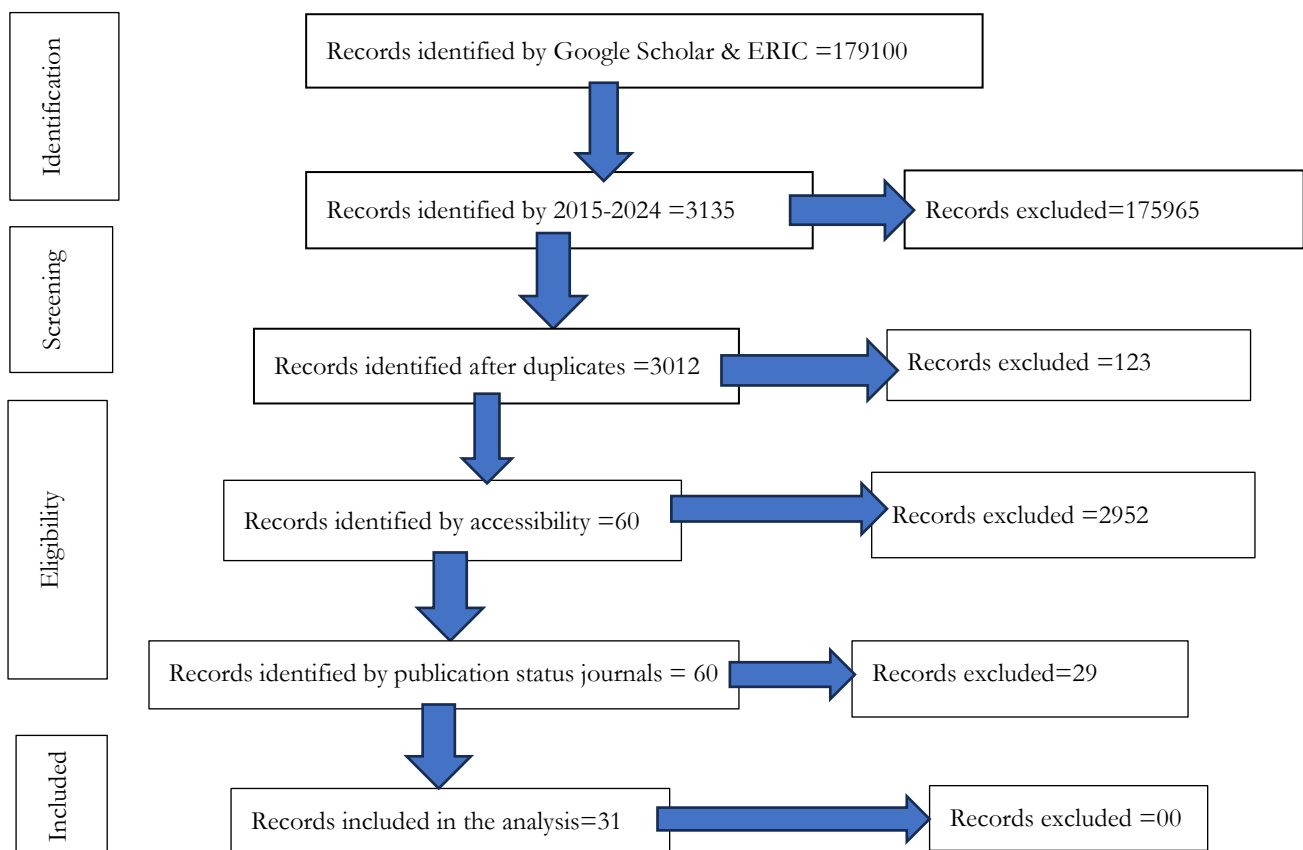


Figure 1. The PRISMA flow diagram summarizing the selection process.

PRISMA records the number of articles found and then makes the screening process

transparent by reporting on decisions made at various stages of the systematic review. The screening process involves several steps designed to identify and select studies that meet the eligibility criteria for inclusion in a systematic review as illustrated by figure 1 below.

The study’s primary data base search tool was Google scholar and Eric-Advanced search which were used to find relevant literature.

We used Google scholar and the advanced search feature to find reviews. We used key words such as financial management, public secondary schools, and service delivery. During this search, this method produced a total of 179100 results, 188143 from Google scholar and 10957 from ERIC-Advanced search. we reduced the number of articles to 3135 by narrowing the publication year range. We were able to refine our research and obtain a more focused set of reviews from recent 2015-2024 to get the current and updated information. We further narrowed the number of articles to 60 basing on accessibility and finally to 31 articles basing on publication status.

During the process, we sorted them by remaining with only 31 articles. Only articles very closely related to financial management practices in secondary schools and their impact on service delivery and matching the screening process were included in the analysis. We screened the articles by focusing primarily on the key elements of educational financial management practices and service delivery. Table 1 shows the analysis of the eligibility criteria for inclusion and exclusion of articles for the research.

Table 1. The eligibility criteria for inclusion and exclusion of articles

| Eligibility | Inclusion | Exclusion |
|---------------------|---|-----------------|
| Time frame | 2015-2024 | Below 2015 |
| Language | English | Other languages |
| Electronic database | Google scholar, Eric Advanced search resources. | Other sources |
| Publication status | Peer-reviewed Published in journal articles | Unpublished |
| Demography | Africa | Outside |

2.1. Analysis

We began with a comprehensive search using Google Scholar and ERIC-Advanced Search, eventually narrowing my results through multiple screening steps, culminating in a selection of 31 articles. These articles were closely aligned with the study’s focus on financial management practices in public secondary schools and their impact on service delivery.

2.1.1. Key Elements in the Screening Process

Initial Search and Screening:

Database Sources: We searched across two major databases (Google Scholar and ERIC Advanced Search) to ensure a broad scope of relevant academic literature.

Initial Results: We identified over 199,100 initial results, which were systematically reduced based on relevance, time frame, accessibility, and publication status.

Screening Criteria:

To ensure the articles selected were directly relevant to the research focus, specific eligibility and exclusion criteria were applied. These criteria helped filter out irrelevant studies and focus on quality, credible, and recent publications.

2.1.2. Steps in Refining the Selection

Time Frame Filter (2015-2024): The initial filter focused on selecting articles published between 2015 and 2024. This ensured that the studies reviewed provided up-to-date data and reflected current trends in financial management practices in secondary schools. Financial management practices in education have evolved over time, and the inclusion of studies within this recent time frame ensures that only relevant, modern practices and impacts were considered.

Language Filter (English): Only English-language studies were included to ensure clarity in the review process and to avoid potential translation issues that could affect the interpretation of data.

Database Focus: By restricting the search to Google Scholar and ERIC Advanced Search, two well-regarded academic resources, the pool of literature was limited to credible, scholarly work. This reduced the likelihood of low-quality or non-academic publications.

Publication Status (Peer-reviewed, Published Articles): I emphasized selecting only peer-reviewed, published journal articles to ensure the highest standard of academic rigor and credibility. Published, peer-reviewed studies undergo a process of scrutiny by experts in the field, which enhances the trustworthiness of the findings.

Geographical Focus (Africa): Studies were restricted to African contexts to ensure relevance to the demographic focus of the research. Financial management practices in African public secondary schools may differ significantly from those in other regions, so focusing on Africa ensured that the analysis was contextually relevant.

2.1.3. Final Selection of 31 Articles

After narrowing down the 60 accessible articles, a final set of 31 articles was selected. These articles were chosen because they met the screening criteria and were highly relevant to the core research question: the impact of financial management practices on service delivery in public secondary schools.

2.2. Data Analysis Approach

2.2.1. Content Analysis

Each of the 31 articles was analysed for key themes related to financial management practices, such as budgeting, resource allocation, accountability, and transparency. The studies were also evaluated for how these practices impacted service delivery in terms of infrastructure, teaching quality, and overall school performance.

2.2.2. Focus Areas in the Articles

Educational Financial Management Practices:

- Budget planning and implementation.
- Revenue generation strategies.
- Financial accountability mechanisms.

Impact on Service Delivery:

- Availability and maintenance of school facilities.
- Quality of teaching materials and resources.
- Influence on student performance and teacher satisfaction.

3. Results

This section is divided into 3 sub-sections to ensure that the results are presented in the best possible format and this has been done using tables, and figures.

Search Strategy

In this study, the documentation of the analysis process and inclusion criteria was done in accordance with the rules. We used the advance search option and selected inclusion criteria such as the title of the article, and the year between 2015-2024 to quickly compile the most recent and relevant articles.

Data Extraction Procedure

This systematic review has extracted the names of the authors, the year of publication, the country, the study design, participant characteristics, study aim, the results and discussion, the conclusion, the recommendation and implication for strategic planning in education for ease of reference, navigation and citation.

3.1. Budgeting

Table 2 below shows all the number of articles reviewed about the effect of budgeting on service delivery. We clearly indicate the research design, research paradigm and key constructs from the study's theories, key findings, sample size and their limitations.

Table 2. Articles reviewed about the effect of budgeting on service delivery in secondary schools

| No | Article Title, Author, year of publication, country and sample size | Theory | Research Design | Research Paradigm, Research focus | Key findings/conclusion and limitation of the study | |
|----|---|---|-------------------------------|------------------------------------|---|--|
| 1. | Financial management practices and students' welfare in government secondary school in Buzaaya county, Kamuli Uganda by Oboth (2020). | Allocative efficiency theory. This theory depicts how scarce resources could be efficiently allocated to priority areas to meet | Research design: correlation. | Research paradigm: interpretivism. | Research focus: Examining the | Key finding: Budgeting was not statistically an influential factor of the variance in students' welfare. limitation of the study: |

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| | Sample size: 229 | people's needs optimally. | relationship between budgeting and students' welfare | relationship between students' welfare | none |
| 2. | Financial management practice and institutional effectiveness in secondary schools in Ikom education zone, Cross River state, Nigeria by Odok et al. (2023). Sample size: 109 | None | Research design: Examining the relationship between budgeting and institutional effectiveness in public secondary schools Research paradigm: mixed method | design: There Is a significant relationship between budgeting and institutional effectiveness in public secondary schools in Ikom education zone focus: | |
| 3. | Influence of principals on financial management practices on achievement of financial targets in public secondary schools of Dagoreti Sub County, Kenya by Shawe (2023). Sample size: 245 | Financial agency. Agency relationship is a contract where by one person who is a principal hires another person who is an agent to perform some duties on his behalf and gets paid. In school management, the principal is the Board of Governors that hires an agent who is a Head teacher to perform duties on behalf of the board/government. The agent is tasked with management of funds disbursed to school. | Research design: Descriptive. Research paradigm: Mixed Method. Research focus: Determining the influence of adequate budget preparation by principals | design: | Key finding: budget preparation is important as it is only through budgeting that schools can be able to allocate resources effectively. Limitation of the study: suspicion which led to some of the respondents to withhold some information due to sensitivity of financial issues |
| 4. | Factors affecting financial management effectiveness in public secondary school Gatanga Sub County, Kenya by Kang'ethe Ngigi et al. (2019). | Agency | Research design: descriptive. Research paradigm: interpretivism. Research focus: Determining the effect of budget control on financial management effectiveness in public secondary schools. | design: | Key findings: Budget control Is an important practice that is essential in effectiveness of financial management in public secondary schools. Limitation of the study: none |
| 5. | Financial resource management and it influence on students' academic performance in Langata Sub County, Kenya by Shawe (2023). Sample size: 260 | None | Research design: Descriptive Research paradigm: mixed method Research focus: Examining the influence of budget management on students' academic performance | design: | Proper financial management is essential for the success of an institution. limitation of the study: none |
| 6. | Influence of financial management practices on the financial performance in public secondary schools in Kathiani Sub County, Kenya by Muia Kinyanzi (Ismail et al., 2023). Sample size: 90 | Prudential | Research design: descriptive survey. Research paradigm: mixed method. Research focus: Establishing the influence of budgeting practices on the financial performance of public secondary | design: | Budgeting leads to improved revenue collection prompt payment of teacher's salaries and completion of school projects. |

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| | | | | schools. | |
| 7. | Principals' financial management practice, educational administration and performance in selected secondary schools in Kenya by Simon Kang 'the and Peninah (Kwanbo et al., 2023). Sample size: 57 | Agency | | Research design: Correlation survey. Research paradigm: Mixed Method | Budget preparation was the most widely exercised financial management practice |
| 8. | Assessment of financial management practices among secondary schools in Kaduna (Nneka Iloabuchi et al., 2016). Sample size:624 | None | | Research design: descriptive survey. Research paradigm: mixed method. Research focus: Examining the procedures of budget preparation in secondary schools. | Budgetary plans are made in collaboration with heads of departments. |
| 9. | Capitation grant and secondary schools' financial management practices in Rubanda, Uganda by Kobusingye et al. (2024). Sample size: 50 | None | | Research design: Descriptive Research paradigm: positivism. Research focus: Assessing the status of financial management practices of capitation grant in USE schools | Key findings: improper preparation of vouchers hinder financial management in schools. There was different status of capitation grant in USE Schools in Rubanda and include, school maintains good financial record keeping, finance manual guidelines from the Ministry are properly followed-designed school record forms from the Ministry are used consistently, among others. |
| 10. | Financial management by principals for administration of public secondary schools in Rivers State Nigeria by (Nneka Iloabuchi et al., 2016). Sample size:344 | None | | Research design: descriptive survey. Research paradigm: interpretivism. Research focus: Examining the extent to which budgeting practices by principals and school bursars affect effective administration of public secondary schools. | Key findings: continuous and transparent demonstration of these financial practices would ensure the provision of the needed facilities and equipment, better school personnel and making the school a friendly environment for effective and efficient instructional activities. Limitation of the study: none |
| 11. | Effectiveness of school heads financial management skills in provision of quality education in secondary schools in Tanzania by Mose (2022). Sample size:169 | None | | Research design: none Research paradigm: interpretivism. Research focus: Evaluating the effectiveness of school heads' financial management skills in the provision of quality education in secondary schools. | Key findings: Financial management skills such as evaluation of budget were Essential for school financial management. Limitation of the study: |

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| 12. | Financial resource management and student's academic performance in public secondary schools in lang'ata sub county, Kenya by Kisanyanya and Omagwa (2018) Sample size: 260 | None | Research design: Descriptive Research paradigm: Interpretivism Research focus: determining the influence of budget management on students' academic performance | Key findings: Not all staffs are involved in the budget making of the schools Financial resource management can truly affect academic performance |
| 13. | Relationship between financial management and school effectiveness in public secondary schools in Sokoto metropolis in Nigeria by Chukwuogo and Obi (2023). | None | Research design: Correlation. Research paradigm: interpretivism. Research focus: Assessing the adherence to budgetary provision or operational guidelines. | Key findings: proper budget implementation means carrying out the planned budget effectively. Budget planning shows how an organization works. limitation of the study: none |
| 14. | Principals budgeting practice for enhancing financial management in secondary schools in Anambra, Nigeria by Amaikwu and Ofojebe (2020) Sample size:257 | None | Research design: Descriptive. Research paradigm: interpretivism. Research focus: Ascertaining principal budgeting practices for enhancing financial management in secondary schools. | Key findings: principals budget planning practices for enhancing financial management in secondary schools include giving priority to the most pressing needs of the school, setting target to be achieved by the school budget, adhering to the official fiscal calendar and forecasting expected income in the school budget. Limitation of the study: none |
| 15. | Financial management practices of principals and teachers job performance in government secondary schools in rivers state, Nigeria by Chukwuogo and Obi (2023). Sample size:470 | Total quality management theory. It states that top level management must be sincere in its efforts to commit to quality (principals must be sincere as this results into better job performance of the teachers) or else all efforts would not work | Research design: correlation. Research paradigm: mixed method Research focus: investigating the relationship between financial management practices of principals and teachers job performance | Key findings: secondary schools with appropriate financial management practices may face numerous challenges in evaluating teachers' job performance and addressing students dwindling academic performance. Limitation of the study: none |
| 16. | Budgeting procedures and principals' financial management of public secondary schools in Rivers State, Nigeria by Owmondah and Nwosu (2020). Sample size:322 | Efficiency and effectiveness of the organization.it states that the function of the chief executive of an organization is to ensure efficiency and effectiveness in an organization. Thus, the school head is saddled with the responsibility of ensuring that funds are effectively and efficiently managed to avoid wastage | Research design: correlational Research paradigm: Research focus: Examining the extent to which budget procedures influence the principals fundraising and spending practice in secondary schools | Key findings: budgeting procedures hhave a positive and strong influence on both principals fundraising and spending practices. limitation of the study: none |

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| | | and this can be achieved by budgeting. | | |
| 17. | Financial management practices adopted by the principals for effective administration of secondary schools in Kloot and Martin (2000). Sample size:258 | None | Research design: descriptive Research paradigm: Interpretivism. Research focus: Identifying the budgeting practices adopted by principals for the effective administration of secondary schools | key findings: the budgeting practices adopted by principals include; embarking on market survey to get facts before preparing the budget, give priority to the most pressing needs in budget planning, make some monetary allocations for unforeseen expenditure in the course of budgeting, estimate the expected income of the school budget and defend the budget in the presence of relevant authorities. Limitation of the study: none |
| 18. | Financial management practices and administrative effectiveness of secondary school's principals in Anambra state, Nigeria by Shawe (2023). | Efficiency | Research design: correlation. Research paradigm: mixed method. Research focus: investigating the relationship between financial management practices and administrative effectiveness of secondary school principals | Key findings: There is a high relationship between financial management practices and administrative effectiveness. This implies that the improvement in financial planning practice also leads to the improvement of administrative effectiveness in secondary schools. |
| 19. | A study of principals' financial management practices in secondary schools (Nneka Iloabuchi et al., 2016). | None | Research design: descriptive. Research paradigm: mixed method. Research focus: Investigating how schools do budgeting | Key findings: principals engage in discussing items to be included in the budget with vice –principals, bursars and relevant staff. Limitation of the study: none |

Owhondah and Nwosu (2020) identified major plans involved in the budget preparation namely, the educational plan which defines the policies of the school, its programs and activities as well as other educational services to be carried out, on the other hand, the budget practices in educational institution follows a systematic procedure, this includes budget planning, budget defense, budget approval and adoption, budget implementation and budget evaluation. In planning, the school budget in most secondary schools, the head teacher, bursar, teaching and non-teaching staff are involved in the collection of the required data that will ascertain the income and expenditure of the school for the fiscal financial year.

Resource allocation is the core of the budget planning process (Shawe, 2023). Findings show that there is management of funds and this mean that a rational budgetary tool for control is monitoring the consumption of financial resources against the budget in order to ensure that spending is in accordance with the budget (Sauer & Seuring, 2023). Findings show that there is management of funds and this mean that a rational budgetary tool for control is monitoring the consumption of financial resources against the budget in order to ensure that spending is in accordance with the budget. (Nurfadila, 2024)

With budget planning, the staff engages in designing the budget activities which are required in the delivery of service to the schools for example purchase of scholastic materials. The institutions issues budget guidelines prior to the preparation of the budget and all staff

engage in budget preparation and discussion within their departments (Ismail et al., 2023) Each and every stakeholder in the budget planning made efforts to ensure that proper planning was done which improved on the service delivery. Sufficient consideration is made during the budgeting process to ensure the costs and the sectors at the district receive proper allocations (Kloot & Martin, 2000) Budget planning prepared schools for today-tomorrow operations by assessing what was to accomplish and such would be achieved to provide required resources that support school activities.

With budget staffing, the staff possessed unique budget roles; they were attached to key school sections from which they actively executed their budget assigned roles hence supporting school operations which ultimately improve on the service delivery. Participating stakeholders improve the identification and understanding of the specific needs and requirements of various departments which lead to more accurate budgeting and resource allocation (Grace & Grace, 2005)

With budget implementation, accountability in school setting helped staff account for the resources advanced to them to execute roles on behalf of the school. such transparency brings about financial stability that led to improved service delivery. Omosdi et al. (2016) noted that budget implementation controls the financial behavior of administrator in a school system because it prevents wastage or reckless spending of funds provided for various education service.

Many schools do not have the committees that monitor the implementation of schools' budget. some schools do not prepare and submit financial reports on time, some transactions aren't recorded or some serial payment vouchers do not have serial numbers (Prudencienne et al., 2023).

Supportive managerial performance in the tasks with in the school are mainly because all the staff are in involved in the budgeting process though sometimes the top management staff reserves the right to take on final decisions on budgeting for the schools (Oboth, 2020).

Enough resources are not allocated to schools various based projects. this mean that most schools do not receive enough funds to cater for various school projects. More so, funds from government take long to be disbursed (Oboth, 2020). As a result, this creates uncertainty in planning, disrupts schools' operations and all this have a negative impact on service delivery.

Budgeting ensures effective implementation of educational programs in all the activities in the school systems are adequately planned for and allocate the resources adequately and effective execution and implementation of education objects in schools. Therefore, there is a relationship between budgeting as a financial management measure and quality service delivery in secondary schools. This is in line with Nwite (2016) who examined financial allocation to education and students' performance in Nigeria and found a significant relationship between financial allocation and students' performance. Budgeting helps adequate resource allocation in schools which influences and improves the service delivery. Activities which are often not budgeted for are not implemented (Mafabi, 2016).

Budget making in schools is guided by clear goals and that public secondary schools identified the sources of finances and matched expected finances with expected expenditure. (Munge, 2016)

There is inadequacy in the budget preparation in some schools (Boma, 2018). This was shown by the inadequacies in the whole procedure. What is budgeted for is always inadequate which in turn affects the service delivery. According to Habitamu (2015), this may be due to hurried preparation of the budget by the finance officers.

Budgeting has a significant effect on service delivery but due to challenges in budgeting such as spending revenue on un budgeted items and failure to realize the budget projections, it follows that the service delivery falls short of expectations (Mafabi, 2016).

Budget variance analysis and budget review is rarely done in schools. (Njoroge, 2019). This is dangerous as it sabotages service delivery. Moreso, in many schools there is little or no use of procurement plan as a guide in procuring goods and services (Njoroge, 2019).

Budgeting plays an important role in payment of the suppliers, completion of school's projects, payment of teachers' salaries and collection of revenue (Kinyanzü, 2019).

3.2. Auditing

Table 3 below shows the number of articles reviewed about the effect of auditing on service delivery. We indicated clearly the Research Design, Research paradigm, Research focus, key findings and their limitation.

Table 3. Effect of auditing on service delivery in government schools

| No | Article title, author, year of publication, sample size and county of origin | Theory | Research design, research paradigm, research focus | Key findings/conclusion and limitation of the study |
|----|---|--|--|--|
| 1. | Inspection and quality audit as quality assurance mechanisms in the management of mission secondary schools of service delivery in Rivers State, Nigeria by Chinyere Uchenna (Giami, 2024). | None | Research design: correlation. Research paradigm: Interpretivism Research focus: Relationship between quality audit relates to the management of mission secondary schools | Key findings: Quality audit relate significantly to the management of mission schools for service delivery |
| 2. | Assessment of financial management practices in secondary schools in Abia state, Nigeria by Okeze et al. (2018). | None | Research design: survey Research paradigm: interpretivism Research focus: determining the auditing practices of secondary schools. | Key findings: There is no significant difference in the mean rating of principals and bursars on auditing practices of secondary schools. Limitation of the study: none |
| 3. | Factors affecting financial management effectiveness in public secondary schools in Gatanga sub county (Auditing in the Public Sector, 2020). | Agency.it suggests that when the owners of the firm leaves management in the hands of other people, then the management and other employees are referred to as agents while the owners are called principals, its concerned with conflict of interests between agents and principals. Headteachers are agents engaged by the government and parents as principals who are tasked with prudent management of the funds disbursed to schools and paid salaries for their work. The principals may lack trust in agents and thus put measures as audits to reinforce their trust. | Research design: descriptive Research paradigm: interpretivism. Research focus: Determining the effect of audit on financial management effectiveness in public secondary schools | Auditing is an essential practice affecting effectiveness of public secondary schools. Limitation of the study: none |
| 4. | Financial management practices by principals for administration of public secondary schools in rivers state Nigeria by Chukwuogo and Obi (2023). | None | Research design: descriptive. Research paradigm: interpretivism Research focus: identifying the ways in which principals auditing of account can enhance effective administration of public secondary schools | Key findings: The ways include, having independent examination of financial statements of the schools in compliance with statutory obligation, examining and evaluating in detail the financial standing of the schools for the period under review and |

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| | | | | ensuring regular and frequent checking on schools' financial transactions and records. Limitation of the study. None |
| 5. | Financial management in secondary schools in Kaloleni county Kenya (Mose, 2022) Sample size: 50 | None | Research design: descriptive case study. Research paradigm: mixed method. Research focus: Examining auditing practice in secondary schools. | Absence of a clear policy directive on financial leadership is reflected by arbitrary auditing practices |
| 6. | Effectiveness of school heads financial management skills in provision of quality education in secondary school in Tanzania by Shawe (2023). Sample size: none because the researchers only reviewed the documents and literature materials from online publications and from the libraries. | None | None Research paradigm: interpretivism. Research focus: Evaluating the effectiveness of school heads financial management skills in the provision of quality education in secondary schools. | There is poor auditing of school finances |

The purpose of auditing we to determine the degree of adherence to the prescribed criteria and to express opinion there on. Generally auditing as a profession can be defined as an independent examination of an expression of opinion on the financial statement of an enterprise by an appointed auditor in pursuance of the appointment in compliance with any relevant statutory obligation (Auditing in the Public Sector, 2020) In adequate audit in schools encourage financial mismanagement (steven 2019). Okeze et al. (2018) in their study, found out that a long span is taken to do auditing; and this makes it lose the financial value of audit. Nachinguru and Mwila (2023) also note that there is poor auditing of schools' finances and the time taken to audit is long. Okeze et al. (2018) assert that timely external audits on the public entities played a significant role in ensuring that public resources are put to the right use. This is in line with Kisanyanya and Omagwa (2018) who asserted that audit of school accounts resulted in good financial management that lead to effective service delivery. Lack of internal audit and irregular auditing create loopholes for proper financial management. Audit reports that are not adopted and implemented reduce the value of the audit in the financial management (Banura, 2018)

Payment vouchers are not always accompanied with the necessary supportive documents (Auditing in the Public Sector, 2020). This is in line with Banura (2018) who stated that payment vouchers provide three constructs that can be used to study financial accountability and these include financial reports, roles and responsibilities of managers and the audit reports. There is a high and positive relationship between auditing a financial management strategy and quality service delivery (Lankin, 2020)

There are annual audits on how public finances were utilized and internal auditors continuously performed audits on country finances. However, even though auditing is done nationally by qualified personnel, the best practices in auditing such as taking the action against those who misappropriate funds and using audit reports for future improvements were not applied (Auditing in the Public Sector, 2020)

Arinaitwe et al. (2021) maintained that auditing practices help in examining various school accounting books ,ascertaining the degree of adherence to budgetary guidelines and finding out the level of integrity of key financial managers in the school through cash survey and also checking school cash books, revenue collected and funds expand helps in detecting fraud, error, mistakes for possible remedial actions .this is supported by(A. Nachinguru & M. Mwila, 2023)who pointed out that auditing practices consist of all measures taken by an organization including education for the purpose of protecting its resources against waste, fraud and inefficiency, ensuring compliance with the policies of the organization and

evaluating the level of performance in organizational units.

3.3. Financial Controls

Table 4 below shows all the number of articles reviewed about the effect of financial internal controls on service delivery. we indicated the research design, research paradigm, key constructs from the study theories, key findings, sample size and their limitations.

Table 4. Effect of financial controls on service delivery in government secondary schools

| No | Article title, author, country of origin, year of publication and sample size | Theory | Research design, research paradigm | Key findings/conclusion and limitation of the study |
|----|--|---|---|---|
| 1. | The effect of cash management practices on performance of public secondary schools in Kisii county Kenya by Giami (2024). Sample size: 184 | None | Research design: descriptive survey. Research paradigm: Establishing the effect of internal control system on financial performance of public secondary school | Key findings: Schools have clear organizational structure, their reporting structure is clearly stipulated and that policies, practices, procedures and guidelines are documented |
| 2. | Financial management practices by principals for administration of public secondary schools in rivers state Nigeria by Andrews and Entwistle (2013). Sample size: 344 | None | Research design: descriptive survey Research paradigm: interpretivism Research focus: Determining the extent cash control practices by principals and school bursars affect administration in public schools | Key findings: Principals and school bursars don't differ in their perception as it's considered to principals' cash control prices. Continuous and transparent demonstration of cash control would ensure the provision of needed facilities, equipment and better personnel. Limitation of the study: none |
| 3. | Financial management practices in public secondary schools in Jimma zone in Ethiopia (World Bank, 2021). | None | Research design: descriptive survey. Research paradigm: interpretivism. Research focus: observing the financial controls available for checking or controlling the disbursement of funds | key findings: principals didn't collect all receipts and invoices for every item bought, pay and account for money spent on maintenance and supervise all financial activities in school Limitation of the study: time constraints, scarcity of resources as well as severity of the issue made the study not become comprehensive |
| 4. | Effect of financial management practices on financial performance of income generating activities in public secondary schools in Mombasa county (Kisanyanya & Omagwa, 2018). | The Resource dependency theory. the theory hypothesizes that despite the fact that all associations have internal assets, majority of them are not independent and in this manner, must rely on external assets to help their activities and goals. This theory recognizes the influence of external factors on organizational behavior. Managers can use this | None Research paradigm: mixed method. Research focus: Determining the effect of financial management practice on financial performance of income generating activities | Key findings: Financial controls influence performance of income generating activities positively. limitation of the study: none |

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| | | theory to reduce environmental uncertainty and dependence. | | |
| 5. | Financial resource management and its influence on students' academic performance in public secondary schools in Lang'ata sub county (Atieno & Kiganda, 2015). | Behavioral leadership theory | Research design: cross-sectional survey. Research paradigm: Research focus: Determining the influence of financial controls on the students' academic performance. | key findings: Proper financial management is essential for the success of the institution |
| 6. | Factors influencing financial management in public secondary schools in Nakuru county (Nurfadila, 2024). | Budget theory | Research design: cross-sectional. Research paradigm: interpretivism. Research focus: Examining the influence of financial controls on financial management in public secondary schools. | There was monitoring of how finance was utilized by the involved departments |
| 7. | Factors affecting financial management in public secondary schools in Embu west sub county, Kenya by Mose (2022). Sample size: 60 | Financial agency | Research design: Descriptive. Research paradigm: interpretivism. Research focus: Evaluating the factors affecting financial management practices | Internal control systems greatly influence financial management |
| 8. | Internal control measures adopted by principals for reducing financial misappropriation in public secondary schools in Anambra state, Nigeria by Kisanyanya and Omagwa (2018). | None | Research design: descriptive. Research paradigm: interpretivism. Research focus: Determining preventive measures adopted by principals for reducing financial misappropriation in secondary schools. | Key findings: Corrective measures are not adopted by principals for reducing financial misappropriation in public secondary schools |

Internal control system is defined as the policies and procedures which are put in place to ensure that the assets of an organization are protected and they are reliable for financial reporting. In the education sector, financial control simply refers to the methods and processes implemented to check and reduce the mismanagement of available funds and other assets of the school. without controlling of the school funds, the objectives of the school may not be achieved. (Tatum 2020)

Financial control is characterized as the procedures intended to secure resources and guarantee that every budgetary exchange is recorded to anticipate and minimize mistakes and extortion. An effective financial control mechanism ensures overall operational efficiency in an organization. Such prevents fraud, increases profitability, improves on operational efficiency, contributes to cash flow maintenance and ensures financial management (Kang'ethe Ngigi et al., 2019). All this improves on the service delivery in secondary schools. This is in line with (Kwanbo et al., 2023) who attributes secondary education quality outcomes to internal control monitoring as part of financial control system. (Kisanyanya & Omagwa, 2018) in his study in Kenya found that internal control monitoring had a positive significant effect on the financial performance in higher institutions of learning.

There is monitoring of how finances are utilized by all involved departments and persons and that control activities enable better employability of available resources. (Munge,2018). Relevant payment procedures, regulations and policies are clearly followed. (Mafabi2016)

The procurement and disposal act reduces the chances of the principals engaging in dubious transactions single handed thus majority schools follow the procurement act when procuring supplies for the schools (Nyaga, 2016).

4. Discussion

In comparing our findings with existing literature, it is clear that stakeholder engagement is crucial in the budgeting process. Previous studies emphasize the importance of involving all stakeholders in budget formulation to enhance transparency and accountability, aligning with my finding that encouraging stakeholder participation is key to effective budgeting. Our results further indicate the need for establishing mechanisms to minimize financial deficits during the year, which is consistent with the literature's recommendation to enhance bookkeeping practices to ensure fiscal responsibility.

Additionally, our findings emphasize the importance of principals strictly adhering to budgetary plans and ensuring the implementation of funds as planned. This aligns with earlier studies, which suggest that proper budgeting and execution of funds by headteachers are crucial for effective financial management. However, our interpretation of this outcome stresses that the culture of proper budgeting and implementation should become a routine practice in school financial management, addressing a gap in the literature that often overlooks the habitual nature of these practices.

Regarding auditing practices, both our findings and the literature agree that timely and adequate audits are essential for effective service delivery in schools. Literature highlights the need for regular inspections, and my research supports this, showing that periodic audits help schools achieve their objectives. Our study also highlights the importance of continuous evaluation of internal control systems, a point consistent with existing research, as it ensures all financial controls are effective and in place for successful auditing.

We further interpreted that school principals should engage both internal and external auditors to ensure a comprehensive audit process, aligning with the literature that stresses the need for independent auditing. Our recommendation to establish an independent auditing unit within the ministry of education to support schools underscores the need for external oversight, a point less frequently discussed in earlier studies but supported by my findings as a crucial step toward improving school financial management.

With respect to financial internal controls, our findings concur with the literature, which points out that headteachers must monitor the disbursement of funds to ensure efficiency in service delivery. Our interpretation extends this to suggest that the Ministry of Education should create policies to reduce financial misappropriation, outlining investigative and corrective procedures, an area that existing research often touches upon but without a clear implementation strategy.

Finally, both our research and previous studies suggest the need for financial control mechanisms to ensure efficient service delivery. We recommend further studies using larger sample sizes across diverse regions to verify these findings and provide a broader understanding of the subject.

5. Conclusions

The study concluded that in cases where headteachers secure funds through various means but fail to implement proper budgeting and fund disbursement, schools often experience ineffective financial management. This mismanagement hinders the achievement of set objectives, negatively affecting both teachers' and students' performance. Additionally, neglect in financial oversight results in deteriorating infrastructure within schools. Therefore, headteachers must prioritize practices that promote efficient financial management to ensure better service delivery.

Regarding the impact of auditing on service delivery, the study found that school accounting departments often suffer from inadequate staffing, while the ministry's audit personnel do not conduct regular reviews of school accounts. This lack of consistent auditing creates gaps in financial accountability, which can further hinder effective management and service delivery within schools.

In terms of financial control, the study highlights the importance of a strong link

between financial controls and service delivery in secondary schools. It concludes that effective internal financial control systems are crucial for ensuring that schools meet their service delivery goals. Proper financial oversight not only helps in achieving programmed objectives but also contributes to the overall success of the school's operations, leading to improved educational outcomes for both staff and students

References


- Akporehe, D. A., Comfort, O., & Egoh, B. (2024). Principles and problems of policy implementation reconsiderations for effective secondary school administration. *Journal of Education and Learning*, 18(1), 228–235. <https://doi.org/10.11591/edulearn.v18i1.21227>
- Amaikwu, J. O., & Ofojebe, W. N. (). Principals' Budgeting Practices for Enhancing Financial Management in Secondary Schools in Anambra State. *National Journal of Educational Leadership*, 5(1), 130-139. <https://journals.ezenwaohaetor.org/index.php/NJOEL/article/view/1382>
- Andrews, R., & Entwistle, T. (2013). Four Faces of Public Service Efficiency. *Public Management Review*, 15(2), 246–264. <https://doi.org/10.1080/14719037.2012.725760>
- Arinaitwe, P., Eton, M., Agaba, M., Turyehbwa, A., Ogwel, B. P., & Mwosi, F. (2021). Financial accountability mechanisms in local governments in Uganda: a case of Kabale District Local Government. *Journal of Accounting and Taxation*, 13(2), 99–109. <https://doi.org/10.5897/JAT2021.0453>
- Atieno, O. M., & Kiganda, E. (2015). Internal control systems on financial accountability in national public secondary schools in Kenya. *European Journal of Economic and Financial Research*, 4. <https://doi.org/10.46827/ejefr.v4i3.831>
- Auditing in the Public Sector. (2020). <https://www.icpau.co.ug/sites/default/files/Resources/Auditing%20in%20Public%20Sector.pdf>
- Banura, W. (2018). Internal control system and education service delivery in Busia municipal council. <https://kyuspace.kyu.ac.ug/bitstream/handle/20.500.12504/504/WYCLIFF%20%20BANURA%20MBA%20FINAL%20REPORT%20DEC%202018.pdf?sequence=1>
- Chukuwogo, N. H., & Obi, E. (2023). Internal control measures adopted by principals for reducing financial misappropriation in public secondary schools in Anambra state. *GPH International Journal of Education Research*, 6(7), 50–64. <https://doi.org/10.5281/zenodo.8238735>
- Giami, C. B. N. (2024). Educational Policy Formulation and Implementation in Nigeria: The Way Forward. *Rivers State University Faculty of Education Conference Journal*, 3(2), 341-354. <https://rsufecj.com/index.php/rsufecj/article/view/35>
- Gough, D., Oliver, S., & Thomas, J.. (2017). *An Introduction to Systematic Reviews*. SAGE Publications.
- Grace, P. G., & Grace, G. (2005). *School Leadership*. Routledge. <https://doi.org/10.4324/9780203974780>
- Ismail, M. D., Kathim, A. M., & Al-Kanani, M. M. (2023). Corporate Governance and its Impact on the Efficiency of Internal Control on Non-Profit Government Institutions: an Exploratory Study. *International Journal of Professional Business Review*, 8(1), e01155. <https://doi.org/10.26668/businessreview/2023.v8i1.1155>
- Kang'ethe Ngigi, S., Peninah, &, & Tanui, J. (2019). Principals' Financial Management Practices, Educational Administration and Performance in Selected Secondary Schools in Kenya. *Nairobi Journal of Humanities and Social Sciences*, 3(1), 15–25. <https://orcid.org/0000-0003->
- Kisanyanya, A. G., & Omagwa, J. (2018). Internal Control Systems and Financial Performance of Public Institutions of Higher Learning in Vihiga County, Kenya. Kenyatta University. <https://ir-library.ku.ac.ke/server/api/core/bitstreams/376e6dda-9ef2-4ca0-9df7-df3876350c66/content>
- Kloot, L., & Martin, J. (2000). Strategic performance management: A balanced approach to performance management issues in local government. *Management Accounting Research*, 11(2), 231–251. <https://doi.org/10.1006/mare.2000.0130>
- Kobusingye, L. K., Marongwe, N., & Odongo, I. O. (2024). No Learner Should Be Left Out: A Systematic Review of Perceived Effects of Inter Class Cognitive Classroom Streaming in Secondary Schools in Sub Saharan Africa. *Journal of Education*, 7(3), 30–46. <https://doi.org/10.53819/81018102t3103>
- Kwanbo, M. L., Ali Baba, E., Akanet, S., & Tanko, M. (2023). Financial Reporting Quality and Control System: A Mixed Approach Assessment. *International Journal of Management, Finance and Accounting*, 4(1), 1–21. <https://doi.org/10.33093/ijomfa.2023.4.1.1>
- Lankin, K. A. (2020). Supporting Families Through the Acute Phase of the Pediatric HSCT Experience. University of Illinois at Chicago. Thesis. <https://doi.org/10.25417/uic.14134469.v1>
- Mafugu, T., Njini, S., Musa Sithole, B., & Abel, S. (2022). A Rreview of financial management practices in selected secondary schools in the Kwekwe district of Zimbabwe. *International Journal of Sciences and Research*, 78(1). <https://doi.org/10.5281/zenodo.6654598>
- Mose, J. A. (2022). Influence of principals financial management practices on achievement of financial targets in public secondary schools of Dagoreti Sub County, Kenya. University of Nairobi. <http://erepository.uonbi.ac.ke/handle/11295/162659>
- Nachinguru, A. G., & Mwila, M. P. (2023). Financial Resource Management: Status and Challenges in Public Secondary Schools in Kinondoni Municipality, Tanzania. *International Journal of Social Science, Management and Economics Research*, 1(1), 1–14. <https://doi.org/10.61421/ijssmer.2023.1101>
- Nneka Iloabuchi, E., Abraham, N. M., & Afangideh, S. T. (2016). Management of Teaching Staff for Quality Education Delivery in Secondary Schools in Abia State, Nigeria. *American Journal of Educational Research*, 4(8), 617–623. <https://doi.org/10.12691/education-4-8-7>
- Nurfadila, N. (2024). Enhancing Public Financial Management through Performance Evaluation and Cost Systems. *Advances in Management & Financial Reporting*, 2(1), 24–35. <https://doi.org/10.60079/amfr.v2i1.264>
- Oboth, J. (2020). Financial management practices and students' welfare in government secondary schools in Buzaaya county in Kamuli district, Uganda. Kyambogo University (Unpublished work). <https://kyuspace.kyu.ac.ug/xmlui/handle/20.500.12504/869>
- Odok, L. O., Okenjom, G. P., & Mgbadike, C. D. (2023). Institutional Effectiveness in Secondary Schools in Ikom Education Zone, Cross River State, Nigeria. *Greener Journal of Educational Research*, 13(1), 23-28. <https://doi.org/10.5281/zenodo.8001400>



- Okeze, W. O., Okpe, P. U., & Ngwakwe, E. J. (2018). Assessment of financial management practices of secondary schools in Abia state. *Journal of economics and environmental education*, 3(1), 33-46. <https://iafee.org/wp-content/uploads/2019/05/Okeze-jeee-vol-3-No-1-pp-33-46.pdf>
- Owhondah, S. N., & Nwosu, K. L. (2022). Administrative strategies for managing students' wastage in public senior secondary schools in Imo State. *International Journal of Economics, Environmental Development and Society*, 3(4), 411-428.
- Sauer, P. C., & Seuring, S. (2023). How to conduct systematic literature reviews in management research: a guide in 6 steps and 14 decisions. *Review of Managerial Science*, 17(5), 1899–1933. <https://doi.org/10.1007/s11846-023-00668-3>
- Shawe, R. (2023). Budget and Organization Management. *Open Journal of Business and Management*, 11(03), 910–919. <https://doi.org/10.4236/ojbm.2023.113049>
- World Bank. (2021). Uganda systematic country diagnostic update 2021. <https://documents1.worldbank.org/curated/en/296161639430085363/pdf/Uganda-Systematic-Country-Diagnostic-Update.pdf>

Research Article

Homework – Necessity or Myth?

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<https://doi.org/eiki/10.59652/jetm.v2i4.286>

Abstract: Throughout generations a question has been posed: do students benefit from writing homework and does homework fulfill its purpose? The debate about the usefulness of homework causes many doubts in the educational public. Learning outcomes and the importance of homework are different today than twenty or more years ago. Contemporary students are not very interested in this type of activity, showing a high degree of non-independence in performing tasks outside the school environment. The author discusses the expediency of writing homework and its impact on students' learning achievements in class. Accordingly, the author examines the positive and negative sides of this extracurricular activity. This article was created based on the analysis of previous research and knowledge about this subject. Some Croatian and Slovenian didacticists believe that homework should not be abolished, but it should be functional, comprising of various exercises aimed at encouraging students to be active. Tasks are justified if they expand the possibility of learning and serve to develop students' abilities and skills. The author states that homework is necessary in the mother tongue teaching, especially at the initial level of primary school education. The teacher must control the quality and quantity of the homework, taking into account the time the student needs to complete it and the type of goals he wants to achieve in relation to the linguistic and literary material. The article offers the examples of homework in the fields of mother tongue, literature, written expression, reading and media culture. Modern technology offers numerous possibilities for creating creative homework.

Keywords: classroom teaching; extracurricular activity; homework; mother tongue; student

1. Introduction

Homework is an integral part of the teaching process. The very term homework is very “elastic” and includes everything that the student has to do outside of classroom, at home. Yavich and Davidovitch (2020) define homework as a task that teachers assign to students at school, and students are required to complete it during extracurricular hours, and they consider it a common learning strategy. There is an eternal generational polemic about the (un)justified need of doing homework (Gill & Schlossman, 2004; Athienitis, 2022). Others also point to the conflicting opinions about the justification of carrying out this activity (Hattie, 2009; Holte, 2016; Hogan, 2021). Students often perceive homework as an additional effort after class.

In the context of modern educational trends, the conditions under which homework should be done have changed. Learning outcomes and the meaning of homework today are different than twenty or more years ago. For example, in Finland, teachers have complete autonomy in choosing teaching activities and work methods, homework is not mandatory and should not take up too much of the students' time. Finnish education experts believe that active work at school is sufficient and homework can burden students, taking away their free time.

Horvat (2020), researching different teaching activities and habits of eighth graders in Croatia and Slovenia, came to the conclusion that most students write homework for one hour a day or less. The 2014 Institute for Social Research report on learning indicates that as many as 60% of fourth-grade students write homework and readings almost always at the last minute, 40% of them also often copy homework, with the boys leading the way (Simeg, 2020). This data is worrisome because it shows the students' lack of interest in this type of activity and a high degree of non-independence in completing tasks outside the school environment,

Received: September 9, 2024

Accepted: September 18, 2024

Published: October 18, 2024



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leading rightfully to the questioning of the purposefulness of homework. Teachers who use homework as punishment contribute to the students' negative attitude (Senekovič, 2007). When homework is used as a punishment or reward, it is not good practice (Jackson & Harbison, 2014).

So, should homework be abolished? This controversy causes many doubts in the educational public (according to *Fatberly.com*). The aim of this paper is to investigate the purpose of assigning and writing homework and whether it affects the educational achievements of students in classroom teaching. We will refer to the findings of the research conducted so far on this issue. The paper is a result of reading and analyzing the obtained data of the relevant literature. We will also offer examples of homework in the field of mother tongue and literature.

2. Purposefulness of Homework Practice and its Impact on Students' Educational Achievements

In modern teaching, the student is in the center of attention and it is very important that students develop an active approach and a positive attitude towards learning. The basic goal of the approach "to learn how to learn" is to train students to apply acquired knowledge and skills in different situations. The teaching process, which is based on a cognitive-constructivist understanding of learning, is a mental process in which the student realizes itself as a complete personality (Marentič Požarnik, 2003). How does the homework practice fit into modern learning and teaching strategies? In many European countries, there have been debates in recent years about the purpose of homework and whether it is useful for children's academic development.

Scientists cite numerous positive effects of writing homework: academic effects in the form of better understanding of educational content and retention of factual knowledge, learning at home, involvement of parents in the educational process, and improvement in students' attitudes towards school. Many teachers claim that homework is important both for learning educational content and for good work ethics (Šimeg, 2020). We can also mention some negative effects: primarily the saturation effect, because overdoing homework can result in general physical and emotional fatigue associated with the deprivation of free time (Škalič, 2016, Athienitis, 2022). The involvement and pressure of parents can also have negative consequences on the students' independence and can hinder their learning. Hattie (2009) opines that homework has almost no effect on children's learning in elementary school. Holte (2016) disagrees that this extracurricular activity encourages work ethic, claiming that it can also be counterproductive as students develop avoidance strategies and experience physical and emotional fatigue. He argues that the practice of homework in Norwegian elementary schools potentially threatens the quality of childhood. In her article „Should we ban homework?“ Frost (2020) states that the disadvantages of homework are beginning to outweigh the advantages.

Ivić (2017) conducted research on student assessments related to homework in the fourth and seventh grades of 13 elementary schools in the Republic of Croatia. 963 students who attended fourth (403 students) or seventh grade (557 students) participated in the research. Two aspects have been singled out in particular - usefulness (purposefulness) and interestness of homework. More than half of the respondents stated that they learn a lot from writing homework, but almost 30% of students do not find homework interesting. The research results point to a high percentage of respondents who believe that homework should be abolished (almost 50% of students), based exactly on additional reflections on the students' motivation for writing homework, and on the purpose and quality of the tasks intended for this activity. The results of the survey conducted by Ivić are shown in Table 1.

Table 1. Presentation of homework aspect particles and their basic descriptive characteristics with regard to the gender of the students and the class they attend

| Homework | Gender | | | | Grade | | | |
|---------------------------------|--------|-------|--------|-------|-------|-------|------|-------|
| | Male | | Female | | 4. | | 7. | |
| | X | sd | X | sd | X | sd | X | sd |
| Homework should be abolished. | 3,35 | 1,604 | 2,99 | 1,622 | 2,79 | 1,651 | 3,44 | 1,541 |
| I learn a lot writing homework. | 3,52 | 1,301 | 3,76 | 1,160 | 4,14 | 1,079 | 3,28 | 1,221 |
| Homework is interesting. | 2,63 | 1,278 | 2,83 | 1,238 | 3,30 | 1,276 | 2,32 | 1,074 |

Source: Ivić, 2017.

There is a statistically significant difference in students' attitudes with respect to age as well: fourth graders think more than seventh graders that homework is interesting; younger students to a greater extent estimate that they learn a lot from writing homework. Ivić still emphasizes the need to find out why a significant number of students express the need to abolish homework. She believes that students should be included in the creation of subject curricula, including considering their suggestions regarding homework that they find useful and interesting, as well as the amount and scope of homework.

The most extensive analysis and study on the connection between homework and school success was made at Duke University in 2006. Neuroscientist Harris Cooper (2007) and colleagues conducted a study called Battle over Homework. The study did not show a direct cause-and-effect relationship between writing homework and school success (no significant differences were found between respondents who regularly wrote homework and those who did not), so many opponents of this extracurricular activity cite these results as an argument against homework. However, Cooper emphasizes that his research is being misinterpreted and that his papers actually proved that homework is very useful for students. Stating that many factors influence school success, he believes that regular tasks students need to perform at home teaches them to manage time, plan and structure. In addition, students are taught responsibility, self-regulation and independence.

In Poland, the ruling coalition's decision to limit homework in elementary school came into force in 2024. According to the new regulations, students in first to third grade will no longer write homework, while teachers can give homework to students in fourth to eighth grade, but students are not obliged to do so. However, exercises to improve fine motor skills, such as writing by hand, are still compulsory (Nolan, 2024).

In contrast to Poland, the Irish Ministry of Education does not provide schools with guidelines on the appropriate amount of homework. Schools decide at a local level the extent to which homework is included in lessons. In Ireland, many schools have a specific approach to carrying out this teaching activity. Students at the Gaelscoil Mhichil Elementary School in West Cork do not have to write homework for one month of the year. Instead, they are required to keep a diary of good deeds done during the day. On Fridays, students at school read the messages they put in the "kindness basket", with the intention of learning the importance of the meaning of support. In the final year of elementary school, however, homework is mandatory as a preparation for secondary school (O'Connor, 2019).

Pupils' attitudes towards homework in Ireland become negative between grades 4 and 5, i.e. between ninth and eleventh grade. This is according to the Children's School Lives study, which was carried out on a sample of 4,000 Irish primary school pupils. However, the same study also showed that parents of students have a very positive opinion of homework (CSL, 2024).

Some Croatian and Slovenian methodologists (Lazarich, 2022, Petek, 2012, Seneković, 2007) emphasize the expediency of fulfilling this extracurricular activity, arguing that homework should not be abolished, but it must be functional, with various tasks that will stimulate students to be active (Bogdan, 2018). Homework is justified when it expands the possibility of learning and serves to develop students' abilities, skills and attitudes (Šimeg, 2020).

2.1. The Role of Parents in Monitoring Extracurricular Activities

To encourage responsibility towards obligations and tasks, a good procedure to follow is finding common agreement with students on the rules for writing homework. Assigning homework has its justification because it encourages independence in work, while transferring the responsibility for learning to students. Independent training facilitates the transfer of knowledge to new areas (Vizek Vidović et al., 2014). Under certain conditions regular homework has a positive effect on learning outcomes (Gage & Berliner, 1998): that homework is related to the educational content and included in the grade of the class subject, that it encourages in-depth processing of the class material and enables success, that homework is of shorter scope and teachers review them regularly with feedback on their validity.

When we discuss the concept of the all-day classes, we should take into account the aspect of work and freedom outside the school walls, without teacher supervision. It refers to the possibility that the child is „left to himself“, choosing to work on something related to school in that situation. Consequently, the student gains insight into her/his own abilities and builds self-esteem. This is an important factor in growing up and maturing. In contrast, excessive supervision over the child's daily activities in the formative period of life can result

in unwanted consequences in the process of her/his psychophysical development (Mostarkić, 2023).

In addition to teachers, parents play a crucial role in influencing students' positive attitude towards homework (Athienitis, 2022). However, led by the desire to help their child and make his/her work easier, parents often overdo it, reducing his creativity and resourcefulness by doing tasks for them. In the manual for parents, *How to Motivate a Child to Write Homework and Achieve Success in School* (Canter & Hausner, 2002), authors list the most common problems associated with writing homework and ways to overcome them. If the child is not doing the best he/she can, the reasons for writing the homework should be explained to child, an agreed time for writing should be introduced, and support should be provided in the form of praise when the child correctly fulfills his/her obligation. If the child does not want to write homework, it should be clearly communicated to the child that certain disciplinary measures will be implemented in agreement with the teacher, but the child should also be praised every time he writes homework well. When a child needs the whole evening to complete homework, it should be necessary to ensure that the work is written during the daytime and in a suitable place. If the child is not independent in writing homework, it should be emphasized that he/she is expected to be independent, but can always count on the parents' support and help. Rewards for completed tasks are not prohibited, but it is good to confirm verbal support with actions.

Answering a question of *How to Encourage a Child to Write Homework More Successfully?*, Cooper (2007) advises parents to be their child's organizer, role model, motivator, supervisor and mentor. The role of the parents in monitoring the performance of their child's activity is to take care of the space within which this activity takes place, expressing an attitude about the importance of the school that the child will adopt, and an unburdened monitoring of his/her work - to be with the child in the time of need and leaving the child alone when he/she does not ask for help.

Parents are tasked with providing feedback on their child's school activities and of a degree of mastery of certain knowledge and abilities. In the first grade, parents are expected to assist children in completing this activity, but over time their supervision stops so that the child becomes independent in solving tasks. Students should be monitored in their school duties, especially at the very beginning of their education, so that they can adapt as easily and quickly as possible. Over time, parents should reduce their influence because they cannot replace teachers (Di Pietro, 2009).

3. Homework in the mother tongue teaching

Homework in the mother tongue teaching is very much necessary, especially at the initial level of primary education and in all areas of language teaching. If we expect students to be creative in the domain of written expression, for example, then they must practice writing essays at home as well. Lugomer (2001) vividly explains a manner in which students progress in language creation - if they want to learn to write quality works, then they must write compositions, not watch others do it. Even football cannot be learned by surfing the internet, but by playing. The more students practice, the better their skills become.

At the beginning of the processing and interpretation of the teaching content, students should be clearly informed about the expected educational outcomes in a particular class. It is also important to define what they should do at home, so they can, in the following classes and in collaboration with teachers, practice the application of the covered content. From their side, teachers need to determine the goals they want to accomplish by assigning certain homework - whether to strengthen the language knowledge and spelling abilities of their students (reproduction function) or encourage creative expression (productive function). Motivation to perform a certain activity is very important (Jurišević, 2012). Students should be assigned homework during the language, literature, language expression or media culture lessons. If homework is given after the school bell rings, many students will not register teachers' instructions due to the noise.

Teachers need to control the quality and quantity of homework, with an awareness of the amount of time necessary to complete it and the type of goals they want to achieve in relation to the language and literature materials. Homework must be a means of practice, and not just a formal obligation; the emphasis is not on whether a particular student wrote the homework, but rather how he/she wrote it and whether he/she managed to do what was expected. The amount of homework does not matter either, but how meaningful the assigned tasks are. With well-targeted questions, students can master the spelling rule of writing

punctuation at the end of a sentence in a short time. It is better to offer two or three constructive questions than a bunch of tasks that the child cannot solve conscientiously because it requires too much time.

Budinski (2019) investigated situations in which teachers assigned their first grade students homework related to certain initial reading and writing materials that they could not cover in class due to the lack of time, although they are methodically more appropriate for teaching in the classroom. In a sample of 323 teachers surveyed, it was shown that such contents most often assigned for homework compared to all other contents are the following: independent inventing and writing words and sentences, reading sentences, texts and primers and rewriting words made up of learned letters. Teachers estimated that the students needed an average of 30 minutes to understand the content and write the homework.

Teachers may occasionally offer students a choice of exercises to practice at home, but without sanctioning them for a failure to do so, aiming to encourage student activity. Each student approaches learning and tasks differently, each child learns in his/her own way, at his/her own pace (Jurišević, 2012).

We shall list some possibilities for assigning homework in the mother tongue teaching:

- teaching of language and communication (workbook, teaching sheets, language-methodical template, spelling check);
- teaching of literature (questions and tasks from textbook, workbook, dramatization of the text, memorizing the poem);
- teaching of literature and creativity (composition writing, creative expression, retelling, auto-dictation);
- teaching media culture (making a picture book or comic book, analyzing a puppet show, etc.);
- teaching reading (reading diary, dramatization of the text, etc.).

Here are examples of homework according to the planned curricular learning outcomes and domains of the Croatian language subject in the 4th grade (with the use of the textbook *Zlatna vrata 4* by Krmpotić and Ivić (2021). Tables 2 and 3 provide examples of homework.

Table 2. Example of homework from the domain Croatian language and communication, spelling

| | |
|---------------------------------|--|
| Lesson: | Names of peoples, inhabitants, countries and geographical entities - capital letter |
| Domain/concept: | A. Croatian language and communication |
| Outcome: | HJ A.4.4. The student writes texts according to a simple structure. HJ A.4.1. The student talks and speaks in accordance with the communication situation |
| Elaboration of outcomes: | HJ A.4.4. Writes with a capital letter: the names of peoples, inhabitants, countries, geographical units HJ A.4.1. Uses new words in a communication situation Homework Choice: a) Uses a map. Write the names of two cities of our homeland that you would like to visit and the names of the geographical units to which they belong. Geographical units should be distinguished. Next to them, write the names of the inhabitants of those geographical units. b) Write an invitation to an unknown friend. Invite him/her to your place. Don't forget to write the geographical entity to which it belongs and the name of your homeland. What other places will you visit? <i>Potentially gifted students</i> Be a teacher. Come up with tasks with which you will check the content we learned about in today's class. <i>Students with difficulties</i> Answer the questions in complete sentences. What is the name of your place? What do we call the inhabitants of your place? In which country is your place located? |
| | <i>Source:</i> Author's own development. |

Table 3. Example of homework from the domain Croatian language and communication, linguistic expression

| | |
|------------------------|---|
| Lesson: | Storytelling – practice and repetition |
| Domain/concept: | A. Croatian language and communication |
| Outcome: | HJ A.4.2. Student listens to different texts, extracts important information and recounts the content of the listened text. |

| | |
|--|--|
| | HJ A.4.3. Student reads the text and recounts the content of the text using notes. |
| Elaboration of outcomes: | HJ A.4.2 Retells the listened text based on the notes. |
| | HJ A.3.4. Connects the graphic structure of the text and content. |
| Homework | a) Interview with one of the older members of your family. Topic: My elementary school (memories). |
| | b) Create a mind map. Report orally. |
| | <i>Potentially gifted students</i> Research what the schools your great-grandmothers and great-grandfathers attended looked like. Create a mind map. Report orally. |
| | <i>Students with disabilities</i> When are you happiest at school? Report orally. What elementary school do you go to? What is your favorite subject? Why? |
| <i>Source:</i> Author's own development. | |

We can also cite an example of homework from literature for the fourth grade of elementary school. The basis of this field is the reading and reception of literary texts, which are an expression of the artistic, linguistic and cognitive understanding of the world and reality (Petek, 2012). Personal development and building of attitudes and opinions about the read work is encouraged in students, and they are stimulated to read for pleasure and to be creative. In the first grade, picture books are often interpreted because the students are just learning letters. Students can recognize certain elements of the text and express their opinion after reading or listening to the text. A very interesting task for students would be to create their own picture book, as with this activity they can express their own creativity and creative ability. The task is to come up with the look and design of the picture book, and then the story that accompanies the photos (Figure 1).

Making your own picture book

At the very beginning, think about the topic of your picture book.
Before you start creating, think about the sequence of events and make a sketch of the picture book.

Accessories:

- scissors, glue, crayons
- decoration material
- cardboard and colored paper
- twine / ribbon

Steps in making:

1. Cut the cardboard to the desired size and glue colored paper over each cardboard.
2. Arrange the cartons on top of each other, in the order in which you want them to be arranged.
3. On one side, punch two holes through all the cardboard and thread a string or ribbon through the holes and tie it.
4. Paint the cover and add the title and author's name.
5. Edit each page according to the sketch and draw the illustrations, then write the text of the picture book.
6. Mark the page numbers with numbers.

Figure 1. Instructions for making a picture book by yourself.
Source: Težak et al., 2021.

Creating your own picture book is a very stimulating and creative homework task. In addition to causing students' immediate interest in the task, it also leads to their creative expression which develops their imagination (Vuk, 2022).

Students often dislike activities related to reading, and the reason may be that the methods used to interpret the work are often outdated and not creative and stimulating enough. However, when digital games are used for the purpose of interpretation of reading works, this activity becomes attractive to students and offers them various opportunities for

learning and receiving new information. Moreover, the digital way of analyzing a reading work can be done either at school or at home as homework.

The internet is a source of a multitude of simple computer tools, very useful in classes, which provide students with the opportunity to express their creativity (Blažić, 2010). Pixton, Comix and StoryboardThat are just a few of the interactive online tools that make creating comics possible. They are free, easy to use, and very interesting to students (Lazzarich & Čančar, 2020). These tools with a pre-prepared content repository offer a wealth of ready-made characters and objects. The readings can be used in a way that the favorite chapter is turned into a comic book. Students need to justify their choice (using the method of working on the computer and the method of oral presentation). Before starting work, teachers show the students examples of comics created in the mentioned programs. During the creation of the comic, they will follow their work, and after completion, watch the created comics together on the projection screen.

We will present an example of a comic strip motivated by an episode from the novel *The Adventures of Arno and Gigi*, written by Nada Mihelčić (*Pustolovine Arna i Đidija*, 2010).



Figure 2. Example of a comic in the Pixton program.
Source: Author's own development.

3.1. Individualization and evaluation of Student Achievements in Extracurricular Work

Homework can also be used to check knowledge - teachers determining whether students have completed the homework independently. To determine the grade, the teacher can ask a supplementary question to an individual student. Students will surely approach writing homework if they are motivated by curiosity and challenging tasks. The following procedures could contribute to a more positive students' attitude towards homework: the possibility of doing homework in pairs or groups, differentiation of tasks, variety and involvement of students in the tasks' design, reference to different sources of knowledge and timely feedback, as well as joint evaluation of the work (Ivić, 2017). Integrated homework that corresponds in content to related subjects, such as language and art (literature, music and visual arts), are particularly stimulating. If we perceive homework as independent work that is assigned to students in a stimulating atmosphere, the child is likely to develop positive emotions towards homework.

Everything that applies to regular classes also applies to distance learning. „Working on homework in the organization of distance learning does not differ in any way from teaching in the classroom. If the student solves the homework and does not receive any feedback from the teacher about the success of his/her work, it has no purpose. If the teacher is unable to review the homework for any reason, it is better not to assign it.“ (Rukljač & Jurjević Jovanović, 2021, p. 6).

For teachers, checking and grading homework is an extra effort. In an increasingly demanding profession, new technologies can help to reduce the pressure on teachers. Several Swiss schools in the canton of Zurich have successfully used artificial intelligence to check and grade students' homework. This took place as part of a five-month pilot project with the aim of scrutinising the effectiveness of the technology in the classroom. The teachers involved expressed their satisfaction with this way of monitoring the success of tasks, as they had more time for other teaching activities.

To avoid causing students' aversion to writing homework, it should not be the result of improvisation, formalism or punishment for indiscipline. It is necessary to carefully determine

the amount of assigned homework in order not to overdo it, without exceeding students' capabilities, because then the parents write the homework, or the student copies it, or he/she comes to school without homework. Additionally, homework should be adapted to the student's age and individual characteristics. Homework also plays an important role in developing work habits, thereby the individualization of assigned tasks is important, although objective circumstances (work commitments and the number of students in the class) may prevent its implementation. Individualization is very necessary when the aim is to help a child with permanent difficulties or encourage a gifted student to work.

It is essential to achieve as active a relationship as possible among students in class, but also towards extracurriculum obligations, to guide them towards evaluating their own work so that they accept personal responsibility for the achieved success in the subject area. The point is not to make homework fun, and students must be aware of that. Homework should primarily be a means of developing self-regulation and work habits in students, affecting their general well-being and academic success (Rukljač & Jurjević Jovanović, 2021). In this context, this extracurricular activity should by no means be considered useless.

4. Conclusions

In this paper we tried to discuss the functionality of homework in the teaching process. The focus was on the initial level of education – classroom teaching. By analyzing previous researches, we tried to once again examine the meaning and purpose of writing homework and its influence on the level of students' knowledge. Although we still lack a direct confirmation that the execution of this extracurricular activity affects the educational achievements of students, we nonetheless believe that the positive effects prevail in the practice of homework. With homework, students additionally practice and learn the covered content, more easily achieving the planned learning outcomes. The most important goal of assigning homework, along with its regular checking and evaluation, is to encourage students to study independently outside of school, in their own environment. Homework is a good opportunity to repeat the material heard in class. Functional teaching of language and literature requires purposeful methods and forms of work.

The quality and abilities of teachers are visible precisely in the organization of classes which is stimulating for all students. The role of the teacher is to present this activity to the students in an appropriate way. Teachers should not overdo the amount of assigned tasks, but should keep them in line with the students' capabilities. Teachers have various motivational methods at their disposal, as well as tools that students can use when doing homework, without perceiving it as an additional effort. Students should be given a choice of tasks that will serve their purpose, primarily in mastering the educational field and practicing the material. Modern technology provides many opportunities for designing creative homework, requiring that teachers are trained to work with digital tools. The involvement of parents in the educational process is also important, but so is that parents do not carry out activities instead of students.

In finishing, we can answer the title question: homework is not just a myth, but a legitimate need. Homework shows students that they can practically apply the content they learn in class outside of school in their everyday life.

References

- Athienitis, A. (2022). The Great British Homework Debate 2022 – Is It Necessary At Primary School?. <https://thirdspacelearning.com/blog/homework-debate-disadvantages-benefits/#:~:text=According%20to%20the%20Education%20Endowment,a%20control%20of%20doing%20nothing>
- Blažič, A. (2010). Pričam ti priču... digitalnu. <https://pogledkrozprozor.wordpress.com/2010/06/21/pricam-ti-pricu%e2%80%a6-digitalnu/>
- Bogdan, T. (2018). Domaća naloga na razredni stopnji. <https://pogledkrozprozor.wordpress.com/2018/06/30/domaca-naloga-na-razredni-stopnji/>
- Budinski, V. (2019). *Početo čitanje i pisanje na hrvatskome jeziku*. Profil Klett.
- Canter, L., & Hausner, L. (2002). *Domaća zadaća bez suza: priručnik za roditelje: kako motivirati dijete da piše domaću zadaću i postigne uspjeh u školi*. Naklada Kosinj.
- Children's School Lives (2021). <https://cslstudy.ie/about/>
- Cooper, H. M. (2007). *The Battle over Homework: Common Ground for Administrators, Teachers, and Parents*. Sage Publications.
- Di Pietro, P. (2009). *Kako preživjeti djetetovu školu: Poticaji za uspješno bavljenje domaćim zadaćama, odnosima s učiteljicom, razrednim okupljanjima i izletima*. Izdavački centar Rijeka.
- Fatherly (2018). 4 Homework Myths that Parents Should Consider. <https://www.fatherly.com/parenting/myths-parents-young-kids-homework>

- Frost, A. (2020). Should we ban homework?. <https://www.weareteachers.com/should-we-ban-homework/>
- Gage, N., & Berliner, D. (1998). *Educational psychology* (7th ed.). Houghton.
- Gill, B. P., & Schlossman, S. L. (2004). Villain or savior? The American discourse on homework. *Theory Into Practice, 43*(3), 174-181. https://doi.org/10.1207/s15430421tip4303_2
- Hattie, J. (2009). *Visible learning*. Routledge Taylor & Francis Group.
- Hogan, J. (2021). School homework: Does it have any benefit at all?. <https://www.irishtimes.com/life-and-style/health-family/parenting/school-homework-does-it-have-any-benefit-at-all-1.4526164>.
- Holte, K. (2016). Homework in Primary School: Could It Be Made More Child-Friendly?. *Studia paedagogica: Childhood, 21*(4), 13-33. <https://doi.org/10.5817/SP2016-4-1>
- Horvat, J. (2020). Nagrade i kazne u odgoju. <https://slidetodoc.com/nagrade-i-kazne-u-odgoju-pripremila-jelena-horvat/>
- Ivić, S. (2017). Strategije poučavanja i zadovoljstvo učenika nastavom (Doctoral dissertation). Filozofski fakultet Sveučilišta u Zagrebu.
- Jackson, J., & Harbison, L. (2014). An Evaluation of the Utility of Homework in Irish Primary School Classrooms. *Irish Teachers' Journal, 2*(1), 47-62., <https://www.into.ie/app/uploads/2014/01/IrishTeachersJournal2014.pdf>
- Jurišević, M. (2012). *Motiviranje učenice v šoli*. Univerza v Ljubljani, Pedagoška fakulteta.
- Krmpotić, M., & Ivić, S. (2021). *Zlatna vrata 4*. Školska knjiga.
- Lazzarich, M., & Čančar, A. (2020). Dječja lektira i novi mediji. *Metodički ogledi, 27*(2), 149-170. <https://doi.org/10.21464/mo.27.2.10>
- Lugomer, V. (2001). Dramski odgoj u nastavi. <http://www.hcdo.hr/knjiznica/strucni-clanci/valentina-kamber-dramski-odgoj-u-nastavi/>
- Marentić Požarnik, B. (2003). *Psihologija učenja in pouka*. Državna založba Slovenije.
- Mihelčić, N. (2010). *Pustolovine Arna i Didija*. Izvori.
- Mostarkić, S. (2023). Rasprave o domaćim zadaćama: treba li ih ukinuti? *Školske novine, 29*, 9-10.
- Nolan, L. (2024). Why did Poland get rid of homework in primary schools?, RTE, <https://www.rte.ie/news/2024/0421/1444630-poland-homework-primary-schools/>
- O'Connor, R. (2019). Irish school replaces homework with acts of kindness: "Be the reason somebody smiles today". <https://www.irishpost.com/news/irish-school-replaces-homework-acts-kindness-reason-somebody-smiles-today-174728>.
- Petek, T. (2012). Strategije raziskovanja in poučavanja pismenosti. *Šolsko polje, 23*(3-4), 199-220. <https://repozitorij.uni-lj.si/Dokument.php?id=75521&lang=slv>
- Rukljač, I., & Jurjević Jovanović, I. (2021). *Digitalno učenje u razrednoj nastavi*. Školska knjiga.
- Seneković, J. (2007). Domaće naloge in poučevanje matematike. *Matematika v šoli, 13*(3-4), 186-195.
- Šimeg, M. (2020). Zadaća treba pomoći učeniku u stjecanju znanja. *Školske novine, 8*, 4.-7.
- Škalič, M. (2016). So domaće naloge nujno zlo? <http://kje-vas-cevelj-zuli-solstvo.blogspot.com/2016/03/so-domace-naloge-nujno-zlo.html>.
- Težak, D., Gabelica, M., Marjanović, V., & Škribulja Horvat, A. (2020). *Škrinjica slova i riječi 3*. Alfa d.d.
- Vizek Vidović, V., Rijavec, M., Vlahović-Štetić, V., & Miljković, D. (2014). *Psihologija obrazovanja*. IEP-Vern.
- Vuk, K. (2022). Svrhovitost pisanja domaćih zadaća i njihov utjecaj na obrazovna postignuća učenika razredne nastave (Graduation thesis). Učiteljski fakultet u Rijeci.
- Yavich, R., & Davidovitch, N. (2020). Homework: At Home or at School? – Attitudes of Teachers, Parents and the General Public: A Case Study. *International Educational Studies, 13*(6), 170-179. <https://doi.org/10.5539/ies.v13n6p170>

Research Article

Guidelines for Developing Innovative Thinking Skills of Teachers in Samut Prakan Vocational Colleges, Thailand

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<https://doi.org/eiki/10.59652/jetm.v2i4.313>

Abstract: The objectives of this research were 1) to study the innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand, and 2) to study guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand. The sample consisted of 5 experts for interviews, and 201 teachers for questionnaires. The research instruments were questionnaires with an IOC (Index of Item-Objective Congruence) value between .67 and 1.00, and a reliability value of .96 and an interview form. Data were analyzed by using mean, standard deviation, and content analysis. The results of the research were as follows : 1) the innovative thinking skills of teachers were at a high level, in overall and particular aspects, ranking from the highest to the lowest mean : Crafting, Imaging, Personalizing, Collaborative, Serious play, and Paying attention, and 3) Development Guidelines of 1) Crafting: Workshops and Training, Collaborative Projects, Case Studies, Industry Collaboration, and Innovation Labs; 2) Imaging: Incorporate Visual Storytelling ,Utilize Digital and Immersive Tools, Real-World Applications and Simulations, Visual Mapping for Critical Thinking, and Collaborative Visual Brainstorming; 3) Personalizing: Teacher Training and Reflection, Student-Centered Learning, Industry Collaboration and Practical Application, Collaborative Platforms for Peer Learning, and Tailored Learning Plans; 4) Collaborative inquiry: Structured Collaborative Environments, Collaborative Research Projects, Technology Integration, Leadership in Collaboration, and Institutional Networks; 5) Serious play: Innovation Labs/Makerspaces, Prototyping and Iteration, Workshops and Collaborative Projects, Challenge-Based Learning, and Innovation Challenges; and 6) Paying attention: Implement Hands-On Workshops, Integrate Technology, Adopt Project-Based Learning, Foster Collaborative Learning, and Encourage Cross-Disciplinary Learning.

Keywords: innovative thinking skills; vocational teachers; educational administration

Received: October 13, 2024

Accepted: October 20, 2024

Published: October 28, 2024



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1. Introduction

In the current era of rapid changes in economics, society, and technology, the 13th National Economic and Social Development Plan (2023–2027) emphasizes the importance of enhancing and improving the quality of public administration to align with the needs of modern society. Additionally, this development plan highlights the crucial role of the education system at all levels, particularly in vocational education, which must focus on producing highly competent manpower to meet the country's economic development needs and effectively adapt to the rapid societal changes (Office of the National Economic and Social Development Council, 2018). Vocational education serves as a key mechanism in preparing a workforce with high skills and competence. Lieutenant Thanuth Wongjinda, Secretary-General of the Office of Vocational Education Commission, stressed the role of vocational education in producing highly capable personnel, which aligns with the concept of “Thailand: Stable and Prosperous through Vocational Expertise” (Office of the Vocational Education Commission, 2023). Progress at this stage is imperative for improving the standard of living for individuals within our society and bolstering the international competitiveness of our nation, especially within the industrial and manufacturing fields, which serve as the foundation for economic advancement (Eradatifam et al., 2020). In the context of Samut Prakan province, an important industrial hub, vocational education plays a vital role in supporting the development of manpower to meet the demands of the business sector.

Therefore, the development of innovative thinking skills is essential, particularly at Samut Prakan Vocational College, which aims to foster both students and teachers in creating new innovations that respond to the needs of the labor market in the digital age.

Fostering innovative thinking holds great importance in driving organizational growth and success. In today's rapidly evolving world, it is crucial for companies to stay ahead of the curve by constantly promoting creativity and encouraging their workforce to think outside the box (Meinel et al.,2020). This is where the significance of developing and educating staff to embrace innovative thinking comes into play. Investing in training programs, workshops, and coaching sessions, organizations can equip their employees with the necessary skills and mindset to generate groundbreaking ideas, problem-solve efficiently, and drive continuous improvement. When employees are empowered to think innovatively, they become valuable assets who can contribute to the company's overall goals and objectives. With a culture that values innovation and nurtures creative thinking, organizations can stay competitive, adapt to change effectively, and unleash their full potential for growth and success (Steinerowska-Streb & Głód,2020). They must share the organization's vision of becoming an innovation-driven entity, like the organization's leaders. This leads to continuous improvements in work processes (Process Innovation), which eventually develop into product or service innovations (Product/Service Innovation) and culminate in the creation of new business models (Business Model Innovation) (Juliana et al.2021). "Innovative Thinking" comprises two key concepts: "thinking" or "thinking skills" and "innovation." Thus, the meaning of "thinking skills" refers to the ability to think, arising from the brain's cognitive processes in response to various situations, potentially cultivated through upbringing, experience, or education (Serdyukov, 2017). Meanwhile, "innovation" refers to the use of creativity to develop or invent new products or processes. Therefore, "Innovative Thinking" refers to generating new ideas that help solve problems or develop new products, services, or processes that add value and benefit customers or clients. Chamchoy (2012) state that innovative thinking skills are the fundamental thinking skills needed to foster innovation within organizations. Cultivating this type of thinking in teachers and staff in educational institutions is crucial because educational administration requires collaboration between teachers and education personnel to drive outcomes through knowledge management processes, ultimately transforming the institution into an innovative organization (Imuetinyan & Ngozi, 2023). The results of such innovation-driven management are reflected in the quality of students, which can be seen as innovative products that stem from effective innovative management (Bednar & Spiekermann-Hoff, 2021).

According to the policy of the Office of the Vocational Education Commission (OVEC), management approaches aimed at enhancing efficiency and raising the quality of vocational education systems are essential in developing the quality of personnel within organizations (Office of the Vocational Education Commission, 2023). These approaches emphasize innovative thinking skills, a process that administrators must prioritize in developing teachers, to foster a working environment conducive to creativity and innovation, particularly in the current context of technological and societal changes. Similarly, Professional Standards in Education (2022) highlight the importance of innovative thinking skills, stating that innovative thinking is a critical necessity for personnel development in organizations. Creativity and innovation are other essential factors that help organizations grow. Continuous development of creative and innovative thinking will provide new approaches to work, solve problems effectively, and view challenges as opportunities for improvement (Abdelhamid, 2022). It also prepares individuals to face changes and emerging technologies in an uncertain world while generating new ideas that are beneficial and valuable to the organization (Brenner & Uebernickel, 2016). This marks the beginning of innovation development within organizations, giving them a sustainable business advantage.

As the evaluation and quality assurance report on educational standards in the group of four public vocational colleges in Samut Prakan Province, namely: 1) Phra Samut Chedi Vocational College; 2) Samut Prakan Polytechnic College; 3) Kanjanapisek Technical College Samut Prakan; and 4) Samut Prakan Technical College, a significant issue has been identified. The innovation, invention, creative works, and research activities of teachers, students, and learners are generally at an overall level of 60%, which is considered average. Furthermore, the executive summary provided recommendations for overall institutional development, suggesting that educational institutions should support and encourage the creation of innovations, inventions, and creative works by teachers, education personnel, and students by applying vocational skills and knowledge. These innovations and inventions should be beneficial to the institution, community, local area, and society. As the quality assurance report

on educational standards of Phra Samut Chedi Vocational College (2021), Kanjanapisek Technical College (2023), Samut Prakan Technical College (2022), and Samut Prakan Polytechnic College (2022) identified that these can be achieved through: 1) Enhancing students' competitiveness in vocational skills; 2) Providing guidance and support to increase graduation rates; 3) Developing or improving competency-based curricula or adding supplementary subjects in line with professional qualifications in relevant fields; and 4) Fostering teachers' and students' work in innovation, invention, creative works, and research, enabling them to compete and apply these contributions effectively at various levels. Horth & Buchner (2014) discussed the innovative thinking skills required to foster innovation in organizations. They emphasized the need to instill these skills in teachers and educational personnel. Since educational administration depends on collaboration between teachers and education staff, managing outcomes through knowledge management processes can transform an institution into an innovative organization. The innovative thinking skills of administrators consist of six key abilities: 1) Paying attention: The ability to notice overlooked details and new patterns by slowing down and observing deeply. It involves thoroughly examining and analyzing a given situation from fresh and novel angles, thereby taking into consideration a wide array of diverse perspectives, all aimed at attaining a significantly enhanced and thorough comprehension (Gadušová et al.2021); 2) Personalizing: Tapping into personal experiences and passions to introduce fresh perspectives at work. It also involves deeply understanding customers to innovate by connecting insights from personal life and customer experiences (Trasmundi et al., 2021); 3) Imaging: Using imagery, metaphors, and stories to process complex information. Imagination is instrumental in fostering innovative prospects and envisioning potential end results (Smith et al., 2022); 4) Serious play: Breaking routine and using playful exploration to foster innovation. Engaging in enjoyable and exploratory activities may yield significant outcomes through the bending of rules and the testing of limits (Kim et al.2021); 5) Collaborative inquiry: Innovation comes from shared ideas through thoughtful dialogue. Engaging various stakeholders in nonjudgmental conversations can lead to new insights and opportunities (McCarthy & McNamara, 2021); and 6) Crafting: The skill of synthesizing opposing ideas to find new solutions. Crafting involves integrating different viewpoints and shaping possibilities from seemingly unrelated information (Ferri et al., 2020).

It is evident that studying strategies to promote innovative thinking skills among teachers at vocational colleges in Samut Prakan Province, Thailand is of great importance (Rapanta, 2021). The rapid and exponential progressions in technology and significant shifts in the economic landscape are increasingly demanding the vocational education system to nurture and foster educators who not only possess exceptional expertise in their respective fields but also exhibit exemplary forward-thinking abilities. These vital skills play an indispensable role in the generation of revolutionary ideas and innovative concepts that can seamlessly adapt to the ever-evolving and dynamic environment, ultimately fulfilling the ever-growing demands and requirements of the highly competitive labor market (McGrath & Yamada, 2023). This research will play a significant role in assisting vocational colleges in Samut Prakan to develop effective strategies aimed at enhancing the overall teaching quality and educational management. Moreover, it will also focus on nurturing a pool of creative and highly adaptable personnel capable of facing and overcoming future challenges (Muzam, 2023). By not conducting this research, there is a risk that educators and educational professionals might not be equipped with the necessary skills and knowledge to promptly adapt to the evolving educational landscape. Consequently, this could potentially lead to an obsolete education system and a significant decrease in competitiveness at both the national and international level. Therefore, the significance of this research cannot be overstated as it holds the power to shape education and ensure its continued relevance and superiority in today's ever-changing world (Fairman et al.2020). This aligns with Chamchoy (2012) emphasized the importance of creating a culture that fosters creativity and innovation, stating that such a culture helps transform an institution into an innovative organization with strong competitive potential. It is essential to foster originality and creativity in educators and leaders in order to enhance the quality of education and create advantageous results for the organization (Yeap et al., 2021).

The researcher thus recognizes that guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand is particularly significant in the context of economic, social, and technological changes. Research in this area will not only elevate the quality of educational management but also provide a key approach to creating innovations that can meet the demands of both current and future labor markets

2. Materials and Methods

This section presents the research methodology employed in gathering and analyzing data to identify innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand. The methodology involves a descriptive research method with both quantitative and qualitative phases. The key components of this methodology are outlined as follows:

2.1. Population and Sample

The study involved two phases: In Phase 1, the population comprised 415 teachers in the group of four public vocational colleges in Samut Prakan Province, namely: 1) Phra Samut Chedi Industrial and Community Education College; 2) Samut Prakan Polytechnic College; 3) Kanjanapisek Technical College Samut Prakan; and 4) Samut Prakan Technical College, and the sample consisted of 201 teachers selected through stratified random sampling based on colleges, using Krejcie & Morgan (1970)'s table. In Phase 2, five experts, who met specific criteria such as a master's degree and at least three years of experience, were chosen for qualitative analysis. These experts included school directors of the group of four public vocational colleges in Samut Prakan Province, Thailand and educational directors in public vocational colleges, Thailand.

2.2. Research Instruments

Two instruments were employed in this study. The first instrument was a survey questionnaire, adapted from Horth & Buchner (2014), utilizing a 5-point Likert scale. The questionnaire was structured into a total of 40 closed-ended questions, specifically designed to address the first objective of the study. The questions were organized into blocks focusing on 6 variables of innovative thinking skills. Data were collected using Google Forms, targeting 201 vocational teachers from Phra Samut Chedi Vocational College, Kanjanapisek Technical College, Samut Prakan Technical College, and Samut Prakan Polytechnic College. The survey took place during the academic year, ensuring a comprehensive representation of the teachers' perspectives across these institutions, and the second instrument was a structured interview questionnaire, developed based on the average results from the first objective of the survey. This interview questionnaire was designed to gather deeper insights from five experts in vocational education management. These experts were selected based on their expertise and knowledge in the field of vocational education. Their input was crucial in validating and expanding upon the findings from the initial survey, providing a well-rounded understanding of innovative thinking in vocational education.

2.3. Quality of Research Instruments

The quality of the research instruments was ensured through a series of steps. First, theories and prior research on teachers in the group of four public vocational colleges in Samut Prakan Province, were studied to inform the development of the instruments. The questionnaires were then reviewed by three experts to assess content validity, achieving an IOC (Index of Item-Objective Congruence) value between .67 and 1.00. The reliability of the survey was tested using Cronbach's alpha coefficient, with a result of .96, indicating a high level of confidence. The instruments were refined and validated based on this testing.

2.4. Data Collection

Data collection was conducted in two phases. For the quantitative data, the researcher distributed the survey questionnaire to the selected sample via Google Forms. The qualitative data were gathered through interviews with the five selected experts. These interviews were conducted both on-site and through Zoom Application, depending on the availability of the participants. The researcher coordinated with the group of four public vocational colleges in Samut Prakan Province, namely: 1) Phra Samut Chedi Industrial and Community Education College; 2) Samut Prakan Polytechnic College; 3) Kanjanapisek Technical College Samut Prakan; and 4) Samut Prakan Technical College to ensure support in the data collection process.

2.5. Statistics Used in Research

The collected data were analyzed using statistical tools. For quantitative data: means, and standard deviations were used to assess the competency levels of the teachers. For qualitative data, content analysis was employed to interpret the expert interviews, providing guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational College.

3. Results

Section I: Analyze the data to study the innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand, both overall and by specific aspects, by calculating the mean and standard deviation.

Table 1 displays the statistical findings of the level of the innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand that it was at a high level in overall, and particular aspects. The highest mean was Crafting followed by Imaging, Personalizing, Collaborative inquiry, Serious play, and Paying attention

Table 1. The results of the mean, standard deviation, level, and ranking on the six innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand

| Innovative Thinking Skills | Mean | Std. Deviation | Description Equivalent |
|----------------------------|------|----------------|------------------------|
| Paying attention | 3.56 | .39 | High |
| Personalizing | 4.05 | .58 | High |
| Imaging | 4.12 | .51 | High |
| Serious play | 4.00 | .56 | High |
| Collaborative inquiry | 4.01 | .60 | High |
| Crafting | 4.18 | .52 | High |
| Total | 3.99 | .45 | High |

Section II : Content Analysis on guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand.

Based on the research findings on the aspect of “Crafting”, which received the highest mean of 4.18 at a high level in the study of guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand, five key informants provided insightful comments and development guidelines:

The first key informant emphasizes that in order for teachers to be able to construct crafting innovative thinking, they need to be able to combine concepts that are in opposition to one another and produce solutions that take into account diverse points of view. In order to cultivate this ability, the first key informant propose encouraging teachers to participate in workshops that provide them with difficult issues to answer and encourage abductive reasoning to link concepts that are not connected to one another. Providing frequent training that is centered on problem-solving in real-world vocational situations was the proposal that was made. This would enable educators to develop new solutions that are in line with the requirements of the respective sector.

The second key informant highlights that vocational education must focus on synthesizing practical skills with creative thinking. The second key informant recommends setting up collaborative projects that require teachers to work with students on industry-based problems, where conflicting ideas often arise. These projects will help teachers learn to guide students through crafting solutions by integrating theory and practice, promoting both technical skills and innovative thinking.

The third key informant emphasizes the importance of balancing tradition with innovation in vocational training. The third key informant suggested creating case studies from industry and business dilemmas that present paradoxes or contradictions. Teachers would guide students in resolving these issues through crafting, combining different perspectives and techniques. The third key informant also recommended that teachers undergo continuous professional development that focuses on how to incorporate creativity into technical disciplines.

The fourth key informant stresses the need to adopt crafting skills through cross-disciplinary projects. The fourth key informant suggested that vocational teachers collaborate with industry professionals from various fields to design learning modules that expose students to multiple viewpoints. By facilitating discussions that embrace conflicting ideas, teachers can model the crafting process for students, teaching them to synthesize solutions that reflect both technical expertise and innovative thought.

The fifth key informant highlights the value of fostering a culture of experimentation and continuous improvement in vocational settings. The fifth key informant proposed that vocational colleges create innovation labs where teachers and students work on prototyping ideas. These labs would provide a space for trial and error, where teachers can mentor students through the process of crafting, connecting disparate ideas into cohesive solutions. This approach ensures teachers and students alike learn how to navigate uncertainty and contradictions in practical settings.

Based on the research findings on the aspect of “Imaging”, which received the highest mean of 4.12 at a high level in the study of guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational College, five key informants provided insightful comments and development guidelines:

The first key informant emphasizes that incorporating imaging techniques into daily teaching practices can help students better grasp complex vocational concepts. The first key informant suggests using visual storytelling as part of project-based learning, where students create visual presentations of their work processes, helping them link theory to practice. A structured use of metaphors for abstract concepts can also make learning more intuitive for vocational students.

The second key informant proposes a more technology-driven approach by incorporating digital imagery tools into the classroom. For instance, students could use software to design their projects visually before the actual creation process. This not only helps in planning but also engages students more creatively. Virtual reality (VR) could also be explored, offering an immersive learning experience that aligns with vocational education’s hands-on nature.

The third key informant stresses the use of imaging through real-world applications, such as field trips or simulations that encourage students to visualize how their skills would be applied in industries. The third key informant suggests integrating workplace simulations into vocational training where students visualize entire production processes, from raw materials to final products, allowing for a deeper understanding of their future roles in the workforce.

The fourth key informant focuses on enhancing critical thinking through visual mapping tools. The fourth key informant suggests that teachers encourage students to create mind maps or process diagrams that represent their thought processes in solving technical problems. By visualizing their approach to a task, students can explore multiple solutions and develop a more flexible, innovative mindset.

The fifth key informant recommends integrating imaging with team-based projects, where students collaborate to design and present solutions visually. By encouraging collaborative visual brainstorming, students develop their innovative thinking skills in a group setting, benefiting from diverse perspectives. This approach also mirrors the real-world dynamics of vocational industries where teamwork and visual communication are key.

Based on the research findings on the aspect of “Personalizing”, which received the highest mean of 4.05 at a high level in the study of guidelines for developing innovative thinking skills of teachers in Samut Prakan Vocational College, five key informants provided insightful comments and development guidelines:

The first key informant suggests that personalizing can be developed through teacher training programs that focus on integrating personal experiences into teaching methods. For vocational students, who often come from diverse backgrounds, teachers should leverage their personal knowledge to connect with students on a deeper level. Teachers should also be encouraged to participate in student-centered activities, such as practical projects or community engagement, to better understand their students’ real-world challenges. Additionally, workshops should be organized for teachers to reflect on their own experiences and apply them to vocational education in innovative ways, such as through practical demonstrations or industry simulations.

The second key informant emphasizes that teachers should be encouraged to draw upon their personal hobbies and non-academic interests, such as craftsmanship or technical hobbies, to engage vocational students more effectively. The second key informant suggests creating a peer-sharing platform where teachers can exchange ideas and experiences, allowing them to see how personal interests can enhance their teaching. For example, a teacher who is passionate about mechanics can apply their knowledge to teaching automotive courses, bringing a real-life perspective to the classroom. Building networks with industry partners is also crucial, as teachers can better understand the skills students need by interacting with professionals in relevant fields.

The third key informant highlights the importance of tailoring teaching approaches to each student’s unique learning style and background. She proposes a mentorship program where teachers interact closely with students, allowing for a more personalized teaching approach. Teachers should be trained to identify students’ strengths and weaknesses early on and adapt their teaching strategies accordingly. Furthermore, field trips to industries** or collaborative projects with companies can be incorporated into the curriculum, allowing teachers and students to apply personal insights to real-world problems, fostering innovation.

The fourth key informant believes that the integration of personal experiences into vocational teaching is essential for fostering creativity. The fourth key recommends implementing interactive workshops that encourage teachers to reflect on their life experiences and think of innovative ways to incorporate them into vocational education. Teachers should also engage in collaborative research with students, encouraging a hands-on approach to problem-solving. This would not only allow teachers to draw from their own experiences but also to learn from the fresh perspectives of their students, creating a cycle of innovation within the classroom.

The fifth key informant stresses the need for understanding the student demographic at a deeper level, especially in vocational education. The fifth key informant suggests that teachers should spend time in the environments where their students live and work—such as factories, workshops, or even family businesses—to gain a better understanding of their students' daily challenges. This immersion will allow teachers to tailor their curriculum to better match the real-world demands students face. Additionally, he recommends implementing customized learning plans for students, which are designed to reflect the unique skills and challenges of each learner.

Based on the research findings on the aspect of “Collaborative inquiry”, which received the highest mean of 4.01 at a high level:

The first key informant emphasizes that collaborative inquiry must be fostered through creating structured environments where teachers and students can engage in open dialogues. Regular cross-departmental meetings and workshops should be held to allow teachers to exchange ideas and best practices. A formal platform for knowledge-sharing must be set up, where teachers can present challenges and brainstorm solutions. This initiative will build a culture of continuous inquiry and reflection, allowing innovation to flourish in real-time classroom environments.

The second key informant focuses on encouraging teachers to participate in collaborative research projects. Teachers should be given opportunities to work on joint projects with peers from different disciplines, which will expose them to diverse perspectives and ideas. Providing time and resources for team-based problem-solving sessions will encourage critical thinking. A mentor system should be established where senior teachers guide younger staff through collaborative research activities, further strengthening the institution's innovative culture.

The third key informant highlights the importance of integrating technology into the collaborative inquiry process. The third key informant suggests that teachers use online collaborative tools such as shared digital workspaces to facilitate continuous interaction and idea-sharing. Collaborative teaching methods, like team teaching, should also be promoted. Teachers from different fields can co-develop lesson plans, creating a more interdisciplinary approach to problem-solving and innovation.

The fourth key informant underscores the need for leadership in collaborative inquiry. Teachers should be trained to lead collaborative discussions, fostering an environment of trust and openness. The college should host regular innovation labs, where teachers work together to address specific challenges in vocational education. Additionally, collaborative problem-solving should be part of the formal teacher evaluation process, rewarding those who actively engage in team-based innovative thinking.

The fifth key informant suggests creating a collaborative network between institutions. By fostering relationships with other vocational colleges, teachers can collaborate beyond their own institution, broadening their perspectives. Regular conferences and collaborative workshops should be organized, encouraging teachers to network, share best practices, and co-create solutions to shared challenges. This will increase the range of experiences and expertise available for collaborative inquiry.

Based on the research findings on the aspect of “Serious play”, which received the highest mean of 4.00 at a high level:

The first key informant suggests fostering creativity and innovation in vocational education. To integrate serious play into teaching, teachers must be encouraged to create an environment where students can freely explore, improvise, and experiment with ideas, without fear of failure. In the context of vocational education, this can be achieved by incorporating hands-on, project-based learning into the curriculum that encourages students to work on real-world problems. It should establish innovation labs or makerspaces where students can engage in practical, exploratory activities. Teachers should be trained to facilitate playful experimentation by setting challenges that require creative problem-solving, with an emphasis on practical application in the vocational field.

The second key informant highlights flexibility in teaching methods and enables students to apply their vocational skills in unorthodox ways. Encouraging improvisation and rapid prototyping within lessons can help students understand the iterative nature of innovation, where testing limits leads to practical insights. Teachers should integrate prototyping exercises in which students can rapidly develop and test models or products. This would involve using simple materials and tools to simulate real-world scenarios, where students can learn by doing, refining their skills through trial and error.

The third key informant focuses on aligning with the need for hands-on experience and active learning. Teachers should create opportunities for students to experiment with vocational tools and equipment in a risk-free, playful environment where exploration is encouraged. It should imply workshops and collaborative projects where students are free to explore and test different techniques, with instructors acting as facilitators rather than strict guides. Ensure that students have access to various materials and tools that allow them to engage in “play” while still focusing on industry-relevant skills.

The fourth key informant emphasizes that Innovation in vocational education requires that students break out of routine learning and engage in creative thinking. Serious play can be integrated by encouraging students to challenge traditional methods and develop solutions through free exploration, teamwork, and experimentation. Group projects should engage where students work together to solve complex, open-ended problems using innovative approaches. Teachers should encourage students to think outside the box by offering flexibility in the way they approach these projects, allowing for creativity in technical problem-solving.

The fifth key informant suggests that learning cannot be understated, especially in a vocational context. Serious play stimulates innovative thinking by reducing the fear of making mistakes and encouraging continuous learning. Vocational students thrive when they are allowed to engage in trial-and-error learning through playful activities that mimic real-world tasks. It should be developed a system where students are given “innovation challenges” – timed, practical tasks that require them to improvise solutions using limited resources. Teachers should facilitate by offering guidance only when necessary, allowing students to independently discover new ways to approach and solve vocational tasks.

Based on the research findings on the aspect of “Paying attention”, which received the highest mean of 3.56 at a high level:

The first key informant emphasizes the importance of nurturing students’ attention to detail in real-world industrial environments. Developing this skill can be achieved by incorporating hands-on projects that require students to observe complex mechanical systems and identify faults or inefficiencies. It should imply workshops that simulate real industrial scenarios, encouraging students to slow down, observe, and troubleshoot mechanical or technical issues. Integrate peer-review sessions where students assess each other’s projects to foster multiple viewpoints.

The second key informant focuses on cultivating attention by integrating technology in the classroom, such as virtual simulations. These can be used to expose students to various technical situations that require close attention to detail, allowing them to recognize overlooked aspects in a controlled environment. It should introduce virtual reality (VR) simulations in vocational training, where students engage in simulated troubleshooting tasks that emphasize the importance of paying attention to small but critical details.

The third key informant stresses that teachers should guide students to enhance their observational skills in technical work through project-based learning. By working on long-term projects, students can revisit their tasks, enabling them to notice patterns or anomalies they might have missed earlier. It should adopt project-based learning where students engage in ongoing technical assignments, requiring them to revisit their work and reflect on earlier decisions. Regular feedback loops from teachers and peers should be established to deepen their observational capabilities.

The fourth key informant highlights the need for collaborative learning environments where students are encouraged to share observations. This enhances their attention skills as they compare perspectives with their peers. It should create collaborative group projects where each student focuses on different aspects of a technical problem. Regular group discussions should be held, allowing students to share their observations and learn from each other’s viewpoints, refining their ability to pay attention to various technical details.

The fifth key informant emphasizes cross-disciplinary learning, where vocational students are exposed to different fields of study to broaden their perspective and improve their attention skills. Learning from diverse contexts encourages students to look for patterns

and details that may not be immediately apparent in their own field. It should organize cross-disciplinary workshops where students from various technical fields work together on common projects. This broadens their ability to pay attention to details beyond their specialized area, fostering creativity and deeper observational skills.

4. Discussion

The innovative thinking skills of teachers in Samut Prakan Vocational Colleges, Thailand that it was at a high level in overall, and particular aspects. The highest mean was Crafting followed by Imaging, Personalizing, Collaborative inquiry, Serious play, and Paying attention. This might be because these particular skills, especially “Crafting,” allow teachers to synthesize complex information and create solutions that blend creativity with practicality, which is essential in vocational education. “Imaging” and “Personalizing” help teachers connect abstract concepts to real-world applications, ensuring that students not only understand theoretical knowledge but can also apply it effectively. The strong focus on collaboration and play allows for innovation to emerge in a more dynamic, flexible environment, meeting the demands of the evolving workforce with creativity and confidence. These skills are essential in fostering an educational culture that emphasizes adaptability, problem-solving, and teamwork, which are critical for the success of both teachers and students in an ever-changing industry landscape. According to Haryani et al (2021) found that the importance of fostering a culture of innovation in educational institutions cannot be overstated when it comes to preparing students for a rapidly changing world. In today’s society, innovative thinking is considered essential as it encompasses the foundational thinking skills that drive innovation within an organization. Therefore, it becomes crucial to cultivate these skills not only among students but also among teachers and staff within educational institutions. By doing so, we create an environment that nurtures and encourages creativity, problem-solving, and out-of-the-box ideas, ultimately equipping students with the tools they need to thrive in an ever-evolving society (Kwangmuang et al.2021). In the field of educational administration, effective collaboration between teachers and educational personnel plays a pivotal role in driving positive outcomes through efficient knowledge management processes. Through this collaboration, the institution can foster an environment of innovation and transformation, leading to enhanced organizational effectiveness and success (Boonmoh & Chanchay, 2024). The end outcome of this intricate and systematic procedure is undeniably the overall caliber and excellence of the enrolled learners, who can rightly be labeled as the distinctive yield that arises from the seamless integration of pioneering and efficacious administrative techniques (Bertrand & Namukasa, 2020).

Development Guidelines of “Crafting” consist of Workshops and Training, Collaborative Projects, Case Studies, Industry Collaboration, and Innovation Labs. These guidelines ensure that vocational teachers in Samut Prakan are equipped with the necessary skills to craft innovative solutions that respond to the complexities of the modern workforce, fostering a learning environment that embraces creativity and practical application. This might be because vocational education in Samut Prakan requires a dynamic approach to meet the ever-evolving demands of the workforce. The integration of workshops, collaborative projects, case studies, and innovation labs ensures that teachers not only develop innovative thinking but also apply their knowledge in real-world scenarios (Burghardt et al.2021). These strategies foster a hands-on learning environment where creativity thrives, and students are prepared to solve complex problems. The emphasis on industry collaboration further bridges the gap between education and the labor market, making the learning process relevant and aligned with current industry standards (Jackson & Bridgstock, 2021). Therefore, these guidelines are essential for equipping both teachers and students with the skills needed to succeed in a rapidly changing world. According to Malhotra et al (2023) stated that reasoning involves being open to a wide range of external perspectives, which can provide valuable insights into both opportunities and challenges that lie ahead. In order to navigate these complexities successfully, organizations must establish robust mechanisms to actively perceive and effectively communicate with these external viewpoints. This can be achieved by placing a strong emphasis on understanding the needs and expectations of customers, as well as keeping a close eye on advancements in technology. Incorporating these external perspectives into their decision-making processes, organizations can better adapt, strategize, and innovate to stay ahead in today’s dynamic and competitive business landscape (Malhotra et al., 2023), as Khasawneh (2024) have revealed that possessing the capacity to perceive and comprehend the demands and requirements of customers and the market serves as a crucial

determinant of an innovative organization's triumphant achievements. Therefore, the process of developing effective and efficient methods to accurately recognize and identify the diverse and ever-changing needs and requirements of customers, comprehending and comprehensively understanding the multifaceted and dynamic nature of market demands, as well as establishing and maintaining highly effective and transparent channels of communication with customers, is widely regarded and recognized as a fundamentally crucial problem-solving approach and a pivotal driving force behind fostering and cultivating innovation within organizations and business enterprises alike.

Development Guidelines of "Imaging" consist of Incorporate Visual Storytelling, Utilize Digital and Immersive Tools, Real-World Applications and Simulations, Visual Mapping for Critical Thinking, and Collaborative Visual Brainstorming. These development guidelines are designed to not only promote innovative thinking among teachers but also ensure that vocational students are well-equipped to visualize and implement creative solutions in their future careers. This might be because imaging, as a tool, allows learners to process complex information more effectively through visualization, enabling them to grasp abstract concepts and apply them in practical, real-world scenarios (Skulmowski et al., 2021). In the context of vocational education, where hands-on learning is key, visual tools such as storytelling and simulations offer a bridge between theory and practice. Furthermore, collaborative activities that involve visual mapping and brainstorming help to foster creativity and critical thinking, essential skills for the modern workforce. By integrating these methods, vocational students will not only develop technical. Lee et al. (2023) stated that utilizing media to facilitate tangible learning experiences entails classifying instructional media to explicate the correlation between audiovisual aids and the various stages of learning experiences and media consumption. This principle is encapsulated in the "Cone of Experience," which comprises the following stages:

- 1) Direct Experience – the most tangible stage, where learners acquire knowledge from real objects and actual locations;
- 2) Contrived Experience – where learners engage with experiences that closely resemble reality;
- 3) Dramatized Experience – role-playing or dramatization;
- 4) Demonstration – presenting or performing actions alongside explanations;
- 5) Field Trips – providing learners with experiences beyond the confines of the classroom;
- 6) Exhibits – showcasing objects and visual displays;
- 7) Television – utilized for both open or closed-circuit broadcasting, featuring live or pre-recorded educational sessions;
- 8) Film – recorded events or narratives on film;
- 9) Recordings, Radio, and Still Images – audio or visual materials that learners observe or listen to without textual input;
- 10) Visual Symbols – such as charts, maps, and graphs; and
- 11) Verbal Symbols – the most abstract level.

Encompassing written words and spoken language, as the research of Cecep et al (2024) conducted it was determined that innovation within the education system is imperative for the advancement and development of both individuals and society as a whole. The study emphasized the significance of both innovation and evolution in this context, highlighting the essential nature of educational innovation due to its crucial role in shaping a sustainable future. The report likened "innovative skills" to biological mutations, illustrating how they enable the evolution of species and ultimately enhance the competitiveness and resilience of educational management. Lotfi et al. (2023) stated that the use of media to create concrete learning experiences refers to instructional media that facilitate student learning, helping to develop knowledge, understanding, skills, attitudes, and competencies in alignment with desired objectives. Media acts as a conduit that aids in conveying and transmitting knowledge from the teacher to the student, enabling the student to achieve the set goals effectively.

Development Guidelines of "Personalizing" consist of Teacher Training and Reflection, Student-Centered Learning, Industry Collaboration and Practical Application, Collaborative Platforms for Peer Learning, and Tailored Learning Plans. By implementing these strategies, vocational education in Samut Prakan can foster an environment where both teachers and students use their unique experiences to drive innovation, ensuring that the education provided is dynamic, relevant, and forward-thinking. This might be because personalizing education helps bridge the gap between theoretical knowledge and practical application, especially in vocational settings where individual experiences play a critical role (Oller et

al.2021).When teachers are trained to reflect on their own experiences and connect them to teaching, it allows for a more authentic and relatable learning environment (Escandell & Chu, 2023).Additionally, student-centered approaches and industry collaboration provide real-world context, making education more relevant and impactful. By tailoring learning to individual students' needs and backgrounds, both teachers and students can thrive in a system that fosters creativity and innovation. According to Gamage et al. (2021) stated that the understanding of individual differences refers to the different learning styles of individuals. Learning style is the way people perceive, understand, organize, and remember information or knowledge. These learning styles are often influenced by genetics, past experiences, and the individual's surrounding society and culture. Each person has their own learning style, and understanding it helps enhance the efficiency of learning. In the field of education, educators who emphasize learning styles do not ask questions like, "Is this student intelligent?" but instead, "How does this student become so intelligent?"

Development Guidelines of "Collaborative inquiry" consist of Structured Collaborative Environments, Collaborative Research Projects, Technology Integration, Leadership in Collaboration, and Institutional Networks. These guidelines aim to create a culture of collaboration, innovation, and shared inquiry, ensuring teachers can continuously develop their innovative thinking skills in alignment with the evolving needs of vocational education (Bendak et al., 2020). This might be because collaborative inquiry allows teachers to engage in diverse perspectives and share knowledge in structured, supportive environments (Brown et al., 2021). When teachers work together through research projects or institutional networks, they are exposed to new ideas and ways of thinking, which fosters creativity and innovation. The amalgamation of technology and effective leadership guarantees that cooperation is not only effective but also yields high productivity. Additionally, by establishing connections within and among organizations, vocational education can continue to adapt to changes in the industry, providing teachers and students with the necessary skills for the future (Munir et al.2022). According to Irfan (2021) described as a procedure that takes place when all parties are engaged in creating the framework, responsibilities, regulations, and cooperative activities. It can be concluded that participants in formal relationships share common goals or objectives. Each party involved in the collaboration acknowledges shared leadership and engages in long-term collaboration, actively participating in every process from initial planning to ongoing operations and eventual evaluation. They willingly accept risks and outcomes together while efficiently sharing resources to achieve the desired outcomes. collaboration in this context emerges from the seamless cooperation of all parties involved, effectively carrying out various activities and initiatives. The key elements that contribute to successful collaboration include effective communication, reciprocal information exchange, collaborative problem-solving, and inclusive shared decision-making processes that ensure everyone's perspective is taken into account. This mutually beneficial collaboration fosters a strong sense of teamwork, synergy, and collective success, contributing to the attainment of common goals and the growth of the parties involved (Paula et al., 2020).

Development Guidelines of "Serious play" consist of Innovation Labs/Makerspaces, Prototyping and Iteration, Workshops and Collaborative Projects, Challenge-Based Learning, and Innovation Challenges. These guidelines provide a clear and actionable roadmap for integrating "Serious Play" into vocational education, ensuring that students are prepared to meet the demands of the evolving workforce with creativity and confidence. This might be because "Serious Play" encourages active learning through hands-on experiences, where students can experiment, make mistakes, and learn in a safe, creative environment. Through the integration of innovation labs and a curriculum based on challenging learning activities, students are provided with the chance to participate in real-life problem-solving exercises, all the while honing their ability to bounce back from setbacks and adjust to new situations (Rosário & Raimundo, 2024). This method is highly important and holds significant value in vocational training, as it focuses on enhancing practical abilities and stimulating creative problem-solving skills, which have become crucial in order to meet the ever-changing demands of rapidly evolving sectors (Chen et al., 2021). To achieve this, the implementation of collective assignments and the development of models are key. These practices not only foster collaboration among students but also cultivate analytical thinking, allowing them to refine and enhance their understanding through repetitive procedures and continuous improvement processes. By integrating these methods into vocational training, students are able to refine their skills and develop a strong conceptual foundation that will equip them for success in their future careers (Guaman-Quintanilla et al., 2022). Kwangmuang et al. (2021) stated that activities are centered around innovation are those that promote and encourage

innovation within the professional setting. All employees contribute to establishing a work environment that fosters creativity and innovation, which involves three essential elements: mutual inspiration, feedback, and constructive critique. Promoting innovation and collaboration need to promote employee participation, openly share pertinent information, and provide the resources necessary for fostering innovation. Innovation is dependent on teams that excel in open communication and have the ability to adapt their structure as needed (Grass et al., 2020).

Development Guidelines of “Paying attention” consist of Implement Hands-On Workshops, Integrate Technology, Adopt Project-Based Learning, Foster Collaborative Learning, and Encourage Cross-Disciplinary Learning. This might be because Paying attention to every intricate detail is of the utmost and unparalleled significance in the realm of vocational education, where an unwavering dedication to precision and unwavering focus reign supreme. These indispensable qualities serve as the quintessential pillars upon which the acquisition of true proficiency in a myriad of highly specialized technical skills is built. Without this meticulous scrutiny and concentration, the attainment of mastery in the vocational sphere would undoubtedly remain an unattainable aspiration (Rasheed & Rashid, 2024). Therefore, it is essential for individuals beginning this educational endeavor to acknowledge the essential role that meticulous attention to detail has in their pursuit of excellence. Practical workshops offer hands-on experience, enabling students to carefully observe and analyze the finer points of their assignments (Harfitt & Chow, 2020). Through the incorporation of advanced technology, such as cutting-edge virtual simulations and state-of-the-art educational tools, students nowadays have unparalleled opportunities to fully engage in identifying and understanding crucial elements within controlled settings. By utilizing project-based learning methods, students are not only able to deeply immerse themselves in their respective subjects but also to sustain their involvement and continuously enhance their work over time. Moreover, the power of collaborative learning plays a pivotal role in promoting knowledge exchange and fostering an open, inclusive environment where students can freely observe, discuss, and learn from one another’s diverse perspectives, creative ideas, and innovative approaches. Villarroel et al. (2020) asserted that meticulous attention to detail entails effectively communicating and establishing clear comprehension of the organization’s vision, goals, and novel strategies. Additionally, it necessitates the dissemination and promotion of active participation in the organization’s vision, goals, and innovation strategies. Training and development are essential for fostering innovation; thus, these processes must be closely integrated with personnel development within the organization (Rampa & Agogué, 2021).

5. Conclusions

The findings from this study underscore that teachers at vocational colleges in Samut Prakan exhibit a high level of innovative thinking skills, with “Crafting” emerging as the most developed skill, followed by “Imaging,” “Personalizing,” “Collaborative Inquiry,” “Serious Play,” and “Paying Attention.” These skills are pivotal in fostering creativity and innovation among students, equipping them to meet the rapidly evolving demands of the labor market, especially in industrial hubs like Samut Prakan. The study emphasizes the critical role of these innovative skills in supporting Thailand’s economic growth by cultivating a workforce that is adaptable, innovative, and well-prepared to tackle the challenges of modern industries.

However, the study does have limitations. It focused solely on vocational colleges in one province, which may limit the generalizability of the findings to other regions or educational settings. Additionally, while the research provides comprehensive guidelines for enhancing each innovative thinking skill, the long-term impact and effectiveness of these strategies on both teachers and students have yet to be thoroughly evaluated.

Future research should seek to broaden the scope of this study by including vocational institutions in other provinces and regions, providing a more diverse perspective on how innovative thinking is fostered in different educational contexts. Additionally, it is essential to assess the long-term implementation of the proposed guidelines to determine their sustained impact over time. Investigating how the integration of innovative thinking influences student outcomes across various industries and sectors could also provide valuable insights into the broader implications of these skills.

In conclusion, this research contributes significantly to the growing body of knowledge on vocational education by offering practical guidelines for enhancing teachers’ innovative thinking skills. These skills are crucial not only for preparing vocational educators to lead effectively in the classroom but also for driving innovation and economic development as

Thailand moves toward an increasingly industrialized future. By fostering a culture of creativity and adaptability, these innovative thinking skills will ensure that both teachers and students are well-equipped to meet the challenges and opportunities of a rapidly changing world.

6. Recommendations

It is recommended that vocational colleges integrate hands-on workshops and training specifically focused on problem-solving and creative thinking, directly linked to real-world industry scenarios. These workshops should be conducted in collaboration with industry partners, enabling teachers to guide students in developing innovative solutions for real industrial challenges. Outcome-based learning methods should be employed, where students work on projects that simulate real industry demands, ensuring they are equipped to meet workforce needs immediately upon graduation.

Also, it is required that vocational colleges should enhance the use of imaging skills, it is advised to incorporate more digital and immersive tools, such as VR, into teaching. Visual storytelling and real-world simulations should also be emphasized to allow students to see how their theoretical knowledge translates into practical application. Collaborative visual brainstorming sessions can also encourage teamwork and creative problem-solving.

Next recommendation concerns personalizing, and it is recommended that teachers should receive ongoing training to integrate personal experiences into their teaching, making learning more relevant to students' real-world contexts. Fostering student-centered learning through mentorship programs and collaboration with industry partners is crucial. Tailored learning plans should be developed to meet the unique needs of each student, encouraging more meaningful engagement in the classroom.

Vocational colleges should establish structured environments for collaboration is key such as regular meetings, cross-disciplinary research projects, and the use of digital tools for teamwork be incorporated into teaching practices. Teachers should also receive leadership training to facilitate collaborative discussions and innovative labs, helping to build a culture of continuous learning and improvement.

Vocational colleges should prioritize creating innovation labs and makerspaces where students can experiment and learn through hands-on activities. It is recommended to incorporate challenge-based learning and prototyping into lessons, encouraging students to test ideas in a flexible, creative environment. Innovation challenges that require students to think quickly and use limited resources will foster critical thinking and creativity.

It is suggested that vocational colleges should support hands-on workshops should continue to be a focus, simulating real-world tasks to improve students' attention to detail. Integrating technology, such as VR simulations, and adopting project-based learning will help students notice and address overlooked details. Encouraging collaborative learning and cross-disciplinary experiences will broaden students' perspectives and sharpen their observational skills.

References

- Abdelhamid, K. F. (2022). Impact of innovation as a competitive advantage in the hospitality industry. *International Journal of Tourism, Archaeology and Hospitality*, 2(3), 287–298. <https://doi.org/10.21608/ijtah.2023.184821.1025>
- Bednar, K., & Spiekermann-Hoff, S. (2021). *On the power of ethics: How value-based thinking fosters creative and sustainable IT innovation*. WU Vienna University of Economics and Business. Working Papers / Institute for IS & Society. <https://doi.org/10.57938/da552c00-906e-47c0-967b-3e38b88b3a74>
- Bendak, S., Shikhli, A. M., & Abdel-Razek, R. H. (2020). How changing organizational culture can enhance innovation: Development of the innovative culture enhancement framework. *Cogent Business & Management*, 7(1), 1712125. <https://doi.org/10.1080/23311975.2020.1712125>
- Bertrand, M. G., & Namukasa, I. K. (2020). STEAM education: Student learning and transferable skills. *Journal of Research in Innovative Teaching & Learning*, 13(1), 43–56. <https://doi.org/10.1108/JRIT-01-2020-0003>
- Boonmoh, A., & Chanchay, K. (2024). The integration of soft skills in language learning classroom: The perspective of Thai ELT teachers at a university of technology. *REFLectiions*, 31(1), 255–274. <https://doi.org/10.61508/refl.v31i1.272794>
- Brenner, W., & Uebernickel, F. (2016). *Design thinking for innovation research and practice* (1st ed.). Springer International Publishing. <https://doi.org/10.1007/978-3-319-26100-3>
- Brown, C., Poortman, C., Gray, H., Ophoff, J. G., & Wharf, M. M. (2021). Facilitating collaborative reflective inquiry amongst teachers: What do we currently know?. *International Journal of Educational Research*, 105, Article 101695. <https://doi.org/10.1016/j.ijer.2020.101695>

- Burghardt, M., Ferdinand, P., Pfeiffer, A., Reverberi, D., & Romagnoli, G. (2021). Integration of new technologies and alternative methods in laboratory-based scenarios. In *Cross Reality and Data Science in Engineering: Proceedings of the 17th International Conference on Remote Engineering and Virtual Instrumentation*. Springer International Publishing. https://doi.org/10.1007/978-3-030-52575-0_40
- Cecep, C. S. R., Amalia, A. N. A., Hafidz, A. H. B. Z. A., Alwi, M. A. Y., & Sania, S. K. L. (2024). The analysis of experiential learning method of Dale's Cone Experience model in improving the effectiveness of Arabic language learning. *Izdiibar: Journal of Arabic Language Teaching, Linguistics, and Literature*, 7(1), 25-40. <https://doi.org/10.22219/jiz.v7i1.30823>
- Chamchoy, S. (2012). Concept of Innovation for School Management in the 21st Century. *Journal of Education and Innovation*, 14(2), 117–128. https://so06.tci-thaijo.org/index.php/edujournal_nu/article/view/9391
- Chen, S. Y., Tsai, J. C., Liu, S. Y., & Chang, C. Y. (2021). The effect of a scientific board game on improving creative problem-solving skills. *Thinking Skills and Creativity*, 41, Article 100921. <https://doi.org/10.1016/j.tsc.2021.100921>
- Eradatifam, M., Heydarabadi, S., & Shahbazi, A. (2020). The impact of design thinking on innovation. *Journal of Design Thinking*, 1(1), 49-60. <https://doi.org/10.22059/jdt.2020.76036>
- Escandell, S., & Chu, T. L. (2023). Implementing relatedness-supportive teaching strategies to promote learning in the college classroom. *Teaching of Psychology*, 50(4), 441–447. <https://doi.org/10.1177/00986283211046873>
- Fairman, B., Voak, A., Abdullah, H., & Indarjo, A. (2020). Re-skilling vocational education and training practitioners in Indonesia. *Journal of Physics: Conference Series*, 1516(1), 012045. <https://doi.org/10.1088/1742-6596/1516/1/012045>
- Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, 10(4), 86. <https://doi.org/10.3390/soc10040086>
- Gadušová, Z., Pavlíková, M., & Havetová, R. (2021). Intervention in teaching reading in a foreign language: Development of divergent thinking and ambiguity tolerance. *Journal of Education Culture and Society*, 12(1), 297–313. <https://doi.org/10.15503/jecs2021.1.297.313>
- Gamage, K. A. A., Dehideniya, D. M. S. C. P. K., & Ekanayake, S. Y. (2021). The Role of Personal Values in Learning Approaches and Student Achievements. *Behavioral sciences (Basel, Switzerland)*, 11(7), 102. <https://doi.org/10.3390/bs11070102>
- Grass, A., Backmann, J., & Hoegl, M. (2020). From empowerment dynamics to team adaptability: Exploring and conceptualizing the continuous agile team innovation process. *Journal of Product Innovation Management*, 37(4), 324–351. <https://doi.org/10.1111/jpim.12525>
- Guaman-Quintanilla, S., Everaert, P., Chiluiza, K., & Valcke, M. (2022). Fostering teamwork through design thinking: Evidence from a multi-actor perspective. *Education Sciences*, 12(4), 279. <https://doi.org/10.3390/educsci12040279>
- Harfitt, G., & Chow, J. M. L. (2020). *Employing community-based experiential learning in teacher education*. Springer. <https://doi.org/10.1007/978-981-15-6003-3>
- Haryani, E., Coben, W. W., Pleasants, B. A., & Fetters, M. K. (2021). Analysis of teachers' resources for integrating the skills of creativity and innovation, critical thinking and problem-solving, collaboration, and communication in science classrooms. *Jurnal Pendidikan IPA Indonesia*, 10(1), 92–102. <https://doi.org/10.15294/jpii.v10i1.27084>
- Horth, D., & Buchner, D. (2014). Innovation leadership: How to use innovation to lead effectively, work collaboratively, and drive results. *Center for Creative Leadership*, 18. https://imamhamzatcoed.edu.ng/library/ebooks/resources/Innovation_Leadership_by_david_horth.pdf
- Ibobo B. I., Nzewi H. N. (2023). Strategic Thinking and Competitive Advantage: Evidence from the Nigerian Pharmaceutical Industry. *International Journal of Entrepreneurship and Business Innovation*, 6(2), 133-148. <https://doi.org/10.52589/IJEBI-SOEMUJMO>
- Irfan, S. (2021). Re-examining the link between collaborative interorganisational relationships and synergistic out-comes in public-private partnerships: Insights from the Punjab Education Foundation's school partnership. *Public Administration & Development*, 41(2), 79–90. <https://doi.org/10.1002/pad.1906>
- Jackson, D., & Bridgstock, R. (2021). What actually works to enhance graduate employability? The relative value of curricular, co-curricular, and extra-curricular learning and paid work. *Higher Education*, 81, 723–739. <https://doi.org/10.1007/s10734-020-00570-x>
- Juliana, N., Hui, H., Clement, M., Solomon, E., & Elvis, O. (2021). The Impact of Creativity and Innovation on Entrepreneurship Development: Evidence from Nigeria. *Open Journal of Business and Management*, 9, 1743-1770. <https://doi.org/10.4236/ojbm.2021.94095>
- Kanjanapisek Technical College. (2023). Planning and Cooperation Division, Samut Prakan 2023. In Annual operation plan report for the fiscal year 2023. <http://backoffice.onec.go.th/uploads/Book/2057-file.pdf>
- Khasawneh, M. A. S. (2024). Closing the industry-academia gap in translation education; Exploring collaborative strategies as tools for effective curriculum alignment. *Kurdish Studies*, 12(1). <https://kurdishstudies.net/menu-script/index.php/KS/article/view/1430>
- Kim, J. S., Relyea, J. E., Burkhauser, M. A., Scherer, E., & Rich, P. (2021). Improving elementary grade students' science and social studies vocabulary knowledge depth, reading comprehension, and argumentative writing: A conceptual replication. *Educational Psychology Review*, 33(4), 1935–1964. <https://doi.org/10.1007/s10648-021-09609-6>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kwangmuang, P., Jarutkamolpong, S., Sangboonraung, W., & Daungtod, S. (2021). The development of learning innovation to enhance higher order thinking skills for students in Thailand junior high schools. *Heliyon*, 7(6). <https://doi.org/10.1016/j.heliyon.2021.e07309>
- Lee, J., Choi, H., Davis, R. O., & Henning, M. A. (2023). Instructional media selection principles for online medical education and emerging models for the new normal. *Medical teacher*, 45(6), 633–641. <https://doi.org/10.1080/0142159X.2022.2151884>
- Lotfi, F., Beheshti, A., Farhood, H., Pooshideh, M., Jamzad, M., & Beigy, H. (2023). Storytelling with image data: A systematic review and comparative analysis of methods and tools. *Algorithms*, 16(3), 135. <https://doi.org/10.3390/a16030135>
- Malhotra, R., Massoudi, M., & Jindal, R. (2023). An alumni-based collaborative model to strengthen academia and industry partnership: The current challenges and strengths. *Education and Information Technologies*, 28(2), 2263-2289. <https://doi.org/10.1007/s10639-022-11276-1>
- McCarthy, K. S., & McNamara, D. S. (2021). The multidimensional knowledge in text Comprehension framework. *Educational Psychologist*, 56(3), 196–214. <https://doi.org/10.1080/00461520.2021.1872379>

- McGrath, S. & Yamada, S. (2023). Skills for development and vocational education and training: Current and emergent trends. *International Journal of Educational Development*, 102, Article 102853. <https://doi.org/10.1016/j.ijedudev.2023.102853>
- Meinel, M., Eismann, T. T., Baccarella, C. V., Fixson, S. K., & Voigt, K.-I. (2020). Does applying design thinking result in better new product concepts than a traditional innovation approach? An experimental comparison study. *European management journal*, 38(4), 661-671. <https://doi.org/10.1016/j.emj.2020.02.002>
- Muzam, J. (2023). The challenges of modern economy on the competencies of knowledge workers. *Journal of the Knowledge Economy*, 14, 1635–1671. <https://doi.org/10.1007/s13132-022-00979-y>
- Munir, M., Sinambela, E. A., Halizah, S. N., Khayru, R. K., & Mendrika, V. (2022). Review of vocational education curriculum in the fourth industrial revolution and contribution to rural development. *Journal of social science studies*, 2(1), 5-8. <https://doi.org/10.56348/jos3.v2i1.20>
- Office of the National Economic and Social Development Council. (2018). The 13th National Economic and Social Development Plan (2023–2027). Retrieved from https://www.nesdc.go.th/article_attach/article_file_20230615134223.pdf
- Office of the Vocational Education Commission. (2023). Annual report 2023. <https://bme.vec.go.th/บริหารจัดการข่าว/รายละเอียดข่าว/ta-bid/1235/ArticleId/42045/42045.aspx>
- Oller, J., Engel, A., & Rochera, M. J. (2021). Personalizing learning through connecting students' learning experiences: an exploratory study. *The Journal of Educational Research*, 114(4), 404-417. <https://doi.org/10.1080/00220671.2021.1960255>
- Paula, I. C. D., Campos, E. A. R. D., Pagani, R. N., Guarnieri, P., & Kavianian, M. A. (2020). Are collaboration and trust sources for innovation in the reverse logistics? Insights from a systematic literature review. *Supply Chain Management: An International Journal*, 25(2), 176-222. <https://doi.org/10.1108/SCM-03-2018-0129>
- Phra Samut Chedi Vocational College. (2021). Educational quality assurance report for the academic year 2021. In Self-assessment report 2022. <http://backoffice.onec.go.th/uploads/Book/2057-file.pdf>
- Professional Standards in Education. (2022). The importance of innovative thinking skills. <https://maekongwa.thai.ac/client-upload/maekongwa/download/.pdf>
- Rampa, R., & Agogué, M. (2021). Developing radical innovation capabilities: Exploring the effects of training employees for creativity and innovation. *Creativity and Innovation Management*, 30, 211-227. <https://doi.org/10.1111/CAIM.12423>
- Rapanta, C. (2021). Can teachers implement a student-centered dialogical argumentation method across the curriculum?. *Teaching and Teacher Education*, 105. <https://doi.org/10.1016/j.tate.2021.103404>
- Rasheed, R., & Rashid, A. (2024). Role of service quality factors in word of mouth through student satisfaction. *Kybernetes*, 53(9), 2854-2870. <https://doi.org/10.1108/K-01-2023-0119>
- Rosário, A. T., & Raimundo, R. (2024). Enhancing Business Higher Education Through Simulation-Based Learning, Problem-Based Learning, and Challenge-Based Learning. *Preprints*. <https://doi.org/10.20944/preprints202407.0747.v1>
- Samut Prakan Polytechnic College. (2022). Educational quality assurance report for the academic year 2022. In Self-assessment report 2022. <http://backoffice.onec.go.th/uploads/Book/2057-file.pdf>
- Samut Prakan Technical College. (2022). Educational quality assurance report for the academic year 2022. In Self-assessment report 2022. <http://backoffice.onec.go.th/uploads/Book/2057-file.pdf>
- Serdyukov, P. (2017). Innovation in education: What works, what doesn't, and what to do about it?. *Journal of Research in Innovative Teaching & Learning*, 10(1), 4-33. <https://doi.org/10.1108/JRIT-10-2016-0007>
- Skulmowski, A., Nebel, S., Remmele, M., & Rey, G. D. (2021). Is a preference for realism really naive after all? A cognitive model of learning with realistic visualizations. *Educational Psychology Review*, 1-27. <https://doi.org/10.1007/s10648-021-09638-1>
- Smith, B. E., Amgott, N., & Malova, I. (2022). "It made me think in a different way": Bilingual students' perspectives on multimodal composing in the English language arts classroom. *TESOL Quarterly*, 56(2), 525-551. <https://doi.org/10.1002/tesq.3064>
- Steinerowska-Streb, I., & Glód, G. (2020). Innovations in Polish family firms: Exploring employee creativity and management practices that stimulate innovative thinking. *Journal of Entrepreneurship, Management and Innovation*, 16(2), 231-260. <https://doi.org/10.7341/20201628>
- Trasmundi, S. B., Kokkola, L., Schilhab, T., & Mangen, A. (2021). A distributed perspective on reading: Implications for education. *Language Sciences*, 84, Article 101367. <https://doi.org/10.1016/j.langsci.2021.101367>
- Villarrol, V., Benavente, M., Chuecas, M. J., & Bruna, D. (2020). Experiential learning in higher education. A student-centered teaching method that improves perceived learning. *Journal of University Teaching & Learning Practice*, 17(5), 8. <https://doi.org/10.5376/1/17.5.8>
- Yeap, C., Suhaimi, N., & Nasir, M. (2021). Issues, Challenges, and Suggestions for Empowering Technical Vocational Education and Training Education during the COVID-19 Pandemic in Malaysia. *Creative Education*, 12, 1818-1839. <https://doi.org/10.4236/ce.2021.128138>

Comparative Education in the Health Professions

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<https://doi.org/eiki/10.59652/jetm.v2i4.306>

Abstract: As the academe in health professions institutions pursue educational reforms that anchors on the systems approach to healthcare, collaborative efforts are essential to establish more responsive and dynamic professional education systems. This paper highlights comparative education as a tool to strengthen health professions education around the world by reviewing previous and the most recent studies done, and showcase how this can improve the current pedagogical landscape. Through comparative education, a holistic approach to health professions education ensures that the learner's training is not only comprehensive but also responsive to the dynamic needs of the country, the region, and the rest of the world by the sharing of best practices, challenges, and opportunities for collaboration. The opportunities that international comparative education provide to the health professions education include the sharing of best practices and difficulties encountered, and the enhanced viewpoint from considering different perspectives. On the other hand, the main challenges include ethnocentrism and the limited resources that majority of institutions face globally especially those from the low- and middle-income countries. Truly, once the lessons learned from comparative educational engagements are integrated into the philosophical and educational foundations in our medical schools, then we are one step closer to becoming responsive to the call for a more holistic and systems – centered health professions education.

Keywords: comparative education; health professions; medicine

Received: October 8, 2024

Accepted: October 24, 2024

Published: October 31, 2024



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1. Introduction

Since the beginning of the 21st century, health professions education has been instituting reforms as a response to society's call for decreasing gaps and inequities in health. It is essential that all stakeholders collaborate in ensuring that instructional and institutional changes are implemented to achieve the main goal of establishing a transformative and interdependent professional education whose graduates will strive to achieve equity in health (Chen et al, 2004; WHO, 2006; Global Health Workforce Alliance, 2008). The proposed reforms are heavily anchored on the concepts of interprofessional and trans-professional education that breaks down professional silos, adaptation of global resources that addresses local concerns, establishment of international linkages to help facilitate prioritization, planning, and policy making, and expansion from academic centers to academic systems strengthened through external collaborations as part of a more responsive and dynamic professional education systems (Frenk, et al. 2010).

The COVID-19 pandemic highlighted the need for innovative models of teaching that respond to the pedagogical imperatives of the three types of learning (informative, formative, and transformative) identified in a 2010 Lancet Commission (Frenk, et al. 2010; Daniel, et al. 2021; Gordon, et al. 2020). The Commission adopted a framework that considered a global outlook, a multiprofessional perspective, and a systems approach highlighting the relationship between education and health systems. It is centred on people as co-producers and as drivers of needs and demands in both systems. By knowing the labour market thoroughly, the provision of educational services generates the supply of an educated workforce to meet the

demand for professionals to work in the health system. Thus, to have a positive effect on health outcomes, the professional education unit must innovate new instructional and institutional strategies which the pandemic has forced us to do. Despite the physical distancing that the pandemic required of us, connectivity around the world got to its strongest point where information can now be easily accessed regardless of geographic location. And since health is a universal concern of society, it is only prudent that comparative education be one of the tools that will strengthen the health professions education worldwide

2. Key Principles and Approaches of Comparative Education

Comparative education is defined as a multidisciplinary field of education that systematically evaluates the similarities and differences between educational systems in two or more national, international, or cultural context, and understand their interactions with the society. Its major goal is to look at the different perspectives globally through the systematic use of comparative method to advance theoretical understanding (Manzon, 2011). Since the thrust of health professions education is to produce professionals who are adept with the health systems approach, comparative education plays a big role in facilitating exchange of ideas among different departments within an institution, among different institutions within a country, and even among different countries within a region and the world. Through this sharing of ideas and experiences, institutions can build on each other and constantly improve their educational methodologies and programs. The main purposes of comparative education for health professions institutions include (1) to learn about its own education system and that of others; (2) to enhance its knowledge of health professions education in general; (3) to improve the educational institution, especially its processes and methods; (4) to understand the relationship between health professions education and society; and (5) to learn and develop possible solutions to societal issues affecting the health professions education and health of the society in general (Ahmady et al, 2018; Bereday, 1964).

The main difference between comparative research versus traditional research is that unlike the rigid scientific frameworks of traditional research, the former is flexible and ever-changing depending on the different phases that a society undergoes and the challenges that a country encounters. In traditional research, a research question is formulated and the scholar reviews available literature, crafts a methodology in pursuing the research, and finally discovers the answers to the set research questions. In contrast, comparative education is an exercise where the interaction between sociological and epistemological constructs become translated into intellectual discourses (e.g. academic definitions, purposes, methods) and institutional structures (e.g. courses, publications, professional societies). Furthermore because of the fluid and flexible nature of comparative education (Manzon, 2018), it can influence schools to a continuum of specialization wherein a health professions educational institution may position itself as a distinct identity (e.g. an institution that produces subspecialists) or an institution training future health professionals with broad and integrated concepts which can cater to a very general health system (e.g. an institution that produces generalists).

3. Relevance of Comparative Education in the Health Professions

Comparative education in the health professions is not just reshaping health professions education but more importantly, it is pioneering advancements and equipping healthcare professionals to meet the diverse needs of societies worldwide through collaborative learning.

The main purpose of comparative education in the health professions is the exploration of the different educational models and strategies that health professions adopt worldwide. This creates a venue where different institutions can share and learn from each other different curricular designs, teaching and learning methodologies, and assessment strategies, facilitating improvement in the training approaches of health professionals. Through comparative education, educational leaders have an opportunity to appreciate the strengths and weaknesses of the different educational models thus helping them in improving their own institutions and strengthen the quality of training that they provide.

4. Opportunities for Comparative Education in the Health Professions

Comparing educational systems between institutions and countries can bring so many advantages and opportunities for change and growth. The first and most obvious is the

opportunity to compare educational strategies and structures in two or more institutions. This does not only facilitate adapting best practices, but also learning experiences on the various approaches and strategies that failed to work. Through this, educational leaders are enabled to holistically evaluate their organizational situation and make better decisions toward the needed reforms. Furthermore, this exercise does not only enable educational leaders to learn from other institutions but from their own organizations as well.

Another opportunity that comparative education provides us is the chance to view education from a different perspective that potentially leads to a better understanding of our society especially the students that we teach, the circumstances that surround them, and the possible issues that they may face.

The art and science of comparative education also facilitates a better understanding of how students' learning is associated with cultural intricacies (Raby, 2009). Therefore, it helps health professions educators prepare for teaching in a multicultural context which is very relevant nowadays especially with the advent of international students coming to our universities regularly for a variety of reasons.

From a wider perspective, comparative education allows educational institutions to undergo reforms with the aim of expanding access for all and improving the overall quality of education by reducing educational inequalities. If this is achieved, education will not just improve the quality of students and graduates but more importantly the society that they serve (WHO, 2006).

Furthermore, governments nowadays are putting much premium to international comparisons as they search for policies that facilitate more cost-effective and efficient ways of providing education in response to the ever-changing demands of health and health care.

Overall, the greatest opportunity that comparative education provides is to allow institutions to learn from the achievements and shortcomings of others and to have a mindset of viewing educational systems from a global rather than an ethnocentric perspective (Ahmady et al, 2018; Bereday, 1964; Manzon, 2018).

5. Challenges of Comparative Education in the Health Professions

The major challenge in pursuing comparative education in its truest form is ethnocentrism. Ethnocentrism is a phenomenon that has existed across all societies and time periods (Abassi et al, 2022; Brown, 2000), and is a concept emanating from the belief that one's own ethnic group is of immense importance and oftentimes superior than others (Bizumic, 2019). This tendency is something that comparative education practitioners have to be mindful of and may be overcome by intentionality (Frenk et al, 2022). Intentionality is the conscious mental ability to refer to or represent something (Jacob, 2010). Thus, educational leaders and institutions must be intentional in doing comparative education -it should be clear to them what the organizational goals are, the intent of comparative visits and discourse, and how the experiences will benefit concerned institutions based on the organizational directions set by the academic leadership.

Another major challenge to comparative education is the limited resources especially in educational institutions belonging to low- and middle- income countries which may not only have limited funding to support these activities but may also have more urgent priorities (Majumder et al, 2023; Majumder et al, 2004). One solution to this is by applying program development grants from international organizations like the United Nations Educational, Scientific and Cultural Organization (UNESCO), World Bank, and the Organization for Economic Cooperation and Development (OECD) which have funding to help facilitate educational reforms in institutions that belong to less privileged areas of the world (OECD, 2007).

6. Factors affecting Comparative Education and Medical Schools

Understanding the intricate relationship of cultural, social, economic, and environmental factors is crucial in shaping the future of health care in the country and the world. These factors also play a vital role in shaping the direction of health professions education if we truly want it to be transformative and responsive to the demands of the current times (Frenk, 2010).

Focusing on medical schools, several factors affect the optimal delivery of the teaching learning environment that facilitates transformative education (Gaur et al, 2020). And each of these factors can be directly or indirectly influenced by comparative education as discussed.

Structural factors. The logistical architecture and physical set-up of health professions institutions, from organizational protocols and guidelines to structural frameworks, shapes the educational journey of students mainly by providing them a safe space where they are respected and nurtured to become the physicians that they envision themselves to be (Troy, et al. 2022). **Educational Factors.** Innovative teaching and learning methods, including methods of assessment enhance engagement of students and maximize their potentials in the achievement of program outcomes (Gaur et al, 2020). **Socio-cultural Factors.** Social dynamics need to be established and refined in any educational organization to facilitate nurturing of professionalism, communication, and collaboration. Comparative studies can help facilitate this by learning from other institutions. Furthermore, integrating the cultural beliefs and norms into the educational environment enriches the teaching – learning journey of both faculty and students, and foster meaningful learnings and experiences in medical school (Alfayez et al, 1990; Beagan, 2003). **Interprofessional Education.** Comparative education facilitates integration of diverse disciplines into the curriculum and actual practice thereby ensuring a well-rounded understanding of medical science. As future doctors, products of medical schools should be well versed in collaborating with professionals from other fields (Mohamed et al, 2021; Zechariah et al, 2019).

These factors are essential to be evaluated and included in strategic management goals for a medical school to maximize the benefits of international comparative education. Through this, the curriculum will be streamlined and improved by consider how the latest global standards can be applied in the local setting to respond to the demands of the health care system in the locality.

7. Conclusion

Indeed, the comparative study of health professions education systems within the country and globally allows us to uncover best practices, challenges, and collaborative opportunities. This holistic approach ensures that the training is not only comprehensive but also responsive to the dynamic needs of the country, the region, and the rest of the world. The opportunities that international comparative education provide to the health professions education include the sharing of best practices and difficulties encountered, and the enhanced viewpoint from considering different perspectives. On the other hand, the main challenges include ethno-centrism and the limited resources that majority of institutions face globally especially those from the low- and middle-income countries. Several factors need to be evaluated and addressed to fully maximize the impact of comparative education especially in medical schools and this includes structural, educational, socio-cultural, and interprofessional factors. If we can fully accept this perspective and integrated it to the educational foundations in our medical schools, then we are one step closer to becoming responsive to the call for a more holistic and systems – centered health professions education

Supplementary Materials & Data availability statement: No supplementary materials and no empirical data are connected to this piece of work given the nature of the article.

Author Contributions: Both authors contributed in the conceptualization, writing, and final approval of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: The Author would like to sincerely thank Ms. Monica Wallet, PhD for facilitating the idea of the article.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Abbasi, L. S., Yasmeen, R., & Sajjad, T. (2022). Challenges faced by health professions educationists en route to educational reforms in Pakistan. *Journal of education and health promotion*, 11, 315. https://doi.org/10.4103/jehp.jehp_424_22
- Ahmady, S., Yazdani, S., Hosseini, F., Forouzanfar, M. M., Tabibi, A., Ahmadiania, F., Tehran, H. A., Kohan, N., & Mohammadi, H. (2018). A comparative study on the function and structure of medical development education office in world's top universities. *Journal of education and health promotion*, 7, 67. https://doi.org/10.4103/jehp.jehp_181_16
- Alfayez, S. F., Strand, D. A., & Carline, J. D. (1990). Academic, social and cultural factors influencing medical school grade performance. *Medical education*, 24(3), 230–238. <https://doi.org/10.1111/j.1365-2923.1990.tb00006.x>

- Bereday, G. (1964). *Comparative Method in Education*. New York: Holt, Rinehart & Winston. https://books.google.com.ph/books/about/Comparative_Method_in_Education.html?id=GpAWAAAAIAAJ&redir_esc=y
- Beagan, B. L. (2003). Teaching Social and Cultural Awareness to Medical Students: 'It's All Very Nice to Talk about It in Theory, But Ultimately It Makes No Difference.' *Academic Medicine*, 78–78(6), 605–614. <http://ereserve.library.utah.edu/Annual/COMM/5115/Shugart/teaching.pdf>
- Bizumic, B. (2019). Ethnocentrism. In V. Zeigler-Hill, T. Shackelford (eds) *Encyclopedia of Personality and Individual Differences*. Springer, Cham. https://doi.org/10.1007/978-3-319-28099-8_2312-1
- Brown, D. E. (2000). Human universals and their implications. In N. Roughley (Ed.), *Being humans: Anthropological universality and particularity in transdisciplinary perspectives* (pp. 156–174). Berlin: Walter de Gruyter.
- Chen, L., Evans, T., Anand, S., Boufford, J. I., Brown, H., Chowdhury, M., ... Wibulpolprasert, S. (2004). Human resources for health: overcoming the crisis. *Lancet (London, England)*, 364(9449), 1984–1990. [https://doi.org/10.1016/S0140-6736\(04\)17482-5](https://doi.org/10.1016/S0140-6736(04)17482-5)
- Daniel, M., Gordon, M., Patricio, M., Hider, A., Pawlik, C., Bhagdev, R., ...Stojan, J. (2021). An update on developments in medical education in response to the COVID-19 pandemic: A BEME scoping review: BEME Guide No. 64. *Medical teacher*, 43(3), 253–271. <https://doi.org/10.1080/0142159X.2020.1864310>
- Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., ...Zurayk, H. (2010). Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet (London, England)*, 376(9756), 1923–1958. [https://doi.org/10.1016/S0140-6736\(10\)61854-5](https://doi.org/10.1016/S0140-6736(10)61854-5)
- Frenk, J., Chen, L. C., Chandran, L., Groff, E. O. H., King, R., Meleis, A., & Fineberg, H. V. (2022). Challenges and opportunities for educating health professionals after the COVID-19 pandemic. *Lancet (London, England)*, 400(10362), 1539–1556. [https://doi.org/10.1016/S0140-6736\(22\)02092-X](https://doi.org/10.1016/S0140-6736(22)02092-X)
- Gaur, U., Majumder, M. A. A., Sa, B., Sarkar, S., Williams, A., & Singh, K. (2020). Challenges and Opportunities of Preclinical Medical Education: COVID-19 Crisis and Beyond. *SN comprehensive clinical medicine*, 2(11), 1992–1997. <https://doi.org/10.1007/s42399-020-00528-1>
- Global Health Workforce Alliance (2008). Scaling up, saving lives. Geneva: World Health Organization, 2008. <https://www.who.int/publications/m/item/scaling-up-saving-lives-2008-report>
- Gordon, M., Patricio, M., Horne, L., Muston, A., Alston, S. R., Pammi, M., ...Daniel, M. (2020). Developments in medical education in response to the COVID-19 pandemic: A rapid BEME systematic review: BEME Guide No. 63. *Medical teacher*, 42(11), 1202–1215. <https://doi.org/10.1080/0142159X.2020.1807484>
- Jacob, P. (2010). "Intentionality". Stanford Encyclopedia of Philosophy. <https://en.wikipedia.org/wiki/Intentionality>
- Manzon, M. (2011). *Comparative Education: The Construction of a Field*. Hong Kong: CERC/Springer. <https://cerc.edu.hku.hk/publications/cerc-studies-in-comparative-education/comparative-education-the-construction-of-a-field/>
- Manzon, M. (2018). Origins and traditions in comparative education: challenging some assumptions. *Comparative Education*, 54(1), 1–9. <https://doi.org/10.1080/03050068.2017.1416820>
- Majumder, M. a. A., Haque, M., & Razzaque, M. S. (2023). Editorial: Trends and challenges of medical education in the changing academic and public health environment of the 21st century. *Frontiers in Communication*, 8. <https://doi.org/10.3389/fcomm.2023.1153764>
- Majumder, A. A., D'Souza, U., & Rahman, S. (2004). Trends in medical education: challenges and directions for need-based re-forms of medical training in South-East Asia. *Indian journal of medical sciences*, 58(9), 369–380. <https://pubmed.ncbi.nlm.nih.gov/15470278/>
- Mohammed, C. A., Anand, R., & Saleena Ummer, V. (2021). Interprofessional Education (IPE): A framework for introducing teamwork and collaboration in health professions curriculum. *Medical journal, Armed Forces India*, 77(Suppl 1), S16–S21. <https://doi.org/10.1016/j.mjafi.2021.01.012>
- OECD. (2007). Education at a Glance 2007: OECD Indicators, OECD Publishing, Paris. <https://doi.org/10.1787/eag-2007-en>
- Raby, R. L. (2009). Comparative and International Education: A Bibliography (2008). *Comparative Education Review*, 53(1), S1–S125. <https://doi.org/10.1086/603609>
- Troy, D., Anderson, J., Jessiman, P. E., Albers, P. N., Williams, J. G., Sheard, S., ...Kidger, J. (2022). What is the impact of structural and cultural factors and interventions within educational settings on promoting positive mental health and preventing poor mental health: a systematic review. *BMC public health*, 22(1), 524. <https://doi.org/10.1186/s12889-022-12894-7>
- WHO. (2006). The world health report: working together for health. Geneva: World Health Organization. <https://www.who.int/publications/i/item/9241563176>
- Zechariah, S., Ansa, B. E., Johnson, S. W., Gates, A. M., & Leo, G. (2019). Interprofessional Education and Collaboration in Healthcare: An Exploratory Study of the Perspectives of Medical Students in the United States. *Healthcare (Basel, Switzerland)*, 7(4), 117. <https://doi.org/10.3390/healthcare7040117>

Research Article

The Impact of Cooperative Learning on English Speaking Skills at Intermediate Level

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<https://doi.org/eiki/10.59652/jetm.v2i4.302>

Abstract: This study was conducted to determine the effectiveness of the cooperative learning (CL) strategy on English speaking competence at the intermediate level at the University of Finance-Marketing (UFM). It was conducted within 2 months. A pre-test and post-test were applied to determine the effectiveness of research treatments (i.e. Kagan CL strategies) in English speaking comprehension at the intermediate level. Moreover, a questionnaire was used to enquire into the students' attitudes towards applying CL in the classroom. To determine the result of this study, the independent sample t-test, paired sample t-test and frequency command were used to analyze the collected data. The result showed that CL strategy enhanced English as a foreign language (EFL) students' English-speaking competence at the intermediate level. The result of the study affirmed the positive effectiveness of CL strategies in teaching English-speaking performance at the intermediate level of EFL students. Through the study, the author also suggested using some different teaching strategies such as Student Teams-Achievement Divisions in teaching English to continue to enhance the effectiveness of CL on English speaking performance.

Keywords: cooperative learning; speaking skills; intermediate level

1. Introduction

1.1. Background of the Study

Teaching English in general and teaching English speaking skill in specific, many teaching methods have used to improve learners' language skills. Among those methods, CL strategy plays an important role to afford the opportunities for developing of teaching language's result. Suwantarathip and Wichadee (2010) pointed out that CL is one of the effective and convenient teaching methods because it encourages interaction among the learners through working in groups whereby it develops their language skills and their achievement in language learning. In groups, learners can share and discuss as well as contributing their knowledge and experiences to complete common tasks and get knowledge and experiences from the other learners. In Fearon and his colleague's research (2012), CL strategy improves not only team spirit but also social communication skills of participants. This means that CL strategy effects on both internality and externality of learners. Through affecting on internal and external factors, CL can help learners increase their motivation and cooperative ability. Thus, the effectiveness or even efficiency of CL strategies on English teaching and learning is shed light on.

Besides that, Nihalani, Wilson, Thomas, and Robinson (2010) find out that the effectiveness of CL strategies on language teaching and learning can be impacted by group-level performance. Group-level performance is understood as the contribution of each member into achieving an expected result for tasks and activities of group. This means that effectiveness of CL can be affected by learner's proficiency. In other words, CL strategy can bring negative effects on learners at low individual level, which also comprises the intermediate level.

At the University of Finance-Marketing (UFM), CL strategy is one of the essential methods has used in the courses at various levels, including the intermediate level. Thus, it is necessary to conduct the study that aims at determining the effectiveness of CL strategy into students' competence on speaking skill at intermediate level, whereby the author attempts to

Received: October 5, 2024

Accepted: October 16, 2024

Published: November 3, 2024



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suggest methods to apply in teaching English in general and teaching English speaking at UFM in particular better.

1.2. The aims and Significations of the Study

Firstly, this study aims at identifying the effects of CL strategy on students' speaking competence at intermediate level at UFM. In other words, the current study attempts to find out whether CL strategy changes learning result and performance of EFL learners' speaking comprehension at intermediate level.

Furthermore, main point of this study is to determine whether students in CL environment outperform students in classroom where traditional teaching methods are used.

Through the result of this study, the author wants to suggest some teaching strategies to develop and promote the advantages of CL strategy as well as reducing and limiting its disadvantages in teaching and learning English speaking at intermediate level (if any).

In summary, the current study attempts to specify the effectiveness of CL strategy forward to a specific skill of English teaching- speaking skill at a specific level – intermediate level. Through this study, it hopes that it is able to contribute to explore a comprehensive and holistic picture about the effectiveness of CL strategy into learning and teaching English in general and learners' learning result and performance in English speaking comprehension in particular.

Research questions of the study

To achieve the mentioned aims, the current study attempts to find out the answers for three following questions:

- (1) Can CL strategy change students' English-speaking competence at intermediate level?
- (2) How does CL strategy affect students' English-speaking competence at intermediate level?

2. Literature Review

2.1. Definition of CL and its Role in English Teaching and Learning

According to Slavin (1989), CL strategy is teaching methods that request learners have to cooperate in the groups or teams to help one another to get a common goal or an assigned task. Kagan' research (1994) pointed out that CL is one of successful teaching strategies in English teaching and learning. It refers to cooperation among learners together to achieve a mutual goal. Through working and discussion in a group or a team, cooperating with others, each student, who can be at different levels of ability in English learning, can apply the various learning activities to improve and develop their language skills and understanding about the subjects. Moreover, in a team, each member can share and exchange the knowledge or experiences that they master with others whereby it helps to create and promote an atmosphere of achievement. It cannot deny that CL strategy has been applied popular because it affords to learners the various benefits. Specifically, it helps to improve students' learning and their academic achievement as well as encouraging students' retention and develop their oral communication and social skills.

In order to shed light on the effectiveness of CL strategy in teaching and learning English, D. Johnson, R. Johnson, and Smith (1991) pointed out five elements of CL strategy as well. The first one is positive interdependence in which each member has to contribute his or her resources or role for success of task of group. Second factor is face-to-face interaction. This method requires each member orally explains to suggest the solutions to solve the common problems. The third one is individual and group accountability, which focuses on observation and recordation the contribution of each member in a group. Fourth element is called interpersonal and small-group skills, which helps learners to develop their leadership, conflict management skills, trust-built et cetera. Group processing is the last one. It helps to recognize and determine the contribution of each member in a group whereby it makes the decisions relevant to continuation or change the way of work of group.

Öztürk (2023) defined cooperative learning is a learning model in which students support each other's learning in cooperation with each other. The education process has many advantages in terms of academic, social, psychological, measurement-evaluation, and economic aspects. Cooperative learning was also recognized as a student-centered model that supports active learning, allowing students to adapt to this role quickly. It involves students working in small groups to maximize their learning and that of their peers. It involves students

working together to achieve common goals or complete group tasks – goals and tasks that they would be unable to complete by themselves, updating the teaching model, and cultivates students' cooperative spirit. (Johnson & Johnson, 2013; Gillies, 2016; Claus, 2021).

2.2. Hypotheses

In general, there are many the previous studies about the effectiveness of CL strategies on teaching and learning English-speaking. Besides the negative above-mentioned appreciations about effects of CL strategy of Azmi, Celik, Yidliz and Tugrul (2014), Beebe and Masterson (2003) and Zhao and Jiang (2009), many others researchers such as Burke (2011), Barkley, Cross and Major (2005), Li and Campbell (2008), Xue (2013) et cetera, strongly claimed that CL affords learners the opportunities to improve, practice and apprehend English speaking skill.

Therefore, it can believe that (1) CL strategies can enhance learning result on EFL students' speaking comprehension at intermediate level. Probably most importantly, based on the proof in the previous studies, it hopes that (2) the learners offer positive attitude towards applying of CL strategies in teaching and learning English speaking comprehension in FLF classroom.

In brief, this study attempted to find out the effectiveness of CL strategies have used in teaching English speaking at UFM as well as reinforcing clues to claim that CL strategy is effective for English speaking teaching at intermediate level.

3. Materials and Methods

3.1. Participants

39 participants in the current study, who came from different majors, including accounting, business administration, finance and banking, marketing, real estate, international business studies and economic law, were learning General English 1 subject at UFM. They attended at two classes which were taught by the author in Thu Duc Campus of UFM in the first semester in 2024 school year.

3.2. Research Instruments

A quasi-experimental design was conducted within two months (i.e. thirty-two sessions). Thyer (2012) and Cook (2003) claimed that quasi-experimental research affords several benefits more than the other research methods. Specifically, because quasi-experimental research does not offer an artificial research environment, the research process is more likely to be genuine. Quasi-experimental design may be more possible than many true experimental designs because it does not constrain the researchers and participants have to spend a lot of time. In addition, lack of randomization also helps quasi-experimental research reduce the time in research process. Taking the mentioned advantages of quasi-experimental research, this study applied this research method to find out the result.

The result of the study was found out through comparing the score of students' pre-tests, post-test period and data analysis from student questionnaire.

The pretest sample which was received and adapted from the Key English Test (KET) Extra version sample (Test 1 and Test 4) of Cambridge University. This test covers five parts. There are total 20 scores for each part. Total score is 100 and calculates by summing all of the score of the five parts.

Post-test sample has the similar structure and form with pre-test. However, because it is used after treatment period, it is more difficult than the pre-test. It consists of more and complex information in the un-familiar context. The conversation is longer than pre-tests and the question request higher analysis as well.

The questionnaire that received and adapted from the sample of Lina (2010) hoped that can bring a holistic picture about effectiveness of CL strategy in teaching English speaking from both learners' and teachers' angles.

In brief, this study attempted to holistically check and evaluate the improvement of learners' competence in learning English speaking whereby it could expose the effectiveness of CL strategy on English speaking comprehension at intermediate level at UFM. To achieve the above aims, the current study applied a quasi-experimental study with pre-posttests sample were Test 1 and Test 4 in KET extra version of Cambridge University and a questionnaire that received and adapted from Lina's research (2010).

3.3. Research Treatments

This study used three Kagan's structures and five Kagan's strategies (1994) to explore

the effectiveness of CL on English-speaking at intermediate level at UFM.

In theory, Kagan’s structures can be divided into five main groups. They are team building, class building, communication building, mastery and concept development. The current study focused using three among five Kagan’s structures. They are team building, class building and concept development.

In term of team building, learners share information with group members in turn. Through giving ideas and creating stories, learners’ contribution in group is fair. Class building structure requests participants show their ideas, viewpoints about a topic or an issue that is given by teacher. Then, learners form small groups to share and discuss together. This group structure helps learners approach a topic or an issue from the other angles whereby this increases knowledge and respect for the other ideas. The last structure is concept development. Teacher gives an issue that requests high analysis and assessment. Learners are given time to prepare answers or solutions. Then, they discuss their result with their shoulder partners. This structure helps to create and assess hypothesis as well as developing inductive and deductive methods (Kagan, 2003). These structures are used because of their simplicity and flexibility. They are applied during study period within 32 sessions.

The five Kagan’s strategies that were applied in this study are Think-pair share, Line up, Pairs-squared, Pairs-compare and One stray strategy.

Think-pair share strategy (see Figure 1) helps student shares and approaches different ideas as well as developing cooperation skill. It also increases individual accountability and equal participation. To apply this strategy, 20 students in experimental group were divided into 5 small groups equally. A question or an issue was posed. Students spent from 2 to 5 minutes to think and find their answer or solution. Then, student discussed with his or her shoulder or face partner to unify result (stage 1). After 2 minutes, student exchanged partner in their group and spent 2 minutes to continue discussing and unifying (stage 2). Subsequently, student exposed answer or solution with class.



Figure 1. Think-pair share strategy procedure.
Source: Kagan (2003)

Line Up is a Kagan’s cooperative strategy helps students develop logical thinking and understand ordering. This strategy includes two steps. Firstly, students received items or subjects from teacher. Second step, students worked in pair to arrange these items or subjects based on some specific criterions such as color, shape, usage et cetera.

Third strategy is Pairs-squared (see Figure 2). This strategy is a good way to share and receive information among students in a group. It has two stages. At first stage, students cooperated with their shoulder partner after a speaking test. After discussing, at second stage, each pair formed a foursome by matching with another pair and continued unifying answers.

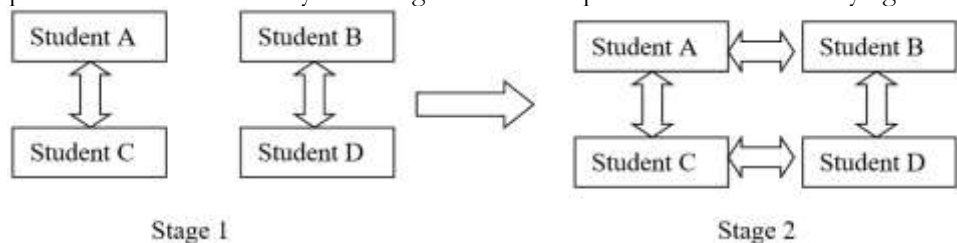


Figure 2. Pairs-squared strategy procedure.
Source: Kagan (2003)

Fourth strategy is Pairs Compare Strategy (see Figure 3). This strategy is developed from Kagan’s class building structure. Each student among first ten students was assigned a number from 1 to 10. Each student among the other ten students was also assigned a number like the first ten students. After a s test, students who had the same number worked in a pair to compare and discus answer.

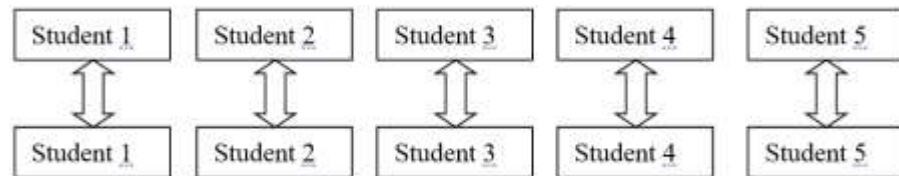


Figure 3. Pairs Compare Strategy procedure.

Source: Kagan (2003)

The last one is One stray strategy. This strategy affords students opportunities to share and approach problem from different angles. Students were assigned to form foursomes. Each student in each group was assigned a number, from number 1 to number 4. After a test, students had a few minutes to share and discuss answer or solution. Until teacher said “stray”, student number one in each group moved to other group to continue sharing and discussing. This procedure continued until student number four’s turn.

During study process, control group and experimental group had two different lesson plans. Experimental group’s lesson plan used the four Kagan’ CL strategies as the main strategies to teach English speaking skill. In contrast, control group’s lesson plan did not use any CL strategies during learning English-speaking.

The four Kagan’s strategies were used because they are simple and popular. They can be applied easily in English speaking teaching in different ways with different teaching conditions.

In short, the main research treatment in this study were five strategies, including think-pair share, line up, pairs-squared, pairs-compare and one stray strategy and team building, class building and concept development structure, three among five Kagan CL structures (1994). These strategies and structures had far-reaching in teaching English in general and teaching English speaking in specific.

3.4. Data Collection Procedure

At the beginning stage of the study, the participants were divided into two groups. 19 students in Class A belonged to control group and 20 students in Class B pertained to experimental group. During learning process, the first group (i.e control group) carried out the tasks individually and the second group (i.e experimental group) discussed in a group and worked in pair or team to complete the assigned tasks. In experimental group, the participants dealt with the tasks through working in pairs and small groups. Each small group had from three to four students. The participants were assigned to work with the partners whereby it hopes to make the dynamic and sociable learning environment among the students. The assignment was also considered careful to ensure the equality relevant to learning proficiency among the experimental groups. The participants were also diffused about the purpose and importance as well as process of the current study. During the experimental process, both two groups received the instruction equally from teacher to ensure that all of the students were able to receive and get the same amount of knowledge. The students were performed the same tasks and course outline.

At the initial stage of the research, a pre-test was offered to check students’ competence. After the treatment stage (i.e after two months from pre-test stage and at the end of the course, as well), a post-test was used to measure the effectiveness of CL strategies into students’ learning result in learning English speaking. The answer keys of the pretest-posttest were not offered until the participants completed their post-test.

At the end of post-test period, a questionnaire was used to explore students’ attitude towards using of CL in English speaking learning in classroom. The questionnaire was delivered to the participants in both experimental and control group. The participants spent about 10 minutes to complete the questionnaire. The students who participated in this study were expounded clearly about the purpose and importance of the questionnaire in this study. The data collection was described as Figure 4.

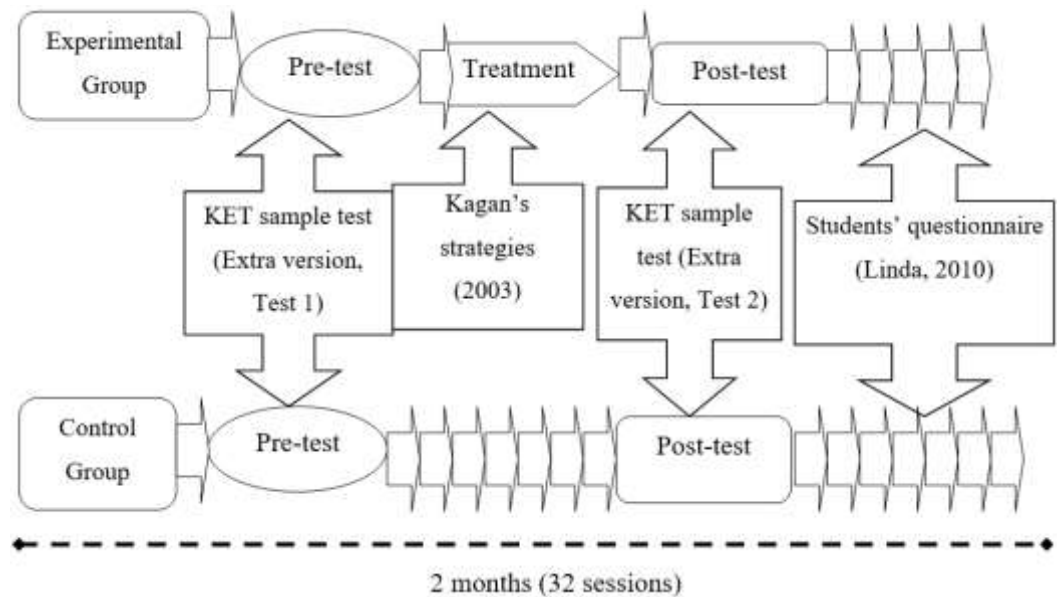


Figure 4. Data collection procedure.

Source: Slavin (1989)

The analysis of collected data from the questionnaire and the scores of pre-tests and post-test stage was carried out through SPSS software, version 26. This procedure was explained in the next part.

3.5. Data Analysis Procedure

As mentioned in data collection procedure, collected data of this study was imported into SPSS software. Obviously, the Cronbach Alpha was used to estimate the reliability of each pre-posttest and questionnaire firstly.

In term of pre-test and post-test, an independent sample t-test was used to check whether the CL strategy is effective on students' learning result and performance in English speaking performance at intermediate level. The independent sample t-test was used because the data is independent. A hypothesis (H01) was exposed to hypothesize that there is not the difference between participants' speaking competence between experimental and control group. In contrast, there was a hypothesis (H1) that students' speaking competence in both groups is different. Similarly, a hypothesis (H02), which supposes that students' attitude towards CL activities is not different between the two, was revealed. Besides that, a hypothesis (H2) was offered that students in experimental group had positive attitude dealing for CL tasks. The independent sample t-test was run twice time. The first one aims at check whether difference between participants' competence in English speaking comprehension at both experimental and control group at the pre-test period. Second time, the t-test was used to compare scores of the two groups at post-test stage. The affirmation or rejection of hypothesis (H01), (H1) and (H02), (H2) answers for the research question of this study.

Then, a paired sample t-test statistic technique was used to find out the difference between the score of experimental groups at the pre-test and post-test. The paired sample t-test expresses the correlation (t-value) between two variables, which is related together. This t-test is used because both the two variables in this case (i.e. the result of the pre-test and post-test stage) are dependent on each other. Moreover, the two variables presented the two different scores of the same object in the two time points (i.e. before and after the intervention).

The result of independent sample t-test and paired t test offered the answer for the question whether CL strategies are affective on English-speaking skills of EFL learners at intermediate level at UFM. Through these finding, the study identified the effectiveness of CL on learners' competence in English speaking comprehension at the intermediate level.

In term of the questionnaires, frequencies were used to analyze collected data and find out result of the study. This analysis points out attitude and estimation towards CL approach from both groups.

4. Results

4.1. Reliability Statistics

As mentioned above, the Cronbach alpha was applied to check the reliability of pre-posttest of control group and experimental group. The result of this measurement scale was showed as in the figure below.

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .502 | 19 |

Figure 5. Reliability statistics of pre-post test score of control group.

The coefficient of Cronbach alpha in this case was higher than 0.5 ($\alpha=5.02$). This means that the score of pre-posttest of control group was reliable. Likewise, reliability of pre-post test score of experimental groups was also described by Cronbach Alpha value in figure 6.

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .674 | 20 |

Figure 6. Reliability statistics of pre-post test score of experimental group.

In this care, Cronbach Alpha value got 0.674 that was higher than 0.5. Therefore, reliability of pre-post test score of experimental groups was assured. By the same token, reliability of questionnaire also mentioned in figure 7.

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .532 | 39 |

Figure 7. Reliability statistics of the questionnaire.

Reliability of the questionnaire in this case was reliable because the coefficient of Cronbach Alpha surpassed value of 0.5 (i.e $\alpha = 0.532$). The finger of reliability of the questionnaire was only higher than the acceptable coefficient (i.e $\alpha = 0.5$) a bit perhaps because the questions was short, and the number of questions is limited (only 11 questions).

Generally, the reliability of the three research tools was reliable. They showed the close correlation and relationship among the variables as well as reliability of participants' responses. These coefficients are really important because they are firm basis for collected data analysis in this study.

4.2. Results of Pre-test and Post-test

Firstly, an independent sample t-test was run to estimate participants' English-speaking competence of both control group and experimental group at pre-test period. The result was presented in the following tables.

Table 1. The comparison between students' English-speaking competence in the two groups at pre-test period (Independent Samples Test)

| Variable | M | SD | t | df | P |
|-------------------------|-------|---------|-------|--------|-------|
| Total score at pre-test | | | 0.675 | | 0.504 |
| Experimental group | 36.85 | 4.10744 | | 36.951 | |
| Control group | 36.00 | 3.75648 | | 37 | |

Table 1 shows that the students' English-speaking competence at pre-test period in experimental group was not different from control group ($p = 0.504$), which was not statistically significant. The mean scores of two group indicate that the average score of experimental groups ($M = 36.85$) is not significantly different with the score ($M = 36.00$) of control group at pre-test. The difference between the means of the two groups is only 0.85 points on a 100-point test. This means that there is not the difference between participants' competence in experimental and control group at the pre-test period is accepted.

Similarly, an independent sample t-test was used to estimate participants' English-speaking competence of both control group and experimental group at post-test period. This

helped to answer the first research question that is whether CL strategy positively effects on students' English-speaking competence at intermediate level. The result was showed in table 2.

Table 2. The comparison between students' English-speaking competence in the two groups at post-test period (Independent Samples Test)

| Variable | M | SD | T | df | P |
|-------------------------|---------|---------|--------|-------|-------|
| Total score at pre-test | | | 19.912 | | 0.000 |
| Experimental group | 88.1000 | 4.72284 | | 33.46 | |
| Control group | 62.5263 | 3.18623 | | 37 | |

Table 2 pointed out P-value is 0.000 ($p = 0.000$). This referred that the students' English-speaking competence at post-test period in experimental group was different from control group. The mean scores of experimental groups are 88.1 ($M = 88.1$) is higher than control group is 62.5263 ($M=62.5263$). This result expressed that there is significant difference between the two mean scores. The difference is 19.912 points on a 100-point test. This supposed that students' English-speaking competence in the post-test period is not different between the two groups is not accepted.

In addition, to find answer for the second research question is that how CL strategy effects on students' English-speaking competence at intermediate level. A pair sample t-test was used to estimate score of pre-test and post-test period in experimental group.

Table 3. The difference between student's competence in two groups (Pair Samples Test)

| Variable | M | SD | T | df | P |
|---------------------------------------|-------|---------|--------|----|------|
| Total score at pre-test and post-test | 51.25 | 4.90837 | 46.695 | 19 | .000 |

Table 3 expressed that students' English-speaking competence in experimental group at pre-test period is different from English speaking competence at post-test period ($p = .000$), which was statistically significant. This showed that English speaking competence in experimental group at post-test period is higher than pre-test period, $t(19) = 46.695$, $p = .000$. This result points out that students' English-speaking competence in experimental group at post-test period is higher than pre-test period.

In short, data analysis pointed out that students' English-speaking competence was equal at the beginning of the study. This was a main footing for applying the research treatments (Kagan CL strategies) in the study. From this application, the effectiveness of CL strategy in teaching English-speaking comprehension at intermediate level was determined. This strategy improved not only students' competence but also their performance in English-speaking skill at intermediate level.

After data analysis from pre-test and post-test scores, the questionnaire was analyzed by frequency command in SPSS version 20. The following graphs expressed data analysis of students' questionnaire.

4.3. Result of Questionnaire

As mentioned above, the collected data from the questionnaire was analyzed by frequency analysis technology in SPSS software version 26. The participants' responses were showed by percent data and illustrated by the graphs. Each graph showed and illustrated a question. The data analysis was specifically conducted below.

Figure 8 showed 90 percent participants have studied English at UFM. In the other hand, all participants in this study attended at least one course at UFM. This helps them familiar with teaching methods and easier in cooperation with others. Moreover, according to Beebe and Masterson (2003), psychology is one of barriers in cooperation and sharing information in a group. Undoubtedly, cooperating with acquaintances helps to maintain a comfortable atmosphere during learning process. Thus, cooperation was performed better.

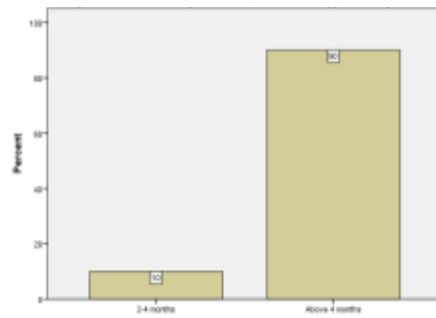


Figure 8. Students’ time period at UFM (question 1).

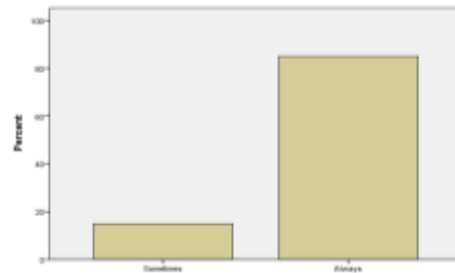


Figure 9. Students’ interaction in learning English-speaking (question 2).

The result from figure 9 expressed that most students always interact with the others to accomplish the group work. Interaction plays an importance role in CL strategy through appearing in four main elements: positive interdependence, face to face interaction, promotive interaction and group processing. Students’ frequent interaction showed a positive attitude towards CL. However, the rest of participants claimed that they sometimes interact with group mates. This means that cooperation in a group sometimes is monopoly of a group students instead of all students.

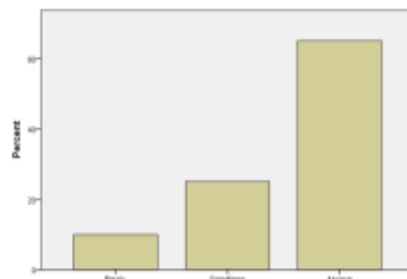


Figure 10. Students’ participating frequency in group work (question 3).

Figure 10 showed that many students always participant to involve the group work in English-speaking learning. This point out that group tasks are only completed by a group student. Meanwhile, some other students sometimes or even rarely participant in group work. This may affect lack of motivation during their English-speaking learning. Depending on their group members cause these students missing knowledge and independence during English-speaking learning process.

Nearly the above graphs, the finger in figure 11 pointed that over 60 percent participants thinks that group work should be shared equally. All members participate in group work helps to increase success for common tasks. In contrast, over 30 percent students claimed that a group of students should be responsible for group tasks. This happens because group’s goals are not linked. As a result, this may lead to dividing a group into two small groups with good students in a group and low students in a group. It may bother individual and group accountability process in accomplishing of CL strategies.

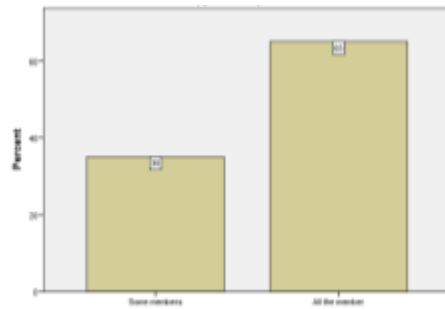


Figure 11. Working assignment in group work in English-speaking competence (question 4).

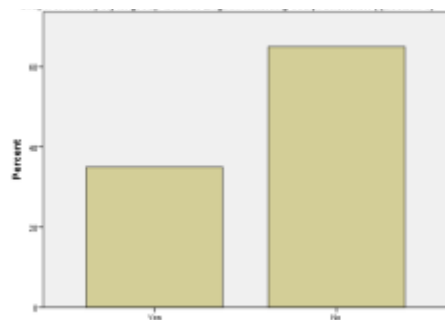


Figure 12. Monopoly in group work in English-speaking competence (question 5).

The figures in figure 12 revealed that many students always accomplish group works. Meanwhile, a significant number of participants relies on their group mates because they claimed that group works should belong to a group of some good students. The negative figures may be caused by the diffusion of responsibility (Slavin, 1996).

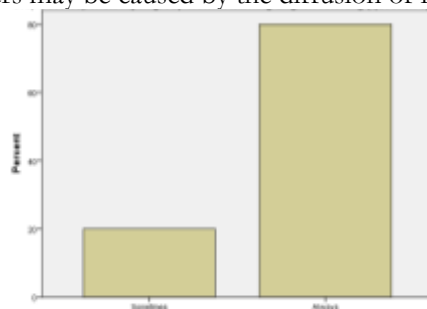


Figure 13. Responsibility in group work in learning English-speaking (question 6).

Figure 13 gave the positive figures because four-fifths participants claimed that they always feel responsible in group work. On other words, these students' individual accountability is high. This may lead to accomplishing group work better because whenever having a sense of responsibility to something, we are able to complete this well. However, undoubtedly, fourth student is lack of responsibility for group work. This puts pressure on other group mates because they have to undertake over their assignment.

This figure below painted that more than four fifth participant is committed to the success of their group mates. This promotes cooperation to achieve success in group again and again. The students in this group possess not only high individual accountability but also high progress in cooperate with others. In contrary, near fourth student is not satisfied with success of everyone in the group. This could happen because group's goal is not linked or assigned clearly.

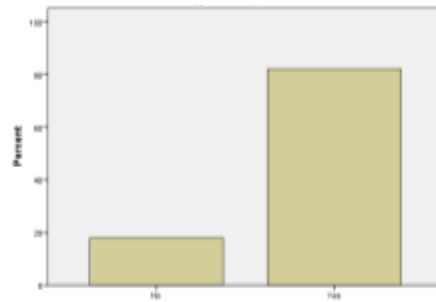


Figure 14. Commitment in group work in English English-speaking competence (question 7).

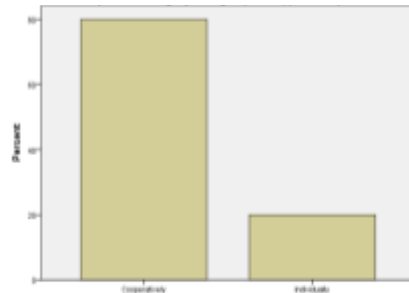


Figure 15. Learning styles in group work (question 8).

Figure 15 showed that most of the students like working in group with their classmate than completing the tasks individually. Even there was no one select working tasks competitively. When working in group, learners' goals are linked whereby each member can share and get knowledge and experience as well as facilitating interaction skill. Besides that, 20 percent student would like to work individually. This happens maybe because of lack of interdependence or psychological factors among them.

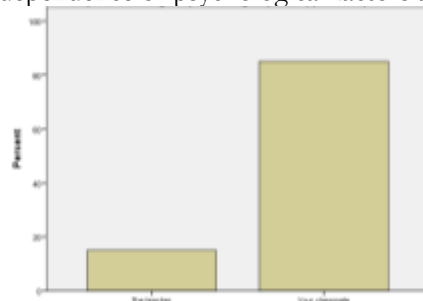


Figure 16. Selecting cooperator in group work (question 9).

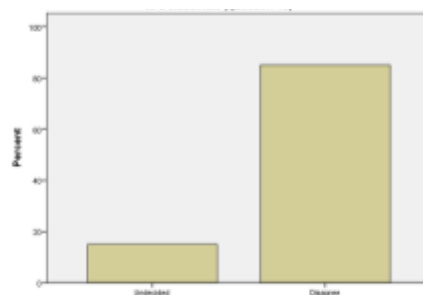


Figure 17. Inconvenience of CL strategy in explaining the task to a classmate (question 10).

Figure 16 answered for the question that who students prefer to discuss the task with. Certainly, teacher and classmate are selected to discuss the tasks in group work. Between the two, classmate is chosen more than teacher is. This points out that teacher plays as a supervisor more than a partner or cooperator in CL strategy. Maybe students feel anxious

when interacting with teacher and motivated in cooperation with their partners. Discussing in pair or group improves interaction and cooperation among members as well. Moreover, exchanging with partner who has the similar background helps students achieve common goals easier.

Figure 17 showed that CL strategy does not bother students to explain the tasks with their classmates. More than eighty percent students claimed cooperation is not a barrier in explanation with their partners. While fifteen percent of student had no idea about this issue. Maybe these students rarely give explanation, or they sometimes face with difficult in sharing information with others.

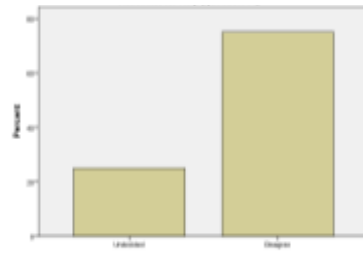


Figure 18. Inconvenience of CL strategy in asking the classmate for help (question 11).

Figure 18 pointed that the majority of students feel comfortable to ask helping from their classmates in English-speaking learning. Meanwhile, fourth students had no idea. Actually, exchanging information is one of main points of CL strategy, especially speaking performance. It is directly relevant to positive interdependence and promotive interaction element of CL strategy.

5. Discussion

In general, there are many the previous studies about the effectiveness of CL strategies on teaching and learning English-speaking. Besides the negative above-mentioned appreciations about effects of CL strategy of Azmi, Celik, Yidliz and Tugrul (2014), Beebe and Masterson (2003) and Zhao and Jiang (2009), many others researchers such as Burke (2011), Barkley, Cross and Major (2005), Li and Campbell (2008), Xue (2013) et cetera, strongly claimed that CL affords learners the opportunities to improve, practice and apprehend English speaking skill.

The result of data analysis pointed out the result of this study. Firstly, the data analysis in table 1 showed that there is no difference of pre-test score in English-speaking competence between control group and experimental group. On the other hand, English speaking competence between the two groups at pre-test period is similar together. However, the data analysis in table 2 expressed that post-test score is different from pre-test score. In short, students' English-speaking competence in experimental group at post-test period is different with their English oral competence at pre-test period. This is also the answer for the first research question that CL strategy can change students' English-speaking competence at intermediate level.

Additionally, the analysis of data in table 3 showed that there is significantly different between students' pre-test score period and students' post-test period in experimental group. In other words, students' English-speaking competence in experimental group at post-test period is different from their English-speaking competence at pre-test period. Moreover, table 2 showed mean scores of English-speaking performances in two group at post-test period is different. Particularly, mean scores of control group at post-test period is 62.5263 ($M=62.5263$) is lower that mean scores of experimental groups at post-test period is 88.1 ($M = 88.1$). From these points, the answer for the second research question is explored. This means that CL strategy affects positive on students' English-speaking competence at intermediate level (research question 2).

Furthermore, the data analysis from the questionnaire pointed out that students maintained a positive attitude towards CL strategies in English-speaking performance. The students always participant in group to accomplish group work as well as having responsibility for common works. Most of them expressed a good interaction with their partners in English-speaking skills. They also claimed that group's goal has to link and clear. From these points, it can say that CL strategy plays an important role in developing of interaction and

cooperation. CL also encourages and develops group processing and interspersed.

Therefore, it can be believed that the null hypothesis 1 and 2 (H01 and H02) is rejected. It means that CL strategies can enhance learning results on EFL students' speaking comprehension at an intermediate level. Probably most importantly, based on the proof in the previous studies, it is hoped that (2) the learners offer a positive attitude towards applying CL strategies in teaching and learning English speaking comprehension in an EFL classroom.

In brief, this study attempted to find out the effectiveness of CL strategies that have been used in teaching English speaking at UFM as well as reinforcing clues to claim that CL strategy is effective for English speaking teaching at an intermediate level.

6. Conclusions

In summary, this project aimed at finding the effectiveness of CL strategies on English speaking skills at an intermediate level at UFM. To achieve this aim, this study conducted qualitative research within two months. This qualitative research included two research instruments: quasi-experiment and student questionnaire. The quasi-experiment used a pre-posttest sample from KET extra version of Cambridge University. The student questionnaire was received and adapted according to the research design. Data analysis was implemented by SPSS software version 26.

The result of the study pointed out that CL strategy was effective at improving students' English-speaking skills at an intermediate level. In addition, students gave positive attitudes about application of CL in learning English-speaking activities. This was similar to the previous studies about the effectiveness of CL on teaching and learning English-speaking performance. This result claimed that CL could be applied at different levels. Moreover, the CL strategies could be used very flexibly and simply in different teaching conditions. This helps CL strategies that have been used popularly and develop day by day.

Limitation of the study

Firstly, a limitation of this study is the number of participants. There are only 39 students among over 4000 students who are learning at an intermediate level at UFM. Moreover, some participants had different backgrounds. Thus, sometimes they may be hard to share information and discuss or unify common results. It wasted time of working groups. A second limitation of the current study is time to conduct the study. Two months is very short for a quasi-experimental study. Within two months, some students are still embarrassed and shy. A few of the students are sometimes talkative or disorderly that requests time to control the class. Moreover, in each session, the teacher also spent a couple of minutes to set up group structures.

In short, this study contains two main limitations. They are the number of participants and time to conduct the study.

Appendix A

PRE-POST TESTS

Part 1 (2-3 minutes)

Phase 1

Interlocutor

Good morning / afternoon / evening.

Can I have your mark sheet, please?

Hand over the mark sheet to the Assessor.

I'm, and this is

He / She will just listen to us.

What's your name?

How old are you?

Where do you come from?

Where do you live?

Back-up prompts

Are you from (Spain, etc.)?

Do you live in ... (name of district / town etc.)?

Phase 2

Now, let's talk about school.

Back-up prompts

What time do you finish school? Do you finish school at 4 o'clock?

What do you eat after school? Do you eat snacks after school?

Now, let's talk about home.

Back-up prompts

Who do you live with? Do you live with your family?

How many bedrooms are there in your house?

Are there three bedrooms in your house?

Extended Response

Now, please tell me what you like doing at home.

Back-up questions

Do you like cooking?

Do you play computer games?

Did you stay at home last weekend?

Optional prompts

Why?/Why not?

What do you think?

Part 2 (3-4 minutes)

Phase 1

Interlocutor

2-3 minutes

Now, in this part of the test we're going to talk together.

Place Candidate booklet, open at Task 1, in front of candidate. Allow candidate adequate time to read the task.

Here are some pictures that show different hobbies.



Do you like these different hobbies? Say why or why not. I'll say that again.

Do you like these different hobbies? Say why or why not.

All right? Now, we will talk together. Can you start?

Allow a minimum of 1 minute before moving on to the following questions.

Interlocutor

Use as appropriate.

Ask the candidate at least one question.

Do you think ...

... playing computer games is boring?

... playing an instrument is difficult?

... playing football is fun?

... reading is interesting?

... painting/drawing is easy?

Which of these hobbies do you like best?

Thank you. (Can I have the booklet, please?) Retrieve Candidate booklet.

Phase 2

Interlocutor

Allow up to a minute.

Now, do you prefer to spend your free time alone or with other people? (Why?)

Which is more fun, playing sports or watching sports? (Why?)

Thank you. That is the end of the test

Appendix B

Hi my students,

I am conducting a study to explore the effects of CL on English-speaking skills at intermediate level at UFM. This means that I am attempting to find out the effectiveness of CL on learning achievement of EFL learners' speaking skills at intermediate level. You can help me understand what you think of using of CL by answering some questions. Please answer all the questions.

I. Demographic Information

Full name:..... Age:..... Class:

How long have you studied English at UFM? Please tick (✓) appropriate box:

- a. Under 2 months
- b. 2 – 4 months
- c. Above 4 months

II. Learners' Attitudes towards Group Work

1. How often do you interact with your classmates to accomplish the task in English-speaking learning?

- a. Never
- b. Rarely
- c. Sometimes
- d. Always

2. How often do you participate in the group to accomplish the group work in English-speaking learning?

- a. Never
- b. Rarely
- c. Sometimes
- d. Always

3. In English-speaking comprehension, group work is generally accomplish by:

- a. None of them
- b. Some members
- c. All the members

4. Group work is monopolized by the more able members in the group.

- a. Yes



- b. No
5. In English-speaking learning, I feel responsible during the group work.
- a. Never
- b. Rarely
- c. Sometimes
- d. Always
6. In English-speaking learning, I feel committed to the success of everyone in the group.
- a. Yes
- b. No
7. In English-speaking comprehension, I prefer to work
- a. Competitively
- b. Cooperatively
- c. Individually
8. In English-speaking comprehension, I prefer to discuss the task with
- a. The teacher
- b. My classmate
- c. Both of them
- d. None of them
9. CL strategy bothers me to explain the task to a classmate
- a. Strong agree
- b. Agree
- c. Undecided
- d. Disagree
- e. Strong disagree
10. CL strategy bothers me to ask my classmate for help
- a. Strong agree
- b. Agree
- c. Undecided
- d. Disagree
- e. Strong disagree

References

- Azmi, B. M., Celik, B., Yidliz, N., & Tugrul, M. C. (2014). Listening Comprehension Difficulties Encountered by Students in Second language Learning Class. *Journal of Educational and Instructional Studies in the World*, 4(4), 1-6.
- Barkley, E. F., Cross, K. P., & Major, C. H. (2005). *Collaborative learning techniques: A handbook for college faculty*. San Francisco: Jossey-Bass Publishers.
- Beebe, S. A., & Masterson, J. T. (2003). *Communicating in small groups*. Boston: Massachusetts Press.
- Burke, A. S. (2011). Group Work: How to Use Groups Effectively. *The Journal of Effective Teaching*, 11(2), 87-95.
- Claus, P. (2021). A review of cooperative language learning approach. *Journal of Educational and Instructional Studies in the World*, 4(4), 1-6. https://www.clausiuspress.com/assets/default/article/2021/11/20/article_1637466955.pdf
- Cook, T. D. (2003). Why have educational evaluators chosen not to do randomized experiments? *The ANNALS of the American Academy of Political and Social Science*, 589(1), 114-149.
- Fearon, C., McLaughlin, H., & Eng, T. Y. (2012). Using student group work in higher education to emulate professional communities of practice. *Education + Training*, 54(2/3), 114-125.
- Gillies, R. M. (2016). Cooperative learning: Review of research and practice. *Australian Journal of Teacher Education*, 41(3). <https://doi.org/10.14221/ajte.2016v41n3.3>
- Johnson, D. W., Johnson, R. T., and Smith, K. A. (1991). CL: Increasing college faculty instructional productivity. ASHE-ERIC Higher Education Report No. 4, George Washington University.
- Kagan, S. (1994). *Cooperative Learning*. San Clemente: Resources for Teachers.
- Kagan, S. (2003). A brief history of Kagan structures. http://www.kaganonline.com/free_articles/dr_spencer_kagan/ASK20.php
- Li, M., & Campbell, J. (2006). Asian students' perception of CL and group assignments in a New Zealand tertiary institution. *Inter-cultural Education*, 19(3), 203-216.
- Lina, H. (2010). CL and Learners' Opportunities to Participate in English Foreign Language Classes [Master's thesis]. University of Ferhat Ab-bas-Setif, Algeria.
- Nihalani, P. K., Wilson, H. E., Thomas, G., & Robinson, D. H. (2010). What Determines High- and Low-Performing Groups?. *Journal of Advanced Academic*, 21(3), 500-529.
- Öztürk, B. (2023). The effect of cooperative learning models on learning outcomes: A second-order meta-analysis. *Journal of Educational and Instructional Studies in the World*, 4(4), 1-6. <https://doi.org/10.29329/epasr.2023.600.13>
- Slavin, R. (1994). *Education for all*. Swets & Zeitlinger Publishers.
- Slavin, R. E. (1989). Research on Cooperative Learning: An international perspective. *Scandinavian Journal of Educational Research*, 33, 231-243.
- Suwantarathip, O., & Wichadee, S. (2010). The impacts of Cooperative Learning on anxiety and proficiency in an EFL class. *The journal of college teaching and learning*, 7(11), 51-57.
- Thyer, B. A. (2012). *Quasi-experimental research designs*. Oxford: Oxford University Press.
- Xue, M. (2013). Effects of CL on English Communicative Competence of Chinese International Graduates in United States Institutions of Higher Education. *The Qualitative Report*, 18(14),1-19.
- Zhao, J. & Jiang, Y. (2009). Analyzing the influencing factors of group learning: A mixed approach. *Modern education and computer science*, 1, 19-27.

Research Article

Exploring the Role of Coordinating Centre Tutors in Implementing Early Grade Reading Initiatives in Wakiso District, Uganda

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<https://doi.org/eiki/10.59652/jetm.v2i4.288>

Abstract: The adoption of Early Grade Reading (EGR) Methodology in 2013 in Uganda brought on board different stakeholders to effectively implement it in the education eco-system. With reference to this particular study, we examined the crucial role of Coordinating Center Tutors (CCTs) in Wakiso District, Central Uganda in the effective implementation of EGR methodology. Wakiso District's socio-economic and cultural diversity necessitates an adaptive approach to EGR, making CCTs indispensable in tailoring instructional methods. Specifically, we set out to scrutinize how CCTs assess EGR instructional practices, and effectiveness of their training programs on effective implementation of EGR in primary schools in Wakiso district. Data was collected from six purposively selected CCTs through face-to-face interviews. Key findings reveal the multidimensional role of CCTs as trainers, mentors, and community engagers. Their instructional practices, range from center-based training to partnered reading, showcasing a holistic strategy. Positive impacts on literacy development, including enhanced comprehension and confidence among learners, under-score the effectiveness of these practices. Continuous professional development initiatives and targeted training contribute significantly to CCT competency, bridging gaps in their earlier college training. In conclusion, the study emphasizes the dynamic role of CCTs in carrying out ongoing support and targeted training programs. The recommendations encompass mentorship programs, collaborative learning environments, diverse instructional methods, continuous professional development, strengthened partnerships, increased community involvement, a structured referral system, and a dynamic learning environment. This study contributes to the understanding of the intricate dynamics surrounding EGR implementation, providing insights for educational policy-makers, practitioners, and researchers aiming to optimize literacy outcomes in diverse contexts.

Keywords: Early Grady Reading (EGR); Centre Coordinating Tutors (CCTs); instructional practices; educational practices

Received: September 13, 2024

Accepted: October 16, 2024

Published: November 15, 2024



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1. Introduction

Early literacy, mostly associated with significant people in history, appeared around 3500-3000 BCE, influencing education outcomes (Gunderson, 2021). This evolution influenced heretical groups as well as official education (Ranum, 2020). In the 19th century, Europe formalized education with a focus on graduation, literacy, and numeracy, a trend observed in Norway, Sweden, and Switzerland (Elstad, 2023). British colonialism introduced education to East Africa, shaping Uganda's assessment methods during colonial rule (Becker, 2022). In the 1930s, whole-language strategies enhanced EGR, fostering comprehension and enjoyment (Sweeney, 2013). Marie Clay's Reading Recovery, founded in 1976 in New Zealand, gained traction globally, including adoption in the US in 1979 (D'Agostino & Harmey, 2016). The 1982 Harare Declaration aimed to combat illiteracy in Africa, emphasizing universal primary education and mother-tongue language literacy (Asiimwe & Ssentanda, 2020). Tanzania and Ethiopia sustained anti-illiteracy efforts post colonially, while Botswana, Kenya, and Zimbabwe faced challenges (Phiri et al., 2020).

In East Africa, efforts to enhance EGR have been characterized by a recognition of the

foundational importance of literacy with Kenya and Tanzania taking lead starting in the early 2000s (Piper et al., 2019). In many developing regions, including East and Southern Africa, the initial focus was often on basic infrastructure and access to education but as access improved, the attention shifted towards quality, prompting the need for effective pedagogical methods (Spaull & Pretorius, 2019). In this evolution, the role of teachers became increasingly central, leading to the emergence of the CCTs. While CCTs are integral to the historical trajectory of EGR implementation as they represent a response to the complex dynamics within classrooms. Over time, it became evident that effective curriculum implementation required a bridge between education policies and the diverse classroom contexts (Pretorius et al., 2020). This realization led to the designation of specialized roles for CCTs, emphasizing their responsibility in translating broader educational objectives into actionable strategies within the local context.

Since 2013, EGR Methodology came into existence in programs including the Uganda School Health and Reading Program, the Literacy Achievement and Retention Activity (LARA), and Global Partnership in Education in Ugandan government schools, supporting various languages for improved mother-tongue literacy (Weatherholt et al., 2019). EGR is a critical phase in a child's education, forming the foundation for future academic success. Despite global efforts to improve literacy rates, challenges persist, necessitating a closer examination of effective strategies (Westbrook et al., 2022). CCTs emerge as key players in addressing these challenges due to their unique position at the intersection of curriculum implementation and classroom dynamics. The implementation of EGR programs in education systems globally has been a subject of paramount importance, recognizing its pivotal role in shaping a child's educational journey (Asimwe & Ssentanda, 2020). As educational landscapes continually evolve, so do the challenges associated with nurturing literacy skills in early learners. The overarching roles of CCTs in implementing the EGR on the African continent sheds light on the evolution of strategies to overcome these challenges (Kotze et al., 2019).

Theoretically drawing on educational theories such as constructivism and socio-cultural learning, these CCTs play a crucial role in mediating between the prescribed curriculum and the individual learning needs of students. Theoretical frameworks acknowledge that learning is a dynamic process influenced by cultural, social, and contextual factors. CCTs, positioned at the nexus of curriculum and classroom, are well-placed to apply these theories in practice.

The Constructivism theory posits that learners actively construct knowledge by building upon their experiences and understanding (Fatimah et al., 2022). Applied to EGR, this approach emphasizes interactive learning experiences tailored to a child's developmental stage. Instructors encourage exploration, inquiry, and critical thinking, fostering a deeper understanding of language and literacy (Suhendi et al., 2021). By engaging students in meaningful, contextually relevant activities, constructivism in EGR aims to build a strong foundation for lifelong literacy skills, recognizing the importance of the learner's active role in the learning process.

Socio-cultural learning theory posits that learning is a social and cultural process, emphasizing the role of social interactions, language, and cultural context in knowledge acquisition (Tzuriel, 2021). Applied to EGR, this theory underscores the importance of collaborative and culturally relevant learning experiences. Children benefit from interactions with more knowledgeable individuals, such as teachers and peers, and cultural context shapes their understanding of literacy (Robles et al., 2021). Socio-cultural learning in EGR recognizes the significance of language, social engagement, and culturally resonant materials, fostering a holistic approach to literacy development within the socio-cultural context of the learners as a precondition for effective instructional practices employed by CCTs.

Study Objective:

In light of the limited evidence of the critical role played by CCTs in effective implementation of EGR initiatives, this study was undertaken in order to:

Evaluate the instructional practices employed by CCTs in Wakiso district and assess their role in enhancing EGR initiatives in lower primary education in Wakiso district.

Justification:

Despite CCTs being designated at the centre of curriculum implementation and classroom dynamics, their actual impact on EGR implementation was uncertain. This ambiguity was compounded by the diverse socio-economic and cultural landscape of Wakiso, demanding a tailored educational approach. Additionally, the lack of evidence regarding the

seamless execution of CCT responsibilities further underscored the urgency for scrutiny. With disparities persisting and a notable graduation rate challenge reported, understanding the specific contributions of CCTs was crucial for optimizing EGR initiatives and ensuring a robust foundation for academic success among young learners. Hence, in the study we addressed these gaps, providing valuable insights for refining EGR strategies in Wakiso District. Understanding the multifaceted roles of CCTs is crucial for refining educational policies and practices. By elucidating the impact of these tutors on EGR, this study provides insights that can inform targeted interventions, professional development programs, and resource allocation.

Wakiso District is part of the Kampala Metropolitan Area in Central Uganda. The district has 1,692 Primary schools of which 273 embrace Universal Primary Education (Okwera, 2019). Joining USAID's School Health and Reading Project in 2012, Wakiso district embraced EGR to enhance lower primary education, requiring pupils to use Luganda until primary three, transitioning to English in primary four calling for support from CCTs (Nyanzi-Kabanda et al., 2022). The USAID/Uganda LARA Quarterly Report (2020) highlights the essential role of CCTs as a prerequisite for improving EGR. While government-aided schools have been equipped with tools, it is imperative to provide continuous support through monitoring, on-site visits, and EGR efficacy advice. The contribution of CCTs in bridging these gaps, ensuring that the resources are effectively utilized in classrooms (Ngaka, 2021). Their involvement in on-site visits and providing guidance on EGRM efficacy contributes significantly to demonstrating the commitment of government-aided schools to the success of the EGRM initiative.

Moreover, the socio-economic and cultural diversity within Wakiso District necessitates an adaptable approach to EGR. CCTs, drawing from pedagogical theories are crucial in tailoring instructional methods to address the unique needs of students (Westbrook et al., 2022). This adaptability fosters a more inclusive and effective learning environment, acknowledging the diverse backgrounds of learners in the district. Despite the recognized importance of CCTs in EGR initiatives, there has been limited concrete evidence affirming the seamless implementation of their roles. In navigating the complex educational terrain of Wakiso District, CCTs emerge as essential channels for bridging the gap between educational objectives and the intricacies of local classrooms (Okwera, 2019). Their role becomes even more critical as they navigate the challenges posed by the diverse socio-economic backgrounds and cultural nuances present in the district. Although the evidence supporting the impact of CCTs in EGR initiatives is currently minimal, their strategic positioning ensures that these programs not only meet global educational standards but also resonate authentically with the specific needs of Wakiso District. In doing so, they contribute significantly to establishing a robust foundation for the academic success of young learners in the region

2. Literature review

2.1. *The Concept of Centre Coordinating Tutors (CCTs)*

CCTs in educational settings, serve as intermediaries between educational policies and classroom dynamics. In the context of EGR initiatives, CCTs are responsible for implementing and coordinating strategies to enhance literacy skills among early learners (Bartlett et al., 2015). Positioned at the intersection of curriculum design and on-the-ground classroom realities, CCTs ensure the effective translation of educational objectives into practical teaching methodologies. CCTs are equipped with pedagogical knowledge, drawing from educational theories to tailor instructional methods that suit the diverse needs of students (Bartlett & Vavrus, 2016). They adapt to the socio-economic and cultural diversity within their assigned districts, fostering inclusive and effective learning environments (Ardhian et al., 2020). Their role extends beyond traditional teaching; CCTs are instrumental in providing on-site support, conducting classroom observations, and offering guidance on the efficacy of EGR programs.

In the broader educational landscape, CCTs act as linchpins, bridging the gap between global educational standards and the specific challenges presented by local contexts (Kraft & Falken, 2020). Their strategic position allows them to navigate complex educational terrains, ensuring that EGR programs align with overarching educational goals while remaining responsive to the unique needs of the communities they serve. In essence, CCTs contribute significantly to laying a solid foundation for the academic success of young learners by facilitating the implementation of effective early-grade reading strategies (Elstad, 2023). Literature by Ranum (2020) highlights the importance of qualified and trained educators in

fostering EGR skills. Becker (2022) and Gunderson (2021) emphasize the significance of teacher support programs, with a specific focus on the role of CCTs in enhancing instructional quality, providing targeted interventions, and promoting a positive learning environment.

2.2. *Early Grade Reading*

EGR is a critical phase in a child's educational journey, typically spanning the initial years of formal schooling, typically from Primary 1 to Primary 3 (Weatherholt et al., 2019). This phase is crucial as it lays the foundation for overall literacy and academic success. During these early years, children transition from learning to read to reading to learn, making proficiency in reading essential for their continued educational development. Effective EGR programs focus on developing foundational literacy skills such as phonics, alphabetic principle, vocabulary, fluency and comprehension (Pretorius et al., 2020). These programs often incorporate evidence-based instructional strategies, engaging materials, and supportive learning environments. The goal is not only to ensure that children can decode and understand written text but also to cultivate a love for reading and learning.

In many educational systems globally, Kotze et al. (2019) stated that successful implementation can significantly impact a child's educational trajectory, setting the stage for continued academic achievement throughout their schooling years.

EGR in Uganda is a critical focus in primary education, marked by initiatives like the EGR Model. Introduced to enhance literacy, EGR emphasizes the use of the mother tongue until primary 3, transitioning to English in primary 4 (USAID/Uganda LARA, 2020). Despite challenges, including low transition rates in some regions, efforts persist to align instructional resources with the model. The role of CCTs is pivotal, adapting pedagogical strategies to diverse socio-economic and cultural contexts (Ngaka, 2021). Ongoing monitoring and support are essential for the success of EGR, emphasizing its foundational importance in shaping educational trajectories (Ssenkande et al., 2022).

2.3. *Effectiveness of Instructional Practices Employed by CCTs of the Implementation of the EGR*

Research by Elstad (2023) consistently underscores the pivotal role CCTs play at the intersection of curriculum implementation and classroom dynamics. Studies such as those by Phiri et al. (2020) and Robles et al. (2021) emphasize the importance of instructional practices that are adaptive to the socio-economic and cultural diversity within educational settings, particularly in regions in the developing world. Graham and Kelly (2019) stated that CCTs, armed with pedagogical theories, have been found to tailor instructional methods to suit the unique needs of students, fostering a more inclusive and effective learning environment.

However, challenges persist which require a comprehensive review as Pretorius et al. (2020) points out the need for continuous monitoring and support for effective instructional practices. The literature suggests that the success of CCTs is contingent upon their ability to adapt to local contexts and address disparities in educational outcomes. The study by Ngaka (2021) highlights that while the use of the mother tongue in instructional methods is recognized, there is a gap in understanding how CCTs navigate this linguistic transition effectively, especially in regions where pupils switch from a local language to English, as seen in Wakiso District.

The CCTs in Uganda play a fundamental role beyond ensuring adherence to the curriculum. They conduct on-site visits, providing hands-on guidance on the efficacy of EGR initiatives. Ardhian et al. (2020) highlight CCTs' significance in bridging gaps and ensuring optimal utilization of educational resources in classrooms. Additionally, research by Graham and Kelly (2019) underscores the pivotal role of CCTs in implementing effective instructional practices. Their work emphasizes the necessity for adaptive, culturally sensitive, and closely monitored approaches to teaching. By offering tailored support, facilitating professional development, and engaging with communities, CCTs contribute to fostering a conducive learning environment and improving educational outcomes for primary school students in Uganda.

2.4 *The Role of CCT Training Programs in the Implementation of EGR Educational Practices*

CCTs, often found in educational systems around the world, are crucial contributors in translating policy objectives into effective instructional strategies especially under the EGR. Null et al. (2017) underscores the importance of targeted training programs for CCTs to equip them with the necessary skills and knowledge. In a study by Tahir and Ertek (2018) it was found that structured training programs significantly improved CCTs' ability to navigate the complexities of EGR implementation, resulting in more effective educational practices. The

training covered areas such as pedagogical approaches, classroom management, and adapting teaching methods to diverse learning needs. Moreover, findings from the work of Hogg et al. (2023) highlight the positive impact of continuous professional development for CCTs. Long term training programs not only enhance their content knowledge but also contribute to the development of leadership skills in implementing the EGR (Graham & Kelly, 2019). CCTs, when well-trained, emerge as educational leaders capable of fostering collaboration among teachers, implementing innovative teaching methodologies in the EGR, and addressing challenges within the educational system (Pretorius et al., 2020).

The literature underscores the importance of context-specific training programs, acknowledging the diverse socio-economic and cultural backgrounds in various educational settings. Kumar's study (2022) showcases the effectiveness of tailoring training initiatives to tackle the specific challenges within a region or district, significantly improving CCTs' ability to implement educational practices. This body of research highlights the instrumental role of CCT training programs in enhancing educational practices, emphasizing the need for customized approaches to meet the unique needs of each community (Hogg et al., 2023). By investing in such tailored professional development opportunities, educational stakeholders can empower CCTs to bridge the gap between policies and on-the-ground implementation, ultimately fostering positive changes and improving learning outcomes for students.

Kraft and Falken (2020) emphasized that the effectiveness of CCTs depends on well designed and contextually relevant approaches that empower them to bridge the gap between educational policies and on-the-ground implementation of EGR. Therefore, investing in the professional development of CCTs becomes paramount. Through targeted training initiatives tailored to address the specific challenges within each region or district, CCTs can better navigate the complexities of their roles and effectively implement educational practices (Ardhian et al., 2020). By enhancing the capacity of CCTs to translate policies into action, EGR programs hold the potential to foster positive changes in teaching methodologies and learning environments. Ultimately, this investment in CCTs' professional growth can contribute to improved learning outcomes and academic success for students across diverse educational settings.

3. Materials and Methods

3.1. Research Approach

The researchers adopted a qualitative approach to explore the roles of CCTs in implementing EGR in Wakiso District. The qualitative approach values context and subjectivity. This approach emphasize exploration to understand the meanings of concepts and capturing rich narratives through using methods such as interviews as applied in this particular study.

3.2. Research Design

The researchers adopted the phenomenological research design which involved interacting with participants to understand the participants' perspectives on the roles of CCTs in implementing EGR in Wakiso district (Bell et al., 2022). This design sought to uncover the intricacies of beliefs, and practices to provide in-depth insights into the context and facilitating a holistic understanding of the studied community or group, in this case the CCTs (Eyler, 2020).

3.3. Study Population, Sample and Sample Selection

The study engaged Coordinating Center Tutors (CCTs) from Wakiso District. Wakiso District consists of eight coordinating centres. Namely; Naddangira, Nkumba, Sseguku, Masuulita, Nsangi, Lake Victoria Entebbe, and Wampewo CCs. Through purposive sampling based on the CCTs lived experiences in facilitating in-service teacher professional development in the different primary schools in the centres they coordinate, we set out to interview all the eight CCTs from the district. However, by the time we finished interacting on the phenomenological histories of their effects of their instructional practices on teaching of EGR by primary school teachers as well as learners' achievements over the years with the sixth participant, we had reached a point of data saturation. Hence, we cut off the other two CCTs from the data collection process.

3.4. Data Collection Methods and Instruments

Data from study participants was collected through use of phenomenological interviews with practicing CCTs in Wakiso District. The interview schedule sought for information about

the effectiveness of instructional practices employed by CCTs in enhancement of instructional delivery and learners' attainment in numeracy and literacy. In addition, it elicited for information about the role of CCT training programs in enhancing educational practices. As stated earlier, a total of six interviews were held.

3.5. *Quality Control*

As recommended by Haven & Van Grootel (2019), the researchers ensured credibility through collaborative engagement with each of the CCTs and by maintaining detailed documentation of their responses for further discussion. To do this, the researchers treated participants as "co-researchers" in an informal setup to empower their voices, and value their contributions throughout the research process to facilitate easy clarification of the responses provided during data collection.

3.6. *Data Management Including Results Analysis*

Data management in this context involved organizing, interpreting, and deriving insights from the narrative raw data collected from key informants. The researchers conducted thematic analysis involving constant comparison of the findings to uncover patterns and themes on the roles of CCTs in the implementation of EGR.

3.7. *Ethical Considerations*

Formal introduction was made to each participant elucidating the study objectives. Utmost confidentiality was ensured and informed consent from each participant was sought. Anonymity was ensured by concealing the identity of all participants. Voluntary participation was ensured during the selection process to ensure that participants were free from coercion.

3.8. *Study Limitations/ Boundaries*

The study was purely qualitative and this limited to solicit the quantitative perspectives regarding the role of CCTs in the implementation of EGR initiatives in Wakiso District. The study sample was limited based on the notion that it was purely qualitative in nature involving only CCTs and saturation was reached with our sixth participant. Various factors beyond the roles of CCTs might have had a stake in the implementation of the EGR.

4. Results

This section presents the results on the role of CCTs in implementing EGR initiatives in Wakiso District. The results are laid out in the order of the study objectives. All the data collected from the CCTs was qualitative in nature revealing their insights on the role of CCTs in implementing EGR in Wakiso District.

4.1. *Effectiveness of Instructional Practices Employed by CCTs*

In our interaction with participants, we inquired about the instructional practices they use in delivering continuous professional development programs (CPD) to teachers of EGR in primary schools as well as their perceived about the impact of such instructional practices on the development of pupils' literacy and numeracy skills.

4.1.1. *The Instructional Practices Applied in Delivering of CPDs to Teachers of EGR in Primary Schools in Wakiso District*

From the data offered by study participants, the most prevalent instructional practices that are used by CCTs in delivering CPDs to teachers of EGR in primary schools of Wakiso include off and on the job trainings. At times, teachers of EGR are trained at the CC and in other instances, the CCT moves to the schools they are attached to. The most prevalent strategy either at the centre or school-based training is collaborative learning through peer-to-peer support through clustering of teachers from different schools as well as mentorship and coaching from lead teachers. Collaborative learning is attained through the incorporation of instructional methods like partnered reading and continuous assessment revealed by KI_04 that "*we emphasize partnered reading, choral reading, and continuous assessment*". Further, the following verbatim affirms these notions:

"...We use Centre and school-based trainings, Lead teachers' mentor other teachers, clustering schools which enables teachers to learn from each other.

CCTs also model methodology during support supervision and monitoring"
KI_01

"...I use demonstrations and team teaching with some of my colleagues and this improves the results as

much as possible. Peer-to-peer support also works well because some teachers are evidently ahead of others in EGR training and practices” KI_02.

The verbatim above affirms that among the instructional practices that CCTs applied in delivering CPDs for EGR teachers include Centre and school-based trainings plus demonstrations as foundation for team teaching with intentions of improving the implementation of the programme in Wakiso District.

Participants further highlighted that team teaching and peer-to-peer support is enhanced by use of resource persons and more knowledgeable others who regularly emphasize the effective role of collaborative learning environment in nurturing EGR methodologies among teachers. For example; KI_05 stated that “*Peer to peer support and use of resource persons knowledgeable in EGR methodology*” and another (KI_06) revealing that:

“...Peer-to-peer support; CCTs are resource persons. I refer teachers to other teachers who are implementing EGR to benchmark from” KI_01

The verbatim affirms that peer-to-peer support was applied as a strong instructional practice for delivering the EGR in Wakiso District. Its efficacy towards bettering the delivery of the EGR rested on the relationships built among the peers as well as seeking for guidance from those with better skills and competences. Consequently, CCTs emphasize the need to reflect on one’s strengths and seek help from colleagues who might be more knowledgeable in the specific EGR methodologies and knowledge.

Further participant KI_01 and KI_06 acknowledge lead teachers as valuable resources in EGR implementation. The lead teachers play a scaffolding function at the school level through mentoring and coaching of new entrants and those struggling with some concepts EGR concepts and methodologies. However, lead teachers’ effectiveness is attained in case of utilization of peer-to-peer support and resource persons. The refusal to make and accept referrals might limit potential collaborations as per the verbatim below: “*...they are resource persons; the lead teachers are a good resource in the implementation of EGR...No I don’t make referrals” KI_03.*

Overall, the integration of mentoring, collaborative learning, and diverse teaching strategies showcases a well-rounded approach to fostering effective EGR practices among teachers, creating a supportive ecosystem for professional development.

4.1.2 The Impact of Instructional Practices of CCTs on Pupils’ Literacy and Numeracy Skills

The participants highlight the positive impact of various teaching practices on literacy in Wakiso District. The emphasis on appropriate methodologies, such as blending syllables and sounds using reading instructional materials, signifies a comprehensive approach to teaching literacy. The integration of library lessons, oral literature, and local languages contributes to a well-rounded education, enhancing pupils’ reading abilities.

“...Through the use of the above-mentioned practices, teachers are able to use appropriate methodology for teaching literacy. There is more use of reading instructional material which enables blending of syllables, sounds, and general comprehension of what is read. There is improvement in the teaching of library lessons, oral literature and use of local language. All these aid the pupil’s reading abilities. More reading games and jingles are used which make reading more interesting” KI_01.

The above verbatim affirms the impact of CCTs’ instructional practices on pupils’ literacy and numeracy skills as evidenced from the frequent use of reading instructional material in the efforts to blend syllables and sounds as well as the overall comprehension.

The adoption of these methodologies by both government and some private schools underscores their effectiveness, leading to improved reading and writing skills among learners. Peer-to-peer support among CCTs is identified as a valuable strategy, providing learners with opportunities to practice literacy and numeracy skills beyond formal classroom instruction. This fosters self-expression, confidence in using local languages, and the development of reading readiness and writing skills as per the following verbatim:

“...Government schools and some private schools have embraced and adopted the methodology and this has helped many Learners to learn to read and write, in CC” KI_02

“...Using peer to peer support learners get an opportunity to practice their literacy and numeracy skills

with their peers even outside the classroom instruction” KI_03.

The verbatim above affirmed that the CCTs’ instructional practices had improved reading and writing skills among learners evidenced by the adoption of the EGR by both government and private schools in Wakiso District.

Furthermore, the mention of boosting confidence among learners by KI_05-“*Boosting confidence among learners*”; suggests that the implemented strategies contribute not only to academic proficiency but also to students’ overall confidence and engagement in the learning process. The incorporation of phonemes/sounds, collaborative learning, instructional materials, and individualized/differentiated learning further illustrates a multifaceted approach to achieving literacy competencies. Overall, these practices create a dynamic and engaging learning environment that positively influences learners’ literacy development. The following observations were made by the key informants:

“...Learners develop self-expression, confidence in using the local language. Learners develop reading readiness skills. Learners develop more writing skills” KI_04

“...Through using phonemes/ sounds, through using collaborative learning pupils’ comprehension is enhanced, through using instructional materials, through individualized and differentiated learning pupils are supported to achieve competences in literacy and numeracy” KI_06.

From the above verbatim, it was affirmed that CCTs’ instructional practices were instrumental in boosting learners’ confidence in addition to academic proficiency which aligns with literacy and numeracy skills in Wakiso District.

4.2. *The Role of EGR Training Programs in Enhancing CCTs’ Pedagogical Practices*

On the other hand, we asked participants to reflect on the role of training programs they have been conducting with teachers of EGR in primary schools in Wakiso district in improvement of their pedagogical practices. Their submissions revealed that the continuous training and professional development has greatly enhanced their competency and effectiveness in supporting literacy development in Wakiso District. The trainings focus on refreshing techniques, improving reading skills, and acquiring support supervision, coaching, and mentoring skills. These initiatives address gaps in practicing teachers’ earlier college training, ensuring a holistic skill set. As CCTs prepare and conduct these trainings, their competency, knowledge and skills to support literacy development effectively is enhanced. These notions were based on the following verbatim:

“...The trainings we offer help us refresh our training techniques i.e., conducting participatory sessions. We also gain reading skills that we might have missed during our earlier college trainings. In addition, we gain support supervision skills, coaching and mentoring skills we use to assist teachers” KI_01

“...Continuous project development initiatives have greatly contributed to our competency and effectiveness in supporting literacy development in Wakiso district. Continuous Professional Development courses that we attend at college conducted by the PSDO (Preservice Development Office) and the training we facilitate in workshops helps us to support teachers with confidence” KI_02

The verbatim above indicates that continuous training as a precondition for professional development was envisaged to enhance the competency and effectiveness of CCTs in improving literacy development among schools implementing the EGR in Wakiso District.

The CCTs’ competency in facilitating EGR methodology is strengthened through their employment of various teaching techniques tailored to different grade levels. Their proficiency is further developed through attending Continuous Professional Development (CPD) courses, conducted by the Preservice Development Officer (PSDO), and cascading EGR knowledge to primary school teachers. This approach not only reinforces their own learning but also enhances their effectiveness by disseminating essential skills to teachers in the community, creating a sustainable impact on literacy development in the district. Overall, the combination of hands-on training, continuous professional development, and knowledge dissemination contributes to the continuous improvement of CCTs and their ability to support literacy development effectively.

“...The above contributed to the competency and effectiveness of CCT’s by retooling us in the necessary

knowledge and skills that enables the us to support the development of literacy” KI_03

“...To teach is to learn. Through training teachers on EGR methodology CCTs competences have been honed. Through attending CPDs and cascading the EGR knowledge and skills to the primary school teachers enhances the CCT’s effectiveness” KI_06

The verbatim affirms that CCTs’ application of a mix of teaching approaches led to their ability to uphold continuous professional development to improve the implementation of the EGR.

5. Discussion

The findings underscore the multifaceted role of CCTs in EGR initiatives, portraying them as pivotal trainers responsible for imparting EGR methodologies to primary school teachers in P1-P3 as also revealed by USAID/Uganda LARA Quarterly Report (2020). The engagement extends beyond theoretical training, actively involving teachers in practical EGR book usage and teaching material development. The findings were in tandem with the notions by Nyanzi-Kabanda et al. (2022) who also found the CCTs’ significant role in fostering community involvement highlights the importance of external support for teachers in implementing EGR methodologies effectively, emphasizing a collaborative approach for a community-wide commitment to enhancing early grade reading outcomes.

Moreover, the emphasis on monitoring and mentoring aspects of CCT responsibilities showcases a comprehensive strategy as also revealed by Ssenkande et al. (2022). Actively overseeing EGR implementation in classrooms, conducting Continuous Professional Development sessions, and providing support supervision contribute to the continuous improvement of teaching practices as also Ngaka (2021) revealed. This approach ensures that teachers are well-equipped and continuously supported in their efforts to enhance literacy skills among learners. The assertions by Westbrook et al. (2022) were echoed having established that the findings collectively illustrate the pivotal role of CCTs as trainers, community engagers, monitors, and mentors, reflecting a holistic strategy to improve EGR outcomes. The multifunctional engagement highlights the importance of collaboration, ongoing training, and community support in fostering effective early grade reading practices in primary schools as also reflected Okwera (2019).

The key informants’ insights into the use of both center and school-based trainings, lead teachers mentoring peers, and clustering schools for collaborative learning reveal a comprehensive pedagogical approach as also revealed by Okwera (2019). The study findings were a reflection of the findings by Suhendi et al. (2021) having established that integration of various instructional methods, such as partnered reading and continuous assessment, showcases a well-rounded approach to fostering effective EGR practices among teachers. The acknowledgment of lead teachers as valuable resources emphasizes their pivotal role, although the reluctance to make referrals may limit potential collaborations and this was consistent with the assertions by Tzurriel (2021). Overall, the combination of mentoring, collaborative learning, and diverse teaching strategies creates a supportive ecosystem for professional development, contributing to a dynamic and engaging learning environment that positively influences learners’ literacy development in Wakiso District.

Implications of the study

- CCTs, as trainers and mentors, actively engage in practical EGR methods, emphasizing a comprehensive strategy for community-wide literacy enhancement.
- Recognizing external support, CCTs foster community involvement, highlighting the importance of collaboration for effective EGR methodologies and outcomes. This would enhance community involvement and collaboration.
- CCTs contribute to continuous professional development, support supervision, and monitoring, ensuring teachers are well-equipped for ongoing improvement in literacy instruction thus reaffirming the ongoing improvement of teaching practices.
- Integration of mentoring, diverse strategies, and collaborative learning creates a supportive ecosystem for effective EGR practices, emphasizing professional development.
- Effective methodologies, like blending syllables, paired with peer support, boost literacy skills, instilling confidence, and creating a dynamic learning environment for improved literacy development.

6. Conclusions

In conclusion, the insights gathered from key informants collectively illuminate the multifaceted role of CCTs in the context of EGR initiatives. Beyond their primary responsibility as trainers, CCTs actively engage in practical demonstrations, aiding in the development of teaching materials and fostering a community-wide commitment to EGR. The integral role of CCTs extends to monitoring, mentoring, and collaborating with teachers, contributing to the ongoing improvement of teaching practices. The study underscores a holistic strategy that integrates various instructional methods, collaborative learning, and continuous professional development, showcasing a comprehensive approach to fostering effective EGR practices among teachers. Notably, the acknowledgment of lead teachers as valuable resources, the emphasis on diverse teaching strategies, and the positive impact on literacy development underscore the dynamic and engaging learning environment created by these practices. The findings emphasize the significance of continuous training and professional development in enhancing the competency and effectiveness of CCTs, ensuring a sustainable impact on literacy development in the educational landscape of Wakiso District. This study underscores the crucial role of CCTs in shaping EGR outcomes. The findings emphasize the importance of targeted training programs for CCTs and advocate for their continued support in educational systems.

Author Contributions: Idea generation, PAA and AB; Literature review PAA and MW; Materials and Methods, PAA and AB; Data coding, developing themes and data presentation, PAA, MW and AB; writing-review and editing, PAA and AB.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Acknowledgments: We thank the six CCTs who participated in the phenomenological interviews.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Ardhian, T., Ummah, I., Anafiah, S., & Rachmadtullah, R. (2020). Reading and Critical Thinking Techniques on Understanding Reading Skills for Early Grade Students in Elementary School. *International Journal of Instruction*, 13(2), 107-118. <https://doi.org/10.29333/iji.2020.1328a>
- Asiimwe, A., & Ssentanda, M. (2020). Challenges to the acquisition of literacy in rural primary schools in Northern Uganda. *Language Matters: Studies in the Languages of Southern Africa*, 51(1), 38-62. <https://doi.org/10.1080/10228195.2020.1717587>
- Bartlett, L., & Vavrus, F. (2016). A Vertical Case Study of Global Policy-Making: Early Grade Literacy in Zambia. In *The handbook of global education policy* (pp. 554-572). <http://dx.doi.org/10.1002/9781118468005.ch31>
- Bartlett, L., Dowd, A. J., & Jonason, C. (2015). Problematizing early grade reading: Should the post-2015 agenda treasure what is measured?. *International Journal of Educational Development*, 40, 308-314. <https://doi.org/10.1016/j.ijedudev.2014.10.002>
- Becker, B. (2022). The colonial struggle over polygamy: Consequences for educational expansion in sub-Saharan Africa. *Economic History of Developing Regions*, 37(1), 27 - 49. <https://doi.org/10.1080/0270780389.2021.1940946>
- D'Agostino, J. V., & Harmey, S. J. (2016). An international meta-analysis of Reading Recovery. *Journal of Education for Students Placed at Risk (JESPAR)*, 21(1), 29-46. <http://dx.doi.org/10.1080/10824669.2015.1112746>
- Elstad, E. (2023). An Overture: A Historical Overview of Political and Cultural Antecedents of the Nordic School System and its Variety of Teacher Education Programmes. In *Teacher Education in the Nordic Region: Challenges and Opportunities* (pp. 17-33). Cham: Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-031-26051-3_2
- Fatimah, S., Rosidin, D. N., & Hidayat, A. (2022). Student-based Learning in The Perspective of Constructivism Theory and Maieutics Method. *International Journal Of Social Science And Human Research*, 5(5), 1632-1637. <http://dx.doi.org/10.47191/ijsshr/v5-i5-10>
- Graham, J., & Kelly, S. (2019). How effective are early grade reading interventions? A review of the evidence. *Educational Research Review*, 27, 155-175. <https://doi.org/10.1016/j.edurev.2019.03.006>
- Gunderson, L. (2021). The consequences of English learner as a category in teaching, learning, and research. *Journal of Adolescent & Adult Literacy*, 64(4), 431-439. <https://doi.org/10.1002/jaal.1116>
- Haven, L., T., & Van Grootel, D. L. (2019). Preregistering qualitative research. *Accountability in research*, 26(3), 229-244. <https://doi.org/10.1080/08989621.2019.1580147>
- Hogg, L., Elvira, Q., & Yates, A. (2023). What can teacher educators learn from career-change teachers' perceptions and experiences: A systematic literature review. *Teaching and Teacher Education*, 132, 104208. <https://doi.org/10.1016/j.tate.2023.104208>
- Kotze, J., Fleisch, B., & Taylor, S. (2019). Alternative forms of early grade instructional coaching: Emerging evidence from field experiments in South Africa. *International Journal of Educational Development*, 66, 203-213. <https://doi.org/10.1016/j.ijedudev.2018.09.004>
- Kraft, M. A., & Falken, G. T. (2021). A Blueprint for Scaling Tutoring and Mentoring Across Public Schools. *AERA Open*, 7. <https://doi.org/10.1177/23328584211042858>
- Kumar, K. (2022). Human and integral education: educational paradigms from the Indian context expanding meanings of peace and conflict. *Journal of Peace Education*, 19(3), 351-372. <http://dx.doi.org/10.1080/17400201.2022.2148639>

- Ngaka, W. (2021). The role of communities in Uganda's mother tongue-based education: Perspectives from a literacy learning enhancement project in Arua district. *Applied Linguistics Review*, 12(4), 545-563. <https://doi.org/10.1515/applirev-2020-2005>
- Null, C., Cosentino, C., Sridharan, S., & Meyer, L. (2017). Policies and programs to improve secondary education in developing countries. *Mathematica Policy Research*. <https://www.edu-links.org/sites/default/files/media/file/PSIPSE%20Review%20of%20the%20Evidence.pdf>.
- Nyanzi-Kabanda, M. N., Omulando, C., & Barasa, P. L. (2022). Towards Using Multiple Languages of Instruction to Enhance Comprehension and Participation in Linguistically Diverse Schools in Uganda. *International Journal of Education and Research*, 10(9), 119-130. <https://www.ijern.com/journal/2022/September-2022/10.pdf>
- Okwera, M. J. (2019). Impact of capitation grant on education outcome in Kyadondo East, Nangabo Subcounty Wakiso District (Doctoral dissertation, Makerere University). <http://hdl.handle.net/20.500.12281/6793>.
- Phiri, K., Ndlovu, S., Dube, T., Nyathi, D., Ncube, C., & Tshuma, N. (2020). Access to formal education for the San community in Tsholotsho, Zimbabwe: challenges and prospects. *Helixyon*, 6(7), e04470. <http://dx.doi.org/10.1016/j.helixyon.2020.e04470>
- Piper, B., Zuilkowski, S. S., Kwayumba, D., & Strigel, C. (2016). Does technology improve reading outcomes? Comparing the effectiveness and cost-effectiveness of ICT interventions for early grade reading in Kenya. *International Journal of Educational Development*, 49, 204-214. <https://doi.org/10.1016/j.ijedudev.2016.03.006>
- Pretorius, E., Mohohlwane, N., & Spaul, N. (2020). Investigating the comprehension iceberg: Developing empirical benchmarks for early-grade reading in agglutinating African languages. *South African Journal of Childhood Education*, 10(1), 1-14. <http://dx.doi.org/10.4102/sajce.v10i1.773>
- Ranum, O. (2020). Erasmus on Tyranny in the Education of a Christian Prince. In *Tyranny from Ancient Greece to Renaissance France*. Palgrave Pivot, Cham. https://doi.org/10.1007/978-3-030-43185-3_14
- Robles, H., Burden, K., & Villalba, K. (2021). A socio-cultural approach to evaluating and designing reading comprehension apps for language learning. *International Journal of Mobile and Blended Learning*, 13(1), 18-37. <https://doi.org/10.4018/IJMBL.2021010102>
- Spaul, N., & Pretorius, E. (2019). Still falling at the first hurdle: Examining early grade reading in South Africa. *South African Schooling: The Enigma of Inequality: A Study of the Present Situation and Future Possibilities*, 147-168. http://dx.doi.org/10.1007/978-3-030-18811-5_8
- Spaul, N., & Pretorius, E. (2019). Still Falling at the First Hurdle: Examining Early Grade Reading in South Africa. In N. Spaul, J. Jansen, J. (eds) *South African Schooling: The Enigma of Inequality. Policy Implications of Research in Education*, vol 10. Springer, Cham. https://doi.org/10.1007/978-3-030-18811-5_8
- Ssenkande, G. W., Mugenyi, P., & Achola, D. (2022). Improving Literacy in Uganda: Why Pedagogical Reforms and Intervention Programs are Underperforming. *International Journal of Educational Reform*, 10567879221085208. <http://dx.doi.org/10.1177/10567879221085208>
- Suhendi, A., Purwarno, P., & Chairani, S. (2021). Constructivism-based teaching and learning in Indonesian education. *KnE Social Sciences*, 76-89. <https://doi.org/10.18502/kss.v5i4.8668>
- Sweeney, S. A. (2013). Exploring teachers' experiences with change related to the whole language movement: A narrative inquiry (Doctoral dissertation, Northeastern University). <https://repository.library.northeastern.edu/files/neu:1069/fulltext.pdf>
- Tahir, R., & Ertek, G. (2018). Cross-cultural training: a crucial approach to improve the success of expatriate assignment in the United Arab Emirates. *Middle East Journal of Management*, 5(1), 50-74. <https://doi.org/10.1504/MEJM.2018.088735>
- Tzurriel, D. (2021). The Socio-Cultural Theory of Vygotsky. In *Mediated Learning and Cognitive Modifiability* (pp. 53-66). <https://doi.org/10.1007/978-3-030-75692-5>
- USAID/Uganda Literacy Achievement and Retention Activity Quarterly Report January 1 to March 31, 2020. https://pdf.usaid.gov/pdf_docs/PA00X258.pdf
- Weatherholt, T., Jordan, R., Crouch, L., Barnett, E., & Pressley, J. (2019). Challenge and drivers of over-enrollment in the early years of primary school in Uganda. *International Journal of Early Childhood*, 51, 23-40. <https://doi.org/10.1007/s13158-019-00238-3>
- Westbrook, J., Baleeta, M., Dyer, C., & Islei, A. (2022). Re-imagining a synchronous linguistic landscape of public and school uses of Runyoro-Rutooro and Runyankore-Rukiga in early childhood education in Western Uganda. *Journal of Multilingual and Multicultural Development*, 1-14. <https://doi.org/10.1080/01434632.2022.2038181>

Research Article

Bridging the Gap: Technical and Management Competencies of BSHM Graduates in the Philippine Context

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<https://doi.org/eiki/10.59652/jetm.v2i4.318>

Abstract: The advancement of the hospitality industry demands competent, well-educated, and highly trained staff for success in a competitive labor market. This study aimed to determine the work readiness of Bachelor of Science in Hospitality Management (BSHM) students by evaluating their technical and management skills and identifying factors affecting skill development. A mixed-method approach was used with 105 randomly selected BSHM-graduating students. Students' self-assessed technical skills were measured using a survey questionnaire, while actual technical skills in housekeeping and food/beverage services were assessed via demonstration tests. Management skills were evaluated using a teacher-developed scale. An open-ended questionnaire gathered qualitative data on the factors affecting skill development from 30 participants. The results showed that the students assessed themselves as competent in housekeeping and food/beverage services. However, the actual assessment revealed competence in housekeeping, but only moderate competence in food/beverage services. Management skills, particularly in analyzing hotel reports and situational analysis, were found to be low. The factors affecting skill development included personal factors (lack of self-confidence, poor study focus), interpersonal factors, teachers' expertise, internship experiences, laboratory exposure, and socioeconomic conditions. The findings suggest a need for continuous post-graduate training and development in specializations, implementation of comprehensive programs to enhance technical and essential skills, and addressing factors hindering skill development to better prepare graduates for industry demands. Recommendations include improving practical exposure, focused training in weaker areas, and enhancing teachers' expertise through professional development.

Keywords: hospitality education; technical readiness; work readiness, learning gaps, hospitality industry

Received: October 14, 2024

Accepted: October 31, 2024

Published: November 20, 2024



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1. Introduction

The advancement of the hospitality industry demands competent, well-educated, and highly trained staff to be successful in a competitive labor market, CMO 62, s. 2017 (CHED Memorandum Order from the Philippines Commission on Higher Education issued in 2017). Kabii and Naghea (2021) noted that it is essential to establish the generic skills that hospitality management graduates must possess to remove concerns about skill-set mismatches. A study by Diaz and Maramento (2024) further noted that there is a growing need for qualified workers in the tourism and hospitality industries, where competency is the top quality that employers seek from BS HRM graduates. According to Hasri, Din, Same, Jakeriah, Patah, (2021), hotels should seek employees with the appropriate skill set to improve their performance in providing the finest service to their guests, and higher education institutions offering hospitality management programs and the hotel sector should have worked together to ensure that graduates satisfy the requirements of the industry before beginning their careers. Accordingly, the most crucial thing for students to do is to acquire as many skills and knowledge as possible that will make them stand out from other applicants when they seek a job in the hotel.

Due to the expansion of travel, lodging, food services, and other related businesses, the

hospitality management degree program is one of the most sought-after college degree programs (De Castro, 2017). Additionally, Diaz and Maramento (2024) stated that graduates had the option to work in hotels, catering, drinks, cruises, events, bars, and hundreds of other positions available; however, to succeed, one needs to have a specific set of skills. The possession and application of competence are the knowledge, abilities, and attitudes required to carry out a particular task according to the standards expected by the workplace (Fantazy et al., 2010). Outstanding job options for graduates in food services and lodging management have been made possible by the demand for qualified management employees. However, this rise in demand has also brought forth issues regarding the design and assessment of hospitality education. Today's hospitality courses cover more than the usual topics of lodging, food and drink, and tourism. They also covered the management of meetings, events, conventions, festivals, leisure activities, gaming, and cruises.

According to Griffin (2020), with this increase comes a demand from students and readiness from educators to increase the number of courses and specialized study area offerings. Programs leading to a vocational degree, such as those in hotel and hospitality management, are intended to satisfy an industry need for skilled future employees. Quinn and Buzzetto-Hollywood (2019) noted that education and competency development are a strategic focus because of the diverse hospitality and tourism sector's rising complexity and technological dependence, which boosts the skill requirements needed and expected of new workers. The majority of studies reviewed by Griffin (2020) from the viewpoint of industry experts, recent graduates, and educators found competencies in the soft domain, such as interpersonal skills, communication, ethics, and leadership, to be the most important for success in hospitality management.

In addition, most studies agree that hard competencies, such as technical or cognitive knowledge of a product or service, are important yet secondary to soft competencies. Rahman (2010) came to the conclusion that essential skills are crucial and necessary in the hospitality business and should be given more consideration. It is crucial to continuously analyze which competencies are essential to ensure that graduates fulfill the needs of the hospitality industry in today's rapidly evolving global business climate.

Thus, this study was conducted to determine the work readiness of BSHM graduate students by evaluating their technical and management skill levels, and to determine the factors that affected the development of these skill sets. This may also serve as the basis for a proposed post-undergraduate training and development program for graduates interested in pursuing careers in hospitality management.

Objectives of the Study

This study aims to determine graduating students' technical and management skills and the factors that have affected the development of these skills, specifically to:

1. Determine the self-assessed technical and management skills of BSHM graduate students through a survey questionnaire.
2. Determine the work readiness skills of BSHM students in terms of (a) technical skills in housekeeping and food and beverage services; (b) management competency through a teacher-made test; (c) identify the factors that affect the technical and management skills of BSHM-graduating students.

2. Materials and Methods

2.1. Research Design

A mixed-method research approach, particularly a descriptive research design, was used in this study. The quantitative part of the study focused on determining the self-assessed technical skills of the BSHM graduating students through a survey questionnaire and measuring both the technical and management skills level of the BSHM graduating students through an actual demonstration skills test and a teacher-made test, respectively, while the qualitative part focused on identifying the factors that affect the BSHM students' technical and management skills development through an open-ended interview questionnaire.

2.2. Sampling Procedure

The subjects of the study were 105 randomly selected 4th year Bachelor of Science in Hospitality Management students enrolled in the Second Semester, School Year 2021–2022 of Isabela State University, Cauayan City, Isabela. Thirty (30) participants were randomly chosen to answer an open-ended questionnaire to gather qualitative data for the study.

2.3. Data Collection

The following instruments were used to gather the data required for the study:

2.3.1. Self-Assessed Technical Skills Survey Questionnaire

The self-assessed technical survey questionnaire was adapted from the Technical Education and Skills Development Authority (TESDA) Self-Assessment Checklist. The instrument is composed of two technical skills self-assessment checklists, namely, the Housekeeping Procedures, which consists of four major competencies, and Food and Beverage Services, which consists of five major competencies.

All 105 BSHM graduates completed a construct-validated survey questionnaire. Participants indicated their level of agreement with 54 evaluative statements regarding their self-assessed technical skills. Each item was scored using a five-point scale

Cronbach's alpha was used to test the normality and reliability of the data. Cronbach's alpha again indicated a high reliability score of .99.

2.3.2. Technical and Management Skills Level

To determine the technical skills level of the graduating students, an actual skills demonstration test in food and beverage services and housekeeping procedures was administered by the researchers using the adapted Technical Education and Skills Development Authority (TESDA) Assessment Checklist.

The management skills level of the graduating students was also measured using a 40-item multiple-choice test to interpret and analyze hotel reports and situational analysis. The test was validated by a language and professional education specialist to review the structure and content of the test items.

2.3.3. Open- Ended Questionnaire

To identify the factors that have affected the development of the technical and managerial skills of the BSHM graduate students, a researcher-made open-ended questionnaire was used for the 30 randomly selected participants. The questions underwent face and content validity to ensure the clarity and conciseness of the question given. The open-ended questionnaire distributed via FB Messenger provided detailed information concerning the students' viewpoints on the factors that have affected the development of their technical and management skills.

2.4. Data Analysis

Frequency and percentage counts were used to determine the students' profiles. Descriptive statistics (mean and standard deviation) were used to determine students' level of self-assessed technical skills.

The student's self-assessed technical skills level was described using an arbitrary scale, ranging from 1 to 5, with corresponding weighted mean ranges and descriptive interpretations. A score of 1, with a weighted mean between 1.00 and 1.50, indicates "Strongly Disagree" or "Very Incompetent." A score of 2, with a weighted mean from 1.51 to 2.50, corresponds to "Disagree" or "Incompetent." A score of 3, covering a weighted mean of 2.51 to 3.50, represents "Moderately Agree" or "Moderately Competent." A score of 4, ranging from 3.51 to 4.50, translates to "Agree" or "Competent." Finally, a score of 5, with a weighted mean of 4.51 to 5.00, denotes "Strongly Agree" or "Very Competent".

The students' actual technical skills assessment level was described using an arbitrary scale, with scores ranging from 1 to 5, each associated with a specific weighted mean range and descriptive interpretation. A score of 1, corresponding to a weighted mean between 1.00 and 1.50, indicates "Very Incompetent." A score of 2, covering a weighted mean from 1.51 to 2.50, is interpreted as "Incompetent." A score of 3, with a weighted mean of 2.51 to 3.50, reflects "Moderately Competent." A score of 4, spanning a weighted mean from 3.51 to 4.50, signifies "Competent." Finally, a score of 5, with a weighted mean between 4.51 and 5.00, denotes "Very Competent."

The students' management skills level was assessed using an arbitrary scale with scores ranging from 0 to 40, each representing a specific descriptive interpretation. A score between 36 and 40 indicates a "Very High" level of management skills, while a score of 26 to 35 reflects a "High" level. Scores from 16 to 25 suggest a "Moderately High" level, and those from 6 to 15 indicate a "Low" level of management skills. Finally, a score between 0 and 5 represents a "Very Low" level of management skills.

Finally, in analyzing the qualitative data gathered using the interview questionnaire, the

transcripts of the interviews were coded and thematically analyzed.

2.5. Ethical Consideration

In conducting the study, ethical considerations were prioritized to respect participants' rights and ensure data integrity. Participation was voluntary, and informed consent was provided by all participants who were fully briefed on the study's objectives and scope. Personal information was anonymized and confidentially handled to protect individual privacy. The study also ensured that the data would only be used for academic and research purposes, avoiding any misuse or misinterpretation that could impact participants' reputation or employability. Feed-back and results are shared with stakeholders to promote transparency and mutual benefits.

3. Results and Discussion

3.1. Determination of the Self-Assessed Technical and Management Skills of the BSHM Graduating Students through a Survey Questionnaire

Table 1 shows the students' assessments of their housekeeping abilities. Students agreed that they possessed the necessary abilities to maintain public areas (M=4.32, SD=.59), which included tasks such as proper choice, use, and storage of chemicals (M=4.39, SD=.67), applying various procedures to keep public areas clean (4.39, SD=.64), locating and reporting problems, and performing preventive maintenance of facilities (M=4.25, SD=.73). Additionally, students also agreed that they could offer housekeeping services to guests (M=4.31, SD=.58), such as cleaning and setting up the guest room in accordance with standards (M=4.37, SD=.65), collecting and storing any items that guests may have left behind (M=4.37, SD=.66), and completing room attendant reports promptly and in accordance with rules (M=4.26, SD=.71). Students agreed that they could offer laundry services to their visitors (M=4.24, SD=.73), including picking up and delivering guest clothing (M=4.17, SD=.80), sorting items, choosing the best methods for laundry (M=4.21, SD=.69), and appropriate use of cleaning agents and chemicals (M=4.27, SD=.65). Finally, the students agreed that they could offer valet/butler services to their guests (M=4.22, SD=.60) by, for example, accessing and using client records to deliver customized services (M=4.20, SD=.71) and building rapport with clients (M=4.33, SD=.67). The overall mean of 4.27 (SD=.56) shows that the students were competent in performing their housekeeping skills.

Table 1. Self-assessment of housekeeping skills of the students.

| Statements on the self-assessed housekeeping skills of students | Mean | SD | Descriptive interpretation |
|---|-------------|------------|----------------------------|
| Competency 1: | | | |
| Provide valet/butler service | | | |
| I can define the role of butler/ valet in accordance with establishment standards. | 4.16 | .72 | Agree |
| I can access and utilize knowledge of individual guests record to provide personalized and quality valet service. | 4.20 | .71 | Agree |
| I can enhance rapport establish and feelings of goodwill between the guest and the establishment through principles of good communication. | 4.33 | .67 | Agree |
| I can follow valet grooming and communication, and provide personalized valet services to guests in accordance with establishment standards. | 4.36 | .62 | Agree |
| I can deal with intoxicated guests and underage drinkers with caution and care in compliance with legal regulations and him in line with enterprise practice. | 4.08 | .83 | Agree |
| I can seek immediate assistance from hotel security personnel for the situations that poses a threat to safety and security according to enterprise procedure as well as legislative requirements as per alcoholic regulations. | 4.20 | .79 | Agree |
| Total | 4.22 | .61 | Competent |
| Competency 2: | | | |
| Provide housekeeping to guests | | | |
| I can accept and record guest/staff housekeeping requests and service delivery in accordance to enterprise policies and procedure. | 4.31 | .66 | Agree |
| I can safely load trolleys with adequate supplies and select correct | 4.28 | .66 | Agree |

| | | | |
|--|---------------|------------|------------------|
| cleaning equipment required for servicing rooms in accordance with establishment procedures. | | | |
| I can identify correctly rooms requiring service based on information supplied to room attendants report and access rooms in accordance with the establishment's customer service and security procedures. | 4.29 | .68 | Agree |
| I can clean and make up the room in accordance with the standard operation procedures of the establishment. | 4.37 | .65 | Agree |
| I can accomplish the room attendants report accordingly and report promptly any unusual or suspicious person, item or occurrence in accordance with establishment procedures. | 4.27 | .71 | Agree |
| I can collect and store guest's belongings left in vacated rooms in accordance with lost and found establishment procedures. | 4.37 | .67 | Agree |
| Total | 4.31 | .59 | Competent |
| Competency 3: | | | |
| Public area maintenance | | | |
| I can select and use cleaning equipment and chemicals according to type of cleaning to be done and use protective clothing whenever necessary. | 4.39 | .67 | Agree |
| I can clean and store chemicals properly in accordance with manufacturer's specifications and requirements; and check all equipment for cleanliness and in safe working condition prior to use. | 4.30 | .65 | Agree |
| I can identify and report defects and carry out routine preventive maintenance on facilities, furniture and fixtures within public areas of the establishment in accordance with enterprise procedures. | 4.26 | .73 | Agree |
| I can apply appropriate procedures in accordance with the technique such as preparing wet and dry areas for cleaning to reduce risk to colleagues and customers. | 4.39 | .64 | Agree |
| I can dispose of garbage and use chemicals in accordance with hygiene, safety and environmental legislation requirements. | 4.32 | .67 | Agree |
| I can store equipment in the designated area and in a condition ready for re-use; and store and control chemicals in accordance with health and safety requirements. | 4.27 | .68 | Agree |
| Total | 4.32 | .59 | Competent |
| Competency 4: | | | |
| Provide laundry service | | | |
| I can pick up and deliver guest clothes and in-house items in accordance with enterprise requirements. | 4.17 | .80 | Agree |
| I can sort items according to cleaning process required and urgency of the item and check for stains and treats items for laundering using the prescribed procedure as well as checks for possible valuables inside the pocket. | 4.24 | .69 | Agree |
| I can select laundry methods in accordance with textile labeling codes and based on fiber and fabric, dye fastness, degree of soilage and washing instructions and operate laundry equipment in accordance with manufacturer's instructions. | 4.22 | .69 | Agree |
| I can record any damage arising from the laundering process and appropriate person(s) is/are notified in accordance with establishment procedures. | 4.28 | .69 | Agree |
| I can use cleaning agents and chemicals in accordance with manufacturer's instructions and specific laundry equipment. | 4.28 | .66 | Agree |
| I can process internal record and billing instructions in accordance with enterprise procedures and produce necessary internal laundry reports. | 4.15 | .73 | Agree |
| Total | 4.24 | .58 | Competent |
| Overall mean | 4.2710 | .56 | Competent |

3.2. Determination of the Work Readiness Skills of BSHM Students in Terms of Technical Skills in Housekeeping and Food and Beverage Services

Table 2 shows the students' assessments of their food and beverage service abilities. Students fully agreed that they were capable of extending a warm welcome to visitors (M=4.38, SD=.71), taking orders for food and drink (M4.40, SD=.67), and inspecting the

quality of the food and the cleanliness of the tableware (MD=4.40, SD=.67). They also affirmed that they could set up the dining room/restaurant area for service (M=4.07, SD=.69) by doing things, such as accurately responding to and recording customer inquiries (M=4.47, SD=.006), setting up the waiter's station with the necessary supplies (M=4.22, SD=.73), folding and laying table napkins appropriately (M=4.18, SD=.74), and setting tables in accordance with restaurant standards (M=4.22, SD=.71). Additionally, they agreed that they could serve food and guests, especially when it came to serving food to the right of the guest (M=4.24, SD=.69), following the meal sequence (M=4.25, SD=.70), and clearing dirty dishes from the tables (M=4.31, SD=.66); however, they only moderately agreed when it came to serving beverages at the proper times (M=3.00, SD=.09), and accurately processing bills (M=3.00, SD=.09). However, students moderately agreed that they were capable of engaging in activities that promote food and beverage products (M=3.00, SD=.00), such as learning the names and pronunciations of dishes, engaging in suggestive selling to aid guests in making decisions, and recommending new items to frequent customers. They also moderately agreed while handling tasks related to offering room service to customers (M=3.01, SD=.13), such as taking phone calls and clarifying order details, deciphering orders from doorknob docketts, confirming the guests' names on the bill, and checking customers' accounts for accuracy. The total mean of 3.61 (SD=.29) demonstrates that students can perform their food and beverage service abilities with competence.

Based on the results of the data gathered on the self-assessment of students, they agreed that they were competent in their housekeeping skills. Besides, students must be aware of a hotel's surroundings, its physical attributes, and the profiles of all of its departments, including housekeeping, as well as the standards that have been implemented and the knowledge in the areas of housekeeping, laundry, and rooms. Besides, the degree to which students are prepared for their future careers depends significantly on their general abilities, foundational area-related skills, functional curriculum-related skills, and concentration area-related skills. Meanwhile, the findings in the field of food and beverage services show that while some competencies result in moderate competence, students agree that they are competent in general. Antara and Anggreni (2023) emphasized that students develop their competencies regardless of their learning strategies. To maintain the industry's vitality, Balan (2018) noted that employees in the hospitality sector, including the food and beverage sector, must meet client needs. Moreover, the students' positive self-assessed skills in housekeeping procedures and food and beverage services conform with the study by Andrade and Du (2005) that as students progressed, their attitudes about self-evaluation tended to grow more favorably

Table 2. Self-assessment on food and beverage services skills of the students.

| Statements on the self-assessed food and beverage skills of students | Mean | SD | Descriptive interpretation |
|--|-------------|------------|----------------------------|
| Competency 1: | | | |
| Prepare dining room/restaurant area for service | | | |
| Answer phone and inquiries promptly and record reservations accurately based on establishments' standards as well as provide additional information about the services offered by the establishment. | 4.48 | 3.00 | Agree |
| Prepare waiter's station with supplies necessary for service, arrange tables and chairs. | 4.23 | .74 | Agree |
| Check cleanliness and condition of all tableware and dining equipment; and fill water pitcher, ice buckets and condiments. | 4.34 | .71 | Agree |
| Set the air-condition and adjust lights according to the time of the day and keep ready electrical appliances/ equipment like coffee pots, tea pots, plate warmers etc. | 3.00 | .098 | Moderately Agree |
| Set table and covers correctly as to the prescribed standards of the establishment and according to the pre-determined menu and/or fixed menu. | 4.23 | .71 | Agree |
| Folds cloth napkins properly and lays them appropriately on the table according to napkin folding style; and skirt table properly for buffet etc. | 4.18 | .74 | Agree |
| Total | 4.08 | .69 | Competent |
| Competency 2: | | | |
| Welcome and take food and beverage orders | | | |

| | | | |
|--|-------------|------------|-----------------------------|
| Acknowledge and greet guest as soon as they arrive with an appropriate welcome; as well as check details of reservations based on the standards of the establishments. | 4.38 | .71 | Agree |
| Escort guest according to table allocations to control the traffic flow of guests in the dining room; and seat guests while applying the standard operating procedure of the establishment such as laying the napkin, serving water when applicable and presenting the menu. | 4.29 | .71 | Agree |
| Take orders accurately and repeat orders for confirmation and note special requests and requirements as well as place orders to the kitchen promptly, all in accordance with the standard of the establishment. | 4.40 | .67 | Agree |
| Provide appropriate tableware according to menu choices and adjust in accordance with the standards of the establishment. | 4.27 | .67 | Agree |
| Before serving, check for quality of food, tableware for chips or cracks, marks, cleanliness, spills and drips of food, and carry out plates and trays safely. | 4.40 | .67 | Agree |
| Relay accurate information about special requests, dietary or cultural requirements to the kitchen and observe work technology according to the standards of the establishment. | 3.00 | .00 | Moderately Agree |
| Total | 4.12 | .52 | Competent |
| Competency 3: | | | |
| Promote food and beverage products | | | |
| Master the names and pronunciations of dishes in the menu and memorize its ingredients and study the descriptions of every item in the menu. | 3.00 | .00 | Moderately Agree |
| Provide information about the food items in clear explanations and master common food allergens to prevent serious health consequences. | 3.00 | .00 | Moderately Agree |
| Offer item on specials or promos to assist guests with food and beverage selections and pairings; and suggest name of specific menu items to help guest in making choices. | 3.00 | .00 | Moderately Agree |
| Carry out suggestive selling discreetly to provide more options to guests and use descriptive words to make it more tempting and appetizing. | 3.00 | .00 | Moderately Agree |
| Suggest slow moving but highly profitable items and offer second servings of items ordered to increase guest check. | 3.00 | .00 | Moderately Agree |
| Recommend new items to regular guests to encourage them to try other items in the menu. | 3.00 | .00 | Moderately Agree |
| Total | 3.00 | .00 | Moderately Competent |
| Competency 4: | | | |
| Provide food and beverage service to guests | | | |
| Serve food orders to the right guest and mention the name of the dish with minimal disturbance to other guests and in accordance to food safety procedures and general service principles; and conduct the 3-minute rule to check guest satisfaction. | 4.24 | .69 | Agree |
| Monitor and observe sequence of meal service in accordance with the standard procedure of the establishment. | 4.25 | .70 | Agree |
| Provides necessary condiments, sauces and appropriate tableware based on the food order and recognize delays or deficiencies in service and follow up promptly based on enterprise policy. | 4.25 | .72 | Agree |
| Serve beverages at appropriate times and temperature efficiently and carry out wine service with minimal disturbance to other guests and in accordance with the establishment's procedure. | 3.00 | .09 | Moderately Agree |

| | | | |
|--|-------------|------------|-----------------------------|
| Remove soiled dishes when guests are finished with the meal and handle food scraps in accordance with hygiene regulations and enterprise procedures. | 4.31 | .66 | Agree |
| Process bills accurately, verify amount with the customer, accept payment for cash and non-cash payments and issue receipts; and complete required documentation in accordance with the enterprise policy. | 3.00 | .09 | Moderately Agree |
| Total | 3.84 | .42 | Competent |
| Competency 5: | | | |
| Provide room service | | | |
| Answer telephone call courteously, use suggestive selling techniques, clarify details of orders with guest for accuracy and advise guest for approximate time of delivery. | 3.00 | .09 | Moderately Agree |
| Interpret accurately room service orders received from doorknob docketts. | 3.00 | .09 | Moderately Agree |
| Prepare and cover food items during transportation to the room, and set up room service equipment and supplies in the trolley according to the food ordered and in accordance with establishment procedures. | 3.00 | .09 | Moderately Agree |
| Verify guest's name on the bill before announcing the staff's presence outside the door and greet guests politely in accordance with the establishment's service procedures. | 3.01 | .19 | Moderately Agree |
| Check guests' accounts for accuracy and presented the bill in accordance with establishment procedures then ask the guest to sign for charge accounts. | 3.00 | .09 | Moderately Agree |
| Explain procedure to take away the tray or trolley when the guests have finished their meal; and check and clean dirty trays from all floors in accordance with the establishment's procedure. | 3.01 | .19 | Moderately Agree |
| Total | 3.01 | .13 | Moderately Competent |
| Overall mean | 3.61 | .29 | Competent |

Table 3 shows students' workplace preparation for housekeeping. The students demonstrated competence in the upkeep of public areas (M=3.67, SD=.69), which included tasks such as storing, choosing, and utilizing chemicals appropriately as well as employing the right process to keep public areas clean. They also demonstrated competency in delivering housekeeping services to guests (M=3.66, SD=.74), which included tasks such as loading trolleys with sufficient supplies (M=3.66, SD=.74), cleaning and preparing rooms in line with standards (M=3.66, SD=.74), and completing room-attendant reports in a timely manner (M=3.66, SD=.74). They also demonstrated competence in offering laundry services (M=3.66, SD=.71), which included tasks such as selecting and delivering guest clothing, classifying items according to cleaning methods, documenting any damage caused by the processes, and using cleaning agents and chemicals correctly, with a mean score of 3.66 (SD=.72). They were also competent in providing butler services to guests (M=3.64, SD=.74), particularly when it came to building rapport and a positive attitude toward guests (M=3.65, SD=.75), as well as handling intoxicated guests with caution and care (M=3.66, SD=.75). The overall mean of 3.65 (SD=.71) shows that the students are competent in performing their housekeeping skills.

Table 3. Work readiness skills of students in housekeeping procedures.

| Work readiness housekeeping skills of students | Mean | SD | Descriptive interpretation |
|---|------|-----|----------------------------|
| Competency 1: | | | |
| Provide valet/butler service | | | |
| Define the role of butler/ valet in accordance with establishment standards. | 3.64 | .74 | Competent |
| Access and utilize knowledge of individual guests record to provide personalized and quality valet service. | 3.64 | .74 | Competent |
| Enhance rapport establish and feelings of goodwillbetween | 3.65 | .75 | Competent |

| | | | |
|---|-------------|------------|------------------|
| the guest and the establishment through principles of good communication. | | | |
| Follow valet grooming and communication, and provide personalized valet services to guests in accordance with establishment standards. | 3.57 | .77 | Competent |
| Deal with intoxicated guests and underage drinkers with caution and care in compliance with legal regulations and him in line with enterprise practice. | 3.66 | .75 | Competent |
| Sought immediate assistance from hotel security personnel for the situations that poses a threat to safety and security according to enterprise procedure as well as legislative requirements as per alcoholic regulations. | 3.64 | .74 | Competent |
| Total | 3.64 | .74 | Competent |
| Competency 2: | | | |
| Provide housekeeping to guests | | | |
| Accept and record guest/staff housekeeping requests and service delivery in accordance to enterprise policies and procedure. | 3.65 | .74 | Competent |
| Safely load trolleys with adequate supplies and select correct cleaning equipment required for servicing rooms in accordance with establishment procedures. | 3.66 | .74 | Competent |
| Identify correctly rooms requiring service based on information supplied to room attendants report and access rooms in accordance with the establishment's customer service and security procedures. | 3.65 | .74 | Competent |
| Clean and make up the room in accordance with the standard operation procedures of the establishment. | 3.66 | .74 | Competent |
| Accomplish the room attendants report accordingly and report promptly any unusual or suspicious person, item or occurrence in accordance with establishment procedures. | 3.66 | .74 | Competent |
| Collect and store guest's belongings left in vacated rooms in accordance with lost and found establishment procedures. | 3.65 | .74 | Competent |
| Total | 3.66 | .74 | Competent |
| Competency 3: | | | |
| Public area maintenance | | | |
| Select and use cleaning equipment and chemicals according to type of cleaning to be done and use protective clothing whenever necessary. | 3.67 | .70 | Competent |
| Clean and store chemicals properly in accordance with manufacturer's specifications and requirements; and check all equipment for cleanliness and in safe working condition prior to use. | 3.67 | .70 | Competent |
| Identify and report defects and carry out routinary preventive maintenance on facilities, furniture and fixtures within public areas of the establishment in accordance with enterprise procedures. | 3.67 | .70 | Competent |
| Apply appropriate procedures in accordance with the technique such as preparing wet and dry areas for cleaning to reduce risk to colleagues and customers. | 3.66 | .70 | Competent |
| Dispose of garbage and use chemicals in accordance with hygiene, safety and environmental legislation requirements. | 3.67 | .70 | Competent |
| Store equipment in the designated area and in a condition ready for re-use; and store and control chemicals in accordance with health and safety requirements. | 3.67 | .70 | Competent |
| Total | 3.67 | .69 | Competent |
| Competency 4: | | | |
| Provide laundry service | | | |
| Pick up and deliver guest clothes and in-house items in accordance with enterprise requirements. | 3.66 | .72 | Competent |

| | | | |
|--|-------------|------------|------------------|
| Sort items according to cleaning process required and urgency of the item and check for stains and treats items for laundering using the prescribed procedure as well as checks for possible valuables inside the pocket. | 3.66 | .72 | Competent |
| Select laundry methods in accordance with textile labeling codes and based on fiber and fabric, dye fastness, degree of soilage and washing instructions and operate laundry equipment in accordance with manufacturer's instructions. | 3.66 | .72 | Competent |
| Record any damage arising from the laundering process and appropriate person(s) is/are notified in accordance with establishment procedures. | 3.66 | .72 | Competent |
| Use cleaning agents and chemicals in accordance with manufacturer's instructions and specific laundry equipment. | 3.66 | .72 | Competent |
| Process internal record and billing instructions in accordance with enterprise procedures and produce necessary internal laundry reports. | 3.62 | .71 | Competent |
| Total | 3.66 | .71 | Competent |
| Overall mean | 3.65 | .71 | Competent |

Table 4 presents student workplace readiness for food and beverage services. The students performed competently ($M=3.65$, $SD=.45$) when preparing the dining room/restaurant area for service, with tasks such as promptly taking phone calls and recording reservations ($M=3.91$, $SD=.70$), folding and laying table napkins appropriately ($M=4.12$, $SD=.74$), and setting the table and covering in accordance with the prescribed standards ($M=3.62$, $SD=.60$). However, they performed only moderately well ($M=3.06$, $SD=.28$) when adjusting the air conditioning and lights of the area. Students also demonstrated competence in greeting and taking orders for food and drinks ($M=56$, $SD=.47$), particularly when it came to acknowledging and greeting guests as soon as they arrived ($M=3.87$, $SD=.70$), escorting guests to their assigned tables ($M=3.84$, $SD=.66$), and taking orders from the guests ($m=3.73$, $SD=.76$). The students performed moderately competent when it came to serving food and beverages to guests ($M=3.28$, $SD=.27$), especially when it came to tasks such as keeping track of the order of the meal ($M3.32$, $SD=.58$), providing sauces and condiments ($M=3.10$, $SD=.55$), and serving beverages at appropriate times ($M=3.00$, $SD=.09$). They also did well when it came to serving meal orders to the appropriate guests, mentioning the dish's name ($M=3.55$, $SD=.53$), and clearing away dirty dishes after customers had finished eating ($M=3.72$, $SD=.56$). The students demonstrated a fair bit of competence in promoting food and beverage products ($M=3.02$; $SD=.19$). This included tasks such as learning the names and pronunciations of dishes ($M=3.02$; $SD=.21$), offering items on promotions, engaging in suggestive selling, and recommending new items to frequent customers, all with a mean of 3.01 ($SD=.19$). The students also displayed a fair level of competency in delivering room service ($M=3.01$, $SD=.13$), which includes tasks like validating the guest's identity on the bill ($M=3.01$, $SD=.19$), politely taking calls, preparing food, and monitoring the guest's accounts where all have a mean of 3.00 ($SD=.09$). The students' overall mean of 3.31 ($SD=.23$) shows that they were moderately competent in demonstrating their food and beverage service abilities.

In terms of the assessment of work readiness, students were found to be competent in performing various tasks in the housekeeping area and moderately competent in food and beverage services. This is due to the fact that food and beverage require more competencies and higher standards, particularly in customer relations and interpersonal skills. The study by Estribor and Pagaran (2022) revealed that a lack of understanding and knowledge of tasks, especially in hands-on activities in FBS, is one of the challenging parts of developing the said skill set. Meanwhile, some authors (Sönmez et al., 2017) claimed that, while some believe that they have the necessary skills and professionalism to meet the requirements for food and beverage services, there is a greater need for teaching staff to be trained and developed.

Table 4. Work readiness skills of students in food and beverage services.

| Work readiness of food and beverage skills of students | Mean | SD | Descriptive interpretation |
|--|------|-----|----------------------------|
| Competency 1: | | | |
| Prepare dining room/restaurant area for service | | | |
| Answer phone and inquiries promptly and record | 3.91 | .70 | Competent |

| | | | |
|--|-------------|------------|----------------------|
| reservations accurately based on establishments' standards as well as provide additional information about the services offered by the establishment. | | | |
| Prepare waiter's station with supplies necessary for service, arrange tables and chairs. | 3.59 | .58 | Competent |
| Check cleanliness and condition of all tableware and dining equipment; and fill water pitcher, ice buckets and condiments. | 3.58 | .63 | Competent |
| Set the air-condition and adjust lights according to the time of the day and keep ready electrical appliances/equipment like coffee pots, tea pots, plate warmers etc. | 3.06 | .28 | Moderately competent |
| Set table and covers correctly as to the prescribed standards of the establishment and according to the pre-determined menu and/or fixed menu. | 3.62 | .60 | Competent |
| Folds cloth napkins properly and lays them appropriately on the table according to napkin folding style; and skirt table properly for buffet etc. | 4.12 | .74 | Competent |
| Total | 3.65 | .45 | Competent |
| Competency 2: | | | |
| Welcome and take food and beverage orders | | | |
| Acknowledge and greet guest as soon as they arrive with an appropriate welcome; as well as check details of reservations based on the standards of the establishments. | 3.87 | .70 | Competent |
| Escort guest according to table allocations to control the traffic flow of guests in the dining room; and seat guests while applying the standard operating procedure of the establishment such as laying the napkin, serving water when applicable and presenting the menu. | 3.84 | .66 | Competent |
| Take orders accurately and repeat orders for confirmation and note special requests and requirements as well as place orders to the kitchen promptly, all in accordance with the standard of the establishment. | 3.73 | .76 | Competent |
| Provide appropriate tableware according to menu choices and adjust in accordance with the standards of the establishment. | 3.54 | .66 | Competent |
| Before serving, check for quality of food, tableware for chips or cracks, marks, cleanliness, spills and drips of food, and carry out plates and trays safely. | 3.36 | .60 | Moderately competent |
| Relay accurate information about special requests, dietary or cultural requirements to the kitchen and observe work technology according to the standards of the establishment. | 3.02 | .21 | Moderately competent |
| Total | 3.56 | .47 | Competent |
| Competency 3: | | | |
| Promote food and beverage products | | | |
| Master the names and pronunciations of dishes in the menu and memorize its ingredients and study the descriptions of every item in the menu. | 3.02 | .21 | Moderately competent |
| Provide information about the food items in clear explanations and master common food allergens to prevent serious health consequences. | 3.01 | .19 | Moderately competent |
| Offer item on specials or promos to assist guests with food and beverage selections and pairings; and suggest name of specific menu items to help guest in making choices. | 3.01 | .19 | Moderately competent |
| Carry out suggestive selling discreetly to provide more options to guests and use descriptive words to make it more tempting and appetizing. | 3.01 | .19 | Moderately competent |

| | | | |
|---|-------------|------------|-----------------------------|
| Suggest slow moving but highly profitable items and offer second servings of items ordered to increase guest check. | 3.01 | .19 | Moderately competent |
| Recommend new items to regular guests to encourage them to try other items in the menu. | 3.01 | .19 | Moderately competent |
| Total | 3.02 | .19 | Moderately competent |
| Competency 4: Provide food and beverage service to guests | | | |
| Serve food orders to the right guest and mention the name of the dish with minimal disturbance to other guests and in accordance to food safety procedures and general service principles; and conduct the 3-minute rule to check guest satisfaction. | 3.55 | .53 | Competent |
| Monitor and observe sequence of meal service in accordance with the standard procedure of the establishment. | 3.32 | .58 | Moderately competent |
| Provides necessary condiments, sauces and appropriate tableware based on the food order and recognize delays or deficiencies in service and follow up promptly based on enterprise policy. | 3.10 | .55 | Moderately competent |
| Serve beverages at appropriate times and temperature efficiently and carry out wine service with minimal disturbance to other guests and in accordance with the establishment's procedure. | 3.00 | .09 | Moderately competent |
| Remove soiled dishes when guests are finished with the meal and handle food scraps in accordance with hygiene regulations and enterprise procedures. | 3.72 | .56 | Competent |
| Process bills accurately, verify amount with the customer, accept payment for cash and non-cash payments and issue receipts; and complete required documentation in accordance with the enterprise policy. | 3.01 | .13 | Moderately competent |
| Total | 3.28 | .27 | Moderately competent |
| Competency 5: Provide room service | | | |
| Answer telephone call courteously, use suggestive selling techniques, clarify details of orders with guest for accuracy and advise guest for approximate time of delivery. | 3.00 | .09 | Moderately competent |
| Interpret accurately room service orders received from doorknob docketts. | 3.00 | .09 | Moderately competent |
| Prepare and cover food items during transportation to the room, and set up room service equipment and supplies in the trolley according to the food ordered and in accordance with establishment procedures. | 3.00 | .09 | Moderately competent |
| Verify guest's name on the bill before announcing the staff's presence outside the door and greet guests politely in accordance with the establishment's service procedures. | 3.01 | .19 | Moderately competent |
| Check guests' accounts for accuracy and presented the bill in accordance with establishment procedures then ask the guest to sign for charge accounts. | 3.00 | .09 | Moderately competent |
| Explain procedure to take away the tray or trolley when the guests have finished their meal; and check and clear dirty trays from all floors in accordance with the establishment's procedure. | 3.01 | .19 | Moderately competent |
| Total | 3.01 | .13 | Moderately competent |

| | | | |
|--------------|------|-----|----------------------|
| Overall mean | 3.31 | .23 | Moderately competent |
|--------------|------|-----|----------------------|

Based on the table below, the management skills level of 52 students (49.7 %) received a low score, whereas 53 students (50.6 %) received a moderately high score. The students' total mean score for management skill proficiency, as determined by a test created by the researchers, demonstrates that their management skills level, particularly in analyzing and interpreting hotel reports and situational analysis, is low.

Based on the assessment of the management skills level of students administered through a teacher-made test, it was revealed that their management skills level, particularly in analyzing and interpreting hotel reports and situational analysis, was low. According to Buegermeister (1983), a hotel manager must possess various abilities to meet business demands. Based on the study of Pratt and Hahn (2016), it was suggested that key competencies for hotel management students can be developed through simulations, experiential learning, and case studies. Nevertheless, Griffin (2020) indicated that programs should stress teaching hospitality students' soft competencies in favor of hard competencies.

Table 5. Frequency, percentage and overall mean of the students in their management skills competency.

| Score | Frequency | Percentage | Descriptive interpretation |
|-------------------|--------------|---------------|----------------------------|
| 6 to 15 | 52 | 49.70 | Low |
| 16- 25 | 53 | 50.60 | Moderately High |
| Total | 105 | 100.00 | |
| Mean score | 15.44 | | Low |
| SD | 3.09 | | |

3.3. Factors that Affect the Technical and Management Skills of the BSHM Graduating Students

In the open-ended interview questionnaire, there are a few factors that affect the development of technical and management skills as perceived by the BSHM graduating students: personal/internal factors, interpersonal factors, teachers' expertise, internship, laboratory exposures, and socioeconomic conditions.

The majority of the participants pointed out that personal factors, particularly lack of self-confidence and focus on studying during the pandemic, and adaptability to change from in-person to online learning have affected their ability to develop their skills. Participant 1 stated, *'For me, the factor that affects my development is dealing with others because I am shy to communicate with others.'* Lack of focus in studying through blended learning during the pandemic has impacted the development of BSHM students' skills because of the many problems they face during online classes (Alawamleh et al., 2022). This is interconnected with other factors, such as the socioeconomic condition of students (Bekova et al., 2021; Jones et al., 2018), in which financially stressed students or with money problems while studying could not focus; thus, the possibility of low academic performance, and ultimately would least develop technical and management skills. This is evident from the statements of Participants 28, 29, and 30.

Meanwhile, on a positive note, Participant 3 stated that *"the factor that affected the development of my skills was my self-confidence, which built me to adapt to new things that helped me indulge in some activities. Through this development, I gained so far and boosted my communication skills that I can apply to my future career."* This conforms with the study of Nicholson et al. (2013) that students who were confident in their abilities also performed better, and thus, would be able to develop more skills and competencies required in the program.

BSHM students also perceived that teachers' expertise and involvement not only in conducting classes (both in-person and online classes) but also in having open communication during consultation hours and follow-up lessons has an effect on the development of technical and management skills. On a positive note, Participant 8 stated that *"The experience of the teachers greatly affected my development. Their sharing on how they experienced things related in the industry helped me a lot to understand what it is to become who I want to be in the future."* Participants 9 and 10 also claimed that their teachers' knowledge and experience positively affected their skill development. On the other hand, Participants 25, 26, and 27 claimed that they had difficulty studying because their teachers were not attending their classes. Participant 24 also stated, *"It is not that I have not learned anything during online classes, but I was distracted, and the difficulty of reaching out with professors and classmates"*. There were also participants who claimed that their communication skills with classmates and teachers became a barrier to the development of their technical and management skills. Some students are shy to communicate, and lack knowledge of how to communicate well with others. These issues fall

under interpersonal factors, such as poor/decreased communication levels with teachers (Okwuduba et al., 2021). Also, in the study by A. Khan, S. Khan, Zia-Ul-Islam, and M. Khan (2017), it was mentioned that teachers' ability to communicate with students has a significant impact on the performance of students. More to this, according to the study of Bal-Taştan, Davoudi, Masalimova, Bersanov, Kurbanov, Boiarchuk, and Pavlushin (2018), teachers' efficacy and motivation have a direct impact on student learning outcomes, and the teaching experience is positively associated with students' performance (Podolsky et al., 2019; Abou-Shouk et al., 2014).

Many participants mentioned that laboratory exposure and internship, both known as practical experiences, also affect the development of their technical skills. Participants 15, 16, 17, 18, and 19 claimed that laboratory facilities were not good enough, including the tools and supplies utilized during hands-on activities. This is congruent with the study of Abou-Shouk, Abdelhakim, Hewedi (2014), which found that tourism and hospitality management students linked their learning process as well as their ability to acquire knowledge and competencies in the quality of facilities utilized while studying. Ramli, Zain, Campus, Chepa, and Bharu (2018) also emphasized that laboratory facilities, including all other campus facilities, have a significant impact on student academic achievement.

On the other hand, participants 11, 12, 13, and 14 claimed that although they had limited hands-on laboratories due to the pandemic, their on-the-job training, also known as internship, slowly helped them develop their skills, particularly in housekeeping, food and beverage, and front office. For instance, Participant 13 stated that *"I am more knowledgeable now and have gained a lot of expertise during OJT deployment"*. This affirms the study by Anjum (2020) that internships have a significant impact on the professional, personal, and skills growth and development of business students. The internship program is important for undergraduate students to enhance their self-development and employment ability (Krishna & Babu, 2021), and internships are the most useful part of the study process among tourism and hospitality students (Doniņa, 2014).

Internship programs are crucial for undergraduate students to enhance their self-development and employability (Krishna & Babu, 2021). Internships are considered the most valuable component of the educational process, particularly in tourism and hospitality (Doniņa, 2014). These experiences provide practical skills, industry exposure, and professional networking opportunities, bridging the gap between academic knowledge and real-world application.

4. Conclusions

This study aimed to evaluate the work readiness of Bachelor of Science in Hospitality Management (BSHM) students by assessing their technical and management skills through various methods. The key findings were that students felt competent in housekeeping skills based on self-assessments, which was confirmed by performance assessments. This indicates a readiness to meet industry demands in housekeeping. A gap was found between the self-perceived and actual skills in Food and Beverage Services. While proficient in basic tasks, the students were only moderately competent in more complex service tasks. Management skills, particularly in analyzing hotel reports and situational analysis, were found to be low based on teacher-made tests despite students' moderately high self-assessments. Factors affecting skill development included personal factors (lack of self-confidence, poor study focus), interpersonal factors, teachers' expertise, internship experiences, laboratory exposure, and socioeconomic conditions. The shift to online learning during the pandemic exacerbated challenges in skill development. The study concluded that while students demonstrated competence in housekeeping, their moderate proficiency in food and beverage services and low management skills suggest the need for more practical exposure and focused training in these areas. Addressing the identified factors hindering skill development is crucial for ensuring that graduates are fully prepared to meet industry demands. The findings highlight the need for continuous post-graduate training and development in specializations, implementation of comprehensive programs to enhance technical and essential skills, and improvement of practical exposure and teachers' expertise.

Recommendations

Based on this study, it is recommended that the BSHM program implements a comprehensive strategy to enhance students' work readiness. This should include increasing practical exposure to food and beverage services, intensifying management skills training, and

addressing the factors hindering skill development. The program should consider incorporating more hands-on experience, industry partnerships for internships, and specialized workshops to bridge the gap between self-perceived and actual skills. In addition, the curriculum should be adapted to mitigate the impact of online learning on practical skill acquisition, possibly through hybrid learning models or simulated work environments. Postgraduate training programs and continuous professional development opportunities should be established to support graduates in their specializations and ensure that they remain competitive in the dynamic hospitality industry.

Acknowledgments: I would like to express my gratitude to Isabela State University for providing the funding and support necessary to conduct this study.

Conflicts of Interest: The authors of the study titled “Bridging the Gap: Technical and Management Competencies of BSHM Graduates in the Philippine Context” hereby declare that there are no conflicts of interest in relation to the respondents from Isabela State University, Cauayan. All data collected from the participants were gathered in accordance with ethical standards, ensuring voluntary participation and confidentiality of the responses. The researchers affirmed that they had no financial, personal, or professional interests that could have influenced the outcome or interpretation of the study’s findings.

All parties involved were committed to ensuring the accuracy and integrity of the research process.

References

- Abou-Shouk, M. A., Abdelhakim, A. S., & Hewedi, M. M. (2014). Factors affecting the development of target competencies among final-year Egyptian tourism and hospitality students. *Journal of Hospitality & Tourism Education*, 26(4), 178–187. doi:10.1080/10963758.2014.959966
- Alawamleh, M., Al-Twait, L. M., Al-Saht, G. R. (2022). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*, 11(2), 380-400. <https://doi.org/10.1108/AEDS-06-2020-0131>.
- Andrade, H., & Du, Y. (2005). Student perspectives on rubric-referenced assessments. *Educational & Counseling Psychology Faculty Scholarship*. 2. https://scholarsarchive.library.albany.edu/edpsych_fac_scholar/2
- Anjum, S. (2020). Impact of internship programs on professional and personal development of business students: a case study from Pakistan. *Future Business Journal*, 6, 2. <https://doi.org/10.1186/s43093-019-0007-3>
- Antara, A. R. I M., Anggreni, Y. N. P. (2023). Exploring Management Food and Beverage Students’ Perception and Expectation of Using Presentation and Dialogue in English Language Learning. *Jurnal Manajemen Pelayanan Hotel*, 7(1), 241-259. <http://dx.doi.org/10.37484/jmph.070112>.
- Balan, T. M. (2018). Conversion of the Food and Beverage Services Course to Outcomes-based Education. *Journal of Tourism & Hospitality*, 7(2), 340. DOI: 10.4172/2167-0269.1000340
- Bal-Taştan, S., Davoudi, S. M. M., Masalimova, A. R., Bersanov, A. S., Kurbanov, R. A., Boiarchuk, A. V., & Pavlushin, A. A. (2018). The impacts of teacher’s efficacy and motivation on student’s academic achievement in science education among secondary and high school students. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(6), 2353-2366.
- Bekova, S. K., Terentev, E. A., Maloshonok, N. G. (2021). Educational Inequality and COVID-19 Pandemic: Relationship between Family socioeconomic status and student experience of remote learning. *Вопросы образования*, 1, 74-92.
- Buergermeister, J. (1983). Assessment of the Educational Skills and Competencies Needed By Beginning Hospitality Managers. *Hospitality Education and Research Journal*, 8(1), 38-53. <https://doi.org/10.1177/109634808300800105>
- Commission on Higher Education (2017). Policies, standards, and guidelines for the Bachelor of Science in Hospitality Management (BSHM). CMO 62, s. 2017. <https://ched.gov.ph/wp-content/uploads/2017/10/CMO-No.-62-s.-2017.pdf>
- De Castro, G. L. (2017). Tracer study of Hotel and Restaurant Management graduates of one state college in the Philippines from 2014-2016. *Asia Pacific Journal of Education, Arts and Sciences*, 4(1), 41-47. <https://apjeas.apjmr.com/wp-content/uploads/2017/03/APJEAS-2017.4.1.2.05.pdf>
- Diaz, S. M., & Maramento, E. L. (2024). The Employability of the Bachelor of Science in Hotel and Restaurant Management Graduates of Guimaras State College AY 2017 –2021: A Tracer Study. *Psychology and Education: A Multidisciplinary Journal*, 16(6), 683-692. DOI: 10.5281/zenodo.10530017
- Doniņa, A. (2014). Significance of Internship in Tourism and Hospitality Education. *Proceedings of the International Scientific Conference of Daugavpils University / Daugavpils Universitātes Starptautiskas Zinatniskas Konferenču Materiāli*. <https://search.ebsco-host.com/login.aspx?Direct=true&db=aph&AN=101460094&Site=ehost-live>.
- Estribor, R. A., & Pagan, J. R. (2022). Learning Engagement of Food and Beverage Services (FBS) Students’ of Matanao National High School during COVID-19 Pandemic. *International Journal of Physical Medicine & Rehabilitation*, 10(3), 43-52. <https://www.longdom.org/open-access/learning-engagement-of-food-and-beverage-services-fbs-students-of-matanao-national-high-school-during-covid19-pandemic.pdf>
- Fantazy, K. A., Kumar, V., & Kumar, U. (2010). Supply management practices and performance in the Canadian hospitality industry. *International Journal of Hospitality Management*, 29(4), 685-693. <https://doi.org/10.1016/j.ijhm.2010.02.001>
- Griffin, W. C. (2020). Hospitality faculty: are we meeting the demands of industry? *Journal of Teaching in Travel & Tourism*, 20(4), 262–283. <https://doi.org/10.1080/15313220.2020.1746225>
- Hasri, N., Din, F. A. M., Same, A. H., Jakeriah, R., & Patah, M. O. R. A. (2021). Hospitality Fresh Graduates’ Competency and Hotel Job Offer Decisions. *International Journal of Academic Research in Business and Social Sciences*, 11(16), 10–26. <http://dx.doi.org/10.6007/IJARBS/v11-i16/11212>

- Jones, P. J., Park, S. Y., & Lefevor, G. T. (2018). Contemporary college student anxiety: The role of academic distress, financial stress, and support. *Journal of College Counseling, 21*(3), 252-264.
- Kabii, F., & Naghea, J. (2021). Preferred Social Networking App by Employees in Tourism and Hospitality Industry in Kenya. *Journal of Tourism Management Research, 8*(1). <https://doi.org/10.18488/journal.31.2020.71.42.51>
- Khan, A., Khan, S., Zia-Ul-Islam, S., & Khan, M. (2017). Communication Skills of a Teacher and Its Role in the Development of the Students' Academic Success. *Journal of Education and Practice, 8*(1), 18-21.
- Krishna, B. V., & Babu, J. S. (2021). Impact of Internship on Employability of Undergraduate Engineering Students: A Case Study. *Journal of Engineering Education Transformations, 34*(4), 67-73. <https://doi.org/10.16920/jcet/2021/v34i4/153410>
- Nicholson, L., Putwain, D., Connors, L., Hornby-Atkinson, P. (2013). Key to successful achievement as an undergraduate Confidence and realistic expectations. *Studies in higher education, 38*(2), 285-298. <https://doi.org/10.1080/03075079.2011.585710>
- Okwuduba, E. N., Nwosu, K. C., Okigbo, E. C., Samuel, N. N., & Achugbu, C. (2021). Impact of intrapersonal and interpersonal emotional intelligence and self-directed learning on academic performance among pre-university science students. *Heliyon, 7*(3), e06611. <https://doi.org/10.1016/j.heliyon.2021.e06611>
- Podolsky, A., Kini, T., Darling-Hammond, L. (2019). Does teaching experience increase teachers' effectiveness? A review of US research. *Journal of Professional Capital and Community, 4*(4), 286-308. <https://doi.org/10.1108/JPC-12-2018-0032>
- Pratt, M. A., & Hahn, S. (2016). Enhancing hospitality student learning through the use of a business simulation. *Journal of Hospitality, Leisure, Sport & Tourism Education, 19*, 10-18. <https://doi.org/10.1016/j.jhlste.2016.05.001>
- Quinn, K., & Buzzetto-Hollywood, N. (2019). Faculty and Student Perceptions of the Importance of Management Skills in the Hospitality Industry. *Interdisciplinary Journal of e-Skills and Lifelong Learning, 15*, 21-41. <https://doi.org/10.28945/4198>
- Rahman, M. (2010). The importance of essential skills in the hospitality industry. *Hospitality Review, 28*(1), 35-47.
- Ramli, A., Zain, R. M., Campus, C., Chepa, P., & Bharu, K. (2018). The impact of facilities on students' academic achievement. *Science International (Labore), 30*(2), 299-311. <http://www.sci-int.com/pdf/636613109483179335.edited.pdf>
- Sönmez, S., Apostolopoulos, Y., Lemke, M. K., Hsieh, Y.-C. (J.), & Karwowski, W. (2017). Complexity of occupational health in the hospitality industry: Dynamic simulation modeling to advance immigrant worker health. *International Journal of Hospitality Management, 67*, 95-105. <https://doi.org/10.1016/j.ijhm.2017.08.006>
- Technical Education and Skills Development Authority (TESDA). (n.d.). Self-assessment guide. <https://www.tesda.gov.ph/Self-Assessment>

Pedagogical Insights

Battling Disinformation About Climate Change in a Non-Science Majors Lecture/Lab Course One Website At a Time

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<https://doi.org/eiki/10.59652/jetm.v2i4.350>

Abstract: With all of the news and social media outlets available, it is easy for anyone to post information for the world to see. This can result in misinformation being shared, especially when it comes to “hot button” topics such as climate change. It is important, therefore, to teach our students how to be both scientifically and informationally literate. This communication describes an assignment used in an environmental science class designed for non-science majors in which climate change is the overarching theme. This assignment helps students learn to identify appropriate sources of information which can then reliably inform them about the effects of climate change. Students can then expand upon this approach outside of class and use it to research any information that they find in the news or on social media. This allows them to critically analyze the sources before reaching an informed decision as to whether it is factual or misleading information.

Keywords: climate change; non-science majors; internet searches; misinformation

1. Introduction

More than in any previous point in human history, misinformation can quickly reach a large audience, often with little to no external scrutiny. “Clickbait” articles with hyperbolic or misleading headlines often get more views and traction from the general public than academic journal publications. Many times, these types of articles can be found in mainstream media or on social media websites. False news is typically transmitted faster through human activities rather than automated robots (Vosoughi et al., 2018). Even errors in artificial intelligence have been reported (Al-Raei, 2024; Zhang & Aslan, 2021). In our own class, having students search the results of melting sea ice shows mistakes in the AI Overview following a Google search. “Buyer beware” has never been more relevant when it comes to the consumption of information.

Some of the clearest examples of misinformation are in regard to climate change, which has become highly politicized and partisan. While the scientific world has long ago reached consensus on the causes and impacts of climate change (Cook et al., 2018; Ding et al. 2011; Lynas et al., 2021), a small percentage of scientists, many outside of science actively, and for self-serving reasons, dissent from and challenge this consensus. Unfortunately, they often garner a dis-proportionate amount of media attention (van der Linden et al., 2017). Misinformation campaigns from partisan sources are well funded and therefore often well produced compared to many sites trying to debunk climate change misinformation. This contributes to the disconnect between scientific consensus on climate change and public opinion (Marlon et al., 2023). This disconnect may be due to a lack of understanding when it comes to the scale of the impact, its causes, and the rate at which things are changing. This misinformation is spread through various individuals through either skeptical, denial or contrary viewpoints (Treen et al., 2020).

Being able to discern between climate misinformation campaigns and the objective presentation of data-backed research is a skill our students must possess to be informed citizens, and for our society to have a chance at diminishing the negative effects of climate change. Here we present how non-science majors taking an environmental science lecture/lab

Received: November 15, 2024

Accepted: November 21, 2024

Published: December 8, 2024



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course can learn to be critical consumers of information and better discriminate between trustworthy and unreliable sources, applying these skills to better understand the effects of climate change on the Earth. By doing so, we are allowing them to recognize the impacts of science on a local and global scale.

2. Activity

Students overwhelmingly use Google as their main research tool (Olsen & Diekema, 2012) and evaluate search results based mainly on title and summary (Walraven et al., 2009). To encourage a more critical analysis of source material we teach our students to examine five criteria of a website.

- Authors: Who wrote the page and why?
- Authority: Is the author a credible source? What are their qualifications?
- Objectivity: Is there an opinion expressed? What is the goal of the page?
- Currency: When was it last updated?
- Coverage: Does the page cite its sources? Is the information comprehensive?

Although we are focusing on climate change, the universality of this approach is emphasized to the non-major students who will hopefully apply it to data gathering in their own discipline-specific studies.

To guide and provide practice in picking appropriate online sources, we assign our students to review three websites, each with a different goal and target audiences: *Skeptical Science* (<https://skepticalscience.com/>) an up-to-the-minute aggregator of the latest climate news aimed at debunking climate misinformation, *Climate Skeptic* (<http://www.climate-skeptic.com/>) a personal blog aimed at attacking the scientific establishment's views on climate change, and *The Environment* (<https://www.heritage.org/environment>), which presents the Heritage Foundation's view of issues, including climate change, from a libertarian point of view. Although we have chosen these websites, instructors using this assignment for their classes can choose any climate change websites they wish. This activity and the post-discussion can be completed during a class period or as a homework assignment. We typically give our students this assignment at the beginning of the semester. This way, they can use this skill as the semester progresses when they are asked to look up information relating climate change to other environmental issues, such as pollution, human population growth and sustainability of natural resources.

After students have the opportunity to peruse and analyze the three sites using the criteria listed above, we then ask them to choose which sites are the most appropriate choices for particular scenarios. Students are first asked to determine which website is the best for researching the politics of climate change, to which students all choose the site from the Heritage Foundation, a libertarian think tank (About Heritage 2023). Next, we ask the students to determine which website is the best for general climate change research and which website is best for general background research on climate change. Based on anecdotal evidence, a significant number of students choose sources based on aesthetics. For example, many students prefer *The Environment* due to its professional appearance, despite its content being ideologically driven and policy-focused. Of the three, however, only *Skeptical Science* is reliably sourced from peer-reviewed academic sources. Unfortunately, it is also the least aesthetically pleasing, and is therefore viewed by students as least reliable.

After students complete the assignment, the instructors review the answers with the students. One of the major concepts we cover is that appearances can be deceiving. Students tend not to choose the two that specifically address the underlying science is their use of the blog format which, at first blush, seems less credible than the slickly produced offering from the Heritage Foundation. The activity emphasizes that one must take time to look at the content of the website and its sources. This is a modernization of the adage that you can't judge a book (or a website) by just its looks.

3. Conclusions

We believe that following this assignment, our students' ability to choose proper websites when researching scientific concepts improves as the semester progresses. Prior to us developing this assignment, we observed our students using any website that on the surface looks like it helps answer questions when completing lab assignments. Case in point, a previous student taking our classes used *Answers in Genesis* (<https://answersingenesis.org/natural-selection/antibiotic-resistance/>), a website espousing

the idea of intelligent design, as a reference when researching the role of natural selection in antibiotic resistance. Since implementing this assignment, we have seen considerable improvement in websites being chosen by the students.

One of our students commented at the end of the semester “*I thought it was interesting to compare different websites based on the type of language and emphasis used. It also helped me understand graphs and other data better for future online use. I also think it’s important to consider who is writing the websites and if there’s any personal bias woven into the data they’re presenting.*”

It is important for teachers of non-science majors to make their students scientifically literate through information literacy. This is a key recommendation of the American Association for the Advancement of Sciences’ Science for all Americans (Rutherford & Ahlgren, 1990). We want our students to be informed citizens. This means being able to fact check news, claims on social media, or the validity of new products being sold, etc., and determine for themselves if they are all they claim to be. This ability to discern fact from fiction is particularly important when researching a scientific concept they hear about in the news or social media. We feel that this assignment allows teachers to train their students in this important skill and at the same time, combat miscommunication we continue to see about climate change.

Supplementary Materials & Data availability statement: No supplementary materials and no empirical data are connected to this piece of work given the nature of the article

Author Contributions: All authors contributed to the development of this lesson and to the writing and editing of this manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: We would like to thank Naomi Cohen of the Francis A. Drexel Library of Saint Joseph’s University for her assistance in designing this lesson. We also thank Brian Kron and Scott McRobert for their critical reading and suggestions for our manuscript.

Conflicts of Interest: The authors declare no conflict of interest

References

- About Heritage (2023). The Heritage Foundation. Available at: <https://www.heritage.org/about-heritage/mission> (Accessed: 08 October 2024).
- Al-Raei, M. (2024). When ai goes wrong: Fatal errors in oncological research reviewing assistance open AI based. *Oral Oncology Reports*, 10, 100292. <https://doi.org/10.1016/j.oor.2024.100292>.
- Cook, J., Ellerton, P., & Kinkead, D. (2018). Deconstructing climate misinformation to identify reasoning errors. *Environmental Research Letters*, 13(2), 024018. <https://doi.org/10.1088/1748-9326/aaa49f>.
- Ding, D., Maibach, E. W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about scientific agreement. *Nature Climate Change*, 1(9), 462–466. <https://doi.org/10.1038/nclimate1295>.
- Lynas, M., Houlton, B. Z., & Perry, S. (2021). Greater than 99% consensus on human caused climate change in the peer-reviewed scientific literature. *Environmental Research Letters*, 16(11), 114005. <https://doi.org/10.1088/1748-9326/ac2966>.
- Marlon, J., Goddard, E., Howe, P., Mildenberger, M., Jefferson, M., Fine, E., & Leiserowitz, A. (2023). Yale climate opinion maps 2023. 2023. <https://climatecommunication.yale.edu/visualizations-data/ycom-us/> (Accessed: 09 October 2024).
- Olsen, M. W., & Diekema, A. R. (2012). “I just wikipedia it”: Information behavior of first-year writing students. *Proceedings of the American Society for Information Science and Technology*, 49(1), 1–11. <https://doi.org/10.1002/meet.14504901176>.
- Rutherford, F. J., & Ahlgren, A. (1990). *Science for all Americans: American Association for the Advancement in Science project 2061*. New York: Oxford University Press.
- Treen, K. M. D. I., Williams, H. T., & O’Neill, S. J. (2020). Online misinformation about climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 11(5). [https://doi.org/10.1002/\(issn\)1757-7799](https://doi.org/10.1002/(issn)1757-7799).
- van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the public against misinformation about climate change. *Global Challenges*, 1(2), 1600008. <https://doi.org/10.1002/gch2.201600008>.
- Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359(6380), 1146–1151. <https://doi.org/10.1126/science.aap9559>.
- Walraven, A., Brand-Gruwel, S., & Boshuizen, H. P. A. (2009). How students evaluate information and sources when searching the World Wide Web for Information. *Computers & Education*, 52(1), 234–246. <https://doi.org/10.1016/j.compedu.2008.08.003>.
- Zhang, K., & Aslan, A. B. (2021). AI Technologies for Education: Recent research & future directions. *Computers and Education: Artificial Intelligence*, 2, 100025. <https://doi.org/10.1016/j.caeai.2021.100025>.

Action Research

Communicative Activities for Written and Spoken Production of Narrative Tenses in English

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<https://doi.org/eiki/10.59652/jetm.v2i4.363>

Abstract: Grammatical forms like narrative tenses might be challenging for English language learners from diverse educational contexts. This study, therefore, proposes alternative communicative activities to embed narrative tenses into contextualized practice through creative writing and imaginative speaking scenarios. Employing a qualitative action research method, the researcher recommends two communicative grammar activities on narrative tenses. To test the effectiveness of these teaching activities, the researcher exploits a test of grammar, an open-ended survey, student artifacts, and observational notes. Findings indicate positive learner perceptions of incorporating such activities in teaching narrative tenses. They also reveal significant improvement in learners' grammatical accuracy. Accordingly, the two contextualized communicative activities for written and oral production that foster narrative tenses are presented. The preparation and procedures for these activities are explained. Possible adaptations to context, level, modality, and assessment are discussed. In addition to bridging the gap between controlled grammar practice and authentic language use, the teaching activities proposed in the current study intend to promote contextualized grammar practice, creative learner engagement, productive skills integration, and storytelling skills. The study's originality lies in reporting the findings of teacher-led classroom practice and proposes two contextualized teaching activities for the communicative practice of narrative tenses, an under-researched area.

Keywords: communicative grammar; English grammar; narrative tenses; speaking; writing

1. Introduction

1.1. A Concise Glimpse into Grammar within the CEFR

The Common European Framework of Reference for Languages (CEFR), or commonly known as the CEFR (Council of Europe, 2001), is an internationally recognized reference tool for language proficiency. It provides a structured framework for learning, teaching, and assessing language skills across six levels, from A1-A2 (Basic User) and B1-B2 (Independent User) to C1-C2 (Proficient User). The CEFR highlights what learners can do in main (e.g., reading, writing, speaking, and listening) and sub-skills (e.g., vocabulary, pronunciation, and grammar), providing a comprehensive overview of language skills at each level to support global language education and assessment. In this regard, it serves as a guide for language learners, teachers, assessors, and researchers interested in descriptors of language skills, including grammar (as part of linguistic knowledge and competence) (Council of Europe, 2001, 2020).

Grammar refers to the knowledge of language users about linguistic units and rules (Fromkin et al., 2014). The CEFR defines it as "the set of principles governing the assembly of elements into meaningful labeled and bracketed strings (sentences)" (Council of Europe, 2001, p. 112-113). Along with vocabulary, grammar is a fundamental constituent of language proficiency (Bannò & Matassoni, 2024; Richards, 2015). Proficient language learners should, therefore, be equipped with grammatical knowledge and competence (Council of Europe, 2001). This means that proficiency in a language requires not only knowing and understanding the relevant grammatical rules and structures but also the ability to utilize them effectively in spoken and written interactions.

Grammatical knowledge, by and large, refers to the overall understanding of the rules,

Received: November 23, 2024

Accepted: December 1, 2024

Published: December 8, 2024



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structures, and forms in a specific language (Zheng et al., 2023). On the other hand, grammatical competence is “the ability to understand and express meaning by producing and recognizing well-formed phrases and sentences in accordance with these principles (as opposed to memorizing and reproducing them as fixed formulae)” (Council of Europe, p.113). It is central to communicative competence (Council of Europe, 2001) since language users utilize grammatical knowledge to establish meaningful interactions. The difference between the two can be likened to declarative and procedural knowledge (Salaberry, 2018). More precisely, the prior refers to the grammar knowledge language users have, while the latter concerns the same knowledge exercised in written or spoken performance.

In addition to grammatical knowledge and competence, it is crucial to maintain grammatical accuracy (Council of Europe, 2020). It refers to accurately using grammar rules, structures, and forms in speaking and writing (Van Moere, 2012). Grammatical accuracy (Figure 1) is operationalized into three groups: specific repertoire control (A1-B1), mistake prominence (B1-B2), and degree of control (B2-C2) (Council of Europe, 2020). However, grammatical accuracy decreases around the B1 level because of learners’ creative language

| Grammatical accuracy | |
|----------------------|--|
| C2 | Maintains consistent grammatical control of complex language, even while attention is otherwise engaged (e.g. in forward planning, in monitoring others' reactions). |
| C1 | Consistently maintains a high degree of grammatical accuracy; errors are rare and difficult to spot. |
| B2 | Good grammatical control; occasional "slips" or non-systematic errors and minor flaws in sentence structure may still occur, but they are rare and can often be corrected in retrospect. |
| | Shows a relatively high degree of grammatical control. Does not make mistakes which lead to misunderstanding. Has a good command of simple language structures and some complex grammatical forms, although they tend to use complex structures rigidly with some inaccuracy. |
| B1 | Communicates with reasonable accuracy in familiar contexts; generally good control, though with noticeable mother-tongue influence. Errors occur, but it is clear what they are trying to express. |
| | Uses reasonably accurately a repertoire of frequently used "routines" and patterns associated with more predictable situations. |
| A2 | Uses some simple structures correctly, but still systematically makes basic mistakes; nevertheless, it is usually clear what they are trying to say. |
| A1 | Shows only limited control of a few simple grammatical structures and sentence patterns in a learnt repertoire. |
| Pre-A1 | Can employ very simple principles of word/sign order in short statements. |

use.

Figure 1. CEFR’s illustrative scale descriptors for grammatical accuracy.
Source: Council of Europe, 2020.

Specific skills and competencies are expected of proficient language users, according to the CEFR (Council of Europe, 2001; 2020). For example, the general linguistic range of proficient language users covers “a broad range of complex grammatical structures appropriately and with considerable flexibility” (Council of Europe, 2020, p. 130), such as receptive linguistic knowledge for oral communicative ability (Loewen et al., 2020). Proficient language users are also “skilled at using contextual, grammatical and lexical cues to infer attitude, mood and intentions and anticipate what will come next” (Council of Europe, 2020, p. 60) in speaking and writing (Kim et al., 2022).

Additionally, the overall spoken interaction requires intermediate language users to “communicate spontaneously with good grammatical control without much sign of having to restrict what [they] want to say, adopting a level of formality appropriate to the circumstances” (Council of Europe, 2020, p.72). Equally, spoken fluency requires language users to “keep going comprehensibly, even though pausing for grammatical and lexical planning and repair is very evident, especially in longer stretches of free production” (Council of Europe, 2001, p.129). In addition, fluency is a key indicator of language proficiency (Peltonen, 2024).

Furthermore, language learners must “use their knowledge of contrasting grammatical structures and functional expressions of languages in their plurilingual repertoire in order to

support comprehension” (Council of Europe, 2020, p.126). Moreover, language users must correctly interpret perceived communication acts and their functions (Council of Europe, 2020). More specifically, proficient users can “distinguish between the use of body posture as a means of structuring the text (e.g., to separate arguments for and against) or as a grammatical device (e.g., for relative clauses)” (Council of Europe, 2020, p.48). Similarly, proficient language users are expected to exhibit great orthographic control, one of the components of linguistic competence that refers to “the ability to copy, spell, and use layout and punctuation” (Council of Europe, 2020, p. 136).

1.2. The Relationship of Grammar with Other Skills

Grammar is closely connected with other language skills and subskills. Understanding grammar is crucial for effective spoken communication (Carter & Mncarthy, 2006). Proficiency in grammar, for example, allows speakers to construct clear, cohesive, and grammatically accurate sentences (Larsen-Freeman, 2009). It also facilitates the logical organization of thoughts, essential for effectively expressing ideas (Afroogh, 2019). A substantial grammatical understanding may make speaking language clearer or easier (Al-wossabi, 2014).

A good grasp of grammar also enables people to understand spoken sentences accurately (Cai & Min, 2024). Understanding sentence structure helps grasp complex concepts and differentiate between tenses and sentence types, improving comprehension during conversations or lectures (Cardinale, 2022; Richards, 2008). Additionally, grammar is essential for interpreting reading texts (Jung, 2009). It further enables readers to grasp the connections between words and phrases (Kaschak & Glenberg, 2000), vital for comprehending sentences (Myhill et al., 2012). Similarly, misunderstandings can occur without a good grasp of grammar, especially in lengthy and intricate sentences (Al Shyiab et al., 2023).

The significance of grammar is perhaps most noticeable in writing (Myhill, 2018). Clear, grammatically sound writing allows the writer to convey ideas logically and persuasively (Andrews et al., 2006). It also contributes to the readability of the text, ensuring that the audience can follow the writer’s arguments without confusion (Lapworth, 2019). Understanding grammar is also essential for using words effectively (Munir, 2016). Grammar dictates how words are used in sentences, and knowing different grammatical categories such as nouns, verbs, and adjectives helps people select and organize words correctly within a language (Crovitz & Devereaux, 2016; San-Mateo-Valdehita & Chacón-García, 2019).

Pronunciation is another skill closely linked to grammar, especially in spoken language (Jones, 2018). Pronunciation, particularly intonation, affects how grammatical structures, such as tenses or sentence types (e.g., questions and statements), are perceived (Gras & Elvira-Garcia, 2021). Spelling is the correct arrangement of letters in written words, intimately related to grammar, particularly in written communication (Swanenberg, 2021; Tonicic, 2022). Poor spelling can alter grammatical meaning or create ambiguity (Altamimi & Ab Rashid, 2019).

In summary, grammar is not an isolated skill but a system that closely interacts with other skills, such as vocabulary, pronunciation, and spelling. Combined, they improve language proficiency, making communication intelligible and understanding more profound. Proficiency in these subskills and grammar are essential for written and spoken language fluency. These connections are meaningful in academic and professional environments, where accuracy in language is crucial.

1.3. Types of Grammar and Instruction

Linguists have differentiated between two types of grammar: descriptive and prescriptive. As the name suggests, descriptive grammar describes language users’ basic linguistic knowledge and explains what forms or structures can be considered grammatical or ungrammatical (Fromkin et al., 2014). Influenced by 18th and 19th-century grammarians, prescriptive grammar dictates how language learners must use grammar (Fromkin et al., 2014). Literature also harbors the distinction between functional and pedagogical grammar. The first highlights the utilization of language to accomplish communicative objectives and centers on the roles of language in various situations and how grammatical forms fulfill particular intentions (Keizer, 2015). The latter is a specialized grammar form explicitly created for teaching and learning and aims to simplify complex grammatical rules and structures for non-native speakers and learners at various proficiency levels (Hinkel, 2024; Larsen-Freeman, 2009).

Concerning the approaches to grammar teaching, the deductive approach focuses on teaching formal grammar through specific rules, whereby students learn grammatical rules

and then use them in language exercises (Benitez-Correa et al., 2019). On the other hand, the inductive approach emphasizes students’ discovery of grammatical rules through exposure to examples (Anani, 2017). Instead of directly teaching rules, learners deduce them by examining language patterns. Parallel to the distinction between inductive and deductive approaches, scholars have distinguished between implicit and explicit grammar instruction. Implicit grammar instruction involves acquiring grammar unconsciously through exposure to language in meaningful contexts, like reading, listening, or conversation (Nezakat-Alhossaini et al., 2014). On the other hand, explicit grammar instruction includes directly teaching grammatical rules and providing explanations, with the teacher clearly explaining grammar rules and structures, followed by targeted practice (Şahinkaya, 2024).

Understanding various grammar and teaching methods is crucial for effective language instruction. Whether using explicit rule-based teaching or implicit communicative approaches, grammar is essential for helping students build solid language skills. Teachers should choose the grammar type and teaching method that aligns with their students’ needs, objectives, and learning environments. Additionally, teaching grammar is essential for nurturing practical communication skills, improving cognitive functions, and fostering success in academic and professional settings because grammar forms the basis for clear, logical, and coherent expression in both written and oral communication (Myhill, 2018). Educators teaching grammar empower students to articulate their thoughts more effectively while promoting critical thinking and cultural awareness.

1.4. Narrative Tenses: Description and Significance

Verb tenses are fundamental grammatical forms for language use (Liamkina & Ryshina-Pankova, 2012). They indicate temporal information about the events in statements, typically categorized into present, past, and future (Cioffi, 2024). The four past tenses are also called narrative tenses (Table 1). Narrative tenses describe past events, tell stories, and even narrate personal anecdotes (Bardovi-Harlig, 1992, 1994; Berman & Slobin, 1994). The past simple tense is suitable for describing actions that occurred and concluded in the past, such as a sequence of events in an individual’s life (Muñoz, 2018). It is also commonly employed in narratives and conversations (Pretorius, 1994). The past progressive tense provides context and depicts a scene or situation that has been ongoing for some time (Stuart & van der Lely, 2015). The past simple and past continuous are commonly used together when one action is interrupted by another (Lenko-Szymńska, 2007). Ultimately, we use the past perfective progressive tense to portray an ongoing action occurring for an extended period (Fang, 2023).

Table 1. Narrative tenses in English.

| Tense | Form | Meaning and Use |
|------------------------|----------------------------------|---|
| Simple | (+) V2 | Happened at a particular point or over a period of time. |
| | (-) did not + V1 | Ex. The boy <i>hurried</i> to catch the last bus. |
| | (?) Did + S + V1 + (O)? | |
| Perfective | (+) had + V3 | Started in past, completed in past, prior to something else taking place. |
| | (-) had not + V3 | Ex. He <i>had seen</i> all the films of the Lord of the Rings trilogy. |
| | (?) Had + S + V3 + (O)? | |
| Progressive | (+) was/were + Ving | Past continuous action, brief or now ended. |
| | (-) was/were not + Ving | Ex. They <i>were sunbathing</i> when the shark was stranded. |
| | (?) Was/Were + S + Ving + (O)? | |
| Perfective progressive | (+) had been + Ving | Started in past, ends in past, prior to some other occurrence. |
| | (-) had not been + Ving | Ex. We <i>had been waiting</i> for the singer before she appeared on stage. |
| | (?) Had + S + been + Ving + (O)? | |

*The descriptions were adapted from Cioffi (2024, p.64). The sentences were formulated by the researcher.

Using narrative tenses, such as past simple, past continuous, and past perfect, assists learners in presenting a coherent timeline when telling a story and ensuring the accurate arrangement of events, which is beneficial for understanding the order of events,

simultaneous occurrences, and cause-and-effect relationships in narratives (Carter & McCarthy, 2006). In addition, using narrative tenses helps to create seamless shifts between different time frames in a story, enhancing overall coherence and readability (McCarthy & O’Keeffe, 2004). Understanding how to use narrative tenses also allows writers to create more complex and engaging stories effectively by manipulating time for dramatic impact, such as using flashbacks and foreshadowing (Thornbury, 2006). Native speakers often utilize different verb tenses when recounting stories, so mastering narrative tenses assists students in expressing themselves more fluently and genuinely in both speech and writing (Swan, 2005). Furthermore, understanding narrative tenses helps learners comprehend and analyze novels, short stories, and spoken anecdotes effectively, as they often involve shifting between past events and reflections (Ur, 2012). Encouraging learners to select the appropriate narrative tense further prompts them to consider the chronological relationships between events, leading to more deliberate language use (Jacobs, 2018).

However, research has indicated that narrative tenses could be problematic for EFL learners (Listia & Febrianti, 2020; Tilahun et al., 2022). From an emic perspective, the researcher has observed that these grammatical forms have also posed a problem for Turkish EFL learners. Given the discussion on the significance of grammar in general and narrative tenses in particular, the researcher evaluates the effectiveness of two communicative teaching activities to teach narrative tenses communicatively for written and oral communication by conducting classroom-based action research. Accordingly, the study addresses the following research questions:

1. Do the proposed teaching activities impact learners’ grammatical accuracy on narrative tenses?
2. How do learners perceive the proposed teaching activities?
3. How can narrative tenses be integrated into contextualized writing practice?
4. How can narrative tenses be integrated into contextualized speaking practice?

2. Materials and Methods

2.1. Research Design

Classroom-Based Action Research (CBAR) involves teachers conducting classroom research to tackle teaching and learning challenges (Cain, 2011). The goal is to enhance educational methods through a continuous cycle of planning, implementing, observing, and reflecting (Mertler & Hartley, 2017). Teachers pinpoint an issue, carry out a strategy, evaluate its impact, and adapt their approach based on the results (Mertler, 2021). Table 2 displays the six aspects of CBAR addressed in this study. Accordingly, the teacher (researcher) covered narrative tenses (focus) in his classroom. To practice in both productive skills (scope), the teacher conducted the two activities with his B1 (in CEFR) (audience) students. The teacher also reflected and acted before, during, and after these processes (cyclical nature). Post-activity reflections of students (outcome) implied positive feedback.

Table 2. The aspects of CBAR used in the study.

| Aspect | CBAR | Research Characteristics |
|-----------------|---|--|
| Focus | specific to classroom settings; aimed at improving teaching and learning | narrative tenses |
| Researcher | typically the classroom teacher who directly interacts with students | teacher as a researcher |
| Scope | narrow, often focusing on a single classroom or specific pedagogical strategy | communicative teaching activities for writing and speaking |
| Audience | primarily intended for immediate use by the teacher and possibly colleagues | English language learners in general, Turkish EFL learners in particular |
| Cyclical nature | emphasis on iterative cycles of reflection and action | Teacher plans, acts, observes, and reflects |
| Outcome | focus on immediate, practical improvement in teaching strategies | Improved use of narrative tenses in a communicative task |

2.2. Context and Participants

The study was conducted with 25 (17 females, eight males) Turkish EFL learners at B1 (in CEFR) level, aged 18 on average, studying in a preparatory school at a prominent state university in Ankara, Türkiye. The students were all non-native speakers of English. They took a proficiency test (B2 level) at the beginning of the academic year (2024-2025 Fall) but failed. They then took the placement test and were placed in a B1 class. They received 24 hours of general English at the B1 level. The class was shared by two lecturers (one of whom is the researcher). The primary course materials were MacMillan’s Skillful Third Edition Level 2 Reading & Writing (Rogers et al., 2023a) and Skillful 2 Listening & Speaking (Rogers et al., 2023b). Figure 2 shows the daily course schedule when the grammar point (e.g., narrative tenses) was covered. Teaching the target grammar structure took three sessions (80 + 50 min.). Conversely, the practice occurred the following week when the program was more convenient for in-class practice.

| THURSDAY | | |
|--|-------------------------|--|
| 1 st and 2 nd Sessions (Block) | 09:00 – 10:20 (80 mins) | SP QUIZ 2 – Skit Project Announcement GRAMMAR PACK (Simple Past & Past Cont. Tense) |
| 3 rd Session | 10:30 – 11:20 (50 mins) | RW 2 • Grammar (p.79-80) LS 2 • Grammar (p.79) |
| 4 th and 5 th Sessions (Block) | 11:30 – 12:50 (80 mins) | LS 2 • Speaking Model (p.78) • Speaking Skill (p.80) • Speaking Task (p.82) (Excluded) In-class Activity Folder – Speaking Task |

Figure 2. The daily course schedule (adapted from the PMD unit of the teacher’s institution).

The narrative tenses were taught within the designated sessions (Figure 2). The teacher followed the materials provided by the institution’s materials and program unit. More precisely, the teaching materials comprised a grammar pack with three parts (simple past/past continuous tense, exercises for self-study, and communicative activities). However, the teacher only used the first part. This document includes grammar instruction through reading text and follow-up comprehension questions, gap-fill exercises, and tabulated grammar rules.

2.3. Procedures for Data Collection

Before data collection, all students gave informed consent to participate in the study. Students were assured that their participation or non-participation would not affect their grades, and all responses were anonymized to protect their identities. The researcher exploited various tools for data collection, including student artifacts (writing samples), observational notes, pre-/post-activity grammar tests, and student feedback through an open-ended survey. Diary entries (i.e., sample writings) were collected at the end of the activity. These were analyzed for grammatical accuracy.

During the activity, the teacher kept detailed observational notes on students’ engagement, participation in peer review, and overall responsiveness to the activity. A short test of grammar (ToG, $\alpha=.70$) (a cloze test with multiple options) comprising 20 questions about past simple and past continuous tenses was adapted from Pearson’s MyGrammarLab Intermediate B1/B2 (Foley & Hall, 2012). The test was administered before and after the activity to measure improvements in students’ grammatical accuracy. After completing the activity, students completed a brief open-ended questionnaire to share their reflections.

2.4. Procedures for Data Analysis

The qualitative analysis (Selvi, 2020) was administered to student artifacts, observational notes, and the open-ended survey through MAXQDA 24 software. The diary entries were analyzed to apply past simple and past continuous tenses correctly. A coding system was used to identify recurring errors or patterns in tense usage, and student feedback was categorized into emerging themes (Braun & Clarke, 2021). Pre- and post-activity test scores were analyzed quantitatively using descriptive and inferential statistics through the IBM SPSS Statistics 25 program to evaluate improvement in grammar accuracy.

3. Results

3.1. Grammatical Accuracy

Since the participants' ToG scores were normally distributed (Kolmogorov-Smirnov, $df=25$, $p=.141$), a Paired-Samples T-test was administered to evaluate the impact of the communicative writing activity (i.e., Time Travel Diaries) on students' ToG scores. There was a statistically significant increase from Time 1 ($M=18.28$, $SD=.891$) to Time 2 ($M=12.96$, $SD=1.719$), $t(24) = 20.24$, $p < .001$ (two-tailed). The mean increase in ToG scores was 5.32, with a 95% confidence interval ranging from 4.77 to 5.86. The eta squared statistic (.88) indicated a large effect size.

The student artifacts (i.e., writing samples) were also analyzed for grammatical accuracy. The correct and incorrect answers for past simple and past continuous tense were calculated and presented in percentage in Table 3. The participants used target grammar forms an average of 13 times. Their use of narrative tenses was 83% accurate on average, concurring with the ToG scores.

Table 3. Descriptive statistics for students' writing samples.

| Participant ID | Total Use (f) | Correct Use (f) | Incorrect Use (f) | Correct Use (%) | Incorrect Use (%) |
|----------------|---------------|-----------------|-------------------|-----------------|-------------------|
| 1 | 12 | 10 | 2 | 83 | 17 |
| 2 | 14 | 12 | 2 | 86 | 14 |
| 3 | 11 | 9 | 2 | 82 | 18 |
| 4 | 15 | 13 | 2 | 87 | 13 |
| 5 | 10 | 8 | 2 | 80 | 20 |
| 6 | 13 | 11 | 2 | 85 | 15 |
| 7 | 16 | 14 | 2 | 88 | 13 |
| 8 | 10 | 9 | 1 | 90 | 10 |
| 9 | 17 | 15 | 2 | 88 | 12 |
| 10 | 14 | 11 | 3 | 79 | 21 |
| 11 | 12 | 10 | 2 | 83 | 17 |
| 12 | 13 | 12 | 1 | 92 | 8 |
| 13 | 11 | 8 | 3 | 73 | 27 |
| 14 | 10 | 8 | 2 | 80 | 20 |
| 15 | 15 | 13 | 2 | 87 | 13 |
| 16 | 12 | 9 | 3 | 75 | 25 |
| 17 | 14 | 11 | 3 | 79 | 21 |
| 18 | 13 | 10 | 3 | 77 | 23 |
| 19 | 10 | 9 | 1 | 90 | 10 |
| 20 | 12 | 11 | 1 | 92 | 8 |
| 21 | 14 | 12 | 2 | 86 | 14 |
| 22 | 15 | 12 | 3 | 80 | 20 |
| 23 | 11 | 9 | 2 | 82 | 18 |
| 24 | 16 | 13 | 3 | 81 | 19 |
| 25 | 12 | 10 | 2 | 83 | 17 |
| M | 13 | 11 | 2 | 83 | 17 |

3.2. Learners' Perceptions

An open-ended survey collected the students' reflections after both communicative grammar activities. The transcripts were transferred to MAXQDA 24 for qualitative content analysis. The analysis revealed five themes: creativity/originality, enjoyment/instructiveness, grammar support, disorganization, and relative impact. The participants collectively expressed the creativity and originality of both activities (i.e., Time Travel Diaries and The Alibi Game: Murder Mystery). They also added that they had fun while practicing and that both activities were instructive. The participants further reported improvement in their grammar use after these teaching activities. However, some noted that the speaking activity was chaotic/disorganized. Some others also mentioned that the speaking activity relatively contributed to their use of target grammar forms. Sample excerpts are presented in Table 4.

Table 4. Sample FGI excerpts regarding participants' reflections.

| Creativity/Originality |
|--|
| <ul style="list-style-type: none"> • <i>Writing was also a very creative idea. It was quite interesting. I was sleepy for the first hour. When I did the activity, it opened up. I liked it very much (P11)</i> • <i>It was very creative to write a text by making ourselves feel like we were in the past (P12)</i> • <i>...but I was happy that the writing exercise was in a storytelling format. The options and flexibility offered were also quite enough in terms of creativity (P15)</i> • <i>I think the activity of going back in time was creative (P16)</i> • <i>Besides that, solving mysteries is a very original and fun idea (P20)</i> • <i>I had a lot of fun because we used our own creativity (P22)</i> |
| Enjoyment/Instructiveness |
| <ul style="list-style-type: none"> • <i>I wish every day could be like this, having fun and learning (P1)</i> • <i>I think writing is instructive and practical (P4)</i> • <i>The activities we usually do in groups in class are great for us to talk more and not get bored. Yesterday was a lot of fun (P5)</i> • <i>I think the writing activity was enjoyable and instructive (P6)</i> • <i>Acting game was a very fun game. We look forward to more (P8)</i> • <i>We chose a detective as a group. The rest of the people acted as suspects, and one of us was the thief, but no one knew who the criminal was. So it was very fun (P9)</i> • <i>The plots were also interesting so I had fun while learning. As for the murder mystery activity, it was fun and we all had a good laugh (P10)</i> • <i>Also, the activity of finding the culprit was very fun (P12)</i> • <i>Writing was fun, but maybe it would have been more fun if we wrote in pairs or with you. I think speaking was a fun and useful activity (P14)</i> |
| Grammar Support |
| <ul style="list-style-type: none"> • <i>Writing about journey past periods really helped as to revise past continuous and past simple (P8)</i> • <i>I really liked writing a story using simple past & past continuous. It helped me better understand where I need to use them (P10)</i> • <i>The activities we did with the past tense were very developmental (P12)</i> • <i>I think the writing activity was good for grammar (P13)</i> • <i>At the same time, since we were writing about the past, I practiced using the tenses we learned (P16)</i> • <i>I think both activities were good. It helped us a lot to reinforce what we have learned (P21)</i> |
| Disorganization |
| <ul style="list-style-type: none"> • <i>The only problem was that playing the killer game was a bit chaotic (P7)</i> • <i>Since it is in the hands of these student groups, there is also an aspect that can be suitable for "gabbing and slacking" so to speak (P15)</i> • <i>Secondly, I think the murder mystery was very fun but disorganized. The innocents (suspects) knew who the murderer was and the plot was hard to make (P19)</i> |
| Relative Impact |
| <ul style="list-style-type: none"> • <i>Speaking has little contribution to grammar. It is much more effective to practice on paper (P4)</i> • <i>I do not have much to say about it, to be honest. It is useful if done properly. If it is short, as our group did, I think it is useless (P15)</i> • <i>Only I could not use the tenses much in speaking, but I enjoyed both activities very much (P16)</i> |

Overall, the students reported their satisfaction with both activities. They said it was very creative to use the target grammar forms in a storytelling format and mystery murder. In addition to their enjoyment, the participants also mentioned the perceived contribution of these activities to their grammar knowledge and development. However, a few students expressed negative remarks about the speaking activity, which could seem chaotic if not handled well, and minimally encouraged grammar use.

3.3. Integrating Narrative Tenses into Contextualized Writing Practice

Following the positive learner perceptions of Time Travel Diaries, teachers interested in implementing it in their classrooms might follow the subsequent steps. One week after teaching the narrative tenses, the teacher must explain the concept of Time Travel Diaries (Appendix A) on the activity day. In the meantime, the teacher must have blank diary pages ready or ask students to use their notebooks. This activity asks students to imagine they are time travelers who go back to a specific day in the past (e.g., the Renaissance, the 1500s in Florence). Since each student might be considered a unique writer with imaginative power, this activity had better be implemented individually.

The teacher tells students they will write diary entries using the target narrative tenses to describe what they did and what was happening then. The teacher explains that practicing both tenses using creative writing is the objective. After the students are familiar with the concept, the teacher gives them a list of historical prompts generated by a generative artificial intelligence (GenAI) tool like ChatGPT. The teacher then asks students to select one and encourages them to brainstorm ideas about the period. Later, the teacher shows a short example of a diary entry (Table 5) on the board. After that, they analyze the sentences and how tenses are used altogether.

Table 5. A short example of a diary entry.

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- ▶ **Prompt:** You are visiting the Colosseum during a gladiator fight. Describe what you saw and what was happening around you.
 - ▶ **Example:** I watched as the gladiators fought bravely. While I was sitting in the crowd, people were cheering loudly.
-

Once the procedures for task performance are explained, the teacher hands out blank diary pages and asks the students to write their entries, imagining they had traveled back in time using their selected prompts. The students are also encouraged to use both tenses accurately while describing the events. After finishing the task, the teacher asks students to share their diaries by reading them aloud. They then reflect on their stories and how they have incorporated both tenses.

Possible adaptations are available for this activity. Teachers might require higher levels (B2 and above) to have higher word counts or incorporate more complex grammatical structures (e.g., past perfect tense and past perfect progressive tense). On the other hand, teachers might provide lower-level students with more structured sentence starters, shorten the length of diary entries, and ask them to focus on only past simple tense by gradually introducing past progressive tense. Teachers might conduct this as a collaborative writing activity in case of time constraints, asking students to work in pairs or small groups. Technology can also be integrated into this activity by using online platforms (e.g., StoryboardThat) or digital notebooks (e.g., Kami), where students turn their artifacts into digital stories using images, audio, and music.

3.4. Integrating Narrative Tenses into Contextualized Speaking Practice

The “Alibi Game: Murder Mystery” (Appendix B) is another teaching activity that teachers might use to help students practice the target narrative tenses meaningfully and contextualized through spoken interaction. In this game, one student plays the detective while the others act as suspects. The suspects must create an alibi using the past continuous (e.g., “I was watching TV when the crime happened”). The detective asks detailed questions, and suspects must respond using past tenses. The objective is to encourage spontaneous use of both tenses while creating consistent alibis. After explaining the game, the teacher might exploit GenAI tools like ChatGPT to create crime stories (see an example in Table 6), ranging from a stolen object to a more dramatic murder mystery.

Table 6. An example of a crime scenario

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- ▶ **Crime:** A priceless painting was stolen from the city’s art museum during a special exhibition.
 - ▶ **Details:** The robbery took place between 7:00 and 7:30 PM on Friday. The museum was closed to the public at that time, but there were a few people still inside for cleaning and preparation work.
 - ▶ **Possible Suspects:**
 - A museum curator
 - A janitor
 - A security guard
 - A visitor with special permission to view the painting
 - An art critic who left early
-

The teacher then provides the suspects with background information about their characters (e.g., occupations, personalities), which they might use when creating their alibis. The students are later told to form groups of four or five (which may vary by the number of suspects or equal distribution of students in the class) and choose one student to be the detective and the remaining group members to be the suspects in the crime. The suspects are reminded to come up with an alibi for what they were doing at the time of the crime (using past continuous) and any other significant events during that period (using past simple), for example, “I was cooking dinner (past continuous) when I heard a loud noise (past simple).” The detective’s job is to ask detailed follow-up questions to uncover inconsistencies or contradictions in the alibis. Some example questions are presented in Table 7. The suspects are told to continue answering in a way that maintains their alibi.

Table 7. Example questions for the detective.

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- What were you doing exactly at 8:00 PM? (past continuous)
 - Did you see anyone suspicious while you were walking your dog? (past simple)
 - How long were you watching TV? (past continuous)
 - When did you leave your house? (past simple)
 - Were you alone, or was someone with you?
-

The detective must listen carefully for any inconsistencies between the suspects’ statements for suspects’ consistency checks. Suspects must also listen to each other’s alibis. If one suspect contradicts another, the detective might suspect a false alibi (e.g., *Suspect A claims to have seen Suspect B at a restaurant, but Suspect B says they were at home at the time*). After interrogating all the suspects, the detectives decide who they think is lying based on contradictions or vague details in their alibis. The suspect with the most inconsistent or suspicious alibi is “arrested.”

Like the communicative grammar practice for writing, the speaking activity that blends practicing narrative tenses might also be adapted to various learners and contexts. For larger classes, teachers might split the class into smaller groups with multiple detectives, ensuring that everyone can participate in both asking and answering questions. Weaker students might be provided with a list of possible alibis or example sentences that students can refer to during the activity. On the other hand, teachers might add a twist where the detective can make surprise accusations based on inconsistencies, encouraging suspects to stay sharp and flexible in their language use for more proficient students. Students who struggle with fluency might be asked to write their alibis before sharing them with the class.

4. Discussion

Using grammar communicatively in writing and speaking has been a central concern for many non-native speakers of English, including Turkish EFL students (Boylu et al., 2022; Gümüş, 2021; Nassaji & Fotos, 2011). As a teacher-researcher who shares this concern in his teaching experience, the researcher has felt the need to conduct action research, where he has evaluated the effectiveness of two treatments: Time Travel Diaries for written interaction and The Alibi Game: Murder Mystery for spoken interaction. Employing various data collection tools, this study addressed four research questions.

The first research question intended to reveal whether there was a difference in students’ grammatical accuracy before and after the Time Travel Diaries. The ToG results indicated a considerable improvement in grammatical accuracy among Turkish EFL students. Likewise, the analysis of students’ diaries revealed an 83% grammatical accuracy, with an average of target grammatical forms occurring 13 times. Previous studies that explored grammar instruction through games or other teaching activities yielded similar findings. For example, Koksall et al. (2014) reported the effectiveness of grammar learning with games.

Similarly, Kufi (2023) found that grammar instruction could be scaffolded using communicative activities, resulting in more successful learner outputs. In another study, *Yildiz and Senel (2017)* indicated a rise in students’ grammar knowledge through task-based language learning activities. Equally, Başar (2020) demonstrated that language teachers are inclined to teach grammar communicatively, which might facilitate the adoption of the Time Travel Diaries. Positive learner and teacher perceptions of using communicative activities (Kaçar & Enginarlar, 2023) might further contribute to implementing such teaching activities for

teaching grammar.

The second research question addressed in the study sought to reveal learners' perceptions of the teaching activities used. Findings indicated that the communicative grammar activities were creative, original, engaging, instructive, and supportive. Earlier work also concurred with our findings (Bae, 2008; Bancolé-Minaflinou, 2018; Javadi & Tajik, 2019). However, some participants pointed to the potential chaos or disorganization that the communicative speaking activity might cause, concurring with previous studies (Floriasti & Permatasari, 2019; Puteri & Asfihana, 2024). Teachers might try smaller groups or conduct frequent inspections to mitigate the possible cases of noise or disorder. Some other participants reported no potential use of target grammar structures in the speaking activity, disagreeing with previous work (Setyowati, 2020; Tiana et al., 2023). This finding points to individual perceptions limited to the three participants in our study.

Concerning the third research question, positive learner feedback showed that Time Travel Diaries effectively engaged students with narrative tenses by combining creative writing with purposeful grammar practice, and imagining themselves as time travelers motivated them to apply grammar in meaningful contexts. Previous work showed that incorporating creative writing contributed to textual understanding and grammar improvement (Paesani et al., 2016). It was also demonstrated that practicing grammar in meaningful contexts motivated students (Nassaji & Fotos, 2011; Rifesser & Hazell, 2023), thus coinciding with our findings. The communicative writing activity's individualization and incorporation of past simple and past progressive tenses might promote a more natural use of language (Cioffi, 2024), making grammar practice more enjoyable (Crossley et al., 2016; Roscoe & McNamara, 2013). Digital tools such as StoryboardThat boost engagement by facilitating various forms of expression (Raslee, 2021; Read, 2022).

Regarding the fourth research question, "The Alibi Game: Mystery Murder" encouraged students to employ the past continuous and past simple tenses in authentic and spontaneous conversations, which supports research that favors teaching grammar in context (Ellis, 2009). The activity's collaborative aspect promoted strong engagement, allowing students to practice grammar while also working together to solve problems. Research indicated that interactive tasks enhanced language processing more profoundly (El Majidi et al., 2021; Zalbidea & Toth, 2024). Additionally, the competitive nature of spotting discrepancies in alibis might encourage students to engage in active and critical listening, enhancing their listening skills and capacity to formulate coherent answers (Parks et al., 2024; Worthington & Fitch-Hauser, 2018). Moreover, using GenAI tools, such as ChatGPT, to create crime stories introduces a digital aspect, allowing educators to design personalized and varied scenarios for different groups (Kim et al., 2022). AI use in language education has proven to enrich the linguistic environment for learners and offer a broader range of input (Huang et al., 2024; Zhai & Wibowo, 2023).

Overall, the findings highlighted the success of employing communicative activities such as Time Travel Diaries and The Alibi Game: Mystery Murder to enhance the grammatical accuracy of Turkish EFL students in both writing and speaking. These activities fostered meaningful and contextual language use, engaging students creatively while encouraging them to use target tenses spontaneously. Although there were perceived challenges like classroom management and inconsistent grammar usage during speaking, the positive feedback from students underscored the benefits of interactive grammar practice. Moreover, incorporating digital tools like AI further enriched the learning experience by providing customized, dynamic scenarios that effectively aid students' language development.

5. Conclusions

This article explored the impact of communicative grammar activities, specifically Time Travel Diaries and The Alibi Game: Murder Mystery, on Turkish EFL students' grammatical accuracy and engagement. The study's findings suggest that contextualized, interactive activities significantly improve both written and spoken grammar skills by fostering active participation and meaningful use of target structures. While most students found the activities engaging and effective, some challenges related to classroom dynamics and individual perceptions of grammar use in speaking tasks were identified. Integrating digital tools, including AI-generated scenarios, further enhanced the learning experience by providing diverse, adaptable content. Overall, this research underscores the value of combining creative, communicative activities with technology to make grammar instruction and practice more effective and enjoyable in EFL contexts.

However, the research also recognizes some limitations. First, this study employed a classroom-based action research design, hence the inability to generalize the findings. Thus, prospective researchers are recommended to exploit various research designs for generalizable outcomes. Second, the study reflected the perceptions of Turkish EFL students, which could vary with different EFL learners in other educational contexts. More research is therefore needed to corroborate the current study's findings. Third, the current research focused on communicative grammar practice, more precisely, two narrative tenses. Future research could include other narrative tenses with more advanced language learners. In addition, prospective researchers might explore the impact of the proposed teaching activities on psychological aspects like motivation and engagement.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The author declares no conflict of interest

Appendix A

Possible Scenarios for the “Time Travel Diaries” Activity

Description: Students imagine they are time travellers who went back to a specific day in the past (e.g., ancient Rome or the 1960s). They write diary entries using both past simple and past continuous to describe what they did and what was happening at the time.

Materials: Blank “diary” pages or notebooks

Model Scenario: Ancient Rome (around 50 AD)

Prompt: You are visiting the Colosseum during a gladiator fight. Describe what you saw and what was happening around you.

Example: I watched as the gladiators fought bravely. While I was sitting in the crowd, people were cheering loudly.

Objectives:

- to develop students’ ability to use past simple and past continuous tenses correctly.
- to enhance creative writing and storytelling skills.
- to encourage engagement through imaginative contexts.
- to practice combining narrative writing with grammar usage.

Learning Outcomes:

- By the end of the activity, students will be able to:
- accurately use the past simple tense to describe completed actions.
- correctly use the past continuous tense to describe ongoing actions in the past.
- create short, coherent diary entries blending both tenses.
- expand vocabulary and sentence structure knowledge in a creative context.

Target Audience:

Level: B1 (intermediate) students (based on CEFR).

Age group: Preparatory school students

Class Size: Medium to large class (15-30 students).

Prerequisites: Students should already be familiar with the basic forms and uses of the past simple and past continuous tenses

| Time | Prompt | Example |
|--------------------------------------|--|--|
| The Renaissance (Florence, 1500s) | You met Leonardo da Vinci while he was painting the Mona Lisa. Describe your conversation and what else was happening in his studio. | <i>I asked Leonardo about his painting techniques. While he was explaining, his assistant was preparing the paints.</i> |
| The 1960s (New York City) | You attended a famous music concert in Central Park. Describe what the atmosphere was like and what events took place. | <i>I danced to the music while the band was playing their biggest hits. People around me were singing along and waving their hands.</i> |
| The Wild West (1800s America) | You visited a small Western town during a showdown between two cowboys. Describe what you did and | <i>I stood by the saloon and watched as the cowboys drew their guns. Dust was blowing across the street while people were hiding behind barrels.</i> |

| | | |
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| | what the town looked like. | |
| Ancient Egypt (Time of the Pharaohs) | You saw the Great Pyramid being built. Describe the construction process and what you observed during your visit. | <i>I walked along the edge of the site and watched as workers were carrying huge blocks of stone. The sun was setting, and the air was filled with dust.</i> |
| World War II (London, 1940s) | You experienced an air raid during the Blitz in London. Describe what you were doing when it started and what happened afterward. | <i>I was walking down the street when the sirens started blaring. People were running to the shelters while I was looking for a safe place to hide.</i> |
| The Medieval Period (A Castle in 1300s Europe) | You attended a royal banquet in a medieval castle. Describe the feast and the activities going on during the event. | <i>I was eating roasted chicken when the musicians started playing. The knights were discussing their next battle while the king was giving orders.</i> |
| The First Moon Landing (1969) | You travelled to the moon with the Apollo 11 crew. Describe what it was like being on the moon and what the astronauts were doing. | <i>I stood on the moon's surface, feeling weightless. Neil Armstrong was taking his first steps while the other astronauts were collecting rocks.</i> |

*The possible scenarios, their prompts, and examples were generated using OpenAI's ChatGPT.

Appendix B

Possible Scenarios for the “Murder Alibi” Activity

Description: One student is a detective, and the others are suspects in a crime. The suspects must create an alibi using the past continuous (e.g., “I was watching TV when the crime happened”). The detective asks detailed questions, and suspects have to respond using both past tenses.

Model Scenario:

Title: The Museum Heist

Crime: A priceless painting was stolen from the city's art museum during a special exhibition.

Details: The robbery took place between 7:00 and 7:30 PM on Friday. The museum was closed to the public at that time, but there were a few people still inside for cleaning and preparation work.

Possible Suspects: a museum curator, a janitor, a security guard, a visitor with special permission to view the painting, an art critic who left early

Materials:

- a fictional crime scenario (e.g., a stolen painting, a murder mystery, or a robbery)
- a brief description of the crime scene (including the time and place the crime took place)
- **Optional:** props or role-playing costumes to add to the atmosphere

Objective:

- to practice the past simple and past continuous tenses in a spontaneous and interactive context
- to use both tenses accurately while constructing consistent alibis for a fictional crime.
- to encourage creativity, critical thinking, and peer interaction in a dynamic setting

Learning Outcomes:

By the end of the activity, students will be able to:

- practice using the past simple and past continuous in a meaningful and spontaneous context, with a focus on accuracy and fluency
- improve their ability to ask and respond to questions in real-time while maintaining grammatical accuracy
- to think on their feet, construct coherent stories, and pay attention to detail

Target Audience:

- **Level:** B1 (intermediate) students (based on CEFR).
- **Age group:** Preparatory school students
- **Class Size:** Medium to large class (15-30 students).
- **Prerequisites:** Students should already be familiar with the basic forms and uses of the past simple and past continuous tenses

Steps for Implementation:

1. Setting the scene
2. Assigning roles
3. Alibi creation
4. Interrogation
5. Cross-examination

6. Conclusion

| Title | Crime | Details | Possible Suspects |
|-----------------------------|---|---|---|
| The Jewellery Store Robbery | A diamond necklace was stolen from a high-end jewellery store downtown during broad daylight. | The crime occurred at 2:15 PM on Wednesday. The store was crowded with shoppers, but security cameras mysteriously malfunctioned for 10 minutes during the robbery. | <ul style="list-style-type: none"> • A regular customer who frequently visits • The store manager • An employee who was on their lunch break • A window cleaner working outside the shop • A delivery person dropping off packages |
| The Party Poisoning | A wealthy businessperson fell ill at a high-profile charity dinner and was later found to have been poisoned. | The poisoning occurred between 9:30 and 10:00 PM, after dessert had been served. There were several toasts, and many guests moved around the room during that time. | <ul style="list-style-type: none"> • A rival businessperson who was also at the party • The host of the dinner • A caterer who prepared the food • A close friend who stayed by the victim's side • A waiter serving drinks |
| The Park Vandalism | A famous statue in the city park was vandalized overnight, with graffiti sprayed all over it. | The vandalism took place between 1:00 and 3:00 AM, according to a witness who heard noise but didn't see anyone. There are no security cameras in the park. | <ul style="list-style-type: none"> • A nearby resident who often complains about park noise • A street artist who was seen earlier in the day near the statue • A night jogger who runs through the park every evening • A park ranger who patrols the area late at night • A local teenager known for pranks |
| The Café Burglary | A popular café was broken into, and the cash register was emptied overnight. | The burglary happened sometime between 12:00 and 5:00 AM. The back door was found unlocked, though the security alarm did not go off. | <ul style="list-style-type: none"> • A café employee who closed up late the night before • The delivery person who arrives early in the morning • A neighbour who often stops by the café in the morning • A local food blogger who featured the café recently • The café owner who needed money for a large payment |
| The Library Book Theft | A rare, first-edition book was stolen from the library's special collections room. | The theft occurred between 4:00 and 4:30 PM on Tuesday. The library was open, but access to the special collections room is | <ul style="list-style-type: none"> • A library volunteer • A visiting scholar who came to research rare books • A librarian working |

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| | | restricted to certain members. No alarms were triggered. | <p>in the special collections area</p> <ul style="list-style-type: none"> • A student doing research for a paper • A courier who delivered some packages earlier that day |
| The Office Scandal | A confidential document went missing from the CEO's office at a major corporation. | The document was last seen on the CEO's desk around 6:00 PM. By the next morning, it had vanished. The office was locked, but several people had access to the keys. | <ul style="list-style-type: none"> • The CEO's assistant • A rival executive • The cleaning staff • An IT technician who was fixing the office computer • A courier who delivered documents that evening |
| The Sports Equipment Sabotage | Someone tampered with the equipment at a major sports event, causing a high-profile team to lose. | The sabotage took place just before the game started at 7:00 PM. Several people had access to the locker room where the equipment was stored. | <ul style="list-style-type: none"> • A rival team member • A coach who had an argument with the team • The equipment manager • A sports journalist covering the event • A fan who had special backstage access |
| The Theatre Costume Theft | A lead actor's costume was stolen just before the opening night of a major play. | The theft happened between 5:00 and 6:00 PM on the day of the performance. The costume was in a locked dressing room, but someone must have gotten in without being noticed. | <ul style="list-style-type: none"> • A jealous understudy • The costume designer • A stagehand who had access to the dressing rooms • The director who was stressed about the production • A rival actor who didn't get the lead role |
| The Concert Instrument Theft | A valuable instrument was stolen from backstage during a major concert. | The theft occurred during the concert intermission, between 8:00 and 8:30 PM. Only a few people were allowed backstage during that time, but someone took the instrument unnoticed. | <ul style="list-style-type: none"> • A fellow musician • A sound technician who was adjusting equipment • The concert hall manager • A stage manager responsible for overseeing the event • A fan with backstage access |

*The possible scenarios, their prompts, and examples were generated using OpenAI's ChatGPT

References

- Afroogh, S. (2019). Contextual reason and rationality (Unpublished Master's thesis). Texas A&M University, USA. <https://hdl.handle.net/1969.1/186349>
- Al Shyab, M. M., Wan Sulong, M. W., Abdul Jabar, A. M., & Mohd Kasim, M. Z. (2023). The role of syntax in the translation of compound-complex sentences between Arabic and English. *International Journal of Academic Research in Business and Social Sciences*, 13(5), 1113-1129. <http://dx.doi.org/10.6007/IJARBS/v13-i5/16877>

- Altamimi, D., & Ab Rashid, R. (2019). Spelling problems and causes among Saudi English language undergraduates. *Arab World English Journal*, 10(3), 178-191. <https://dx.doi.org/10.24093/awej/vol10no3.12>
- Al-wossabi, S. A. (2014). Spoken grammar: An urgent necessity in the EFL context. *English language teaching*, 7(6), 19-26. <https://doi.org/10.5539/elt.v7n6p19>
- Anani, G. E. (2017). Teaching and learning of grammar at the basic level of education: revisiting inductive teaching approach. *Education Journal*, 6(1), 51-62. <https://doi.org/10.11648/j.edu.20170601.17>
- Andrews, R., Torgerson, C., Beverton, S., Freeman, A., Locke, T., Low, G., ... & Zhu, D. (2006). The effect of grammar teaching on writing development. *British Educational Research Journal*, 32(1), 39-55. <https://doi.org/10.1080/01411920500401997>
- Bae, J. O. (2008). Integrating grammar teaching into a syllabus comprising communicative activities with both fluency and accuracy emphasized. *언어과학연구 (Journal of Language Science)*, 46, 101-125. <https://www.kci.go.kr/kciportal/po/search/poTotalSearchList.kci>
- Bancolé-Minaflinou, E. (2018). Exploring the teaching of communicative grammar in EFL classes in Benin to promote language Use in CBA context. *World Journal of Education*, 8(6), 58-73. <https://doi.org/10.5430/wje.v8n6p58>
- Bannò, S., & Matassoni, M. (2024). Back to grammar: Using grammatical error correction to automatically assess L2 speaking proficiency. *Speech Communication*, 157. <https://doi.org/10.1016/j.specom.2023.103025>
- Bardovi-Harlig, K. (1992). The telling of a tale: Discourse structure and tense use in learners' narratives. *Pragmatics and Language Learning*, 3, 144-161.
- Bardovi-Harlig, K. (1994). Anecdote or evidence? Evaluating support for hypotheses concerning the development of tense and aspect. In E. Tarone, S. M. Gass, & A. D. Cohen (Eds.), *Research methodology in second language acquisition* (pp. 41–60). Erlbaum.
- Başar, S. (2020). Teacher cognition in grammar teaching: A case study in a Turkish EFL context. *International Journal of Modern Education Studies*, 4(2), 57-80. <http://dx.doi.org/10.51383/ijonmes.2020.51>
- Benitez-Correa, C., Gonzalez-Torres, P., & Vargas-Saritama, A. (2019). A comparison between deductive and inductive approaches for teaching EFL grammar to high school students. *International Journal of Instruction*, 12(1), 225-236. <https://doi.org/10.29333/iji.2019.12115a>
- Berman, R. A., & Slobin, D. I. (1994). *Different ways of relating events in narrative: A cross-linguistic developmental analysis*. Erlbaum.
- Boylu, E., Ustabilut, M. Y., & İnal, E. (2022). Grammar-learning beliefs of students who learn Turkish as a foreign language. *International Journal of Psychology and Educational Studies*, 9(1), 32-50. <https://dergipark.org.tr/en/download/article-file/2230067>
- Braun, V., & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis?. *Qualitative Research in Psychology*, 18(3), 328-352. <https://doi.org/10.1080/14780887.2020.1769238>
- Cai, H., & Min, S. (2024). Listening and grammatical knowledge. In E. Wagner, A. O. Batty & E. Galaczi (Eds.), *The Routledge handbook of second language acquisition and listening* (pp. 161-173). Routledge.
- Cain, T. (2011). Teachers' classroom-based action research. *International Journal of Research & Method in Education*, 34(1), 3-16. <https://doi.org/10.1080/1743727X.2011.552307>
- Cardinale, V. (2022). Comprehending comprehension: The key role of expectancy grammar in second language education (Unpublished Master's thesis). Università Ca' Foscari Venezia, Italy. <http://hdl.handle.net/10579/22273>
- Carter, R., & McCarthy, M. (2006). *Cambridge grammar of English: A comprehensive guide*. Cambridge University Press.
- Cioffi, F. L. (2024). *Stellar English: A down-to-earth guide to grammar and style*. Princeton University Press.
- Council of Europe (2020). *Common European framework of reference for languages: Learning, teaching, assessment*. Companion Volume. Council of Europe.
- Council of Europe. (2001). *Common European framework of reference for languages: Learning, teaching, assessment*. Cambridge University Press.
- Crossley, S. A., Kyle, K., & McNamara, D. S. (2016). The development and use of cohesive devices in L2 writing and their relations to judgments of essay quality. *Journal of Second Language Writing*, 32, 1–16. <http://doi.org/10.1016/j.jslw.2016.01.003>
- Crovitz, D., & Devereaux, M. D. (2016). *Grammar to get things done: A practical guide for teachers anchored in real-world usage*. Routledge.
- El Majidi, A., de Graaff, R., & Janssen, D. (2021). Debate as a pedagogical tool for developing speaking skills in second language education. *Language Teaching Research*, 28(6), 2431-2452. <https://doi.org/10.1177/13621688211050619>
- Ellis, R. (2009). Corrective feedback and teacher development. *L2 Journal: An electronic refereed journal for foreign and Second Language Educators*, 1(1), 3-18. <https://doi.org/10.5070/l2.v1i1.9054>
- Fang, Y. (2023). The function of tense and voice in mood system in public service advertising texts. *International Journal of Frontiers in Sociology*, 5(8), 145-152. <https://doi.org/10.25236/IJFS.2023.050823>
- Floriasti, T. W., & Permatasari, I. (2019). Improving speaking skills through role plays for nursing students in Indonesia context. In S. Madya, W. A. Renandya, M. Oda, D. Sukiyadi, A. Triastuti, Ashadi, E. Andriyanti, & N. Hidayanto (Eds.), *English linguistics, literature, and language teaching in a changing era* (pp. 315-319). Routledge.
- Foley, M., & Hall, D. (2012). *MyGrammarLab intermediate B1/B2*. Pearson.
- Fromkin, V., Rodman, R., & Hyams, N. (2014). *An introduction to language*. Cengage Learning.
- Gras, P., & Elvira-Garcia, W. (2021). The role of intonation in Construction Grammar: On prosodic constructions. *Journal of Pragmatics*, 180, 232-247. <https://doi.org/10.1016/j.pragma.2021.05.010>
- Gümüş, H. (2021). Teaching grammar through form-focused instruction: The case of teaching modal verbs to Turkish EFL learners. *Journal of Language Research*, 5(1), 1-16. <https://doi.org/10.51726/jlr.886107>
- Hinkel, E. (Ed.). (2024). *Practical grammar teaching for the second language classroom*. Routledge.
- Huang, F., Wang, Y., & Zhang, H. (2024). Modelling generative AI acceptance, perceived teachers' enthusiasm and self-efficacy to English as a foreign language learners' well-being in the digital Era. *European Journal of Education, Research, Development, and Policy*, 59(4), e12770. <https://doi.org/10.1111/ejed.12770>
- Jacobs, R. (2018). *Teaching narrative*. Palgrave Macmillan.
- Javadi, Y., & Tajik, A. (2019). The need to develop authentic materials in teaching grammar communicatively for Iranian high school students: Theoretical perspectives. *Journal of Language Teaching, Literature & Linguistics*, 2(1), 101-118. <http://dx.doi.org/10.22034/jltll.v4i1.50>

- Jones, T. (2018). Pronunciation with other areas of language. In O. Kang, R. I. Thomson, & J. Murphy (Eds.), *The Routledge handbook of contemporary English pronunciation* (pp. 370- 384). Routledge.
- Jung, J. (2009). Second language reading and the role of grammar. *Studies in Applied Linguistics & TESOL*, 9(2), 29–48. <https://doi.org/10.7916/salt.v9i2.1447>
- Kaçar, I. G., & Enginarlar, H. (2023). A qualitative study into Turkish EFL teachers' and students' perceptions of communicative task effectiveness in a tertiary education context. *Bingöl Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 26, 462-478. <https://doi.org/10.29029/busbed.1349653>
- Kaschak, M. P., & Glenberg, A. M. (2000). Constructing meaning: The role of affordances and grammatical constructions in sentence comprehension. *Journal of Memory and Language*, 43(3), 508-529. <https://doi.org/10.1006/jmla.2000.2705>
- Keizer, E. (2015). *A functional discourse grammar for English*. Oxford University Press.
- Kim, J., Lee, H., & Cho, Y. H. (2022). Learning design to support student-AI collaboration: Perspectives of leading teachers for AI in education. *Education and Information Technologies*, 27(5), 6069-6104. <https://doi.org/10.1007/s10639-021-10831-6>
- Koksal, O., Cekic, A., & Beyhan, O. (2014). Views of Turkish EFL students with regard to learning grammar with games. *International Journal on New Trends in Education and Their Implications*, 5(1), 82-92. <http://www.ijonte.org/FileUpload/ks63207/File/09.koksal.pdf>
- Kufi, E. O. (2023). Scaffolding Turkish EFL students' grammar learning experiences through output activities. *Turkish Journal of Educational Studies*, 10(3), 253-270. <https://dergipark.org.tr/tr/download/article-file/1923386>
- Lapworth, K. (2019). *The writer's guide to good style: A 21st century guide to improving your punctuation, pace, grammar and style*. Hodder Education.
- Larsen-Freeman, D. (2009). Adjusting expectations: The study of complexity, accuracy, and fluency in second language acquisition. *Applied Linguistics*, 30(4), 579-589. <https://doi.org/10.1093/applin/amp043>
- Lenko-Szymńska, A. (2007). Past progressive or simple past? The acquisition of progressive aspect by Polish advanced learners of English. In E. Hidalgo, L. Quereda, & J. Santana (Eds.), *Corpora in the foreign language classroom* (pp. 253–266). Rodopi. https://doi.org/10.1163/9789401203906_017
- Liamkina, O., & Ryshina-Pankova, M. (2012). Grammar dilemma: Teaching grammar as a resource for making meaning. *The Modern Language Journal*, 96(2), 270-289. <https://doi.org/10.1111/j.1540-4781.2012.01333.1.x>
- Listia, R., & Febriyanti, E. R. (2020). EFL learners' problems in using tenses: An insight for grammar teaching. *Indonesian Journal of English Teaching*, 9(1), 86-95. <https://doi.org/10.15642/ijet.2020.9.1.86-95>
- Loewen, S., Isbell, D. R., & Sporn, Z. (2020). The effectiveness of app-based language instruction for developing receptive linguistic knowledge and oral communicative ability. *Foreign Language Annals*, 53(2), 209-233. <https://doi.org/10.1111/flan.12454>
- McCarthy, M., & O'Keeffe, A. (2004). Research in the teaching of speaking. *Annual Review of Applied Linguistics*, 24, 26–43. <https://doi.org/10.1017/S0267190504000029>
- Mertler, C. A. (2021). Action research as teacher inquiry: A viable strategy for resolving problems of practice. *Practical Assessment, Research & Evaluation*, 26, 1-14. <https://doi.org/10.7275/22014442>
- Mertler, C., & Hartley, A. (2017). Classroom-based, teacher-led action research as a process for enhancing teaching and learning. *Journal of Educational Leadership in Action*, 4(2), 1-16. <https://doi.org/10.62608/2164-1102.1056>
- Munir, F. (2016). The effectiveness of teaching vocabulary by using cartoon film toward vocabulary mastery of EFL students. *Journal of English Language Teaching and Linguistics*, 1(1), 13-37. <http://dx.doi.org/10.21462/jeltl.v1i1.20>
- Muñoz, C. P. (2018). Tense switching in English narratives: an FDG perspective. *Open Linguistics*, 4(1), 657-684. <https://doi.org/10.1515/opli-2018-0032>
- Myhill, D. (2018). Grammar as a meaning-making resource for improving writing. *L1-Educational Studies in Language and Literature*, 18, 1–21. <https://doi.org/10.17239/L1ESLL-2018.18.04.04>
- Myhill, D. A., Jones, S. M., Lines, H., & Watson, A. (2012). Re-thinking grammar: The impact of embedded grammar teaching on students' writing and students' metalinguistic understanding. *Research Papers in Education*, 27(2), 139-166. <https://doi.org/10.1080/02671522.2011.637640>
- Nassaji, H., & Fotos, S. S. (2011). *Teaching grammar in second language classrooms: Integrating form-focused instruction in communicative context*. Routledge.
- Nezakat-Alhossaini, M., Youhanaee, M., & Moinzadeh, A. (2014). Impact of explicit instruction on EFL learners' implicit and explicit knowledge: A case of English relative clauses. *Journal of Language and Linguistic Studies*, 10(2), 183-199. <https://dergipark.org.tr/en/download/article-file/147090>
- Paesani, K., Allen, H. W., & Dupuy, B. (2016). *A multiliteracies framework for collegiate foreign language teaching*. Pearson.
- Parks, E. S., Faw, M. H., & Lane, L. R. (2024). *Listening: The key concepts*. Routledge. <https://doi.org/10.4324/9781003410775>
- Peltonen, P. (2024). Fluency revisited. *ELT Journal*, 78(4), 489-492. <https://doi.org/10.1093/elt/ccad047>
- Pretorius, E. J. (1994). "In those days we were not knowing many things": Tense and aspect usage in L2 learners' narrative texts. *Language Matters*, 25(1), 72-95. <https://doi.org/10.1080/10228199408566084>
- Puteri, S. A., & Asfihana, R. (2024). Portraying the students' perception on English speaking class activities within independent curriculum implementation: A Photovoice study. *Panyonara: Journal of English Education*, 6(2), 43-66. <https://doi.org/10.19105/panyonara.v6i2.13339>
- Raslee, N. N. (2021). Digital storytelling as a pedagogical tool for enhanced learner engagement. *International Journal of e-Learning and Higher Education*, 15(1), 50-79. <https://ir.uitm.edu.my/id/eprint/65997>
- Read, S. (2022). Fostering creativity through the integration of classroom technologies: A digital storyboarding case study example. In E. Sengupta and P. Blessinger (Eds.), *ICT and innovation in teaching learning methods in higher Education* (pp. 119-137). Emerald. <https://doi.org/10.1108/S2055-364120220000045007>
- Richards, J. C. (2008). *Teaching listening and speaking* (Vol. 35). Cambridge University Press.
- Richards, J. C. (2015). *Key issues in language teaching*. Cambridge University Press.
- Rifesser, J., & Hazell, C. (2023). Teaching grammar as and in context in the foreign languages classroom. In N. Pachler and A. Redondo (Eds.), *A practical guide to teaching foreign languages in the secondary school* (pp. 118-136). Routledge.
- Rogers, L., Bohlke, D., Brinks-Lockwood, R., & Zemach, D.E. (2023a). *Skilful 2. Reading and writing* (Third Ed.). MacMillan.

- Rogers, L., Bohlke, D., Brinks-Lockwood, R., & Zemach, D.E. (2023b). *Skillful 2. Listening and speaking* (Third Ed.). MacMillan.
- Roscoe, R. D., & McNamara, D. S. (2013). Writing Pal: Feasibility of an intelligent writing strategy tutor in the high school classroom. *Journal of Educational Psychology, 105*(4), 1010-1025. <https://doi.org/10.1037/a0032340>
- Şahinkaya, H. A. (2024). Explicit vs. implicit grammar teaching in EFL classroom: A literature review. *International Journal of Academic Research in Education, 9*(1), 14-26. <https://doi.org/10.17985/ijare.1369773>
- Salaberry, M. R. (2018). Advanced conceptualizations of tense and aspect in L2 acquisition. In P. A. Malovrh & A. G. Benati (Eds.), *The handbook of advanced proficiency in second language acquisition* (pp. 361–380). John Wiley & Sons.
- San-Mateo-Valdehita, A., & Chacón-García, C. (2019). Learning word class in a second language through vocabulary learning activities: definition-choosing, gap-filling, and sentence-writing. *Journal of Spanish Language Teaching, 6*(1), 49-63. <https://doi.org/10.1080/23247797.2019.1590001>
- Selvi, A. F. (2020). Qualitative content analysis. In J. McKinley and H. Rose (Eds.), *The Routledge handbook of research methods in applied linguistics* (pp. 440-452). Routledge.
- Setyowati, L. (2020). The role of speaking practices on grammar learning. *JEELL (Journal of English Education, Language and Literature) English Departement of STKIP PGRI Jombang, 7*(1), 18-28.
- Stuart, N. J., & van der Lely, H. (2015). Role of aspect in understanding tense: an investigation with adolescents with SLI. *International Journal of Language & Communication Disorders, 50*(2), 187-201. <https://doi.org/10.1111/1460-6984.12125>
- Swan, M. (2005). *Practical English usage*. Oxford University Press.
- Swanenberg, J. (2021). Writing and writing systems: Sociolinguistic aspects. In J. Stanlaw (Ed.), *The international encyclopedia of linguistic anthropology* (pp. 1–8). Wiley-Blackwell.
- Thornbury, S. (2006). *An A-Z of ELT: A dictionary of terms and concepts*. Macmillan Education.
- Tiana, D. M., Jimmi, J., & Lestari, R. (2023). The effect of grammar mastery and self-esteem towards students' speaking skill. *Scope: Journal of English Language Teaching, 7*(2), 157-164. <http://dx.doi.org/10.30998/scope.v7i2.15343>
- Tilahun, S., Simegn, B., & Emiru, Z. (2022). Using grammar consciousness-raising tasks to enhance students' narrative tenses competence. *Cogent Education, 9*(1), 2107471. <https://doi.org/10.1080/2331186X.2022.2107471>
- Toncic, J. (2022). Spelling and grammar: Insights into the magic of Standard English and schooling. *English Today, 38*(1), 52-62. <https://doi.org/10.1017/S0266078420000486>
- Ur, P. (2012). *A course in English language teaching*. Cambridge University Press.
- Van Moere, A. (2012). A psycholinguistic approach to oral language assessment. *Language Testing, 29*(3), 325-344. <https://doi.org/10.1177/0265532211424478>
- Worthington, D. L., & Fitch-Hauser, M. E. (2018). *Listening: Processes, functions, and competency*. Routledge. <https://doi.org/10.4324/9781315389202>
- Yildiz, M., & Senel, M. (2017). Teaching grammar through task-based language teaching to young EFL learners. *The Reading Matrix: An International Online Journal, 17*(2), 196-209. <https://readingmatrix.com/files/17-a267g7f3.pdf>
- Zalbidea, J., & Toth, P. D. (2024). Roles of interaction and output in input processing. In W. Wong & J. Barcroft (Eds.), *The Routledge handbook of second language acquisition and input processing* (pp. 212-224). Routledge.
- Zhai, C., & Wibowo, S. (2023). A systematic review on artificial intelligence dialogue systems for enhancing English as foreign language students' interactional competence in the university. *Computers and Education: Artificial Intelligence, 4*. <https://doi.org/10.1016/j.caeai.2023.100134>
- Zheng, H., Miao, X., Dong, Y., & Yuan, D. C. (2023). The relationship between grammatical knowledge and reading comprehension: A meta-analysis. *Frontiers in Psychology, 14*, 1098568. <https://doi.org/10.3389/fpsyg.2023.1098568>

Research Article

Teachers' Beliefs on Fostering Democratic Values and Skills in Bangla Language Classroom

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<https://doi.org/eiki/10.59652/jetm.v2i4.304>

Abstract: This paper advocates the necessity of developing democratically responsible citizens to build a sustainable society, recognizes the importance of practicing democratic skills and values in building democratic citizens, and subsequently explores the teachers' beliefs and views on fostering democratic values and skills in Bangla language classrooms through teaching-learning practices. In doing so, this paper uses primary data collected from 4 teachers with semi-structured interviews respecting the constructivist perspective. In addition, this study focuses on five democratic values and skills: shared decision-making, knowledge generation, acceptance of diversity, informed decision-making, and participatory evaluation, as necessary for secondary-level students in Bangladesh. This paper finds that the participant teachers highlighted the scope of fostering democratic values and skills through classroom teaching-learning practices and acknowledged the importance of facilitating them in the Bangla classroom in order to develop future democratic citizens. The findings also pointed out some challenges to the seamless practice of those values and skills. This paper calls for policymakers to revise the existing secondary curriculum and a particular intervention in teacher training programs.

Keywords: Bangla language classroom; democratic values and skills; teachers' beliefs; teaching-learning practices

1. Introduction

Education for Sustainable Development, the most emerging concept in education, has recognized the value of cultivating a sense of citizenship, human rights, social justice and democracy among students to promote sustainable development (Bentham, 2013). In this case, education stands center for facilitating and promoting democratic ideals and values in learners. The literature highlights that the quality of democracy in society is inextricably tied to the quality of education (Biesta, 2007) and that education can activate democratic culture (Acemoglu et al., 2005). However, researchers have explained various significant perspectives for teaching democratic values and ideals through education; where some have considered textbooks and value-based theoretical content as a medium for teaching students democratic values and skills, primarily through social studies courses, while others have thought of making students democratically capable, competent, and responsible citizens by involving them in democratic learning processes and environments (Sant, 2019). The proponents of the second view argue that as children develop through participation in and practice of democratic culture throughout their school years, it will have an impact on both their micro-individual as well as macro-social lives (Pereira, 2016). In this case, the classroom, as a vital organ of a democratic society, can engage students in the democratic process, such as respect for diverse opinions, free expression, peer interactions in cooperative activities, pupils' participation in democratic decision-making, and at the same time, the democratic environment in the classroom plays a crucial role as the key hub for fostering democratic citizenship skills among students (Angell, 1991). Subba (2014) and Daher (2019) argue that democratic values and skills can be gradually developed in students' mindsets by bringing them (democratic practices) into the teaching-learning process, and it also accelerates students' learning. In addition, Dadvand (2015) argues that to promote democratic skills in students, teachers can adopt dialogic approaches in classroom teaching-learning, organize thought-provoking and collaborative activities, and engage them in power-sharing in the

Received: November 1, 2024

Accepted: November 17, 2024

Published: December 8, 2024



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classroom, all of which are included under the features of student-centered pedagogy. Respecting this thought, the modern student-centered pedagogy as an integrated form of these processes has recently been introduced in various countries with the potential to democratize learning (Sriprakash, 2010) as well as foster democratic skills in students (Altinyelken, 2015; Anderson-Levitt, 2003).

Interestingly, as being a part of global sustainable development with high expectations for democratizing society, Bangladesh National Education Policy 2010 clearly states “the development of a democratic culture” as one of the educational goals (p. 2). To actualize the policy goal, the national curriculum 2012 has incorporated theoretical issues of democratic values and skills, particularly in the “Bangladesh and Global Studies” subject; however, though student-centered pedagogy has the potential to foster democratic values and skills in students, there is no clear indication of facilitating democratic values and skills in the classroom through teaching-learning practices. It can be expected that the student-centered pedagogy recommended in the newly developed National Curriculum Framework 2021 exposes the students to engage in learning activities, participate in democratic culture in the classroom, and get experiences that will help them to become democratically responsible citizens in the future. In this research context, it is to be mentioned that secondary schools in Bangladesh are entrusted with conveying the knowledge, skills, and attitudes necessary for children to integrate successfully into society and contribute to its sustainable development (Rahman et al., 2010). At the same time, Bangla is a compulsory subject for students of all streams (general, madrasah, and English medium) in every class up to the lower-secondary level and for madrasah and general stream students up to the higher secondary level. Therefore, it seems that practicing democratic values and skills in the Bangla classroom will help students from all streams to participate in the democratic culture. Having said that though, globally, there are some research studies on fostering democratic values and skills among students in language classrooms, particularly in English language classrooms (e.g., Gimenez & Molinari, 2019; Serrano, 2008), and regionally here in Bangladesh in ‘Bangladesh and global studies’ classrooms (e.g., Jahan et al., 2022), however, there is no research on fostering democratic values and skills in Bangla classrooms. In addition, it is indisputable that the effective implementation of teaching-learning in the classroom (Borg, 2006; Stuart & Thurlow, 2000) and the seamless practice of democratic values and skills (Dadvand, 2015) is significantly impacted by the teachers’ perceptions. Knowles (2018), for instance, discovered a positive link between instructors’ perceptions of citizenship education and their actual teaching practices.

Under this reality, this research explores how Bangladeshi secondary school teachers perceive the scope of facilitating democratic values and skills in Bangla classrooms using student-centered and active learning techniques, which (their perceptions) act as a prerequisite for its effective implementation in the classroom. In doing so, the researchers incorporated the following research objectives:

1. to explore the teachers’ perception of fostering democratic values and skills in Bangla classroom
2. to underline the challenges to ensure seamless facilitation of democratic values and skills in Bangla classroom

2. Literature Review

2.1. *Conceptualizing teaching-learning practices and fostering democratic values and skills*

Fostering democracy in the classroom refers to aligning democratic values and skills with pedagogical practices, incorporating techniques in teaching that allow pupils to be engaged in various democratic practices, and offering a safe classroom atmosphere where pupils can actively participate in the learning process (Subba, 2014). Diverse teaching-learning approaches have been labeled democratic in classroom contexts (Jacobs & Power, 2016). Most scholars claimed that active learning (de Baessa et al., 2002; Subba, 2014) and student-centered approaches (Altinyelken, 2015; Jacobs & Power, 2016) ensure a democratic environment in the classroom and hence students can learn particular democratic values and skills by participating in an ongoing process. As mentioned earlier, this paper incorporated five democratic values and skills, for example, shared decision-making, knowledge generation, acceptance of diversity, informed decision-making and participatory evaluation, as essential for Bangladeshi secondary school students. This section conceptualized the relations between these democratic values and skills and their teaching-learning practices in the classroom.

Decision-making in a democratic society refers that everybody, as a democratic citizen,

should have the scope to participate in decisions made for society (Jacobs & Power, 2016). Similarly, to cultivate future democratic citizens, students should have the opportunity to engage in decision-making processes with instructors in the classroom. They further argued that in classroom teaching-learning practices, this is a matter of power-sharing that can be executed by encouraging students' active engagement and providing opportunities for their choices. In addition, teachers should create spaces in the classroom that are more dialogical (Dadvand, 2015), in which students can participate in decision-making, and learning will be a collective matter more than any one individual (Altinyelken, 2015). Students and teachers can work together to develop shared learning experiences (Cohen et al., 2010), and the classroom should give space for meaningful peer-to-peer interaction (group work, peer work, etc.) (Jacobs & Power, 2016), which helps them develop shared decisions.

Knowledge generation in a democratic culture refers to the realization that both learners and teachers have a role in developing the knowledge that society and individuals require rather than relying totally on teachers and textbooks (Jacobs & Power, 2016). Therefore, teachers should not be the sole source and authority of knowledge but mere facilitators who encourage children to learn and facilitate learning in diverse ways (Subba, 2014). This concept connects with the element of student-centered learning, teachers as co-learners (Jacobs & Power, 2016), and can be implemented in a classroom teaching-learning context using classroom discussion (Richards & Schmidt, 2013). In a classroom discussion, the emphasis is on understanding the viewpoints of others, engaging in collaborative reasoning, and exploring ideas as a group collaboration. Thus, classroom discussion provides scope for students' participation in their own learning (Schuitema et al., 2018) as co-constructors with teachers (Schweisfurth, 2011).

Acceptance of diversity is a comprehensive notion that encompasses all aspects of difference, such as gender (Sanders & Downer, 2012), variety of lifestyles, and diversity of thoughts (Jacobs & Power, 2016), which all are crucial to developing a democratic society. Jacobs and Power (2016) discussed that the classroom could facilitate students' versatile ideas (as a means of listening and respecting others' views) by designing tasks or questions that have multiple logical replies and engaging in group work. Participation in group collaborations and classroom activities improves students' communication skills (Hashimoto & Fukuda, 2011) and develops a sense of community (Jacobs & Power, 2016). Recognizing the potentiality of group-work, de Baessa, Chesterfield, and Ramos (2002) argued that using student-directed small groups is linked to the evidence of democratic personality among children with diverse genders and cultures. In addition, relationships between student-student and student-teacher are significant in education for democracy since they are analogous to the relationships between citizens, and what is practiced in school will undoubtedly transfer to behaviors outside of school. Therefore, teachers should strive to foster healthy and constructive relationships between students, with particular attention to gender relations and the treatment of minority groups or vulnerable children (Carr, 2013). When teachers treat students fairly, it fosters a sense of being empowered in the students and teachers can persuade them to acquire democratic attitudes, which will eventually manifest themselves in their daily lives (Kesici, 2008).

As a democratic component, informed decision-making refers to proactive skills that enable individuals to make decisions based on reliable information. In addition to developing creative and critical thinking abilities about knowledge and surface realities (Wolk, 1996 as cited in Alajlan, 2015), which primarily foster a sense of meaning-making and ultimately lead students to make informed decisions, teachers can begin with explaining their objectives (why students should learn a particular topic or issue) for the class to make students well-informed about certain topics (Jacobs & Power, 2016). Moreover, Hosgorur (2002) argued that teachers should provide learners with the essential information, should explain to pupils the purpose of the learning activity and what is expected to be accomplished from the activity in order to help them develop abilities to make an informed decision in a democratic classroom.

Additionally, in a genuinely democratic society, as a form of participatory evaluation, everyone can join in figuring out the effectiveness of efforts to develop a particular society (Jacobs & Power, 2016). They argued that this could be visualized in the classroom as an image of society when students take an active role in evaluating their own learning and their peers' responses. In a similar vein, Subba (2014) asserted that teachers should support their pupils to evaluate their own work. This participatory evaluation, compared to conventional pan-paper-based tests, boosts student engagement, improves their capacity for self-monitoring (Jacobs & Power, 2016), and promotes fairness and a sense of justice (Carr, 2013).

2.2. Teachers' Beliefs and Democratic Values and Skills in Teaching

Research on teachers' beliefs showed mixed results towards democracy teaching, among which most of the research revealed teachers' positive attitudes toward teaching democracy to students through participatory classroom activities, and in contrast, a little research indicated teachers' unwillingness to adapt the new pedagogy and pointed the practice of antiquated teacher-centered learning approaches. In a qualitative study conducted in the Bangladeshi context, Jahan, Sarker, and Ali (2022) indicated teachers' positive mindsets towards facilitating and teaching democratic values and norms using interactive classroom activities and also pointed out some challenges as internal factors such as large class sizes, high workloads, and relatively limited time slots for large classes. Likewise, regarding practice and teaching democratic ideals to young pupils, Gomes's (2020) research from the similar context highlighted teachers' willingness and desire to improve their practices for developing future democratic individuals and classrooms. Altinyelken (2015) conducted a study on democratizing Turkey through student-centered approaches and showed that the teachers hold a positive mindset and recognize the democratizing potential of student-centered classroom activities. In addition to the challenges pointed out by Jahan, Sarker, and Ali (2022), this research further highlighted classroom management as a critical challenge to promote democracy through increased student participation. Güleç & Balçık (2009) further argued that teachers believed students engaging classroom activities (group work and collaborative activities) would help their students to gain democratic skills, for example, effective discussion, critical thinking, the ability to combat inequity, cooperation, and collaboration, and showing respect and empathy for diversity. Similarly, taking into consideration the significance of teachers' beliefs, Sarwar, Yousuf, and Hussain (2010) also investigated secondary school teachers' perceptions of the development of democratic values and strategies to enhance the democratic system, as well as their attitudes toward democracy, and explored that an open climate and appropriate active teaching methods were the most effective methods for the development of democratic values in secondary school students.

3. Materials and Methods

As the goal of the research was to rely as much as possible on the participants' views of the lived life being studied, the research nature was respectively under constructivism, which is typically seen as a guiding approach to qualitative research (Creswell, 2014) and the qualitative design was considered for this study. Creswell (2014) argued that constructivism helps to explore the participants' subjective meanings of their experiences, and the meanings are varied and multiple. Under the constructivist perspective, qualitative design permits researchers to examine a topic in-depth and in detail (Patton, 2015) and is more suitable to understand a phenomenon from the participant's point of view (Lincoln & Guba, 1986).

To collect research data, semi-structured interviews were applied in this study, as "semi-structured qualitative interviews are best suited for addressing research questions that center on participants' meaning-making, reflections on experiences, life stories, and opinions on events and activities" (Roulston, 2012). For the interviews, four secondary-level Bangla teachers were purposively selected in this study from different schools. Kesici (2008) argued that purposive sampling significantly appeared in qualitative research. The participants had at least four years of experience in teaching Bangla at secondary schools. The interview questions were open-ended, and the participants were asked some follow-up questions where necessary. The researcher conducted face-to-face interviews at the suitable location with the permission of the informant teachers. Each interview lasted between 45 to 60 minutes, and all the interviews were recorded by phone recorder. In addition, all the interviews were conducted in Bangla, the first language of the participants, and were later translated into English during the transcriptions of the data.

In developing the interview questions, five democratic values and skills were considered, and a total of eleven guiding questions were formulated for the teachers' interviews. The questions were developed from the different scholarly theories and perspectives discussed in the literature on the distinctive and similar features of teaching practices of democratic components. In qualitative research, piloting is frequently seen as the primary trial to evaluate its validity (In, 2017). Therefore, to check the validity of the instruments, a pilot study for interviews was undertaken before implementing the tool, and the items of questions were modified and redeveloped where necessary.

This study strictly maintained the ethical considerations guided by the British Educational Research Association (BERA) (2018). Further, to ensure confidentiality, the

participant teachers were coded as PT1, PT2, PT3, and PT4 for representing interviews 1, 2, 3, and 4, respectively.

The data gathered was analyzed through an inductive approach. An inductive approach is a significant method in qualitative research, which helps to extract concepts and theories from the grounded level in the process of data collection and analysis; however, it acknowledges the use of pre-existing theories as a foundation of investigation (Bryman, 2016). Therefore, pre-existing theories of democracy in accordance with classroom teaching-learning practices have been considered as the basis, and the data transcribed has primarily been coded according to the theoretical aspects. The data analysis process followed the sequence of (phase 1) transcribing the data, (phase 2) pre-coding and coding, (phase 3) recording growing ideas-memos, profiles, etc., and finally (phase 4) interpreting the data to draw conclusions suggested by Dornyei (2007).

4. Results and Discussion

4.1. Fostering Democratic Values and Skills in Bangla Classroom

The participant teachers admitted the scope of teaching democratic values and skills via classroom teaching-learning practices and acknowledged the importance of facilitating them in the classroom in order to develop future democratic citizens. This major finding is similar to the study by Jahan, Sarker, and Ali (2022), Altinyelken (2015), and Dadvand (2015), where they explored teachers' positive mindset to facilitate democratic values and skills in the classroom. The significant findings pointed out in this study are discussed under each theme.

4.1.1. Shared-decision making

To cultivate future democratic citizens, students should have the opportunity to participate in decision-making processes in the classroom (Jacobs & Power, 2016). Discussing the issue, the participant teachers highlighted the potential of group-work to develop shared decision-making skills among students. For example, one teacher stated:

"Through group-work, students will express their opinions or write in notebooks. After then, they will come to a conclusion by combining everyone's views. That's why we should create opportunities for discussion among themselves." [PT4]

This finding is similar to Crosby (2018), who thinks group work is a collaborative task that necessitates students to engage in intensive interaction with their peers and helps them reach a decision based on shared understanding. Thus, by offering group-work, teachers can develop a sense of power sharing and respect in students.

4.1.2. Knowledge Generation

Knowledge generation in democratic culture refers to the realization that both learners and teachers have a role in the knowledge formation process, which society and individuals require, rather than relying totally on teachers and textbooks (Jacobs & Power, 2016). In a democratic classroom, it refers, in general, to the two-way follow of learning and classroom discussion. Like Jacobs and Power (2016), the participant teachers show a positive mindset toward students' participation in classroom discussions. For instance, talking about sharing experiences between teachers and students in the classroom, **PT1** stated:

"I personally think that the teacher should not follow the jug-mug theory all the time. ... I think the teacher and student sharing (discussion) should be in the classroom. I think that when my students make an argument, I should take the argument. ... I also have a lot to learn from them."

Evaluating the statement, it seems that the teacher also recognized students' abilities and believed that through active participation in the discussion process, students could share their ideas and experiences in the classroom, and everyone could actively participate in learning. The perception of PT1 has aligned with Schuitema, Radstake, van de Pol, and Veugelers' (2018) arguments. She explains that in a classroom discussion, the emphasis is on understanding the viewpoints of others and engaging in collaborative reasoning. Thus, classroom discussion provides scope for students' participation in their own learning (Schuitema et al., 2018) as co-constructors with teachers (Schweisfurth, 2011).

4.1.3. Acceptance of Diversity

Discussing acceptance of diversity, Subba (2014) argued that teachers should not give any student priority over others under any circumstance, and there should be equal opportunities for all students from different backgrounds to participate actively in classroom discussions and activities. Fairly treating students fosters a sense of being empowered in the students (Kesici, 2008). In this regard, the participant teachers also pointed out the matter of

gender equality to teach students democracy. They assumed that both male and female pupils should have equal opportunities in the classroom, which would promote the value of equality among students. As **PT2** highlighted this message in discussing acceptance of diversity in an interview:

“What is the job of a teacher? To change their (students) perspective, to break down their narrow-mindedness, and to create a new one so that they can learn to be generous. It is normal that there will be boys and girls in the class. In this case, girls should not be given fewer chances than boys. Everyone should be treated equally, and then they will learn to treat everyone equally.”

Carr (2013) supports **PT2**'s assumption of gender equality. He argues that social relationships are significant in education for democracy since relationships between students are analogous to the relationships between citizens, and what is practiced in school will undoubtedly transfer to behaviors outside of school.

Respect for and consideration of different ideas is another integral component of acceptance of diversity in the classroom. According to Jacobs and Power (2016), students' versatile ideas can be facilitated in the classroom through group-work and structuring tasks or questions with multiple valid responses. Similarly, in this research, the participating teacher expressed an optimistic view for transferring the value of diversity acceptance and cooperation among students through group-work in the classroom. **PT1**'s perception is a good example here:

“I think, through teamwork (group-work), a good relationship is formed between them, i.e., if I make a group of 5 members among them, a friendly atmosphere develops between them, and they become one of five without fighting or competing with each other, and all together they try to reach a conclusion with mutual understanding.”

PT1's perception of group-work is parallel with the findings of de Baessa, Chesterfield, and Ramos (2002) who showed that the degree of democratic behaviour among children of diverse genders and cultures was positively associated with the utilization of student-directed small groups.

4.1.4. Informed Decision Making

Establishing and maintaining democracy requires the development of critical and reflective citizens. For this reason, one of the primary purposes of education in a democratic society is to strengthen students' capability to make informed and well-reasoned decisions on the relevant local, regional, and global social challenges (Yilmaz, 2009). However, to make students well-informed about certain topics, teachers can begin with explaining their objectives (why students should learn a particular topic or issue) for the class (Jacobs & Power, 2016). Similarly, in this study, the participating teachers demonstrated a positive attitude toward explaining the objectives of any learning activities and content to facilitate this skill in the classroom. In addition, they believe that explaining the purpose of a lesson in the classroom creates meaning in students and makes them interested and engaged in the lesson. **PT2**'s statement is reflective of that:

“Of course, it (explaining objectives) is necessary because every activity has a purpose. If students do not know why they are doing something, then they will not get interested in that work, or their effort will not be 100%.... If the learners understand why they are learning or the lesson's purposes, then learning becomes easier for them, and their interest and effort will be higher than before.”

It is clear from the above statement that **PT2** thinks that by knowing the lesson's purpose, the students can realize the meaning of learning and learn how learning affects their lives, which builds their critical thinking skills and enables them to make informed decisions. This finding is also supported by Hosgorur's (2002) concept, which underlines that teachers should provide learners with the essential information, should explain to pupils the purpose of the learning activity and what is expected to be accomplished from the activity in order to help them develop abilities to make an informed decision in a democratic classroom.

4.1.5. Participatory Evaluation

In a truly democratic society, everyone, as a citizen, can take part in determining the efficacy of the work to improve society (Jacobs & Power, 2016). They argue that students can acquire this skill when they have opportunities to participate in assessing themselves and their peer's responses in the classroom as a reflection of a democratic society. Jacobs and Power's (2016) conceptualization of assessment is similar to the study's finding that indicated that the participant teachers expressed the potential of students' active participation in the evaluation process, which directly makes them capable of participating in a broader social context. They also think it inculcates democratic values of justice in them. For instance, **PT2** talked about

the scope and advantage of students' active participation in classroom assessment:

"Yes, it is more effective when we give him/her a notebook of one of his/her classmates and ask him/her to read it. Then he/she comes to comparison, and he/she himself/herself is forced to admit that 'it is better than me'. He/she is comparing it to himself/herself. What happens through this is that he/she no longer thinks of himself/herself as the best. He/she recognizes good writing as good, and from there, he/she realizes and corrects his/her own mistakes. It is also a democracy."

The above statement of PT2 is parallel to the finding of Mussawy, Rossman, and Haqiqat (2021), which underlines teachers' willingness to participatory assessment and shows that teachers were open to giving students opportunities to review their peers' work as well as to provide constructive feedback. The finding is also supported by Carr (2013), who argued that teachers should engage students in assessment through self, peer, and collaborative assessment since this can enhance their critical thinking ability, help them develop judgmental standards, and foster a sense of justice.

4.2. Challenges

The teachers gave insightful views on facilitating democratic values and skills to students through day-to-day interactive and student-engaging classroom activities, and at the same time, they mentioned some required conditions and pedagogical challenges for their smooth execution. The finding pointed out large class sizes, limited class time, and high workloads as significant barriers to democratic practices in the classroom. Below the two statements reflect this:

"Democracy can be practiced in the classroom, but the number of students should be limited. Suppose, when there are 70-80 students in a classroom; then it is seen that 5-6 students have to sit on a bench... Then Do I give time in front, give time in between, or give time in the back of the class? ...teacher-student ratio should be low. Then it will be possible to make everyone participate equally." [PT4]

And

"In just 40 to 45 minutes giving them (students) group-work, doing that group-work, and then giving them a presentation (presentation of group-work), I can't complete it in a class." [PT1]

This finding is similar to Jahan, Sarker, and Ali (2022), who highlighted large class sizes, limited time slots for large classes, and high workloads as impediments to practicing democracy in secondary classrooms from the teachers' point of view. Where the first two challenges consistently support PT4 and PT1's statement above, the last challenge (high workloads) is consistent with the opinion of PT2. **PT2** expressed his understanding by saying that:

"As many classes as having in a year, we (teachers) get many opportunities that is not. There is also a matter of our preparation. In addition, we have also to do some schoolwork. Consequently, it gets difficult."

In addition, most of the participating teachers discussed the challenges of classroom management for practicing democratic values and skills. Whereas current views of curriculum and instruction emphasize students' active participation, comprehension, problem-solving, and independence, the term classroom management involves issues of a supportive relationship, active participation, group management method, nature of task activities as well as promoting social skills (Evertson & Weinstein, 2011) which are required to foster democratic values and skills in the classroom. For instance, **PT2** talked about managing diverse students and ensuring their participation in the classroom as a formidable challenge:

"Some students play a very passive role in the classroom. ... They are silent. They will not give you any opinion. Whatever you say, they will accept it in silence. Even if they have problems, they won't tell you."

Furthermore, the data analysis reveals that the extensive Bangla curriculum and the pressure to cover it in a short amount of time inhibit democratic activities in the classroom. Due to the wide range of curriculum, the length of class time, and the large number of classes scheduled annually, there is not enough opportunity for doing such activities in the classroom. At the same time, the participating teachers strongly criticized the result-oriented competition and noted the pressure from parents to cover the syllabus in their responses. In this case, the statement of **PT3** is a good example:

"In fact, if you consider the obstacles, then there is a competition going on in our country. How is the competition? - Good results should be done. And under a certain curriculum, we have a syllabus every year and a plan that we have to finish this topic by this time (this year). ...in that case ... the duration of each class, and the number of classes that we have annually, it is not that we get a lot of opportunities for doing interactive classroom activities. ... Plus ... you have to evaluate these things. Then, the fear of not completing the syllabus comes into play. Again, if the syllabus is not completed, it is usually not accepted by the parents."

The above-mentioned challenges that teachers assumed as significant concerns of practicing students engaging classroom activities to facilitate democracy in students reflect

Yilmaz (2009), Altinyelken (2015), Hemmati and Azizmalayeri (2022). Yilmaz's (2009) study pointed out that teachers faced challenges regarding classroom management and time management issues to ensure students' active participation and lack of skills that required intervention in teacher training. Interestingly, the challenges Altinyelken (2015) highlighted from the teachers' perspective are consistent with the majority of the challenges in this study. The study included large classroom sizes, time pressure and stress to cover curriculum topics on time, classroom control, complaints from parents and their expectation only of exam-oriented performance, as well as seating arrangements and space limitations that hinder organizing group activities.

5. Conclusions and Implication

Bangladeshi policy makers and educators quite often emphasize the value of fostering critical and democratic citizenship among the learners. The significance of this study lies with the fact that the participant teachers recognized the opportunities to teach democratic values and skill in the classrooms, highlighting the need to cultivate future democratic citizens. The research findings focus on the notes delivered by the teachers on the issues which are conducive for facilitating democratic skills, however a few teachers' beliefs and articulations reflected their ignorance and unawareness towards the teaching of democratic values. This research indicated that there was always scope for facilitating democratic values and skills given in the existing teaching-learning practices in the Bangla classroom context, and group-work, classroom discussion, bias-free instruction, life-oriented classroom activity, and active participation in the assessment process helped to serve these values and skills into the students. The findings further pointed out large class sizes, limited class time, high workloads for teachers, extensive Bangla curriculum, and classroom management as challenges to seamless facilitation of these values and skills in the classroom. This research opens up the opportunity for further research direction. For instance, this study focuses on teachers' perceptions. A similar study can be conducted to investigate the students' perceptions.

The study findings shed light on some essential policy suggestions. Policymakers should focus on particular interventions in teacher training programs and should revise the secondary curriculum to explicitly introduce the relationship between teaching-learning practices and fostering democratic values and skills in the classroom. They should take significant action to minimize high teacher-student ratio as per-class into 1:30 suggested by national education policy and establish balances between Bangla curriculum and class hour allotted annually considering classroom democratic practices. Further, policymakers should incorporate the qualitative evaluation approach (record keeping, narrative report writing) to assess positive changes in students' democratic behavior.

Supplementary Materials & Data availability statement: The data collected for this research will be available by emailing to the researcher.

Funding: This research received no external funding.

References

- Acemoglu, D., Johnson, S., Robinson, J. A., & Yared, P. (2005). From Education to Democracy? *American Economic Review*, 95(2), 44–49.
- Alajlan, S. M. (2015). Saudi female students' perceptions of their democratic empowerment in the classroom at King Saud University [PHD Thesis]. North Dakota State University.
- Altinyelken, H. K. (2015). Democratizing Turkey through student-centred pedagogy: Opportunities and pitfalls. *Comparative Education*, 51(4), 484–501. <https://doi.org/10.1080/03050068.2015.1081794>
- Anderson-Levitt, K. M. (2003). A World Culture of Schooling? In *Local meanings, global schooling: Anthropology and World Culture Theory* (pp. 1–26). Palgrave Macmillan. https://doi.org/10.1057/9781403980359_1
- Angell, A. V. (1991). Democratic Climates in Elementary Classrooms: A Review of Theory and Research. *Theory & Research in Social Education*, 19(3), 241–263. <https://doi.org/10.1080/00933104.1991.10505640>
- Bentham, H. (2013). Clearing the path that has been laid: A conceptualisation of education for sustainable development. *Journal of Teacher Education for Sustainability*, 15(2), 25–41. <https://doi.org/10.2478/jtes-2013-0009>
- Biesta, G. (2007). Education and the Democratic Person: Towards a Political Conception of Democratic Education. *Teachers College Record*, 109(3), 740–769. <https://doi.org/10.1177/016146810710900302>
- Borg, S. (2006). *Teacher cognition and language education: Research and practice*. Continuum.
- British Educational Research Association [BERA] (2018). *Ethical Guidelines for Educational Research*, fourth edition, London. <https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2018>
- Bryman, A. (2016). *Social research methods* (Fifth edition). Oxford University Press.
- Carr, P. R. (2013). *Education for democracy: A Curriculum Framework*. Agriteam Canada Consulting Ltd.


- Cohen, J., Pickeral, T., & Levine, P. (2010). The foundation for democracy: Promoting social, emotional, ethical, cognitive skills and dispositions in K-12 schools. *Inter-American Journal of Education for Democracy*, 3(1), 73–94.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publication.
- Crosby, K. D. (2018). Fostering Civil Discourse within the Democratic Classroom. *AILACTE Journal*, 15(1), 1–14.
- Dadvand, B. (2015). Teaching for Democracy: Towards an Ecological Understanding of Pre-Service Teachers' Beliefs. *Australian Journal of Teacher Education*, 40(2), 77–93. <https://doi.org/10.14221/ajte.2015v40n2.6>
- Daher, W. (2019). *Assessing students' perceptions of democratic practices in the mathematics classroom*. Eleventh Congress of the European Society for Research in Mathematics Education. <https://hal.archives-ouvertes.fr/hal-02421242>
- de Baessa, Y., Chesterfield, R., & Ramos, T. (2002). Active Learning and Democratic Behavior in Guatemalan Rural Primary Schools. *Compare: A Journal of Comparative and International Education*, 32(2), 205–218. <https://doi.org/10.1080/03057920220143183>
- Dornyei, Z. (2007). *Research Methods in Applied Linguistics* (First). Oxford University Press.
- Evertson, C. M., & Weinstein, C. S. (Eds.). (2011). *Handbook of classroom management: Research, practice, and contemporary issues*. Routledge.
- Gimenez, T., & Molinari, A. C. (2019). Democratic Practices in the English Language Classroom: Exploring Possibilities for Deliberative Pedagogy. In *Decentralization. Deliberation. Democracy. Our Power in Diversity* (pp. 56–75). Legislation Institute of the Verkhovna Rada of Ukraine.
- Gomes, R. R. (2020). Democratic values in public primary schools in Bangladesh: A qualitative investigation [Master's Thesis]. University of South-Eastern Norway.
- Güleç, S., & Balçık, E. G. (2009). An examination of democratic attitudes of primary school teachers. *Bulgarian Journal of Science and Education Policy*, 3(2), 173–194.
- Hashimoto, N., & Fukuda, S. (2011). Reaching for their own goals: A more democratic classroom. *The Language Teacher*, 35(1), 17–22. <https://jalt-publications.org/files/pdf-article/2011-1-art3.pdf>
- Hemmati, M. R., & Azizmalayeri, F. (2022). Iranian EFL Teachers' Perceptions of Obstacles to Implementing Student-Centered Learning: A Mixed-Methods Study. *International Journal of Foreign Language Teaching and Research*, 10(40), 132–152.
- Hosgorur, V. (2002). Sınıf Yönetiminde Yapısalci Yaklaşım [Structural approach in Classroom Management]. *Eurasian Journal of Educational Research*, 0(9), 73–78.
- In, J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology*, 70(6), 601. <https://doi.org/10.4097/kjae.2017.70.6.601>
- Jacobs, G., & Power, M. A. (2016). Student Centered Learning—An Approach to Fostering Democracy in Schools. *Beyond Words*, 4(2), 79–87.
- Jahan, R., Sarker, S., & Ali, A. (2022). Scope of Fostering Democratic Skills through Student-Centred Pedagogy in Bangladeshi Secondary Schools. *NAEM Journal*, 15(02), 115–124.
- Kesici, S. (2008). Teachers' opinion about building a democratic classroom. *Journal of Instructional Psychology*, 35(2), 192–203.
- Knowles, R. T. (2018). Teaching Who You Are: Connecting Teachers' Civic Education Ideology to Instructional Strategies. *Theory & Research in Social Education*, 46(1), 68–109. <https://doi.org/10.1080/00933104.2017.1356776>
- Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 1986(30), 73–84. <https://doi.org/10.1002/ev.1427>
- Ministry of Education. (2010). National Education Policy. https://moedu.portal.gov.bd/sites/default/files/files/moedu.portal.gov.bd/page/ad5cfca5_9b1e_4c0c_a4eb_fb1ded9e2fe5/National%20Education%20Policy%202010%20final.pdf
- Mussawy, S. A. J., Rossman, G., & Haqiqat, S. A. Q. (2021). Students' and Faculty Members' Perceptions and Experiences of Classroom Assessment: A Case Study of a Public University in Afghanistan. *Higher Learning Research Communications*, 11(2), 22–39. <https://doi.org/10.18870/hlrc.v11i2.1244>
- NCTB. (2021). National Curriculum Framework 2021. https://nctb.portal.gov.bd/sites/default/files/files/nctb.portal.gov.bd/page/0d5a8524_e5bc_4bfc_9e14_985380773fa9/2023-04-05-05-53-eb730ced57e4704a4e10e83b40a6d305.pdf
- Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (Fourth edition). SAGE Publications, Inc.
- Pereira, L. J. (2016). Values Education in Bangladesh: Understanding High School Graduates' Perspectives: thesis for Doctor of Philosophy. University of the Incarnate World. https://athenaeum.uiw.edu/uiw_etds/20
- Rahman, Md. M., Hamzah, M. I. M., Meerah, T. S. M., & Rahman, M. (2010). Historical Development of Secondary Education in Bangladesh: Colonial Period to 21st Century. *International Education Studies*, 3(1), p114. <https://doi.org/10.5539/ies.v3n1p114>
- Richards, J. C., & Schmidt, R. W. (2013). *Longman Dictionary of Language Teaching and Applied Linguistics* (4th ed.). Routledge. <https://doi.org/10.4324/9781315833835>
- Roulston, K. (2012). Interviews in Qualitative Research. In C. A. Chapelle (Ed.), *The Encyclopedia of Applied Linguistics*. Blackwell Publishing Ltd. <https://doi.org/10.1002/9781405198431.wbeal0572>
- Sanders, K., & Downer, J. (2012). Predicting acceptance of diversity in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, 27(3), 503–511. <https://doi.org/10.1016/j.ecresq.2011.12.001>
- Sant, E. (2019). Democratic Education: A Theoretical Review (2006–2017). *Review of Educational Research*, 89(5), 655–696. <https://doi.org/10.3102/0034654319862493>
- Sarwar, M., Yousuf, M. I., & Hussain, S. (2010). Attitude Toward Democracy in Pakistan: Secondary School Teachers Perceptions. *Journal of College Teaching & Learning*, 7(3), 33–38. <https://doi.org/10.19030/tlc.v7i3.100>
- Schuitema, J., Radstake, H., van de Pol, J., & Veugelers, W. (2018). Guiding classroom discussions for democratic citizenship education. *Educational Studies*, 44(4), 377–407. <https://doi.org/10.1080/03055698.2017.1373629>
- Schweisfurth, M. (2011). Learner-centred education in developing country contexts: From solution to problem? *International Journal of Educational Development*, 31(5), 425–432. <https://doi.org/10.1016/j.ijedudev.2011.03.005>
- Serrano, J. R. (2008). ELT and Citizenship: Basic Principles to Raise Social Awareness Through Language Teaching. *HOW Journal*, 15(1), 63–82.
- Sripakash, A. (2010). Child-centred education and the promise of democratic learning: Pedagogic messages in rural Indian primary schools. *International Journal of Educational Development*, 30(3), 297–304. <https://doi.org/10.1016/j.ijedudev.2009.11.010>
- Stuart, C., & Thurlow, D. (2000). Making It Their Own: Preservice Teachers' Experiences, Beliefs, and Classroom Practices. *Journal of Teacher Education*, 51(2), 113–121. <https://doi.org/10.1177/002248710005100205>



- Subba, D. (2014). Democratic Values and Democratic Approach in Teaching: A Perspective. *American Journal of Educational Research*, 2(12A), 37–40. <https://doi.org/10.12691/education-2-12A-6>
- Yilmaz, K. (2009). Democracy Through Learner-Centered Education: A Turkish Perspective. *International Review of Education*, 55(1), 21–37. <https://doi.org/10.1007/s11159-008-9112-1>

Research Article

Educational Approach of Special Relativity using an OpenAI's custom GPT as a teaching assistant

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<https://doi.org/eiki/10.59652/jetm.v2i4.328>

Abstract: Generative Artificial Intelligence (GenAI) has emerged as a valuable assistant in education. Many GenAI tools have been designed to aid teachers in offering personalized learning to their students, tailored to their educational needs and difficulties. In this paper we present a custom Open AI's GPT (IBL Educator GPT) that is designed and developed based on Inquiry based Learning and offers teachers a framework in which they can interact with ChatGPT and design educational strategies regarding Special relativity. To evaluate this tool via questionnaire that measures physics teachers' beliefs concerning the adoption of AI tools in the classroom The utilization of the IBL Educator GPT has led to the improvement in teachers' perspectives regarding the adoption of artificial intelligence-based tools for personalizing teaching.

Keywords: science education; Artificial Intelligence; educational technology

1. Introduction

Special Theory of Relativity (STR) is one of the most influential theories of the 20th century and has changed the way we view the world. It is part of many undergraduate curriculums, and it is often suggested that it should be integrated into an upper secondary curriculum. As it describes abstract as well as counterintuitive phenomena, students encounter several difficulties understanding its basic principles and consequences. There is a growing interest in studying these difficulties and developing tools and methods that address most of them.

As far as students' difficulties are concerned, they can be organized into three main categories (Alstein et al, 2021) (A) frames of reference, (B) postulates of SRT, and (C) relativistic effects.

A. Frames of reference

The notions of the frame of reference and the observer play an important role in setting a strong underpinning for students understanding the special relativity and its applications. As such, it is essential to explore students' difficulties concerning these notions. Students treat frames of reference as concrete objects, fixed to bodies (Tanel, 2013; Panse et al., 1994), for example both the ship and its reference system experience friction with the water. Students also tend to use a privileged frame of reference to describe a phenomenon. For example, between a moving train and a platform, the reference frame of the platform is preferred (Arriasseq & Greca, 2012; Scherr et al., 2001; Panse et al., 1994; Ramadas et al., 1996; Villani & Pacca, 1987). Moreover, events can be observed only inside the frames of reference that students have chosen (Tanel, 2013). As far as inertial observers are concerned, students confuse them with people who simply see or look and not with someone they observe and measure (Arriasseq & Greca, 2012). An interesting finding is that postgraduate students of the Department of Physics express the opinion that the speed, trajectory, and displacement of a moving object are independent of the reference system (absoluteness) and in fact there is only one true speed and only one true displacement traveled (space). Any variation in measurements between different inertial observers has come from optical illusion (Villani & Pacca, 1990).

Received: November 1, 2024

Accepted: November 19, 2024

Published: December 10, 2024



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B. Postulates of SRT

A common mistake that students make is that they try to interpret the basic postulates of STR within the framework of classical physics, something that leads them to wrong answers. According to the 1st postulate, namely the principle of special relativity, observers in any two inertial frames of reference must agree on the laws of physics. Students confront many difficulties understanding this postulate. In particular, students find it difficult to perceive the equivalence between motionless and uniform motion. They believe that phenomena (either electromagnetic or mechanical) can progress differently for different observers. For instance, they believe that an object moving at a constant speed relative to an observer O can accelerate or decelerate relative to a different inertial observer O' (Gousopoulos et al., 2023). According to the light postulate "light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body" (Einstein, 1905). Students consider that the "true" speed of light can be observed only in the rest frame of the light source (Villani & Pacca, 1987) and they use the Galilean velocity addition formula in problems in which the speed of light is asked. Moreover, according to students the fact that we cannot travel at speeds greater than the speed of light is because we have not yet developed the appropriate technology (Guisasola et al., 2009).

C. Relativistic effects

The basic relativistic effects that we will discuss are the relativity of simultaneity, the time dilation and the length contraction. Students consider two events to be simultaneous when they occur in the same space and time (Arriasecq & Greca, 2010). They also considered that two events that are simultaneous for one initial observer must be simultaneous for any other inertial observer (Gousopoulos et al., 2023). As far as the time dilation and length contraction are concerned, students believe that these phenomena are occurring only in the "moving" frame of reference (Selçuk, 2010; Aslanides & Savage, 2013), whereas other students ascribe time dilation and the length contraction to the absoluteness of time and space respectively (Dimitriadi & Halkia, 2012).

1.1. Approaches to Teaching STR Using Digital Technologies

STR deals with abstract and counterintuitive phenomena that are difficult for students to visualize and to interpret. As such, teaching approaches that use multimedia can have a positive impact on students understanding the key concepts of the STR. These approaches utilize either realistic virtual environments or interactive simulations that are based on thought experiments.

In general, realistic virtual environments enable students to visualize the effects that take place when travelling at speed near the speed of light. According to the literature, there are several virtual environments that have been reported. In particular, the "Real Time Relativity" visualizes relativistic effects such as time dilation, length contraction and Doppler shift (McGrath et al., 2010). The "Relativistic Asteroids" is a game that is based on the respective classic video arcade game "Asteroids" where students experience some of the effects of STR in a gamify way. In this game moving objects are contacted and change their colors due to their speed and based on the length contraction and Doppler shift respectively (Carr & Bossomaier, 2011). Moreover, "A Slower Speed of Light" is a game where students can experience a relativistic world, and their objective is to collect orbs while they are moving in more of less relativistic speed (Kortemeyer, 2019). Finally, the "Einstein's playground" is a planetarium show where students can experience the relativistic effects of STR in different speeds. In this show, they can see that while the speed at which they are moving approaches the speed of light length contraction and the relativity of simultaneity are observable, whereas at lower speed these effects cannot be detected (Sherin et al., 2017). The above-mentioned approaches have led to positive learning outcomes.

One very famous approach to STR is the use of thought experiments that constitute significant educational tools in familiarizing students with the key concepts of STR (Velentzas & Halkia, 2011). If we take a step forward and visualize these thought experiments utilizing relevant simulations, we increase the possibility of enhancing students' understanding regarding STR. One of such efforts has been reported by Horwitz and Barowy (1994) who developed the "Relab", a simulation tool that allows students to explore, model and simulate thought experiments. The integration of this tool into a teaching sequence showed positive learning outcomes. Another relevant tool has been reported by (Belloni et al., 2004) who developed java applets that mainly visualize relativistic effects (relativity of simultaneity, time dilation and length contraction).

1.2. *Generative Artificial Intelligence in Education*

GenAI (Generative A.I.) is a field of A.I. that focuses on the creation of new content, namely, text, image, audio, code and more based on the training data in response to prompts. GenAI utilizes machine learning algorithms to capture the underlining distribution of the training data and generate novel content that resembles a human-created one. GenAI is the technology that empowers LLMs and has a significant impact on multiple domains, such as IT and DevOps, entertainment, education, banking and finance, healthcare, human resources, and on working professionals in general.

As far as education is concerned GenAI has many applications, from content generation to personalized and adaptive learning experiences. Some of its capabilities are the following: It can assess assignments, provide feedback and propose a learning path tailored to learners' needs (Aryadoust et al., 2024). It can, also, detect special needs and learning difficulties to assist educators create specific lesson plans to address these difficulties. Despite the power of GenAI technologies, many concerns have been raised regarding potential biases, inaccuracies and the safety of sensitive personal data. One of the propositions that can address the aforementioned issues, is to ensure the alignment of GenAI generated content with the established educational goals.

In view of the above, this paper explores the acceptance of an OpenAI's custom GPT in teaching Special Theory of Relativity to upper secondary students. Therefore, the following hypotheses are composed:

H1. OpenAI's custom GPT that has been designed and developed based on the Inquiry Based Learning leads to an increased adoption of AI tools in classrooms.

H2. OpenAI's custom GPT that has been designed and developed based on the Inquiry Based Learning leads to an improved AI Knowledge.

H3. OpenAI's custom GPT that has been designed and developed based on the Inquiry Based Learning leads to an improved AI Pedagogy.

H4. OpenAI's custom GPT that has been designed and developed based on the Inquiry Based Learning leads to an improved self-concept regarding teaching Special Theory of Relativity.

2. Materials and Methods

This paper tries to highlight the leverage that GenAI tools, like ChatGPT, can give teachers regarding the design and implementation of an educational approach of Special Relativity at an upper secondary level. Moreover, this paper explores the potential shift in teachers' beliefs concerning the adoption of AI tools in the classroom. As such, a custom GPT was designed and developed based on the Inquiry Based Learning (IBL Educator GPT (you can have access here: <https://chatgpt.com/g/g-GHyDSFa8h-ibl-educator>). IBL is a constructivist educational approach that brings the students to the center of the educational process. In this context, students are engaging in active learning, exploration and problem solving. Pedaste et al. (2015), create a framework in which the phases are as follows: orientation, conceptualization, investigation, conclusion and discussion. When teachers enter the subject, they intend to teach, in our case topics on Special Relativity, the GPT proposes 3 fundamentally different approaches for each phase of the previously mentioned framework. Along with these options, the GPT offers comparison and contrast of them based on specific GenAI generated metrics. This is very significant, since teachers can start using IBL Educator GPT to support their decision making by simply seeking multiple perspectives on how to create an educational approach of Special Relativity. The prompt that fuels the GPT is the following:

“Act as an experienced educator. The users are teachers who will provide you with the subject they want to teach. Based on the selected subject, you should give them educational ideas and resources that are organized as follows: Orientation: is the process of stimulating curiosity about a topic and addressing a learning challenge through a problem statement Conceptualization: is the process of stating theory-based questions and/or hypotheses, generating research questions based on the stated problem, and generating hypotheses regarding the stated problem. Investigation: is the process of planning exploration or experimentation; collecting and analyzing data based on the experimental design or exploration Conclusion: is the process of drawing conclusions from the data by comparing inferences made based on data with hypotheses or research questions. Discussion: is the process of presenting findings of particular phases or the whole inquiry cycle by communicating with others and/or controlling the entire learning process or its phases by

engaging in reflective activities, presenting outcomes of an inquiry phase or of the whole inquiry cycle to others (peers, teachers) and collecting feedback from them, describing, critiquing, evaluating and discussing the whole inquiry cycle or a specific phase. For each phase 1. Propose 3 fundamentally different options, 2. Give the user 3 metrics to compare and contrast and 3. Evaluate these options using these metrics and before moving to the next phase, ask the user if they want to proceed to the next phase.”

For example, for the topic of time dilation the three options of investigation proposed by GPT are the following:

Investigation Phase: Planning and Collecting Data

In this phase, students explore or experiment to collect data that helps answer the research question or test their hypothesis. For time dilation, direct experiments in the classroom are challenging, so simulations, real-world data, or thought experiments can be effective alternatives.

Option 1: Computer Simulation of Time Dilation at High Speeds

Activity: Use a time dilation simulation tool (like PhET’s “Relativity Lab” or similar software) where students can adjust the speed of an object approaching the speed of light and observe how time changes relative to an observer.

Data Collection: Students record how time dilation varies with increasing speed and create a graph to visualize the relationship.

Goal: Explore the mathematical relationship between velocity and time dilation as predicted by the Lorentz factor.

Option 2: GPS Satellite Data Exploration

Activity: Guide students to research or analyze available GPS satellite data, which shows how clocks on satellites differ from clocks on Earth due to both velocity and gravitational time dilation.

Data Collection: Students examine and calculate the differences in time experienced by satellites versus ground-based clocks over a fixed period.

Goal: Investigate how both high speed and gravity impact time dilation, combining concepts of special and general relativity.

Option 3: Classroom Thought Experiment on Gravitational Time Dilation

Activity: Students design a thought experiment where they imagine a clock near a black hole versus one on Earth. They calculate the time difference using the general relativity equations and research black holes’ gravitational influence.

Data Collection: Students calculate time dilation effects based on mass and gravitational pull of celestial bodies like black holes or planets.

Goal: Explore the mathematical predictions of time dilation in strong gravitational fields, linking it to Einstein’s theory of general relativity.

Metrics to Compare Options:

1. Feasibility: How easy is it for students to carry out the investigation given the available resources (technology, data, etc.)?

2. Conceptual Challenge: How demanding is the investigation in terms of mathematical and theoretical understanding?

3. Engagement and Hands-On Learning: How involved are students in collecting and interpreting their own data?

Evaluation of Options:

Option 1: Computer Simulation of Time Dilation

Feasibility: High. Simulation software is widely accessible, and students can explore scenarios without physical limitations.

Conceptual Challenge: Moderate. Students will need to understand the Lorentz factor but can manipulate the variables easily.

Engagement: High. The hands-on aspect of manipulating variables engages students in the exploration process.

Option 2: GPS Satellite Data Exploration

Feasibility: Moderate. It may require access to specific data sets or sources, which can be found through research, though some guidance will be needed.

Conceptual Challenge: High. Students must apply both special and general relativity and understand real-world applications of the theory.

Engagement: High. Students can connect the investigation directly to everyday technology, making the data feel relevant and interesting.

Option 3: Thought Experiment on Gravitational Time Dilation

Feasibility: High. It doesn't require any specific resources, just imagination and calculation tools.

Conceptual Challenge: High. Understanding gravitational fields and applying general relativity equations is quite advanced.

Engagement: Moderate. While thought experiments are useful, they lack the hands-on component that can engage some learners more fully.

In order to export conclusions regarding the IBL Educator GPT evaluation 14 science teachers was comprised the sample that was characterized by convenience. The science teachers selected for this study, was teaching STR to upper secondary students in the context of science clubs in their schools. Therefore, an intervention was designed and implemented that included the training of these teachers to the foundations and applications of artificial intelligence in education. The before-mentioned intervention was carried out for 5 weeks. After this period the teachers embedded the IBL Educator GPT in their educational design of a series of lesson in STR that lasted 6 weeks. Before and after the intervention mentioned before, an online survey was given to the participants. The survey consisted of 21 questions that was grouped into 4 categories. A 5 -point Likert scale was used in order the respondents to evaluate their experience of the utilization of the IBL Educator GPT. The survey was distributed to the teachers having a return rate of 100% before and after the above -mentioned intervention. Data analysis was conducted using the R software.

3. Results

For evaluating the developed GPT a pilot study was conducted. Fourteen science educators have tested its capabilities, and they filled in a questionnaire before the use of GPT and the same questionnaire after its use (Appendix A). The questions of the questionnaire were selected from published instruments in education and so they are characterized by validity and reliability (Braun et al., 2008; Chiu et al., 2024). The questionnaire consists of 4 main constructs with 4 questions each: AI Knowledge, AI Pedagogy, AI Adoption and Self – Concept (see Appendix). For each structure the non-parametric Wilcoxon signed rank test applied, to compare the scores of the pretest and posttest.

The results show that all 4 hypotheses, proposed in this study, are accepted. In particular, as far as the AI knowledge is concerned the test indicated that in post-test ranks were statistically significantly higher than pre-test ranks, $Z=-3.233$, $p<.001$. As regards AI Pedagogy the post-test ranks were statistically higher than pre-test ranks $Z=-3.180$, $p=.002$. For AI Adoption and Self - Concept we had the same picture with $Z=-3.180$, $p=.002$ and $Z=-3.059$, $p=.002$ respectively.

4. Discussion

Generative AI tools, like ChatGPT have emerged as significant teaching assistants that can help teachers with the design and development of innovative educational approaches of challenging physics topics, such as Special Relativity. Students at upper secondary schools face many difficulties concerning relativistic phenomena, and due to their abstract nature teachers confront a lot of obstacles when trying to enhance students' understanding. Thus, a well-structured GPT which is based on a well-established educational framework can aid teachers tackle the previously mentioned difficulties and challenges. One interesting feature of the developed GPT is that it gives 3 options, and some key metrics based on which it offers a comparison in order to help teachers take a better decision regarding the educational approach to the subject they want to teach. Moreover, a pilot study was conducted so as to observe the potential shift in teachers' beliefs concerning the adoption of AI tools in the classroom. In particular, teachers' perspectives on the adoption of artificial intelligence-based tools for personalizing teaching improved after the use of the developed GPT in their educational design of a series of lessons regarding Special Relativity at upper secondary School Level. The same results have emerged regarding the other 3 constructs; AI Knowledge, AI Pedagogy and science teachers' self-concept as regards their ability to teach relativistic concepts have enhanced. More specifically, the scores of the participants after the

intervention were statistically higher than their scores before the intervention in the four before-mentioned constructs. After the intervention science teachers' level of AI Knowledge and pedagogy was increased and this led teachers to acquire a better view regarding AI adoption in their classroom and enhance their self-concept as far a teaching STR in high school is concerned. These finding come as an addition to the effort of the educational community to address the difficulties students face when trying to understand the concepts of Special Theory of Relativity. So, this paper further confirms the benefits of Generative AI tools in helping teachers to design high quality educational materials and didactic approaches.

5. Conclusions

The trigger of this research was the need of embedding the possibilities of generative AI in Education. This can be accomplished in several ways, one of which is to be utilized by teachers in their teaching design. As such, an educational program was designed that involved the training of 14 science teachers of the generative ai concepts and applications. A questionnaire was built based on previous research, that measured AI knowledge, AI pedagogy, adoption of AI in education and self-concept concerning teaching Special Theory of Relativity in upper secondary students. The results were very encouraging, showing an improvement of teachers' view regarding the 4 previous-mentioned constructs. One of the research limitations is the small number of participants, but it has been, already, designed a research with a large participant base for more accurate results. AI tools can have a great impact on Education helping teacher in designing educational approaches tailored to students' needs, provides students with feedback and suggestions according to their educational needs and level of their writing skills, can reduce teachers' workload (repetitive managing tasks, and grading of simple assignments) and thus focus on more complex teaching tasks and explain difficult concepts in simple terms, leading the users to understand complex subjects and thus making them part of scientific developments. As such, more research should be carried out in order educational scientist to unveil ways that can incorporate AI tools effectively in education taking into account several concerns related to data privacy, responsible AI usage, inaccurate and biased information provided by AI tools.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Questionnaire

AI knowledge

I can distinguish whether a tool is AI-based or not.

I can create content with AI.

I can explain what AI is.

I know how to choose the right AI tools to effectively complete a task.

AI pedagogy

I can choose an AI tool to use in my classroom that enhances what I teach, how I teach, and what students learn.

I can choose an AI tool that enhances my teaching subject content for a lesson.

I can teach lessons that appropriately combine my teaching subject, AI tools, and

teaching approaches.

I can help others coordinate the use of subject content, AI tools, and teaching approaches.

ChatGPT Adoption Intention

In the next weeks, I intend to use ChatGPT for my teaching preparation

I intend to use ChatGPT to get the answers to my teaching-related questions.

I feel that I would use ChatGPT for teaching purposes.

I believe that ChatGPT would be beneficial and more helpful for my teaching work.

Self- Concept

I can give an overview of the topics of Special Theory of Relativity to my students

I can clearly present complicated issues of Special Theory of Relativity to my students

Now I see myself in the position to process a typical question of Special Theory of Relativity coming from my students

I can work out the contradictions and similarities of learning content (e.g., contradictions between different models or methods) of Special Theory of Relativity

References

- Alstein, P., Krijtenburg-Lewerissa, K., & Van Joolingen, W. R. (2021). Teaching and learning special relativity theory in secondary and lower undergraduate education: A literature review. *Physical Review Physics Education Research*, 17(2), 023101. <https://doi.org/10.1103/PhysRevPhysEducRes.17.023101>
- Arriasecq, I., & Greca, I. M. (2012). A teaching–learning sequence for the special relativity theory at high school level historically and epistemologically contextualized. *Science & Education*, 21, 827–851. <https://doi.org/10.1007/s11191-010-9231-5>
- Aryadoust, V., Zakaria, A., & Jia, Y. (2024). Investigating the affordances of OpenAI's large language model in developing listening assessments. *Computers and Education: Artificial Intelligence*, 6, 100204. <https://doi.org/10.1016/j.caeai.2024.100204>
- Aslanides, J. S., & Savage, C. M. (2013). Relativity concept inventory: Development, analysis, and results. *Physical Review Special Topics – Physics Education Research*, 9(1), 010118. <https://doi.org/10.1103/PhysRevSTPER.9.010118>
- Belloni, M., Christian, W., & Dancy, M. H. (2004). Teaching special relativity using Physlets®. *The Physics Teacher*, 42(5), 284–290. <https://doi.org/10.1119/1.1737961>
- Braun, E., Gusy, B., Leidner, B., & Hannover, B. (2008). Das Berliner Evaluationsinstrument für selbsteingeschätzte, studentische Kompetenzen (BEvaKomp). *Diagnostica*, 54(1), 30–42. <https://doi.org/10.1080/02602938.2010.534762>
- Carr, D., & Bossomaier, T. (2011). Relativity in a rock field: A study of physics learning with a computer game. *Australasian Journal of Educational Technology*, 27(6). <https://doi.org/10.14742/ajet.928>
- Chiu, T. K., Ahmad, Z., & Çoban, M. (2024). Development and validation of teacher artificial intelligence (AI) competence self-efficacy (TAICS) scale. *Education and Information Technologies*, 1–19. <https://doi.org/10.1007/s10639-024-13094-z>
- Dimitriadi, K., & Halkia, K. (2012). Secondary students' understanding of basic ideas of special relativity. *International Journal of Science Education*, 34(16), 2565–2582. [10.1080/09500693.2012.718099](https://doi.org/10.1080/09500693.2012.718099)
- Einstein, A. (1905). On the electrodynamics of moving bodies. *Annalen der Physik*, 17, 891–921. <https://www.fourmilab.ch/etexts/ein-stein/specrel/specrel.pdf>
- Gousopoulos, D., Kapotis, E., & Kalkanis, G. (2023). Students' difficulties in understanding the basic principles of relativity after standard instruction. arXiv preprint arXiv:2311.09914. <https://arxiv.org/abs/2311.09914>
- Guisasola, J., Solbes, J., Barragues, J. I., Morentin, M., & Moreno, A. (2009). Students' understanding of the special theory of relativity and design for a guided visit to a science museum. *International Journal of Science Education*, 31(15), 2085–2104. <https://doi.org/10.1080/09500690802380698>
- Horwitz, P., & Barowy, B. (1994). Designing and using open-ended software to promote conceptual change. *Journal of Science Education and Technology*, 3, 161–185. <https://doi.org/10.1007/BF01575899>
- Kortemeyer, G. (2019). Game development for teaching physics. *Journal of Physics: Conference Series*, 1286, 012048. <https://doi.org/10.1088/1742-6596/1286/1/012048>
- McGrath, D., Wegener, M., McIntyre, T. J., Savage, C., & Williamson, M. (2010). Student experiences of virtual reality: A case study in learning special relativity. arXiv:0911.0226. <https://doi.org/10.48550/arXiv.0911.0226>
- Panse, S., Ramadas, J., & Kumar, A. (1994). Alternative conceptions in Galilean relativity: frames of reference. *International Journal of Science Education*, 16(1), 63–82. <https://doi.org/10.1080/0950069940160105>
- Pedaste, M., Mäeots, M., Siiman, L. A., de Jong, T., van Riesen, S. A. N., Kamp, E. T., Manoli, C. C., Zacharia, Z. C., & Tsourlidaki, E. (2015). Phases of inquiry-based learning: Definitions and the inquiry cycle. *Educational Research Review*, 14, 47–61. <https://doi.org/10.1016/j.edurev.2015.02.003>

- Ramadas, J., Barve, S., & Kumar, A. (1996). Alternative conceptions in Galilean relativity: inertial and non-inertial observers. *International Journal of Science Education*, 18(5), 615–629. <https://doi.org/10.1080/0950069960180509>
- Scherr, R. E., Shaffer, P. S., & Vokos, S. (2001). Student understanding of time in special relativity: Simultaneity and reference frames. *American Journal of Physics*, 69(S1), S24-S35. <https://doi.org/10.1119/1.1371254>
- Selçuk, G. S. (2010). Addressing pre-service teachers' understandings and difficulties with some core concepts in the special theory of relativity. *European Journal of Physics*, 32(1), 1. <https://doi.org/10.1088/0143-0807/32/1/001>
- Sherin, Z., Tan, P., Fairweather, H., & Kortemeyer, G. (2017). "Einstein's playground": an interactive planetarium show on special relativity. *The Physics Teacher*, 55(9), 550-554. <https://doi.org/10.1119/1.5011832>
- Tanel, Z. (2013). Student difficulties in solving problems concerning special relativity and possible reasons for these difficulties. *Journal of Baltic Science Education*, 13(4), 573-582. <https://doi.org/10.33225/jbse/14.13.573>
- Velentzas, A., & Halkia, K. (2011). The 'Heisenberg's Microscope' as an example of using thought experiments in teaching physics theories to students of the upper secondary school. *Research in Science Education*, 41, 525-539. <https://doi.org/10.1007/s11165-010-9178-1>
- Villani, A., & Pacca, J. L. A. (1987). Students' spontaneous ideas about the speed of light. *International Journal of Science Education*, 9(1), 55–66. <https://doi.org/10.1080/0950069870090107>
- Villani, A., & Pacca, J. L. A. (1990). Spontaneous reasoning of graduate students. *International Journal of Science Education*, 12(5), 589–600. <https://doi.org/10.1080/0950069900120510>

Research Article

A Case Study on Enhancing Pragmatic Competence in EAP Learners: Examining the Impact of Targeted Instruction in Request Speech Acts

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<https://doi.org/eiki/10.59652/jetm.v2i4.336>

Abstract: This article examines the role of pragmatic instruction on developing pragmatic competence in English for Academic Purposes (EAP) learners, particularly focusing on the speech act of requests. While research has long explored various factors influencing pragmatic competence, including instructional methods, this study specifically addresses how targeted pragmatic instruction impacts learners over time. Conducted as a qualitative longitudinal study, this research examines changes in learners' pragmatic performance over a four-week period, during which participants completed both written and oral discourse completion tasks. Findings suggest that pragmatic instruction significantly enhances learners' pragmatic abilities. Notably, participants have demonstrated a greater range of request strategies supportive moves, reflecting increased awareness of the social and cultural implications of their requests. These findings indicate the vital role of pragmatic instruction in enhancing learners' ability to adapt their language use based on social variables such as power dynamics and distance. The study also highlights the importance of integrating pragmatic instruction into EAP curricula to improve learners' communicative competence, enabling them to navigate both academic and social interactions with greater sensitivity and appropriateness.

Keywords: pragmatic performance; discourse completion tasks; supportive moves; request strategies

1. Introduction

The adoption of the communicative approach in language teaching has brought inter-language pragmatics to the forefront, capturing the interest of educators and scholars alike. There is a shared belief that pragmatic competence deserves greater emphasis in foreign language instruction, given its crucial role in overall communicative competence (Bardovi-Harlig, 2001; Taguchi, 2015). Despite numerous studies investigating the link between language instruction and pragmatic competence development, there remains significant hesitancy among English teachers to actively cultivate this skill in English as a Foreign Language (EFL) learners. Many international students studying in English-speaking countries have in-advertently displayed socially inappropriate behaviors due to limited pragmatic awareness (Wang, et al., 2016). This observation highlights the need to explore the role of language teaching in fostering learners' pragmatic competence, as pragmatic failures – misinterpretations of speaker intentions – can lead to misunderstandings, confusion, communication breakdowns, and perceptions of rudeness or insensitivity among EFL learners, even when unintentional (House & Kádár, 2023; Osuka, 2021).

This research seeks to explore how language instruction can facilitate learners' acquisition of pragmatic knowledge, particularly in the context of speech acts like requests. The speech act of requesting has been selected for its universal relevance in daily interactions and its recognized difficulty for language learners. Although prior research suggests that pragmatic instruction can support the development of pragmatic competence, there is a noticeable gap in studies focused on English for Academic Purposes (EAP) contexts (Ishihara & Cohen, 2021). This is particularly significant, as international students in academic settings need to be adept at navigating the pragmatic nuances of English to succeed in their studies and avoid potential misunderstandings. Therefore, this study aims to address how the

Received: November 1, 2024
Accepted: December 8, 2024
Published: December 12, 2024



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integration of pragmatic instructions in EAP context can effectively contribute to learners' pragmatic development in the use of request strategies and supportive moves whilst prompting a request.

This study involves five international students pursuing higher education in the UK, all of whom were enrolled in the same pre-session course at a university, situated within an EAP context. The course aims to familiarize students with the academic environment in a foreign country while offering some degree of pragmatic instruction. The primary objective of the research is to investigate the impact of classroom instruction on the development of pragmatic competence among English language learners, particularly. Furthermore, the study seeks to offer practical recommendations for teaching practices that may enhance the development of pragmatic competence in second language learners.

2. Literature Review

2.1. *Speech act Theory*

A Speech Act can be defined as an action performed by a speaker when he speaks, and this act will be expressed directly or indirectly (Yule, 2020). Austin (1975) has introduced various speech acts types and the concepts of locutionary, illocutionary, and perlocutionary acts to describe common divisions in speech acts. Illocutionary acts are of particular interest in this respect because they have much to do with the intended meaning of the utterance (O'Keeffe et al., 2019). Therefore, illocutionary acts are by nature context-based, and this fits well with pragmatic competence goals. Nonetheless, Searle (1976) later criticised Austin's taxonomy for its inconsistencies and limitations. Adapting these concepts, Searle (1976) proposed a new set of speech acts labelled as representatives, directives, commissives, expressives and declarations. Of these, directives are of particular interest to this research because they are prevalent in various daily activities and interactions, thus prompting the needs to be explored and investigated. According to O'Keeffe et al. (2019), a directive is a speech act where the speaker tries to get the hearer to do something, and this research focuses on one particular type of directive - the request form.

Requests are ubiquitous in everyday communication, and not just in the context of foreign language teaching. The use of certain speech acts, particularly requests, can be challenging to learners as they require a significant amount of time for learners to develop thorough understanding (Kasper & Rose, 2002). This can be attributed to the fact that requests involve not only linguistic ability but also the proper consideration of several social and cultural factors, including the distance between speaker and hearer, the relative status or power between interlocutors and the degree of imposition in the request itself (Brown & Levinson, 1987). Divergent perceptions of such factors may lead to significant differences in the use of request strategies between learners and native speakers. Thus, the speech act of request among many other areas in pragmatics has been addressed by researchers, among which exists this study.

2.2. *Politeness theory and request strategies*

Directives, speech acts of request in particular, are generally assumed to be relevant to the concept of politeness. According to Watts (2003), politeness as a linguistic phenomenon lacked a theoretical base until the Speech Act theory was first introduced in the 1960s, and this has positioned politeness as one of the fairly new subfields of linguistic pragmatics. Given that politeness is inherently a cross-cultural concept that varies across different social settings, it has become one of the most debated topics within pragmatics. Individuals are able to differentiate between polite and impolite behaviours at a very young age, and yet they can find it challenging to interact appropriately across different cultural contexts due to discrepancies. As a result, defining politeness remains contentious, leading to the development of multiple theoretical frameworks. Chief amongst the influential models is Brown and Levinson (1987)'s politeness theory despite facing criticism.

The Brown and Levinson model, influenced by Grice's (1975) Cooperative Principle as well as Goffman's (1959) notion of face, distinguish two types of face: the negative face and the positive one. Face, according to Brown and Levinson (1987, p. 61), refers to an individual's "public self-image" that they seek to maintain. Positive face involves the desire for one's self-image to be acknowledged and appreciated, while negative face refers to the desire for autonomy and freedom from imposition. Consequently, positive politeness aims to preserve a person's positive face, while negative politeness seeks to protect their negative face (O'Keeffe et al., 2019). Furthermore, Brown and Levinson (1987) also introduced three key

variables to assess the degree of politeness required in an interaction: social distance, power differences, and the rank of imposition in a particular culture. Social distance is regulated by socio-cultural factors influencing the familiarity between two interlocutors; power differences refer to hierarchical dynamics in the interaction; and the rank of imposition (also referred as cultural ranking) determine how threatening a speech act is perceived to be within a particular culture. Speakers should select the appropriate politeness strategies in tandem with these factors and the contextual variables. While Brown and Levinson's framework has made a substantial contribution to the field of pragmatics, their approach has been criticised for its non-universality (Matsumoto, 1988). It is also worth mentioning that Watt (2003) has introduced another theory of politeness reckoned as a prominent complementation to Brown and Levinson's model, though it is out of the scope of this study.

In relation to requests, Blum-Kulka et al. (1989) argue that requests can be understood as expressions of a speaker's desire for a future action. Requests, often interpreted as the action of asking the hearer to do a favour at the benefit of the speaker and thus viewed as impositive and intrusive, may threaten the hearer's negative face. As Brown and Levinson (1987, p. 65) point out, certain speech acts inherently threaten face, particularly those that conflict with the face desires of either the speaker or the hearer. Requests, as a prime example, are frequently seen as face-threatening acts. Due to their imposition, requests often necessitate mitigation strategies to minimise the potential threat to the hearer's face. Indirect request strategies, alongside internal and external modifications, can help soften the imposition and make the request more polite (Blum-Kulka et al., 1989).

The standard sequence in requests usually includes alerters (e.g. 'Hai'), supportive moves or external modifiers (e.g. 'You have the most beautiful handwriting I've ever seen!'), head acts (e.g. 'Would it be possible to borrow your notes for a few days?') and internal modifiers, including downgraders (e.g., 'Would it be possible...') and upgraders (e.g., 'I really need it'). A classification framework of these components has been formulated and proven valid across languages in the findings of the Cross-Cultural Speech Act Realisation Project by Blum-Kulka et al. (1989). Furthermore, Trosborg (1995) suggested an additional classification of requests depending on the level of directness. In this study, both schemes are employed with some adaptations in analysing requests strategies, with emphasis on the head act and external modifiers (supportive moves). The analysis of the internal modifiers like downgraders, upgraders, and alerters are beyond the scope of this research.

Blum-Kulka (1989) and Trosborg (1995) proposed distinct categorisations of request strategies, building upon earlier classifications that arranged these strategies according to levels of indirectness. The specific categorisation of request strategies used in this study is outlined in Table 1, as adapted from Blum-Kulka (1989, p. 202). This table is organised with an increasing level of indirectness.

Table 1. Request strategies

| Descriptive category | Examples |
|----------------------|---|
| Mood Derivable | Clean up the kitchen. Move your car. |
| Performative | I'm asking you to move your car. |
| Hedged performative | I would like to ask you to move your car. |
| Obligation statement | You'll have to move your car. |
| Want statement | I would you to clean the kitchen. I want you to move your car. |
| Suggestory Formulae | How about cleaning up? Why don't you come and clean up the mess you made last night? |
| Query Preparatory | Could you clean up the mess in the kitchen? Would you mind moving your car? |
| Strong hints | You've left the kitchen in a right mess. |
| Mild hints | We don't want any crowding (as a request to move the car). |

Note: Adapted from *Cross-cultural pragmatics: requests and apologies* (p. 202) by S. Blum-Kulka, J. House, & G. Kasper, 1989.

External modifications, also referred to as supportive moves, are elements that occur outside the main speech act, either preceding or following it. These modifications generally serve to provide additional information that establishes the context and reinforces the request, thereby influencing its illocutionary force. Their primary function is to either mitigate or intensify the strength of the request. This study focuses on external modifications that serve to soften the request. The classification of external modifications used in this research is outlined in table 1 below.

Table 2. Types of supportive moves (external modifications)

| Name | Definition | Example |
|----------------------------|---|--|
| Grounder | A clause which can either precede or follow a request and allows the speaker to give reasons, explanations or justifications for his or her request. | 'I would like an assignment extension because I could not deal with the typing time' |
| Disarmer | A phrase with which "a speaker tries to remove any potential objections the hearer might raise upon being confronted with the request" (Blum-Kulka et al., 1989, p.287) | 'I know that this assignment is important but could you ...?' |
| Preparator | The speaker prepares the hearer for the ensuing request. | 'I really need a favour...' |
| Getting a precommitment | The speaker checks on a potential refusal before performing the request by trying to get the hearer to commit. | 'Could you do me a favour?' |
| Promise | The speaker makes a promise to be fulfilled upon completion of the requested act. | 'Could you give me an extension? I promise I'll have it ready by tomorrow.' |
| Imposition minimiser | "The speaker tries to reduce the imposition placed on the hearer by this request." (Blum-Kulka et al., 1989, p.288) | 'I would like to ask for an extension. Just for a few days.' |
| Apology | The speaker apologises for posing the request and/or for the imposition incurred. | 'I'm very sorry but I need an extension on this project.' |
| Discourse Orientation move | Opening discourse moves which serve an orientation function but do not necessarily mitigate or aggravate the request in any way. | 'You know the seminar paper I'm supposed to be giving on the 29th...' |

Note: Adapted from "I just need more time": A study of native and non-native students' requests to faculty for an extension (p. 92) by H. Woodfield & M. Economidou-Kogetsidis, 2010, *Multilingua*, 29(1), based on Blum-Kulka et al., 1989, and Sifanou, 1999.

2.3. Teaching of Pragmatics

A number of studies have explored the impact of pedagogical interventions on learners' pragmatic competence. Research indicates that certain aspects of pragmatics can be effectively taught through classroom instruction (Ishihara & Cohen, 2021). Notably, speech acts, hedges, discourse markers, and conversational structures are identified as some of the most teachable elements of pragmatics (Rose, 2005). Explicit instruction has been shown to aid learners in noticing specific aspects of the target language, transforming input into intake, and facilitating long-term retention (Ishihara & Cohen, 2021). This is particularly relevant for nuanced language features like backchannels and turn-taking, which are often overlooked (Bardovi-Harlig, 2024). In contrast, implicit instruction is suggested to promote long-lasting and readily accessible pragmatic knowledge (Ishihara & Cohen, 2021). Therefore, integrating pragmatic elements into classroom activities – such as authentic dialogue analysis, pragmatic discussions, or role-playing – can enhance the development of pragmatic competence.

However, challenges remain in teaching pragmatics in classroom environments. One significant issue is that textbooks, a primary source of pragmatic input, frequently lack

sufficient coverage of pragmatic information or fail to provide adequate interpretations of language use (O’Keeffe et al., 2019). Additionally, many teachers may lack awareness of English pragmatic norms and may not have access to relevant research, leading to a reliance on intuition, which can be both inaccurate and unreliable (Ishihara & Cohen, 2021). Furthermore, the replication of real-world scenarios in classroom settings is limited, potentially impeding students’ preparedness for diverse language encounters. Bardovi-Harlig Dörnyei, and Dörnyei (1998) emphasized that the language students encounter in classrooms often lacks the variety and emphasis necessary for developing pragmatic competence. Van Dyke and Acton (2022) further argued that classroom interactions tend to be overly polite compared to real-world contexts, and only a narrow range of speech acts are typically represented in classroom discourse.

3. Materials and Methods

3.1. Participants

The study’s participants consist of five international postgraduate students enrolled in a pre-session course aimed at preparing them for master’s or PhD programs at a university in the United Kingdom. Selection criteria for participants did not include restrictions based on gender, proficiency level, or field of study. However, two groups were formed based on nationality, enabling a more nuanced analysis for the research objectives. A summary of participant profiles is provided in table 3.

Throughout the research process, the researcher must consider various ethical concerns, with participant consent being a primary focus. To address this, a consent form was provided to all participants, detailing the study’s purpose and obtaining their agreement to participate. In accordance with the University’s ethical guidelines, participants’ identities have been strictly safeguarded to ensure confidentiality. Additionally, all information gathered during the study has been used exclusively for this research and will remain confidential.

Table 3. Participants’ profiles

| Name (codified) | Country of origin | Level of education | Level of English proficiency (IELTS score) |
|-----------------|-------------------|--------------------|--|
| Student 1 | Saudi Arabia | PhD | 6.0 |
| Student 2 | China | Master | 5.5 |
| Student 3 | China | Master | 6.0 |
| Student 4 | China | Master | 5.5 |
| Student 5 | Japanese | Master | 6.0 |

3.2. Research instruments

The present study involved two rounds of data collection with a four-week interval between each session. The research was carried out with qualitative research methods, utilizing production tasks such as Written Discourse Completion Tests (WDCTs) and role-play activities. These tasks were employed to observe the progression of participants’ pragmatic competence, specifically focusing on their use of pragmatic strategies.

The design of the tests and role-play activities was derived from prior research in the field of pragmatics (Blum-Kulka, 1989; Rose, 1992; Tanck, 2004). The situations presented in the tasks varied in terms of social status and social distance and were situated within familiar contexts for the participants. The WDCTs comprised five scenarios in the pre-test and five in the post-test, while the role-plays featured six distinct situations. In the first session (the pre-test), students were provided with six cue cards representing different situations and were required to select and perform three, while the remaining scenarios were reserved for the second session.

To ensure clarity in question phrasing and relevance to the research objectives (i.e., eliciting the speech act of requests), the tests were piloted by five participants (three native English speakers and two EFL/ESL speakers). The participants, subsequently, completed the tasks under the supervision of the researcher to ensure the reliability and validity of the data.

3.3. Data analysis

After completing the collection and selection of data, the analysis was conducted using the speech act of request framework mentioned in the previous section of this paper. This analysis involved classifying the data into specific categories to allow the formulation of a

working hypothesis based on the findings.

The data analysis process began with the identification of the strategies used by speakers when making requests, focusing on whether they primarily employed head acts or utilised modifiers in relation to the intended hearers. All the responses were coded as in the classification scheme mentioned in section 2.2. Afterwards, the data were interpreted and described to address the research question before presenting the conclusion.

4. Results

Discourse completion tests are employed as a method to elicit data and evaluate learners' pragmatic competence, serving to provide insights that address the first research question. This approach has been widely favored in prior research on second language pragmatic competence (Blum-Kulka et al., 1989; Sasaki, 1998; Billmyer & Varghese, 2000). The responses collected from participants are subsequently coded to delineate units for analysis. As outlined in section 2.2, the analysis focuses on identifying the strategy type in the head act of the request as well as supportive moves. To determine the type and calculate the frequency of request strategies or modifications used, the responses are first analysed and categorised in a table where strategies or modifications are displayed in rows. If a strategy is absent from any response, it is excluded from the analysis. All data are systematically coded and categorized following the coding scheme described in section 2.2.

4.1. Discourse completion tests

4.1.1. Strategy types:

As indicated in Table 4, there is minimal variation in the request strategies employed by participants in the pre-test. The most commonly used strategy is the conventionally indirect request, specifically the query preparatory form (e.g., *Would you.../Could you...?*). This preference may be attributed to instruction, as these structures are frequently taught in formal classroom environments for making requests. Only one instance of the mood derivable strategy (a direct request) is observed, which appears in Student 4's response to question one in the first test (*Go for it, my friend.*). Considering the social distance between speaker and hearer, as well as the rank of imposition in question one, the conventionally indirect strategy may be more appropriate. Nonetheless, Student 4 is a Chinese student, aligning with findings from other studies that suggest direct request strategies are the second most commonly used among Chinese students (Chen et al., 2023).

Table 4. Distribution of request strategies used by participants (pre-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|--------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Mood derivable | | | | | 1 | 1 |
| Query preparatory | 5 | 5 | 5 | 4 | 5 | 24 |

In the second test, a range of request strategies were observed, as illustrated in Table 5 below. Participants demonstrated the ability to generate more diverse types of requests compared to the first test. Notably, two examples of strong hints (*Our team has just got an important project which needs all the members to join.; The project is important, so we need all members to finish it on time.*) and two instances of obligation statements (*You have to finish the project before going on a holiday.; You will have to cancel your ticket.*) were identified in response to question four. While the former strategy appears appropriate given the context, the appropriateness of the latter is debatable. Interestingly, both students who used obligation statements also employed the phrase "I'm afraid that ..." – a way to soften the request; therefore, this strategy might be considered acceptable.

Table 5. Distribution of request strategies used by participants (post-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|----------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Obligation statement | | | 1 | | 1 | 2 |
| Query preparatory | 4 | 4 | 4 | 5 | 4 | 21 |
| Strong hints | 1 | 1 | | | | 2 |

4.1.2. Supportive moves

As illustrated in Table 6, the initial test reveals that participants in this study exhibit a very limited variety and frequency of supportive moves, with the exception of grounders. Notably, neither disarmers nor preparators are present in any of the responses across the five



situations analyzed. In contrast, grounders appear most frequently, with 25 instances identified, typically following requests. This finding aligns with prior research (Blum-Kulka & Olshtain, 1986; Hassall, 2001; Otcu and Zeyrek, 2008). Interestingly, four promises were made (e.g., *I'll transfer the money back to you tomorrow; I will return the money to you tomorrow; Tomorrow, I will return it to you; I can buy you lunch after we finish moving out*), with three of these promises occurring in the context of borrowing money. The act of promising repayment is thoughtful and appropriate in such situations, yet only three students – all Chinese – demonstrated the ability to utilize this form of modification.

Table 6. Distribution of supportive moves implemented by participants (pre-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Grounder | 5 | 5 | 5 | 5 | 5 | 25 |
| Getting a precommitment | | | | | 1 | 1 |
| Promise | | 1 | 2 | 1 | | 4 |
| Imposition minimiser | | | 1 | 1 | 1 | 3 |
| Apology | 1 | | 1 | | | 2 |
| Discourse orientation move | 1 | | | 2 | 1 | 4 |
| Supportive moves total | 7 | 6 | 9 | 9 | 8 | |

At a later stage, participants demonstrated their capability to incorporate a variety of external modification strategies in their responses. Notably, a majority displayed a tendency to employ at least one preparatory element in their requests. This observation aligns with the findings of Economidou-Kogesidis (2009) and Schauer (2008), whose studies also revealed a similar reliance on preparators. These researchers suggest that the use of preparators may be linked to the learners' proficiency level, which could result in diminished confidence, or to their social roles as international students. Moreover, participants showed an increased tendency to include apologies (e.g., *I'm sorry..., I'm sorry to trouble you...*) in their requests. The frequency of this strategy rose significantly from 2 to 14 occurrences, making apologies the second most common supportive move. The frequent use of apologies, along with the excessive use of "Thank you," can be seen as evidence of progress of pragmatic competence, since this aligns with British cultural context.

Table 7. Distribution of supportive moves implemented by participants (post-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Grounder | 5 | 5 | 5 | 5 | 5 | 25 |
| Disarmer | 1 | | 1 | | 2 | 4 |
| Preparatory | 1 | 1 | 1 | 2 | | 5 |
| Getting a precommitment | 1 | 1 | 1 | 1 | 1 | 5 |
| Promise | | | | 1 | | 1 |
| Imposition minimiser | 1 | 1 | 1 | | 1 | 4 |
| Apology | 2 | 3 | 4 | 2 | 3 | 14 |
| Discourse orientation move | 1 | | 1 | 1 | | 3 |
| Supportive moves total | 12 | 11 | 14 | 12 | 12 | |

4.2. Role-plays

In this study, a series of role-plays were incorporated alongside the WDCTs to gather more authentic data on the production of speech acts. The data obtained from the role-plays will be coded and presented in a manner similar to the WDCTs; however, instead of comparing the first and second role-plays, the analysis will focus on comparing the role-play data to that of the WDCTs.

4.2.1. Request strategies

In the first role-play session, participants exhibited slight variations in their chosen

request strategies (Table 8). While the query preparatory remained the most favored strategy type, a modest increase in the use of the direct strategy, specifically mood derivable forms, was noted in the responses of all three Chinese participants (e.g., Please show your ID; So please give it back to me; Please return it to me). This observation aligns with prior findings indicating that, alongside the query preparatory approach, Chinese individuals tend to employ direct strategies in their request-making behaviors. However, distinctions between WDCTs and role-plays became less significant in the second role-play session (Table 9). The query preparatory strategy was predominantly used, though strong hints were notably absent, likely reflecting the influence of social distance and power dynamics between interlocutors in most role-play scenarios. Additionally, the obligation statement (e.g., I'm afraid you have to return it to me) appeared to be appropriately employed, incorporating the phrase "I'm afraid" to mitigate directness.

Table 8. Distribution of request strategies used by participants for role-plays (pre-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|--------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Mood derivable | | 1 | 1 | 1 | | 3 |
| Query preparatory | 3 | 2 | 2 | 2 | 3 | 12 |

Table 9. Distribution of request strategies used by participants for role-plays (post-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|----------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Obligation statement | | | | | 1 | 1 |
| Query preparatory | 3 | 3 | 3 | 3 | 2 | 14 |

4.2.2. Supportive moves

In contrast to findings from the WDCTs, the initial role-play reveals an underuse of several supportive moves (Table 10). This outcome supports the observation that grounders are the most commonly employed supportive move or external modification in requests, aligning with prior research (in section 4.1.2). Participants' significant reliance on this modifier may be due to its capacity to allow speakers to provide reasons or justifications for their requests, positioning it as a fundamental component in the act of requesting (Schauer, 2008). This finding may also relate to the notion that “the addition of supportive moves will not generally result in more complex pragmalinguistic structures to be planned,” thereby making such modifications – particularly grounders – less grammatically complex and pragmalinguistically demanding (Hassall, 2001, p. 274). Such characteristics may facilitate early acquisition among learners, contributing to the prevalent use of grounders in this study. Regarding other supportive moves, there is no recorded instance of promise or imposition minimizers, which are used reasonably in the WDCTs. Notably, response lengths in the WDCTs are generally greater than those in the role-plays, potentially accounting for the limited use of external modifiers besides grounders. This disparity may also highlight the gap between participants' pragmatic awareness (receptive knowledge) and their actual communicative performance (production).

Nonetheless, contrary to the first role-play, the second role-play yields results more aligned with the WDCTs (Table 11). In the second session, a variety of supportive moves appear, particularly a notable increase in the use of apologies. This heightened presence of apologies suggests participants' growing awareness of the imposition involved in their requests.

Table 10. Distribution of supportive moves implemented by participants for role-plays (pre-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Grounder | 5 | 3 | 3 | 4 | 3 | 25 |
| Preparatory | | | | | 1 | 1 |
| Discourse orientation move | 1 | | 1 | 1 | | 3 |
| Supportive moves total | 6 | 3 | 4 | 5 | 4 | |

Table 11. Distribution of supportive moves implemented by participants for role-plays (post-test).

| Request strategies | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Total |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-------|
| Grounder | 3 | 3 | 3 | 3 | 3 | 16 |
| Disarmer | 1 | 1 | 1 | | | 3 |
| Preparatory | | | | 1 | | 1 |
| Getting a precommitment | | | | | 1 | 1 |
| Promise | 1 | 1 | | 2 | | 4 |
| Imposition minimiser | | | 1 | 1 | 2 | 4 |
| Apology | 4 | 2 | 1 | 4 | 1 | 12 |
| Discourse orientation move | 1 | 1 | 1 | | 1 | 4 |
| Supportive moves total | 11 | 8 | 7 | 11 | 8 | |

5. Discussion

The current study indicates that classroom instruction can positively impact learners' development of pragmatic competence. This finding aligns with previous research in pragmatics instruction (e.g. Jeon & Kaya, 2006; Sykes & González-Lloret, 2020; Taguchi, 2015), which demonstrates that learners generally exhibit improved appropriateness and a broader range of strategies for producing requests following instructional interventions. The observed enhancement in students' pragmatic awareness, as shown in the WDCTs and roleplays in this study, may be attributable to Schmidt's (1993) noticing hypothesis. However, due to the study's time constraints, the long-term retention of students' pragmatic production remains uncertain, warranting caution when attempting to generalize the findings.

In terms of request strategies, the results indicate that learners predominantly rely on conventionally indirect request strategies, particularly the query preparatory form, in both pre- and post-instruction phases. This aligns with prior research suggesting that these forms are frequently taught in formal classroom settings and are considered polite and effective in various contexts (Blum-Kulka et al., 1989; Chen et al., 2023). However, the increase in diversity of strategies post-instruction, including the emergence of strong hints and obligation statements, demonstrates a developing awareness of contextual factors such as power dynamics and social distance. These findings support the argument that targeted pragmatic instruction enhances learners' ability to adapt their language use to different social settings (Ishihara & Cohen, 2021). Future pedagogical efforts should focus on further diversifying the range of strategies taught, including less commonly used forms like strong hints and performatives, to prepare learners for nuanced real-world interactions (Taguchi, 2015).

The study also suggests that supportive moves, particularly grounders, were the most commonly used modifications throughout the study, reflecting their fundamental role in softening requests and providing context (Schauer, 2008). The significant increase in the use of apologies post-instruction highlights learners' growing sensitivity to potential impositions in their requests. This shift aligns with findings from studies emphasizing the cultural appropriateness of apologetic strategies in British contexts (Economidou-Kogetsidis, 2009). The introduction of other supportive moves, such as preparators and imposition minimizers, suggests that learners are becoming more adept at employing a range of pragmatic tools to navigate interpersonal communication effectively. These results underscore the importance of integrating explicit instruction on supportive moves into language curricula to foster comprehensive pragmatic competence, as suggested by Sykes and González-Lloret (2020). Expanding the scope of instruction to include various modifications could further enhance learners' ability to manage face-threatening acts in diverse cultural settings.

Nonetheless, the study's findings support pedagogical interventions designed to facilitate learners' acquisition of specific pragmatic skills, particularly in performing the speech act of requesting. Increasing students' sensitivity to cultural differences in request-making across languages through activities like discussions and roleplays appears essential. Such practices may enhance learners' understanding of the primary patterns involved in request production, promoting more appropriate language choices as their proficiency advances. Additionally, exposure to common request patterns used by native speakers is crucial for learners to make

suitable language choices. These patterns may be derived from established research on English requestive acts, such as Blum-Kulka et al.'s (1989) work. Moreover, integrating pragmatic instruction alongside traditional grammatical and lexical knowledge may yield more effective outcomes.

The findings also propose important implications for language teaching, particularly in the context of EAP. The positive impact of targeted pragmatic instruction on learners' request strategies and supportive moves suggests that integrating pragmatics into language curricula can significantly enhance students' communicative competence. Specifically, instructors should incorporate explicit lessons on speech acts like requests, emphasizing both strategy selection and the use of supportive moves to manage politeness and mitigate imposition. Given the increasing diversity of student populations in academic settings, particularly international students, there is a clear need for curricula that address the cultural nuances of pragmatics (House & Kádár, 2023). Teachers should also consider using role-plays, discourse completion tasks, and other interactive activities to simulate real-world communication, allowing students to practice and refine their pragmatic skills. Furthermore, these findings highlight the importance of ongoing research into the long-term retention of pragmatic skills, suggesting that future studies should assess the durability of instructional effects over extended periods and explore ways to integrate pragmatics instruction across different language proficiency levels (Jeon & Kaya, 2006).

6. Conclusions

The findings of this study align with prior empirical research on the pragmatic competence of English language learners, suggesting that pragmatic competence – a crucial aspect of communicative competence – can be more effectively developed with targeted instruction. Many international students for whom English is not a first language often encounter challenges in both interpreting and executing the pragmatic elements of speech acts, particularly requests. This underscores the necessity of incorporating pragmatic instruction within the English for Academic Purposes (EAP) curriculum, given its critical role in interpersonal communication, especially in the context of the United Kingdom. The benefit of explicit instruction observed in this study aligns with Schmidt's noticing hypothesis, which posits that such instruction aids in promoting the noticing process, thereby enhancing learners' awareness of pragmatics and contributing to the transformation of input into intake.

Additionally, this study indicates that cultural influences, along with other variables, also impact the development of pragmatic competence, supporting findings from other research. Consequently, language instructors should consider these factors to optimize students' pragmatic development.

However, this study has its limitations. Due to the restricted time frame, questions remain regarding the long-term retention of participants' pragmatic development. Furthermore, the study's small sample size (limited to five participants) warrants cautious interpretation of its findings. Future research is essential to address these limitations, with a delayed post-test potentially assessing the retention of pragmatic skills over time, and larger sample sizes aiding in broader generalizability. Such expanded research could yield deeper insights into the pragmatic competence of second language (L2) learners, benefiting both language learners and instructors in their respective pursuits of English language proficiency.

References

- Austin, J. L. (1975). *How to do things with words*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198245537.001.0001>.
- Bardovi-Harlig, K. (2001). Evaluating the empirical evidence: Grounds for instruction in pragmatics? In K. R. Rose & G. Kasper (Eds.), *Pragmatics in Language Teaching* (pp. 13–32). Cambridge: Cambridge University Press.
- Bardovi-Harlig, K. (2024). Teaching of pragmatics. In *The TESOL Encyclopedia of English Language Teaching*. John Wiley & Sons, Inc. <https://doi.org/10.1002/9781118784235.celt0924.pub3>.
- Bardovi-Harlig, K., Dörnyei, Z., & Dörnyei, Z. (1998). Do language learners recognize pragmatic violations? Pragmatic versus grammatical awareness in instructed L2 learning. *TESOL Quarterly*, 32(2), 233. <https://doi.org/10.2307/3587583>.
- Billmyer, K., & Varghese, M. (2000). Investigating instrument-based pragmatic variability: Effects of enhancing discourse completion tests. *Applied Linguistics*, 21(4), 517–552. <https://doi.org/10.1093/applin/21.4.517>
- Blum-Kulka, S., & Olshain, E. (1986). Too many words: Length of utterance and pragmatic failure. *Studies in Second Language Acquisition*, 8(2), 165–179. <https://doi.org/10.1017/S0272263100006069>
- Blum-Kulka, S., House, J., & Kasper, G. (1989). *Cross-cultural pragmatics: requests and apologies*. Ablex Pub. Corp.
- Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language usage*. Cambridge University Press.
- Chen, C. D., Chen, L. X., & Chen, Y. (2023). When two cultures meet: On request behaviour in Chinese and English. *East Asian Pragmatics*, 8(2), 245–270. <https://doi.org/10.1558/eap.22675>.

- Economidou-Kogetsidis, M. (2009). Interlanguage request modification: The use of lexical/phrasal downgraders and mitigating supportive moves. *Multilingua - Journal of Cross-Cultural and Interlanguage Communication*, 28(1), 79–111. <https://doi.org/10.1515/mult.2009.004>
- Goffman, E. (1959). *The presentation of self in everyday life*. Doubleday.
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Speech Acts* (pp. 41–58). BRILL. https://doi.org/10.1163/9789004368811_003.
- Hassall, T. (2001). Modifying requests in a second language. *IRAL - International Review of Applied Linguistics in Language Teaching*, 39(4). <https://doi.org/10.1515/iral.2001.005>
- House, J., & Kádár, D. Z. (2023). Speech acts and interaction in second language pragmatics: A position paper. *Language Teaching*, 1–12. <https://doi.org/10.1017/S0261444822000477>
- Ishihara, N., & Cohen, A. D. (2021). *Teaching and learning pragmatics: Where language and culture meet* (2nd ed.). Routledge. <https://doi.org/10.4324/9781003168188>
- Jeon, E. H., & Kaya, T. (2006). 5. Effects of L2 instruction on interlanguage pragmatic development: A meta-analysis. In J. M. Norris & L. Ortega (Eds.), *Language Learning & Language Teaching* (Vol. 13, pp. 165–211). John Benjamins Publishing Company. <https://doi.org/10.1075/llt.13.10jeo>
- Kasper, G., & Rose, K. R. (2002). *Pragmatic development in a second language*. Wiley-Blackwell.
- Matsumoto, Y. (1988). Reexamination of the universality of face: Politeness phenomena in Japanese. *Journal of Pragmatics*, 12(4), 403–426. [https://doi.org/10.1016/0378-2166\(88\)90003-3](https://doi.org/10.1016/0378-2166(88)90003-3).
- O’Keeffe, A., Clancy, B., & Adolphs, S. (2019). *Introducing pragmatics in use* (2nd ed.). Routledge. <https://doi.org/10.4324/9780429342950>.
- Osuka, N. (2021). The effect of study-abroad on pragmatic transfer. *Chinese Journal of Applied Linguistics*, 44(1), 3–20. <https://doi.org/10.1515/CJAL-2021-0001>
- Otcu, B., & Zeyrek, D. (2008). Development of requests: A study on Turkish learners of English. In M. Pütz and J. Neff-van Aertselaer *Developing Contrastive Pragmatics: Interlanguage and Cross-Cultural Perspectives* (pp. 265–300). New York: De Gruyter Mouton. <https://doi.org/10.1515/9783110207217.3.265>
- Rose, K. R. (1992). Speech acts and questionnaires: The effect of hearer response. *Journal of Pragmatics*, 17(1), 49–62. [https://doi.org/10.1016/0378-2166\(92\)90028-A](https://doi.org/10.1016/0378-2166(92)90028-A).
- Rose, K. R. (2005). On the effects of instruction in second language pragmatics. *System*, 33(3), 385–399. <https://doi.org/10.1016/j.system.2005.06.003>
- Sasaki, M. (1998). Investigating EFL students’ production of speech acts: A comparison of production questionnaires and role plays. *Journal of Pragmatics*, 30(4), 457–484. [https://doi.org/10.1016/S0378-2166\(98\)00013-7](https://doi.org/10.1016/S0378-2166(98)00013-7)
- Schauer, G. A. (2008). Getting better in getting what you want: Language learners’ pragmatic development in requests during study abroad sojourns. In M. Pütz & J. Neff-van Aertselaer (Eds.), *Developing Contrastive Pragmatics: Interlanguage and Cross-Cultural Perspectives* (pp. 403–432). New York: De Gruyter Mouton. <https://doi.org/10.1515/9783110207217.3.403>
- Schmidt, R. (1993). Consciousness, learning and interlanguage pragmatics. In G. Kasper & S. Blum-Kulka (Eds.), *Interlanguage Pragmatics* (pp. 21–42). New York: Oxford University Press. <https://doi.org/10.1093/oso/9780195066029.003.0002>
- Searle, J. R. (1976). A classification of illocutionary acts. *Language in Society*, 5(1), 1–23. <https://doi.org/10.1017/S0047404500006837>.
- Sykes, J. M., & González-Lloret, M. (2020). Exploring the Interface of Interlanguage (L2) Pragmatics and Digital Spaces. *CALICO Journal*, 37(1), i–xv. <https://www.jstor.org/stable/27113777>.
- Taguchi, N. (2015). Instructed pragmatics at a glance: Where instructional studies were, are, and should be going. *Language Teaching*, 48(1), 1–50. <https://doi.org/10.1017/S0261444814000263>.
- Tanck, Sharyl (2004). *Speech act sets of refusal and complaint: A comparison of native and non-native English-speakers’ production*. TESOL, College of Arts and Sciences, American University. <https://doi.org/10.17606/M6XQ04>
- Trosborg, A. (1995). *Interlanguage Pragmatics: Requests, Complaints, and Apologies*. Berlin, New York: De Gruyter Mouton. <https://doi.org/10.1515/9783110885286>
- Van Dyke, A., & Acton, W. R. (2022). Spontaneous classroom engagement facilitating development of L2 pragmatic competence: A naturalistic study. *Pedagogical Linguistics*, 3(1), 1–28. <https://doi.org/10.1075/pl.20011.van>
- Wang, I., Ahn, J. N., Kim, H. J., & Lin-Siegler, X. (2017). Why Do International Students Avoid Communicating with Americans?. *Journal of International Students*, 7(3), 555–582. <https://doi.org/10.32674/jis.v7i3.288>.
- Watts, R. J. (2003). *Politeness* (1st ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511615184>.
- Woodfield, H. & Economidou-Kogetsidis, M. (2010). ‘I just need more time’: A study of native and non-native students’ requests to faculty for an extension. *Multilingua - Journal of Cross-Cultural and Interlanguage Communication*, 29(1), 77–118. <https://doi.org/10.1515/mult.2010.004>
- Yule, G. (2020). *The Study of Language* (7th ed.). Cambridge: Cambridge University Press.

Research Article

Knowledge and Emotions in Socioscientific Decision-Making

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<https://doi.org/eiki/10.59652/jetm.v2i4.367>

Abstract: Socioscientific issues require practical decisions that use knowledge and emotions as inputs for the decision-making process. To examine how these resources influence decision-making, this investigation was conducted from a constructionist epistemological stance, a symbolic interactionism theoretical perspective, and a grounded theory methodology. Twenty-five informants were purposefully selected based on the study's selection criteria. Data were collected through semi-structured interviews, transcribed, and analyzed using Hennink and Kaiser's strategies to achieve theoretical saturation. The analysis revealed that: (1) Knowledge of socioscientific issues was associated with emotion-related objects that elicited negative emotional responses from decision-makers; (2) These negative emotions triggered the use of related conceptual and contextual knowledge in generating decision alternatives; (3) Positive emotions motivated decision alternatives toward specific goals; (4) Decision alternatives contained both cognitive and affective components; and (5) Decisions were based on the appraisal of the overall cognitive and affective baggage of these alternatives. The findings underscored the importance of decision-makers enhancing their cognitive and affective resources and incorporating both when making practical decisions to effectively address socioscientific issues, thereby contributing to positive outcomes for individuals, societies, and the global community.

Keywords: decision alternatives; decision appraisal; socioscientific decisions; grounded theory

1. Introduction

Decision-making is a crucial skill linked to excellence and productive living (Asikhia et al., 2021), as well as to quality, efficiency, and rationality (Azhar et al., 2021). It also plays a significant role in fostering progress and development (Sari, 2023), happiness (Hamzah et al., 2021), and life satisfaction (Sari, 2022). This process is both cognitive and emotive, involving the recall of past actions and the prediction of their outcomes to generate alternative strategies. These strategies are then evaluated cognitively and affectively to inform decision making (Imani et al., 2021; Fischhoff & Broomell, 2020). Effective decision making necessitates the strategic integration of various resources to produce practical decisions that align with appropriate means and goals (Feng et al., 2022). A deeper understanding of how decisions are made offers valuable opportunities to enhance our decision-making abilities (Taherdoost & Madanchian, 2023a).

In 2015, the United Nations (UN) established 17 Sustainable Development Goals (SDGs) through the 2030 Sustainable Development Agenda, which focuses on social, economic, and environmental pillars to improve the quality of life for all (Filho et al., 2024). Achieving these goals depends on effective decision-making, which literature suggests requires further scientific investigation for improvement (Ge et al., 2024). Practical decision-making, defined as making appropriate decisions using suitable means to achieve desirable outcomes (Taherdoost & Madanchian, 2023a), is essential for various industries in addressing the UN's call for global partnerships to advance the SDGs (Barberà-Mariné et al., 2024). This is particularly important in sectors such as healthcare (Kapeke et al., 2023), education (Samsuri et al., 2023), social services (Nykänen et al., 2021), emergency response (Hou et al., 2021), and environmental management (Carrick et al., 2022). Given that different industries operate within distinct local contexts, decision-makers must consider various forms of specific knowledge and examine their roles as resources in generating practical decisions for real-world

Received: November 26, 2024

Accepted: December 17, 2024

Published: December 22, 2024



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applications (Wu & Liang, 2024).

The factors influencing decision-making are represented by various forms of consumable knowledge, including implicit and tacit knowledge (Ortiz Barrera, 2023), rational, emotional, and spiritual knowledge (Bratianu & Bejinaru, 2023), general and specific knowledge (Mabade & Mapangwana, 2022), sensorial and abstract knowledge (Hallo & Nguyen, 2021), and contextual and conceptual knowledge (Suomala, 2020). Despite the diverse terminology, knowledge is often regarded as a cornerstone of decision-making (McLean et al., 2023), and the crucial element missing in decision-making processes (Schulz, 2023). However, the relationship between knowledge and decision-making provides limited insight into how knowledge is acquired or utilized to improve decisions (Fischhoff & Broomell, 2020).

To make practical decisions that are effective within specific contexts, decision-makers must understand the nature of knowledge, its role as a valuable decision-making resource, and its conversion into efficient actions and practices. This investigation addresses these needs within the framework of socioscientific decision-making by seeking to answer the following research questions:

1. How does knowledge influence socioscientific decision-making?
2. How do emotions influence in socioscientific decision-making?
3. How are decision alternatives generated socioscientific decision-making?
4. How are decision alternatives appraised for socioscientific practical decisions?

2. Materials and Methods

2.1. Research Design

This investigation was based on a constructivist epistemology and a symbolic interactionist theoretical perspective, which view knowledge as co-constructed through the shared interpretation of language and symbols during social exchanges between the informants and the researcher (D. Mohajan & H. Mohajan, 2022). Additionally, a grounded theory methodology was employed to uncover the meanings (Tops et al., 2024) underlying the informants' socioscientific decision-making in the context of the COVID-19 pandemic. Data were collected through individual interviews and analyzed using Hennink and Kaiser's (2022) approach to theoretical saturation, from which the grounded theory was developed.

2.2. Informants

A purposeful sampling method was used to identify the most relevant data sources for gaining insights into the situation. In this study, cases were selected based on specific criteria: enrollment as a regular student in a public high school, grade level as grade 11, age between 15 and 17 years, academic status as top-performing learners, physical and psychological fitness, and voluntary participation. A total of twenty-five informants participated in individual interviews, meeting the minimum requirement of twenty interviewees (Staller, 2021) and twenty interview sessions (Sebele-Mpofu, 2020) needed to achieve theoretical saturation in grounded theory. All informants were assessed as physically and psychologically fit by a registered nurse and a registered guidance counselor.

The informants participated in individual interviews, the primary method of data collection, to share their experiences during the COVID-19 pandemic. These interviews allowed for the co-construction of meaning, with both researchers and informants contributing to the development of meaningful data. An interview guide with trigger questions, which was translated into the local language by school teachers familiar with the area, was used. The interview instrument was validated and ethically reviewed by experts from various fields. Audiovisual recordings were made using cameras, microphones, cell phones, and laptops. The informants' profiles, presented with pseudonyms for privacy, are included in Table 1.

Table 1. Informants' profile.

| Title 1 | Age | Sex | Academic status |
|----------|-----|--------|------------------|
| Maribel | 16 | Female | With High Honors |
| Janice | 15 | Female | With Honors |
| Mecel | 15 | Female | With Honors |
| Mary Ann | 15 | Female | With Honors |
| Glenn | 15 | Male | With Honors |

| | | | |
|-----------|----|--------|-------------|
| Jacquilyn | 17 | Female | With Honors |
| Faith | 15 | Female | With Honors |
| Rogelio | 15 | Male | With Honors |
| Noreen | 15 | Female | With Honors |
| Marvin | 15 | Male | Top 10 |
| Gemma | 16 | Female | Top 10 |
| Noemi | 15 | Female | Top 10 |
| Julian | 15 | Male | Top 10 |
| Dolores | 15 | Female | Top 10 |
| Philip | 15 | Male | Top 10 |
| Pedro | 15 | Male | Top 10 |
| Inne Jean | 15 | Female | Top 10 |
| Marilou | 16 | Female | Top 10 |
| Salvador | 16 | Male | Top 10 |
| Estella | 15 | Female | Top 10 |
| Cerila | 16 | Female | Top 10 |
| Elizabeth | 16 | Female | Top 10 |
| Vivencio | 16 | Male | Top 10 |
| Ivy | 17 | Female | Top 10 |
| Judy | 16 | Female | Top 10 |

2.3. Data Collection

The initial phase of data collection involved both technical and ethical reviews of the methodology. Consent and assent forms, in accordance with the guidelines set by the Philippine Health Research Ethics Board (2017), were obtained from the informants and their parents after they were thoroughly informed about the study. Individual semi-structured interviews were conducted with the assistance of a registered guidance counselor, who served as an observer and simultaneously assessed the informants' psychological well-being. During these interviews, informants shared their experiences during the COVID-19 pandemic, which led to the formulation of probing questions. This concurrent data collection allowed the researcher to confirm initial findings, refine the results, and provide comprehensive support for these discoveries. Between three and six interviews were conducted each day over a period of five consecutive days, with theoretical saturation being reached by the 25th session.

2.4. Data Analysis

The interviews were manually transcribed, and the transcripts were analyzed using the strategies outlined by Hennink and Kaiser (2022) for achieving saturation. The analysis followed several steps: (1) code frequency counts, which involved counting new codes in each transcript until few or no new codes emerged; (2) the comparative method, where daily batches of 3 to 6 transcripts were reviewed, and all new codes were listed for each batch; (3) the stopping criterion, which involved identifying similar codes in the first day's set of transcripts, then examining the subsequent transcripts until the stopping criterion was met after the 20th interview, followed by the final five interviews to test whether new codes might still emerge; (4) high-order groupings, which involved developing meta-themes, salient themes, or categories from the previously identified codes; and (5) code meanings, which entailed examining issues, new aspects, dimensions, or nuances within the developed categories and themes until no new information surfaced.

Throughout the data analysis process, the researcher applied (1) initial coding, which involved memo-taking and the constant comparison of transcripts to identify codes and concepts; (2) focused coding, which included revising, renaming, adding, and deleting codes to refine categories; and (3) theoretical coding, which connected codes and concepts to form themes, continuing until theoretical saturation was reached. Theoretical saturation then served as the foundation for the grounded theory developed from the analysis.

2.5. Trustworthiness

The data collection instrument, procedures, and analysis were subjected to technical examination by experts in Science Education, Psychology, and Social Science. An ethical review was conducted by specialists in Psychiatry, Biology Education, and Social and Environmental Science. Informed consent and assent forms were obtained to ensure the informants' anonymity, as well as their rights to voluntary participation, privacy, and

confidentiality.

The interviews were conducted in the informants' native language, with the assistance of a registered guidance counselor and a registered nurse to ensure their psychological and physical well-being.

This collaboration of expertise from various disciplines, along with the measures implemented to safeguard the informants' safety and data security, significantly enhanced the trustworthiness of the collected data.

2.6. Ethical Consideration

This research was approved by the Research Ethics and Review Committee of West Visayas State University on March 27, 2023 under the URERC Protocol Number WVSU.URERC-2022.GS-I_005.

3. Results

Related knowledge structures continued to develop into integrated frameworks that function as cognitive justifications for behaviors, aiming to resolve the perceived socioscientific problem situation. In the interview, informants combined their conceptual knowledge of virus transmission with their understanding of facemasks to explain why they must wear them. Their knowledge of virus transmission was also integrated with their understanding of physical distancing to explain the necessity of maintaining a one-meter distance when conversing. These enhanced knowledge structures served as their reasoning, as shared by Marilou and Jacquilyn:

- Marilou: "*Like kung magwa ka, suksuk ka facemask kay ang COVID dyan sa hangin. Mafilter kuno ang virus*" (If you go outside, you should wear your facemask because the COVID [virus] is [spread] by the air. [Facemasks] filter the virus).
- Jacquilyn: "*Kay diba gapsread ang COVID 19 tungod sang hangin...kung mag-istorya ka sir, parayu ka guid. Indi ka gid magparapit... Para mas indi pagid kasulod*" (The COVID-19 [virus] is spread by air... If you talk, you should keep a certain distance. Do not stay close [with the person you are talking with] ... this is to avoid getting infected).

This knowledge build-up also included the integration of contextual knowledge with conceptual understanding. Drawing from their prior knowledge of facemask use and physical distancing, informants incorporated their awareness of the prescribed protocols related to the actual pandemic situation. Ivy and Vivencio added:

- Ivy: "*Tam-an ka budlay sir kung indi ka magmask kay tam an ka strikto tulad nga pandemic bala aw. Gamay lang nga magwa kaw tapos waay kaw tig mask nadakop ka dayun.*" (It was difficult, sir, because if you do not wear your facemask, [the officers] were strict during the pandemic. If you go outside without wearing your mask, you would be arrested).
- Vivencio: "*Ang COVID-19 isa ka global nga situasyon. Kag tama ka delikado kay damo napatay mo...Makalalaton by physical kag istorya istorya. Indi sagi laagan lagaw. Indi magwa. May mga batas batas.*" (The COVID-19 pandemic is a global situation. It was dangerous because many have died. It was very contagious through physical contact and when talking with others. You should not roam around. You should not go outside. There were rules.)

In terms of emotions, the knowledge of the pandemic situation elicited negative emotional responses that corresponded to the informants' affective profiles of the problem. Estella, Mariel, and Janice shared the following:

- Estella: "*Pina ko gid nga nabatyagan during time nga to. Like depress. Stress. physically and mentally stressed. Nagabatyag ka anxiety, problem kag sadness.*" (What I felt that time... depression. Stressed...physically and mentally stressed. I felt anxious, problems, and sadness)
- Mariel: "*Makacontact kalang sa isa ka tao nga may COVID, malatnan ka dayun. Waay kaw kamaan kung infected [ang tawo] ukon indi... Pwede makapatay*" (If you are more distant, much safer. A contact with an infected person means you become infected too. You do not know if the person you are interacting is infected or not... Can cause death)
- Janice: "*It can spread easily... makapatay*" (deadly)

The negative affective profiles were complemented with ideal situations that expressed positive emotions as motivations to mitigate the associated problem situation. Martin described:

- Glenn: "*Kay this pandemic naduraan ko tig freedom nga magsocialize kag magwa sa balay. Kag*

mag imaw sa mga friends ko kay ako paralagaw ako abi kag palasocialize... Te, this pandemic namag-uban lang ako kay indi ko sanay kag nadulaan ko bala tig freedom magbulag... Dapat waay dun ran. Nga may imaw [na] ako nga pwede ko kaparapit sa mga tao nga close kanakon... Ang Facebook, Messenger, Youtube, IG. Kaisa gadangatan 11 mga manug-12.” (I lost my freedom to socialize because I could not go outside during the pandemic. I was not used to being restricted... I hope it would not be that way. That I should be able to go with the people I feel close with... [I use] Facebook, Messenger, Youtube, IG... Sometimes, I stay late until 11 or about 12 [in the morning].)

These negative-to-positive emotion dynamics involved behaviors that worked as attempts to resolve the negative emotion-causing component of the problem situation. Janice informed:

- Janice: *“Kung kulang sa nutrisyon, sir, ang isa ka tawo kag indi healthy tana te dasig tana malatnan. Makabato ang resistensya mo, sir. Dapat safe sa pagkaon, sir. Kay hambal nanda kuno, sir, amo ran makaano [makaparayo] ka COVID-19... Kay hambal nanda kuno sir amo ran makaano ka COVID 19 kay gabina resistensya mo kuno, sir.”* (If a person is undernourished, they are not healthy. Then they can easily get infected. Your immunity can fight [the infection]. You have to eat healthy food. They say this prevents COVID-19... Because they say that causes weak resistance against COVID, sir).

Meanwhile, the same-valenced emotions triggered conflicting behaviors that target the same component of the problem situation. Mecel referred to Glenn’s earlier statement about staying up late and said:

- Mecel: *“Bawal magpulaw. Tapos sakto gid ang oras sa pagtulog... Para ma-avoid ang social anxiety”* (You cannot stay up late. Then you need to have the rightful amount of sleep... To avoid social anxiety).

Cross-examination of Mecel and Glenn’s statements revealed conflicting behavioral responses driven by feelings of isolation, which led to staying up late for socialization, and feelings of anxiety, which were associated with the desire to obtain adequate rest and sleep.

In general, the conceptual and contextual knowledge of the problem situation provided both cognitive and affective considerations, which influenced the development of decision alternatives. The informants’ emotions played a significant role in shaping related knowledge they used to generate these alternatives. When it came to handwashing, the informants faced challenges when their preferred brand of antibacterial soap was unavailable. As a result, they sought alternative solutions that aligned with both knowledge of the actual and ideal situations. Janice, Noreen, and Mariel responded:

- Janice: *“Sundon gid ang proper handwashing”* (Follow proper handwashing)
- Noreen: *“Kung ano lang available nga babon. Bawi lang sa pulas... Kaisa sir waay gapanghugas. Gapang alcohol nalang”* (Make use of whatever soap is available. Do rub your hands more... Sometimes, I do not wash my hands. I use alcohol instead)
- Mariel: *“Gamit lang sanitizer”* (You may use sanitizer).

These alternatives also contained affective components in the form of negative emotions stemming from the actual problem situation and positive emotions as motivations to prevent unfavorable outcomes. In the interview, these emotions included their desire for safety and security, as framed in their ideal situations. Julian, Salvador, Vivencio, and Elizabeth shared:

- Julian: *“Mas safety. Maging safe, sir”* (Safer. To become safer, sir).
- Salvador: *“For prevention. Para sa imo, sir, daw ginabura mo man nga maavoid ang amo karan, sir”* (For you, sir, you do that to avoid that [COVID-19], sir)
- Vivencio: *“Para ma-prevent ang ano [COVID-19]”* (To prevent COVID-19)
- Elizabeth: *“Para indi maanohan [malatnan] ka COVID, sir”* (So you won’t get infected with COVID).

The components and consequences of the alternative frameworks formed were carefully and thoughtfully evaluated, as described by Janice, Pedro, and Dolores:

- Janice: *“Daw mas maingat ka bala tulad sa mga decisions mo aw. Naisipan mo gid mayad kun ano maayo himuon mo nga desisyon”* (You become more careful of your decisions. You really thought of what good decisions to make).
- Pedro: *“Naisipan mo gid mayad”* (You really think of it).
- Dolores: *“Kung ano maging resulta na”* (What will be the result).

This evaluation involved cognitive appraisals of alternatives for concrete results that countered the actual pandemic situation. Estela, Marvin, and Salvador informed:

- Estela: *“Indi dun mag-quarantine. Nga pwede dun bala kami, sir, kabulag tig mayad. Waay dun tig mga protocols nga dapat sundon. Patas tulad, indi dun kinanglan quarantine pass para kabakal ano gusto mo kay kang nagligad, sir, kinanglan antes ka magna, quarantine pass. Kang ligad, indi kaw kabalubilo sa mga friends mo. Tulad okay dun”* (I hope, sir, we won’t have the same [situation] as before. We do not need to be quarantined. That we are able to freely move. No more protocols that should be followed. Like now, that we do not need a quarantine pass to buy what we want, unlike before when you needed to obtain one before you were permitted to go out. Before, we were not able to interact with our friends. Now, it is okay).
- Marvin: *“...nga nagalagaw ko bala. May imaw ako nga pwede ko kaparapit, and mga memories ko kang san-o nga wala pa nag-abot ang pandemic”* (...that I can now roam around, that I have someone I can be with, and my memories before the pandemic).
- Salvador: *“Nga mahimo mo dun gusto mo. Tanan mo mahimo nga waay dun tig... [moved his hands to suggest limited movements]”* (That you can do what you want. You can do everything without limitations).

In the same way, the affective components of the alternatives were appraised based on the likeness or unlikeness of the results. Gemma, Inne Jean, and Faith focused on the desired positive feelings, while Glenn focused on the avoidance of negative emotions, sharing:

- Gemma: *“Daw mas secure ikaw, sir, nga mahambal mo nga healthy ikaw kay amo dan. The more nga safe”* (You feel more secure, that you can say you are healthy. You are safer).
- Inne Jean: *“Based sa result na. Lantawon mo ang good effect kag bad effects”* (Based on its result. You look at the good effects and bad effects).
- Faith: *“Ang matapus dun kag makaenjoy dun. Nga waay tig worry nga may COVID nga nabilin kag maglapta liwat”* (That this will end and we can enjoy. That you do not worry that COVID could spread again).
- Glenn: *“Para sa imo, sir, ginaubra mo man nga ma-avoid ang amo karan [mainfect]. Like kung may mag ubo, sir. Stop!”* (For you, sir, you do it to avoid [getting infected]. Like if somebody coughs, sir. Stop!)

4. Discussion

Decision-making relies on various forms of knowledge that guide both cognitive and emotional processes, such as evaluating outcomes, selecting preferences, and integrating past judgments into current decisions (Fischhoff & Broomell, 2020). In the context of socioscientific decision-making, knowledge guides individuals in generating decision alternatives and appraising related practical outcomes. Chen, Ge, Li, and Peng (2021) discussed this in terms of multiple data sources that enhance information management.

Decision-makers consider both conceptual and contextual knowledge, as noted by Bader, Ahearn, Allen, Anand, Coppens, and Aikens (2023). Conceptual knowledge includes categories, relationships, principles, and representations used to create strategies and identify errors (Braithwaite & Sprague, 2021), supporting reason-based decision-making. For instance, informants combined their understanding of virus transmission with pandemic guidelines to justify their reasons to wear masks and practice physical distancing. Results additionally shows how conceptual knowledge serves as a framework that can be applied across various situations. As Dohn (2021) explains, knowledge transfer involves adapting knowledge to fit the specific needs of a new context.

As decision-makers gain contextual knowledge, they develop situational awareness (Munir et al., 2022), helping them recognize patterns and respond to new challenges (Sipiorski, 2023). Contextual knowledge connects past experiences with current conditions, allowing decision-makers to make more relevant choices. Informants’ past knowledge helped them identify patterns, predict outcomes, and adjust strategies based on previous successes or failures. Pettersen, Ertesvåg, Pöysä, Vaaland, and Virtanen (2023) support this idea, suggesting that understanding the context shapes how past knowledge is applied. Literatures aligned with contextual knowledge enhancing understanding of the present, predicting future outcomes (Agnisarman et al., 2021), and evaluating risks (Briggs & Lumsdon, 2021); thereby, improving decision-making.

The integration of both conceptual and contextual knowledge plays a critical role in decision-making, enabling decision-makers to make reasoned and contextually appropriate choices. This aligns with Klaver, Sins, Walma van der Molen, and Guérin (2022), who emphasized the importance of both internal and external resources, such as experiences and

sociocultural contexts, in shaping practical decision-making. As demonstrated in the responses of the informants, drawing on various sources of knowledge enhances the decision-making process, fostering a more practical approach to resolving socioscientific issues.

In terms of its role as an affective component in decision-making, the findings demonstrate that emotions significantly influenced decisions. Particularly in the context of socioscientific issues like the pandemic, informants reported experiencing negative emotions, including stress, anxiety, and sadness, which directly shaped their decisions to mitigate the pandemic's negative effects. For example, the fear of infection and the uncertainty surrounding COVID-19 motivated them to implement precautionary measures. These findings support existing research that emphasizes the role of emotions in guiding choices, including action tendencies, that solve problems and promote positive outcomes (Tsopanova, 2023).

Emotions play a key role in decision-making, influencing our choices as either incidental or integral. Incidental emotions relate to decisions unrelated to the core issue, while integral emotions are directly tied to the main issue itself. For example, during the pandemic, some informants, frustrated by social restrictions, stayed up late to socialize. On the other hand, others, anxious about isolation, focused on getting enough rest. These conflicting responses show how similar emotions, such as stress or anxiety, can lead to different behaviors that may support or not support the main issue of COVID-19. This aligns with Action Tendency Framework, which suggests that how we interpret emotions can lead to different decisions (Campbell et al., 2023). In this sense, decision-making process became guided by its goal-setting mechanisms, which shapes how decision-makers evaluate options and make choices.

Both knowledge and emotions during the pandemic contributed to the generation of decision alternatives. Informants demonstrated flexibility when confronted with resource limitations, such as the unavailability of their preferred soap. In response, they considered knowledge of existing resources that they used in re-constructing their choices. Among which include switching to a different brand of soap, using alcohol or sanitizer, or relying on meticulous handwashing with water alone. This ability to generate alternatives, aiming for optimal and satisfactory courses of action, aligns with existing research, which emphasizes the importance of available knowledge in responding to changing circumstances and finding viable solutions (Taherdoost & Madanchian, 2023a; Taherdoost & Madanchian, 2023b).

Decision alternatives, including their action tendencies, were guided by both conceptual and contextual knowledge, as well as positive emotions such as the informants' desire for safety. They framed these alternatives as responses to the threat of COVID-19, prioritizing the prevention of infection and ensuring safety. This complements the idea that decision-makers rely on both knowledge and emotions to generate practical choices when faced with complex issues (Kóbor et al., 2023). The informants' focus on safety and illness prevention, above other goals, acted as key motivators for their behaviors, reflecting research on goal-setting mechanisms in decision making (Bairagi, 2023).

Decision-makers modify their choices to reflect the dynamic nature of decision-making. Card, DellaVigna, Jiang, and Taubinsky (2024) explained that knowledge is constantly updated to fit new circumstances, aligning with Kerzner's (2023) "phantom alternatives," where decision choices are revisited and adjusted based on changes in the situation. The informants' responses, influenced by both knowledge and emotions, highlight the importance of adapting viable decision alternatives to address socioscientific challenges.

Interestingly, alternatives related to the same goals, as informants described. Knowledge serves an instrumental role in goal setting, that decision-makers relate available knowledge to achieve the same goal. Literatures similarly relate by describing that it is the goal that defines knowledge, rather than knowledge defining goals (Chae & Shin, 2024). From this, decision alternatives were then appraised. Goal setting is an important step in decision-making.

Decision-making involves evaluating alternatives based on existing knowledge to select the most appropriate option. Informants emphasized the importance of assessing knowledge and potential outcomes, aligning with Polhill and Edmonds' (2023) concept of evaluating actions based on available knowledge and anticipated consequences. Their decisions were influenced by a desire to regain freedom from restrictions, reflecting both adaptive and posterior rationality, where choices are guided by past knowledge, the current context, and the outcomes of previous experiences (Elgendy et al., 2023). Ultimately, decisions are updated, leading to a final choice when the decision-maker feels confident.

Affective evaluations also significantly influenced decision-making, with many informants highlighting positive emotions, such as safety and security, as key motivators. They viewed the end of the pandemic as an opportunity to resume life without fear of

infection, reinforcing the idea that emotions guide decisions toward favorable outcomes (Kim, 2023). Conversely, some informants emphasized the role of negative emotions, particularly fear, in shaping decisions, demonstrating how emotional responses to infection risks prompt behaviors to mitigate harm. Decision-makers associate positive emotions with desirable outcomes, selecting options that lead to more favorable feelings. These choices are also driven by an inherent aim to avoid negative, harmful, and dangerous outcomes, which aligns with Lerner, Dorison, and Kim’s (2023) concept of negative-to-positive emotion dynamics, where emotional responses guide decisions toward outcomes that enhance positive feelings.

The meaningful presentation of the socioscientific decision-making process based on the findings of this investigation is shown in Figure 1.

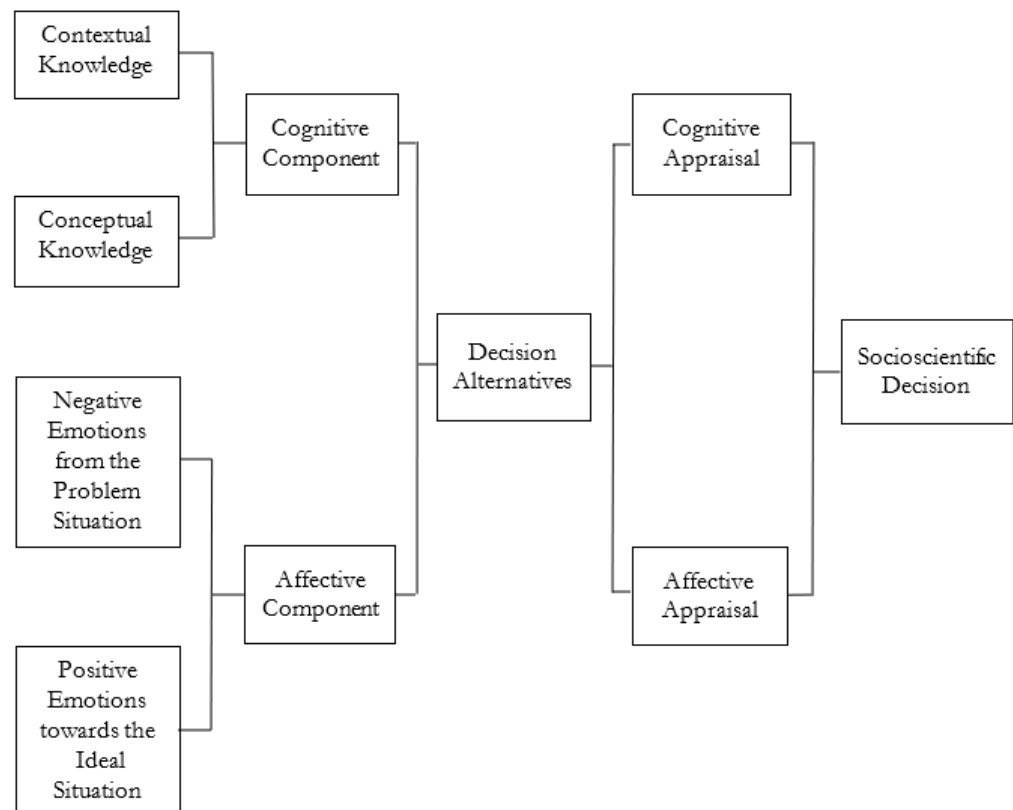


Figure 1. Socioscientific decision-making process.
Source: Author’s development.

Socioscientific decisions, in general, are determined through cognitive and affective appraisals of knowledge and emotions within decision alternatives, aimed at avoiding negative situations and achieving positive outcomes. This interplay between these components emphasizes their equal importance in decision-making, ultimately leading to decisions with favorable results amidst socioscientific issues.

5. Conclusions

Socioscientific issues require practical decision-making to address the challenges they present. Decision-makers often respond to emotion-related objects in the situation with negative emotions, which trigger cognitive, emotional, and behavioral reactions that influence their decision-making. Consequently, decision alternatives are shaped by both conceptual and contextual knowledge, along with positive emotions that guide the selection of optimal options for resolving the issue and determining necessary actions. These alternatives are evaluated based on the decision-maker’s confidence in their chosen course of action and their emotional responses to potential outcomes. This study acknowledges several limitations, including the characteristics of the informant group, the study site, the interview method, limited related literature, and the focus on the COVID-19 pandemic as the primary socioscientific issue. Future research should address these limitations by incorporating larger and more diverse samples, expanding the study sites, conducting a comprehensive review of

literature on cognition and emotion, employing varied data collection methods, and exploring additional socioscientific issues beyond COVID-19 to enhance the relevance of the research. Despite these limitations, the investigation emphasizes the significant role of knowledge and emotions in the cognitive and affective processes of decision-making, highlighting the importance of developing decision-making frameworks that integrate various types of knowledge and promote positive emotions. Such frameworks can guide individuals, societies, and global communities toward actions that improve their situations by facilitating decisions that lead to beneficial outcomes and contribute to resolving pressing societal and global challenges.

Funding: The author did not receive any external funding for this study. The research was conducted independently by the author.

Acknowledgments: The researcher would like to thank Dr. Peter Ernie D. Paris and Dr. John Erwin P. Pedroso of the West Visayas State University, his supportive friends, relatives, family, and God.

Conflicts of Interest: The author declares no conflict of interest.

References



- Agnisarman, S., Madathil, K. C., Bertrand, J., Piratla, K., Gajjar, D., & Gramopadhye, A. (2021). Context enabled decision aids to support the situation awareness and performance of risk engineers carrying out loss prevention surveys. *International Journal of Industrial Ergonomics*, *83*, 103108. <https://doi.org/10.1016/j.ergon.2021.103108>
- Asikhia, O., Ogunode, O., Oladipo, S., & Fatoke, O. (2021). Effective management decision making and organisational excellence: A theoretical review. *The International Journal of Business & Management*, *9*(1). <https://doi.org/10.24940/theijbm/2021/v9/i1/bm2101-049>
- Azhar, N. A., Radzi, N. A., & Wan Ahmad, W. S. (2021). Multi-criteria Decision making: A systematic review. *Recent Advances in Electrical & Electronic Engineering*, *14*(8), 779–801. <https://doi.org/10.2174/2352096514666211029112443>
- Bader, J. D., Ahearn, K. A., Allen, B. A., Anand, D. M., Coppens, A. D., & Aikens, M. L. (2023). The decision is in the details: Justifying decisions about socioscientific issues. *Journal of Research in Science Teaching*, *60*(10), 2147–2179. <https://doi.org/10.1002/tea.21854>
- Bairagi, B. (2023). Multiple objective and subjective criteria evaluation technique (MOSCET). *Optimization Techniques in Engineering: Advances and Applications*, 297–311. <https://doi.org/10.1002/9781119906391.ch18>
- Barberà-Mariné, M.-G., Fabregat-Aibar, L., Ferreira, V., & Terceño, A. (2024). Assessment of the Progress of Sustainable Development Goals (SDGs) in the European Union. *The European Journal of Development Research*, *36*, 1372–1397. <https://doi.org/10.1057/s41287-024-00641-0>
- Braithwaite, D. W., & Sprague, L. (2021). Conceptual knowledge, procedural knowledge, and metacognition in routine and nonroutine problem solving. *Cognitive Science*, *45*(10), Article e13048. <https://doi.org/10.1111/cogs.13048>
- Bratianu, C., & Bejinaru, R. (2023). From knowledge to wisdom: Looking beyond the knowledge hierarchy. *Knowledge*, *3*(2), 196–214. <https://doi.org/10.3390/knowledge3020014>
- Briggs, C., & Lumsdon, D. (2021). Practical wisdom: How do personal virtue beliefs and contextual factors interact in adolescents' moral decision-making? *Journal of Moral Education*, *51*(3), 293–311. <https://doi.org/10.1080/03057240.2021.1891871>
- Campbell, N. M., Dawel, A., Edwards, M., & Goodhew, S. C. (2023). Motivational direction diverges from valence for sadness, anger, and amusement: A role for appraisals? *Emotion*, *23*(5), 1334–1348. <https://doi.org/10.1037/emo0001165>
- Card, D. E., DellaVigna, S., Jiang, C., & Taubinsky, D. (2024). Understanding expert choices using decision time: NBER Working Paper No. w32515. <https://doi.org/10.2139/ssrn.4851789>
- Carrick, J., Bell, D., Fitzsimmons, C., Gray, T., & Stewart, G. (2022). Principles and practical criteria for effective participatory environmental planning and decision-making. *Journal of Environmental Planning and Management*, *66*(14), 2854–2877. <https://doi.org/10.1080/09640568.2022.2086857>
- Chae, H., & Shin, I. (2024). Compete or cooperate? goal orientations and coworker popularity in the knowledge-sharing dilemma. *Behavioral Sciences*, *14*(3), 250. <https://doi.org/10.3390/bs14030250>
- Chen, J., Ge, X., Li, W., & Peng, L. (2021). Construction of spatiotemporal knowledge graph for emergency decision making. In *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS* (pp. 3920–3923). Brussels, Belgium. <https://doi.org/10.1109/igarss47720.2021.9553867>
- Dohn, N. B. (2021). Conceptualizing knowledge transfer as transformation and attunement. *Frontline Learning Research*, *9*(3), 13–30. <https://doi.org/10.14786/flr.v9i3.733>
- Elgendy, N., Elragal, A., & Päiväranta, T. (2023). Evaluating collaborative rationality-based decisions: A literature review. *Procedia Computer Science*, *219*, 647–657. <https://doi.org/10.1016/j.procs.2023.01.335>
- Feng, J., Han, P., Zheng, W., & Kamran, A. (2022). Identifying the factors affecting strategic decision-making ability to boost the entrepreneurial performance: A hybrid structural equation modeling – artificial neural network approach. *Frontiers in Psychology*, *13*. <https://doi.org/10.3389/fpsyg.2022.1038604>
- Filho, W. L., Sierra, J., Price, E., Eustachio, J. H., Novikau, A., Kirrane, M., Dinis, M. A., & Salvia, A. L. (2024). The role of universities in accelerating the Sustainable Development Goals in Europe. *Scientific Reports*, *14*(1). <https://doi.org/10.1038/s41598-024-65820-9>
- Fischhoff, B., & Broomell, S. B. (2020). Judgment and decision making. *Annual Review of Psychology*, *71*(1), 331–355. <https://doi.org/10.1146/annurev-psych-010419-050747>

- Ge, Y., Han, F., Wu, F., Zhao, Y., Li, H., Tian, Y., Zheng, Y., Luan, W., Zhang, L., Cai, X., Ma, C., & Li, X. (2024). Sustainable decision making based on systems integration and decision support system promoting endorheic basin sustainability. *Decision Support Systems*, 179, 114169. <https://doi.org/10.1016/j.dss.2024.114169>
- Hallo, L., & Nguyen, T. (2021). Holistic view of intuition and analysis in leadership decision-making and problem-solving. *Administrative Sciences*, 12(1), 4. <https://doi.org/10.3390/admsci12010004>
- Hamzah, S. R., Kai Le, K., & Musa, S. N. (2021). The mediating role of career decision self-efficacy on the relationship of career emotional intelligence and self-esteem with career adaptability among University Students. *International Journal of Adolescence and Youth*, 26(1), 83–93. <https://doi.org/10.1080/02673843.2021.1886952>
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>
- Hou, L.-X., Mao, L.-X., Liu, H.-C., & Zhang, L. (2021). Decades on emergency decision-making: A bibliometric analysis and literature review. *Complex & Intelligent Systems*, 7(6), 2819–2832. <https://doi.org/10.1007/s40747-021-00451-5>
- Imani, E., Harati, A., Pourreza, H., & Goudarzi, M. M. (2021). Brain-behavior relationships in the perceptual decision-making process through cognitive processing stages. *Neuropsychologia*, 155, 107821. <https://doi.org/10.1016/j.neuropsychologia.2021.107821>
- Kapeke, K., Muse, K., Rowan, J., Saw, P., White, T., Ojinnaka-Psillakis, A., Peries, T. D., Miranda, N. P., Ali, S., Dau, A., Taafua, L., Nalupta, C., Harvey, M., & Zorbas, C. (2023). Who holds power in decision making for Young People's Future? *Medical Journal of Australia*, 219(S10), S30-S34. <https://doi.org/10.5694/mja2.52147>
- Kerzner, H. (2023). Developing alternatives. In *Project Based Problem Solving and Decision Making* (pp. 73–80). John Wiley & Sons, Inc. <https://doi.org/10.1002/9781394207862.ch6>
- Kim, H. (2023). Voters' political decision making in the 20th presidential election: Voters' affective valence. *Journal of the Korea Contents Association*, 23(1), 12–23. <https://doi.org/10.5392/jkca.2023.23.01.012>
- Klaver, L. T., Sins, P. H., Walma van der Molen, J. H., & Guérin, L. J. (2022). Strengthening science education through attention to student resources: A conceptualization of socioscientific capital. *Journal of Research in Science Teaching*, 60(5), 1162–1192. <https://doi.org/10.1002/tea.21827>
- Kóbor, A., Tóth-Fáber, E., Kardos, Z., Takács, Á., Éltető, N., Janacsek, K., Csépe, V., & Nemeth, D. (2023). Deterministic and probabilistic regularities underlying risky choices are acquired in a changing decision context. *Scientific Reports*, 13, 1127. <https://doi.org/10.1038/s41598-023-27642-z>
- Lerner, J. S., Dorison, C., & Kim, J. (2023). How Do Emotions Affect Decision Making? In A. Scarantino (Ed.), *The Routledge Handbook of Emotion Theory*. <https://doi.org/10.31234/osf.io/xbsza>
- Mabade, A. S., & Mapangwana, N. L. (2022). Moving from general knowledge to specific knowledge in a democratic culture: A case study approach. *Open Journal of Social Sciences*, 10(02), 298–313. <https://doi.org/10.4236/jss.2022.102022>
- McLean, M., Warner, B., Markham, R., Fischer, M., Walker, J., Klein, C., Hoeberechts, M., & Dunn, D. C. (2023). Connecting Conservation & Culture: The importance of indigenous knowledge in conservation decision-making and resource management of Migratory Marine Species. *Marine Policy*, 155, 105582. <https://doi.org/10.1016/j.marpol.2023.105582>
- Mohajan, D., & Mohajan, H. K. (2022). Constructivist grounded theory: A new research approach in Social Science. *Research and Advances in Education*, 1(4), 8–16. <https://doi.org/10.56397/rae.2022.10.02>
- Munir, A., Aved, A., & Blasch, E. (2022). Situational Awareness: Techniques, challenges, and prospects. *AI*, 3(1), 55–77. <https://doi.org/10.3390/ai3010005>
- Nykänen, P., Schön, U.-K., & Björk, A. (2021). Shared decision making in social services – some remaining questions. *Nordic Social Work Research*, 13(1), 107–118. <https://doi.org/10.1080/2156857x.2021.1958908>
- Ortiz Barrera, M. (2023). Tacit and explicit knowledge: Drivers of the competitiveness of Universities. *Mercados y Negocios*, 50, 51–70. <https://doi.org/10.32870/myn.vi50.7708>
- Pettersen, E. B., Ertesvåg, S. K., Pöysä, S., Vaaland, G. S., & Virtanen, T. E. (2023). Students' situational engagement and its as-association with overall engagement: The application of the InSitu instrument in the context of a Norwegian lower secondary school. *Scandinavian Journal of Educational Research*, 68(4), 619–632. <https://doi.org/10.1080/00313831.2023.2175245>
- Philippine Health Research Ethics Board. (2017). National Ethical Guidelines for Health and Health-related Research. Department of Science and Technology - Philippine Council for Health Research and Development.
- Polhill, J. G., & Edmonds, B. (2023). Cognition and hypocognition: Discursive and simulation-supported decision-making within Complex Systems. *Futures*, 148, 103121. <https://doi.org/10.1016/j.futures.2023.103121>
- Samsuri, W., Sumarta, S., & Acep Bahrum, A. B. (2023). Exploring teachers' practical decision making in terms of teaching procedures. *Academy of Education Journal*, 14(1), 40–48. <https://doi.org/10.47200/aoej.v14i1.1356>
- Sari, A. R. (2023). The impact of good governance on the quality of Public Management Decision making. *Journal of Contemporary Administration and Management*, 1(2), 39–46. <https://doi.org/10.61100/adman.v1i2.21>
- Sari, M. P. (2022). Decision-making and life satisfaction: The role of General Decision-making styles and maximizing tendency as predictors. *Humaniora*, 13(2), 127–135. <https://doi.org/10.21512/humaniora.v13i2.7769>
- Schulz, M. (2023). Knowledge and inquiry—the missing key for a knowledge-based decision theory. *Asian Journal of Philosophy*, 2, 54. <https://doi.org/10.1007/s44204-023-00106-x>
- Sebele-Mpofu, F. Y. (2020). Saturation controversy in qualitative research: Complexities and underlying assumptions. A literature review. *Cogent Social Sciences*, 6(1). <https://doi.org/10.1080/23311886.2020.1838706>
- Sipiorski, E. (2023). Scientific Knowledge: Its Impacts on Judicial Decision-Making and International Law in the Era of Sustainability. In M. d. G. Garcia, A. Cortés (Eds), *Blue Planet Law. Sustainable Development Goals Series* (pp. 59-69). Springer, Cham. https://doi.org/10.1007/978-3-031-24888-7_5
- Staller, K. M. (2021). Big enough? sampling in qualitative inquiry. *Qualitative Social Work*, 20(4), 897–904. <https://doi.org/10.1177/14733250211024516>
- Suomala, J. (2020). The consumer contextual decision-making model. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.570430>

- Taherdoost, H., & Madanchian, M. (2023a). Decision making: Models, processes, techniques. *Cloud Computing and Data Science*, 5(1), 1–14. <https://doi.org/10.37256/ccds.5120233284>
- Taherdoost, H., & Madanchian, M. (2023b). Multi-criteria Decision making (MCDM) methods and concepts. *Encyclopedia*, 3(1), 77–87. <https://doi.org/10.3390/encyclopedia3010006>
- Tops, L., Cromboom, M. L., Tans, A., Deschodt, M., Vandenbulcke, M., & Vermandere, M. (2024). Healthcare providers' perception of caring for older patients with depression and physical multimorbidity: Insights from a focus group study. *BMC Primary Care*, 25, 223. <https://doi.org/10.1186/s12875-024-02447-9>
- Tsopanova, E. (2023). The role of emotions in decision-making systems. *Problems of Engineering Cybernetics and Robotics*, 80, 33-40. <https://doi.org/10.7546/PECR.80.23.04>
- Wu, Z., & Liang, C. (2024). A review and prospects of manufacturing process knowledge acquisition, representation, and application. *Machines*, 12(6), 416. <https://doi.org/10.3390/machines12060416>

Research Article

Satisfaction Level of the Students on the Quality of Services Provided by Build Bright University, Siem Reap Campus

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<https://doi.org/eiki/10.59652/jetm.v2i4.384>

Abstract: This research investigates the key factors influencing student satisfaction with the quality of services provided at Build Bright University (BBU), Siem Reap Campus, Cambodia. The study aims to evaluate the benefits of maintaining and enhancing service quality to attract and retain students, assess overall student satisfaction levels, and examine strategies used to promote professional development among students. A quantitative research design, utilizing descriptive statistics and a survey-based methodology, was employed to gather data from 438 first-year students enrolled in the Foundation Year program. The findings highlight that students express high satisfaction with accreditation, the formal recognition of the university's academic standards, curriculum alignment, the extent to which the academic programs meet national and international educational standards, teacher resources, the availability of qualified instructors, teaching materials, and instructional strategies, and professional staff, administrative and support staff who contribute to a positive academic environment. However, areas such as course materials, textbooks, reading materials, and online resources, learning resources, additional materials and tools that enhance learning, and campus facilities, physical infrastructure such as classrooms, laboratories, and study spaces, need improvement. Based on these results, the study provides recommendations to enhance service quality, including updating course materials, upgrading campus infrastructure, strengthening faculty development programs, and improving student support services. This research offers valuable in-sights into the factors shaping student satisfaction in Cambodian higher education institutions and highlights strategies for improving student retention and success.

Keywords: educational quality assessment; higher education services; service quality improvement; academic Satisfaction

Received: December 14, 2024

Accepted: December 18, 2024

Published: December 24, 2024



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1. Introduction

Higher education serves as a cornerstone for economic and social development, fostering individual growth and contributing to national progress (Jia et al., 2022). Cambodia, like its regional counterparts, is striving to expand and enhance its higher education sector to meet the growing aspirations of its population. However, the country faces unique challenges rooted in its turbulent history. The Khmer Rouge regime (1975–1979) severely disrupted education, eradicating critical human resources and educational infrastructure (Bennett, 2019). While significant progress has been made since the privatization of higher education in 1997, which spurred rapid growth in student enrollments and institutions, concerns about quality persist. These challenges include inadequate academic resources, low faculty qualifications, and limited research output, which hinder Cambodia's integration into the global academic community.

In Siem Reap, a province with diverse educational providers – including government schools, NGO schools, and private universities – Build Bright University (BBU) stands out as a pivotal institution. Established in 2002, BBU's Siem Reap Campus has provided critical benefits to the local community. By offering programs from associate to doctoral levels, it has reduced the financial burden on families by eliminating the need for students to relocate to Phnom Penh. Additionally, BBU has facilitated local job opportunities, empowering both men and women to compete in an increasingly dynamic job market. Despite its contributions,

questions remain about the quality of services provided by BBU, especially in terms of student satisfaction, which is a key indicator of institutional success (Pandita & Kiran, 2023).

A review of existing literature highlights several dimensions of student satisfaction in higher education, including teaching quality, campus facilities, administrative support, and digital accessibility (Li et al., 2022). However, studies specifically addressing Cambodian higher education are limited, particularly in the context of regional institutions like BBU (Ek & Muth, 2023). Existing research has largely focused on national-level trends, leaving a gap in understanding localized factors affecting student satisfaction. Moreover, while the global shift towards digital education has transformed higher education delivery, its implications for institutions like BBU remain underexplored (Guo, 2022).

Addressing this gap is critical to ensuring that institutions like BBU can maintain relevance and competitiveness. This study is, therefore, necessary to identify the primary factors influencing student satisfaction with the quality of services provided by Build Bright University, Siem Reap Campus. By understanding these determinants, the research aims to contribute to improving service delivery and enhancing the overall educational experience for students.

Objective of study

To critically investigate the factors shaping student satisfaction with the quality of services provided by Build Bright University, Siem Reap Campus, with a focus on improving service quality to attract, retain, and support students' professional development.

2. Literature Review

2.1. Understanding the Factors Shaping Student Satisfaction

The conceptual review explores the key concepts that underpin the study, highlighting their interconnections and relevance to understanding student satisfaction and service quality at Build Bright University, Siem Reap Campus. Central to this investigation are concepts such as quality assurance, curriculum, teaching materials and instructional strategies, information services and student support staff, infrastructure, and main course books and learning materials. These factors collectively influence the quality of the educational experience, shaping students' overall satisfaction. The alignment between the curriculum design, the effectiveness of teaching methods, and the availability of student support services plays a significant role in how students perceive the quality of education. Similarly, the infrastructure of the institution, including classrooms and facilities, and the availability of relevant learning resources, further contribute to the overall student experience. This conceptual framework highlights the need for an integrated approach to improving service quality, with a focus on enhancing these key elements to attract, retain, and support students' professional development.

The quality assurance in higher education is critically linked to accreditation, which serves as a formal recognition of an institution's adherence to recognized educational standards (Kayyali, 2023). Accreditation ensures that institutions provide quality education and meet both national and international benchmarks, promoting trust among students, parents, and stake-holders (Duarte & Vardasca, 2023). This process emphasizes accountability and continuous improvement in educational quality.

The curriculum forms the foundation of an institution's academic offerings, aligning with national higher education and postgraduate standards while incorporating an international scope to enhance students' employability (Schwartz & Diliberti, 2021). By ensuring compatibility with global job market requirements, curricula contribute to the development of industry-ready graduates. In addition, the inclusion of international perspectives fosters global competencies, enabling students to adapt to diverse professional environments (Bermúdez-Edo et al., 2017).

Teaching materials and instructional strategies are integral to enhancing the learning experience (Arif et al., 2023). Effective teaching resources, coupled with innovative pedagogical techniques, improve students' comprehension and retention (Febria, 2021). Institutions that prioritize dynamic teaching strategies and interactive learning foster critical thinking and engagement among students (Adewusi et al., 2023; Lundvall, 2012)

Information services and student support staff play a pivotal role in enriching the academic journey. These professionals, characterized by their gentleness, friendliness, and high levels of responsibility, contribute significantly to students' academic success and personal development. By providing timely assistance and fostering an inclusive environment, they address various academic and non-academic needs (Smith & Byrne, 2016).

The infrastructure of educational institutions, including classrooms, laboratories, and modern facilities, significantly impacts the quality of education provided. State-of-the-art buildings and facilities support academic and extracurricular activities, creating an optimal environment for teaching and learning (O'Flaherty & Phillips, 2015). Such infrastructure not only enhances functionality but also contributes to students' overall academic satisfaction (An et al., 2023).

Main course books and learning materials, comprising primary textbooks and resources, are essential for effective course delivery. These materials provide students with foundational knowledge and support independent study (Makhene, 2022). By offering a robust repository of academic resources, institutions equip learners with the tools required to excel in their studies.

2.2. *Factors Influencing Student Satisfaction in Higher Education*

The empirical review examines previous studies and research findings related to student satisfaction and service quality in higher education institutions, focusing on the factors that shape students' experiences. The previous studies highlight several key factors that influence student satisfaction, including quality assurance, curriculum, teaching materials and instructional strategies, information services and student support staff, infrastructure, and main course books and learning materials.

Accreditation by recognized bodies such as the Accreditation Committee of Cambodia plays a critical role in ensuring educational quality. Empirical studies show that institutions with ac-credited programs often achieve higher student satisfaction and better employment outcomes for graduates compared to non-accredited institutions (Pandita & Kiran, 2023). Such accreditation not only aligns with national education standards but also enhances institutional credibility in the global academic arena.

The curriculum forms the backbone of any academic institution, shaping students' learning experiences and future career prospects. Research highlights that internationally aligned curricula significantly improve students' employability and global competitiveness (Oxley & McGeown, 2023). Basson's study emphasizes the importance of aligning curricula with international standards to enhance students' employability and global competitiveness.

Teaching materials and strategies also profoundly impact the quality of education. Empirical evidence suggests that interactive and technology-enhanced teaching methodologies lead to improved student engagement and academic performance (Gao, 2022). Institutions that prioritize innovative teaching practices often see higher retention rates and better graduate success.

The role of staff in providing support services is crucial to creating a positive learning environment. Research underscores the importance of approachable, friendly, and responsible staff in improving student satisfaction and institutional reputation. For instance, a study by Wong and Chapman (2022) highlighted that supportive student services significantly correlate with higher student retention and academic achievement.

Buildings and facilities, including modern classrooms, laboratories, and other infrastructure, are essential for supporting academic activities. Empirical studies confirm that well-maintained and resource-rich facilities contribute to improved learning outcomes and higher levels of student satisfaction (Harefa et al., 2023). Furthermore, access to modern educational facilities is often seen as a marker of institutional quality (Tabassum et al., 2023).

Lastly, the availability of high-quality course books and learning materials significantly enhances the delivery of academic programs. Studies demonstrate that access to relevant and up-to-date materials directly impacts students' academic success and knowledge retention (Römhild & Holleder, 2023).

3. Materials and Methods

3.1. *Research Design*

This study adopts a quantitative research design, utilizing descriptive statistics to examine and analyze the key factors influencing student satisfaction with the quality of services offered at higher education institutions. Descriptive statistics are employed to summarize the data on student satisfaction levels and their perceptions of service quality, facilitating the identification of patterns and trends. A survey-based methodology, a widely used quantitative approach for gathering data on attitudes, opinions, and satisfaction, is implemented. The structured questionnaire enables the collection of quantifiable data that can be analyzed statistically.

3.2. *Data*

The present study uses primary data collected from first-year students at Build Bright University, Siem Reap Campus. A total of 438 students were selected from 32 classes in the Foundation Year program for the study. To ensure validity, a clear and appropriate sampling method was applied. The study included all 32 classes from the academic year 2021-2022, comprising 1,230 students across three enrollment stages. Ethical approval for the study was obtained from the university's research ethics committee. Participation was voluntary, and informed consent was obtained from all participants, ensuring they understood the purpose of the study and their right to confidentiality and anonymity. Students were assured that their participation would not affect their academic standing. Data was securely stored and only used for research purposes, in compliance with ethical research standards. The data reflects the level of student satisfaction, measured on a scale from 1 to 5, where 1 indicates "very dissatisfied," 2 indicates "dissatisfied," 3 indicates "neutral," 4 indicates "satisfied," and 5 indicates "very satisfied."

Data collection was conducted using a structured questionnaire created with Microsoft Forms and distributed to students in Promotion 20. The sample size was calculated using Taro Yamane's formula (Taro Yamane, 1967). A sample random sampling method was employed to select the final sample of 438 students, ensuring a robust and unbiased selection process. Taro Yamane's Formula for Sample Size Calculation:

$$n = \frac{N}{1 + N(e^2)} \quad (1)$$

In this formula, n represents the sample size to be calculated, N denotes the total population size, which in this case is 1,230 students, and e refers to the margin of error or the level of precision desired for the sample estimate. Typically, a margin of error of 0.05 is used, which corresponds to a 95% confidence level. By using these values in the formula, the sample size can be determined to ensure that the sample accurately represents the population while maintaining a manageable level of error.

3.3. Statistical Techniques

The first statistical technique employed in this study is Descriptive Statistics, which provides a comprehensive summary of the key characteristics of the data collected from first-year students regarding their satisfaction levels and perceptions of service quality. This includes measures of central tendency – such as the mean, median, and mode – to determine average satisfaction levels across various factors. Additionally, measures of dispersion – such as the standard deviation and range – are utilized to assess the variability in satisfaction scores and the extent of differences in students' responses. The formulas for these calculations are as follows:

The mean is calculated by summing all the values in the dataset and dividing by the number of observations:

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} \quad (2)$$

Where x_i represents each individual data point, and n is the total number of observations.

The standard deviation measures the average deviation of each data point from the mean:

$$SD = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \quad (3)$$

Where x_i is each data point, \bar{x} is the mean of the dataset, and n is the number of data points.

Together, these techniques provide valuable insights into student satisfaction and their perceptions of service quality.

Another critical statistical technique applied in this study is Reliability Analysis, which tests the consistency of the survey instrument. This ensures that the questionnaire items reliably measure the factors related to service quality and student satisfaction. The primary method used for this analysis is Cronbach's Alpha, a statistic that evaluates the internal consistency of survey items. A Cronbach's Alpha value above 0.7 is generally considered acceptable, indicating that the survey instrument is reliable and that the items within each factor consistently measure the intended construct (Hayes & Coutts, 2020). The formula for calculating Cronbach's Alpha is:

$$\alpha = \frac{N}{N-1} \left(1 - \frac{\sum_{i=1}^N \sigma_i^2}{\sigma_T^2} \right) \quad (4)$$

Where N represents the number of items in the scale, σ_i^2 is the variance of the i-th item, and σ_T^2 is the variance of the total score, which is the variance of the sum of all items.

To further ensure the validity of the constructs, Exploratory Factor Analysis (EFA) is

employed. The key formula for EFA involves the factor model, which is represented as:

$$X = \Lambda F + \epsilon \quad (5)$$

Where X is the vector of observed variables, which is represented as a matrix of size $n \times p$, where n denotes the number of observations and p represents the number of observed variables. Λ is the matrix of factor loadings, which is of size $p \times k$, where k is the number of factors being extracted. F is the vector of common factors, also known as latent variables, and is of size $k \times 1$. Finally, ϵ is the vector of unique variances or errors, which is of size $n \times 1$, representing the residuals or variances that cannot be explained by the common factors.

To facilitate data processing in the STATA system, abbreviated variables are employed. Accreditation refers to the accreditation granted by the Accreditation Committee of Cambodia, ensuring the institution meets recognized standards for quality education. Curriculum represents the academic framework that aligns with national higher education and postgraduate standards, offering an international scope to enhance students' employment prospects. Blended Learning refers to an instructional approach combining in-class and e-learning methods, which was especially important during the COVID-19 pandemic for offering flexible learning options. Teacher Resources and Methodology denote the teaching materials and instructional strategies used to improve the learning experience. Professional Staff refers to staff members responsible for providing information services and assisting students with a focus on gentleness, friendliness, and high levels of responsibility. Buildings and Facilities encompass the institution's physical infrastructure, including classrooms, laboratories, and modern facilities that support academic activities. Fees refer to the charges applied for various educational services and programs. English Program is designed to improve students' language skills, communication abilities, and meet the job market's demands. Main Course Books and Learning Materials include the primary textbooks and resources used for course delivery. Finally, Resolution of Students' Problems refers to the institution's approach to resolving student issues in a manner that is both friendly and responsible.

4. Results

This section examines the validity and reliability of the questionnaire used in this study, as well as the study's findings. Construct validity is evaluated using several methods, including the correlation matrix of questionnaire items, the Kaiser-Meyer-Olkin (KMO) test, and exploratory factor analysis. The reliability and internal consistency of the factors identified through the factor analysis are assessed using Cronbach's alpha. Additionally, descriptive statistical analysis is conducted to summarize the data, thereby presenting the results of critically investigating the factors influencing student satisfaction with the quality of services provided by Build Bright University, Siem Reap Campus.

4.1. Construct Validity Assessment Using Factor Analysis

To enhance the validity of a questionnaire in this study, construct validity is assessed through factor analysis. This method helps determine whether the items in the questionnaire are appropriately aligned with the intended underlying construct, ensuring that the questionnaire accurately measures what it is designed to evaluate. To conduct factor analysis, the process begins with examining the correlation matrix of the questionnaire items to assess the relationships between them. The Kaiser-Meyer-Olkin (KMO) test is then used to evaluate the suitability of the data for factor analysis, with a value close to 1 indicating that the data is appropriate for this method. The principal factor extraction method is employed to identify the underlying factors, followed by an examination of the rotated factor loadings (pattern matrix), which reveals the strength and direction of relationships between items and factors. Finally, the unique variances and factor rotation matrix are analyzed to improve the interpretability of the factors and refine the model, ensuring that the items are validly aligned with the intended constructs.

4.1.1. Correlation Matrix of Questionnaire Items

To assess whether factor analysis is appropriate for this study, it is important to check the correlations between the items. Items with moderate to strong correlations, greater than 0.4, suggest that factor analysis could be a suitable method (Gu et al., 2016).

Table 1. Correlation matrix of questionnaire items.



| | Accre. | Curri. | Blen.Lear | Tea.Re&Method. | Prof.St. | Build&Fac | Fees | Eng.Pr. | Mai.Cou | Resolution. |
|-----------------|--------|--------|-----------|----------------|----------|-----------|--------|---------|---------|-------------|
| Accre. | 1.0000 | | | | | | | | | |
| Curri. | 0.7020 | 1.0000 | | | | | | | | |
| Blen.Lear | 0.5730 | 0.6256 | 1.0000 | | | | | | | |
| Tea.Re&M ethod. | 0.6920 | 0.6719 | 0.5492 | 1.0000 | | | | | | |
| Prof.St. | 0.5958 | 0.6621 | 0.5856 | 0.6371 | 1.0000 | | | | | |
| Build&Fac | 0.5955 | 0.5886 | 0.6004 | 0.5910 | 0.6042 | 1.0000 | | | | |
| Fees | 0.5035 | 0.5513 | 0.5592 | 0.5748 | 0.5463 | 0.5580 | 1.0000 | | | |
| Eng.Pr. | 0.5871 | 0.6227 | 0.5393 | 0.5472 | 0.5945 | 0.5909 | 0.5437 | 1.0000 | | |
| Mai.Cou | 0.6177 | 0.6193 | 0.5875 | 0.6073 | 0.5868 | 0.6555 | 0.6277 | 0.6436 | 1.0000 | |
| Resolution | 0.6192 | 0.6308 | 0.5181 | 0.5987 | 0.6998 | 0.5339 | 0.5657 | 0.6075 | 0.5824 | 1.0000 |

Note: The abbreviation of Accre. = Accreditation, Curri. = Curriculum, Blen.Lear. = Blended Learning, Tea.Re&Method. = Teacher Resources and Methodology, Prof.St. = Professional Staff, Build&Fac. = Buildings and Facilities, Fees = Fees, Eng.Pr. = English Program, Mai.Cou. = Main Course Books and Learning Materials, and Resolution. = Resolution of Students' Problems.

Based on the results presented in Table 1, the correlation matrix reveals moderate to strong positive correlations between the questionnaire items. Most variables exhibit significant correlations, with many values exceeding 0.50, indicating meaningful relationships between the items. Curriculum (aligned with national higher education and postgraduate standards, designed to be international in scope, providing students with enhanced employment opportunities) shows a strong correlation with Accreditation (granted by the Accreditation Committee of Cambodia) at 0.7020, Teacher resources and methodology (resources and strategies used to improve the learning experience) at 0.6719, and Professional staff (staff providing information services and assisting students with gentleness, friendliness, and a high level of responsibility) at 0.6621.

Similarly, Blended learning (combining in-class and e-learning methods, particularly during the COVID-19 pandemic) demonstrates strong correlations with Curriculum, Teacher resources and methodology, and other variables, further indicating interconnectedness among the factors. Overall, the results suggest that the questionnaire items are highly interrelated, with most variables showing moderate to strong correlations, implying the presence of common underlying dimensions. This strong inter-correlation supports the suitability of the data for further analysis, such as factor analysis, to identify key latent factors.

4.1.2. Kaiser-Meyer-Olkin (KMO) Test

The KMO (Kaiser-Meyer-Olkin) test evaluates the sampling adequacy for factor analysis by measuring the proportion of variance among the variables that may be common variance. It assesses whether the correlations between the variables are sufficiently strong to justify performing factor analysis in this study. A KMO value closer to 1 indicates that the data is highly suitable for factor analysis, meaning the variables are well correlated with each other. In contrast, a value closer to 0 suggests weak correlations among the variables, which may make factor analysis inappropriate. The KMO test helps determine if the data meets the necessary criteria for extracting meaningful factors through factor analysis.

Table 2. Kaiser-Meyer-Olkin (KMO) Test.

| Variable | kmo |
|-----------------------------------|--------|
| Accreditation | 0.9386 |
| Curriculum | 0.9516 |
| Blended Learning | 0.9597 |
| Teacher Resources and Methodology | 0.9485 |
| Professional Staff | 0.9393 |



| | |
|--|--------|
| Buildings and Facilities | 0.9564 |
| Fees | 0.9506 |
| English Program | 0.9617 |
| Main Course Books and Learning Materials | 0.9504 |
| Resolution of Students' Problems | 0.9379 |
| Overall | 0.9492 |

Based on the results presented in Table 2, the Kaiser-Meyer-Olkin (KMO) test confirms that the data is highly suitable for factor analysis. The KMO values for all individual variables are well above the threshold of 0.90, ranging from 0.9379 for Resolution of Students' Problems to 0.9617 for the English Program, both falling into the excellent category. This suggests that each variable is strongly correlated with the others and is highly appropriate for factor analysis. The overall KMO value of 0.9492 further reinforces this conclusion, indicating that the dataset as a whole is very suitable for factor analysis. These results demonstrate that the data is adequate for extracting meaningful factors, providing a solid foundation for proceeding with the analysis.

4.1.3. Exploratory Factor Analysis

To enhance the validity of the questionnaire in this research, exploratory factor analysis (EFA) was conducted. EFA is a statistical technique used to identify the underlying structure of data and ensure that the questionnaire items align with the theoretical constructs they are intended to measure (Williams et al., 2010). The clustering of items, as expected, indicating good construct validity, can be assessed through the analysis of factor loadings. Items that do not load strongly on their intended factors may be revised or removed to improve the questionnaire's overall validity.

Table 3. Factor analysis/correlation (Method: principal factors).

| Factor | Variance | Difference | Proportion | Cumulative |
|------------------------------------|-----------|------------|------------|------------|
| Factor1 | 5.97465 | 5.81543 | 1.0170 | 1.0170 |
| Factor2 | 0.15922 | 0.02099 | 0.0271 | 1.0441 |
| Factor3 | 0.13822 | 0.10482 | 0.0235 | 1.0676 |
| Factor4 | 0.03340 | 0.00493 | 0.0057 | 1.0733 |
| Factor5 | 0.02847 | | 0.0048 | 1.0781 |
| Number of obs | 438 | | | |
| Retained factors | 5 | | | |
| Number of params | 40 | | | |
| LR test: independent vs. saturated | Prob>chi2 | = 0.0000 | | |

The results from Table 3, which presents the factor analysis using the principal factors method, reveal that Factor1 accounts for the largest variance of 5.97465, explaining the majority of the variability in the dataset. The variance explained by subsequent factors is much smaller, with Factor2 explaining 0.15922, Factor3 0.13822, and the remaining factors explaining even less. The Difference column shows that the largest difference in variance occurs between Factor1 and Factor2 (5.81543), highlighting the dominance of Factor1 in explaining the data. The Proportion column indicates that Factor1 explains 1.0170 (or 101.7%) of the total variance, with the other factors contributing significantly less, especially Factor2 which accounts for only 0.0271 (or 2.71%). The Cumulative variance, which sums the explained variances, shows that after Factor1, the cumulative variance reaches 1.0170, and increases slowly thereafter, with the cumulative variance after Factor5 being 1.0781, suggesting that the additional factors contribute very little to the total variance. The analysis is based on 438 observations, and 5 factors were retained, indicating that these factors were sufficient to explain the data. The LR test results (Prob > chi2 = 0.0000) suggest that the factor model is a

good fit for the data, as the null hypothesis of the independent model fitting the data as well as the saturated model is rejected at a highly significant level. Overall, the factor analysis indicates that while the first factor explains most of the variance, the remaining factors contribute minimally, and the model fits the data well.

Table 4. Rotated factor loadings (pattern matrix) and unique variances.

| Variable | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Uniqueness |
|--|---------|---------|---------|---------|---------|------------|
| Accreditation | 0.7943 | -0.2051 | 0.0482 | -0.0371 | -0.0310 | 0.3224 |
| Curriculum | 0.8201 | -0.1470 | -0.0081 | 0.0246 | 0.0228 | 0.3046 |
| Blended Learning | 0.7324 | 0.0541 | 0.1009 | 0.1039 | 0.0494 | 0.4373 |
| Teacher Resources and Methodology | 0.7888 | -0.1307 | 0.0149 | 0.0210 | -0.1138 | 0.3470 |
| Professional Staff | 0.7944 | -0.0015 | -0.1918 | 0.0626 | 0.0242 | 0.3277 |
| Buildings and Facilities | 0.7603 | 0.1021 | 0.1307 | 0.0232 | 0.0367 | 0.3926 |
| Fees | 0.7154 | 0.1883 | 0.0358 | 0.0135 | -0.0587 | 0.4479 |
| English Program | 0.7540 | 0.0853 | -0.0148 | -0.0980 | 0.0786 | 0.4082 |
| Main Course Books and Learning Materials | 0.7927 | 0.1497 | 0.1231 | -0.0680 | 0.0014 | 0.3295 |
| Resolution of Students' Problems | 0.7712 | 0.0005 | -0.2344 | -0.0361 | -0.0058 | 0.3489 |

The results presented in Table 4 provide insights into the underlying structure of the data through the rotated factor loadings (pattern matrix) and unique variances. Factor 1 is the most influential, with strong positive loadings for several key variables, including Accreditation (0.7943), Curriculum (0.8201), Teacher Resources and Methodology (0.7888), Professional Staff (0.7944), Buildings and Facilities (0.7603), and Main Course Books and Learning Materials (0.7927). This suggests that Factor 1 represents a latent construct related to the overall quality of services at educational universities, encompassing aspects such as accreditation, curriculum design, resources, and infrastructure.

In contrast, Factor 2 shows weaker and negative loadings for variables such as Accreditation (-0.2051), Curriculum (-0.1470), and Teacher Resources and Methodology (-0.1307), indicating an inverse relationship with the variables in Factor 1. This factor may represent negative or contrasting aspects of the institution. Factor 3 has weak loadings, particularly for Professional Staff (-0.1918) and Resolution of Students' Problems (-0.2344), indicating that it does not strongly represent a meaningful construct in the data. Factor 4 shows very weak loadings across most variables, particularly for Blended Learning (0.1039), suggesting that it does not play a significant role in the factor structure. Similarly, Factor 5 exhibits minimal loadings, indicating it contributes little to explaining the relationships between the variables. The uniqueness values reveal that some variables, such as Fees (0.4479), have a significant portion of their variance unexplained by the factors, suggesting they represent independent constructs.

In contrast, variables like Curriculum (0.3046) and Main Course Books and Learning Materials (0.3295) have lower uniqueness values, indicating their variance is largely accounted for by the factors. Overall, Factor 1 stands out as the most significant in explaining the interrelationships among the variables, while the other factors contribute less. Some variables exhibit higher uniqueness, indicating they are less dependent on the factor model. These results demonstrate that the questionnaire is valid, particularly for measuring the construct represented by Factor 1. This validity ensures that the questionnaire can be used with confidence to assess the overall quality of services at educational universities.

Table 5. Factor rotation matrix.

| | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 |
|---------|---------|---------|---------|---------|---------|
| Factor1 | 1.0000 | 0.0082 | -0.0007 | 0.0008 | 0.0003 |
| Factor2 | -0.0063 | 0.8146 | 0.5695 | -0.0314 | 0.1055 |
| Factor3 | -0.0051 | 0.5541 | -0.8199 | -0.0668 | 0.1275 |
| Factor4 | -0.0014 | 0.0702 | -0.0391 | 0.9962 | -0.0346 |
| Factor5 | -0.0010 | 0.1564 | -0.0438 | -0.0469 | -0.9856 |

The results presented in Table 5, the factor rotation matrix, offer insights into the relationships between the five factors after rotation, which aims to enhance interpretability. Factor 1 shows minimal correlation with the other factors, with very low values across all variables (Factor 2 = 0.0082, Factor 3 = -0.0007, Factor 4 = 0.0008, and Factor 5 = 0.0003), suggesting that Factor 1 is relatively independent and distinct. Factor 2, on the other hand, has a strong correlation with itself (0.8146) and a moderate correlation with Factor 3 (0.5695), indicating some overlap but primarily reflecting its own construct. Factor 3 demonstrates a strong negative correlation with itself (-0.8199), highlighting its independence, although it also shares some variance with Factor 2 (0.5541). Factor 4 is highly correlated with itself (0.9962), indicating that it is a well-defined factor, distinct from the others with very weak correlations across the other factors. Finally, Factor 5 is strongly correlated with itself (-0.9856), reinforcing its distinct nature, with very weak correlations with the other factors (Factor 2 = 0.1564, Factor 3 = -0.0438, Factor 4 = -0.0469). In conclusion, the factor rotation matrix demonstrates that the factors are largely independent, with some overlap between Factor 2 and Factor 3, and highlights the unique variance explained by each factor.

4.2. Reliability Testing with Cronbach's Alpha

To assess the reliability and internal consistency of the factors derived from the factor analysis, this study applies Cronbach's Alpha. This statistical test measures the degree to which the items within each factor are related, ensuring that they consistently assess the same underlying construct. A higher Cronbach's Alpha value (typically above 0.70) indicates a strong correlation among the items within each factor, thus confirming the reliability of the questionnaire and its ability to produce stable, dependable results across different samples. By performing Cronbach's Alpha testing, we can verify that the variables grouped within each factor are coherent and collectively measure the intended aspects of service quality at educational universities, as identified in the factor analysis.

Table 6. Evaluates the internal consistency and reliability of the survey items through Cronbach's Alpha testing.

| Factor | Average interitem covariance | Number of items in the scale | Scale reliability coefficient |
|---------|------------------------------|------------------------------|-------------------------------|
| Factor1 | 0.4977 | 6 | 0.9100 |

The results of the Cronbach's Alpha analysis in Table 6 demonstrate excellent internal consistency and reliability for the scale. Factor 1, which includes six key survey items, shows an average inter-item covariance of 0.4977, indicating that the items are positively correlated and collectively measure a similar underlying construct. The scale reliability coefficient (Cronbach's Alpha) for Factor 1 is 0.9100, significantly exceeding the commonly accepted threshold of 0.7 for good reliability. This high value suggests that the items within Factor 1 are strongly interrelated and consistently capture the intended construct, reflecting a robust internal consistency. Therefore, Factor 1 can be considered a reliable scale, and no major modifications to the items are necessary. However, further analysis of individual item performance may be conducted to ensure each item contributes optimally to the overall scale.

4.3. Descriptive Statistical Analysis

For the Descriptive Statistical Analysis, the focus is on the six key variables that exhibit strong loadings on Factor 1, which is the most influential factor in explaining the interrelationships among the data. These variables are: Accreditation, Curriculum, Teacher Resources and Methodology, Professional Staff, Buildings and Facilities, and Main Course Books and Learning Materials. The strong positive loadings for these variables indicate their significance in capturing the construct represented by Factor 1, which is central to the overall service quality at educational universities. Given their prominence, these six variables provide a solid foundation for assessing educational quality and ensuring the questionnaire's validity. By concentrating on these variables in the analysis, the study can more accurately evaluate the key factors influencing service quality at educational institutions.

The following analysis presents the descriptive statistics for various aspects of student satisfaction, measured on a 1 to 5 scale, where 1 represents “very dissatisfied,” 2 denotes “dissatisfied,” 3 indicates “neutral,” 4 signifies “satisfied,” and 5 indicates “very satisfied.” The results include the mean, standard deviation, mode, median, and range for each variable, providing insights into general trends and variations in student satisfaction across these key educational aspects.

Table 7. Descriptive statistics.

| Variable | Obs | Mean | Std. Dev. | Mode | Median | Range |
|--|-----|--------|-----------|------|--------|-------|
| Accreditation | 438 | 4.3311 | 0.8544 | 5 | 5 | 4 |
| Curriculum | 438 | 4.2192 | 0.9088 | 5 | 4 | 4 |
| Teacher Resources and Methodology | 438 | 4.4247 | 0.9189 | 5 | 5 | 4 |
| Professional Staff | 438 | 4.3037 | 0.8854 | 5 | 5 | 4 |
| Buildings and Facilities | 438 | 4.2968 | 0.9219 | 5 | 5 | 4 |
| Main Course Books and Learning Materials | 438 | 4.1644 | 0.8505 | 4 | 4 | 4 |

Based on the descriptive statistics presented in Table 7, the data provides a detailed analysis of student satisfaction across various aspects of their educational experience at the university. Accreditation has a mean score of 4.33, indicating that most students are satisfied with the university’s accreditation status. The standard deviation of 0.85 suggests moderate variation in responses, with the mode being 5 (“very satisfied”), indicating that this is the most common response. The median of 5 further supports the high level of satisfaction with accreditation, while the range of 4 reveals that responses span from “satisfied” to “very satisfied,” with only a small portion of students expressing lower levels of satisfaction. This suggests that students are satisfied with the official recognition granted by the Accreditation Committee of Cambodia, ensuring that the university meets established and recognized standards for quality education. This process is essential for validating the university’s commitment to providing education that meets both national and international standards.

Curriculum has a mean of 4.22, reflecting general satisfaction, although slightly lower than the scores for accreditation and teacher resources. The standard deviation of 0.91 indicates moderate variability in responses, and the mode of 5 (“very satisfied”) suggests that many students are pleased with the curriculum. However, the median of 4 (“satisfied”) shows that more students are content but not extremely satisfied, indicating some variability in perceptions. The range of 4 again shows that responses cover a spectrum from “satisfied” to “very satisfied.” This indicates that students are satisfied with the structured academic framework of the university, aligned with national higher education and postgraduate standards. It is designed to provide students with an international scope of knowledge, preparing them for successful careers by enhancing their employability in a competitive global market.

Teacher Resources and Methodology has the highest mean score of 4.42, indicating a high level of satisfaction. The standard deviation of 0.92 suggests some variation, but the mode of 5 and median of 5 indicate that most students are highly satisfied with the teaching resources and methodologies. The range of 4 shows that responses range from “satisfied” to “very satisfied,” with the majority of students expressing the highest level of satisfaction. This suggests that students are satisfied with the materials and instructional methods employed by the university to support and enhance the learning experience. This includes textbooks, multimedia resources, and various teaching techniques aimed at improving student engagement and comprehension.

Professional Staff has a mean score of 4.30, indicating strong satisfaction, though slightly lower than that for teaching resources and methodology. The standard deviation of 0.89 indicates moderate variability, while the mode of 5 and median of 5 suggest that the majority of students are very satisfied with the professional staff. The range of 4 again shows a broad spectrum of responses, from “satisfied” to “very satisfied.” This indicates that students are satisfied with the individuals who are responsible for supporting them, offering essential information services, and providing assistance with academic and non-academic matters. The

professional staff's focus on being approachable, friendly, and responsible contributes to creating a supportive and welcoming environment for students.

Buildings and Facilities also have a mean score of 4.30, suggesting general satisfaction, although it ranks slightly lower than teacher resources and accreditation. The standard deviation of 0.92 again indicates moderate variability in responses, with the mode of 5 and median of 5 showing that most students are highly satisfied with the buildings and facilities. The range of 4 indicates some variation in responses, but overall, students seem pleased with the physical infrastructure. This indicates that students are satisfied with the physical infrastructure of the university, including classrooms, laboratories, and other facilities that enable academic activities. The availability and quality of these resources are crucial in supporting effective learning environments.

Finally, Main Course Books and Learning Materials has the lowest mean of 4.16, suggesting that while students are generally satisfied, they are less satisfied with the course books and learning materials compared to other aspects. The standard deviation of 0.85 suggests relatively consistent responses, but the mode of 4 ("satisfied") and the median of 4 indicate that fewer students are "very satisfied" with the learning materials. The range of 4 shows that responses span from "satisfied" to "very satisfied." This suggests that students are satisfied with the core textbooks and supplementary resources used in the delivery of academic courses. These materials form the foundation of the learning process and contribute significantly to students' understanding of the course content.

Overall, while most students express high satisfaction with various aspects of their educational experience, areas like Main Course Books and Learning Materials exhibit slightly lower satisfaction. The moderate variability in responses across all variables suggests there are differences in how students perceive certain aspects of their education.

5. Discussion

The findings provide valuable insights into student satisfaction across various dimensions of their educational experience at Build Bright University, Siem Reap Campus. Overall, the results reflect a strong level of satisfaction among students, particularly in areas such as Accreditation, Teacher Resources and Methodology, Professional Staff, and Buildings and Facilities. However, some variability in responses suggests areas that may benefit from further improvement, particularly in the realm of Main Course Books and Learning Materials.

Accreditation received a high satisfaction rating with a mean score of 4.33, indicating that most students are content with the university's accreditation status. The results suggest that students value the university's adherence to recognized educational standards, which not only fosters trust but also ensures that their degrees are recognized internationally. This finding is consistent with existing literature, which emphasizes the importance of accreditation in promoting quality education and improving student satisfaction (Kayyali, 2023; Pandita & Kiran, 2023). The positive student feedback highlights the role of accreditation in signaling institutional accountability and continuous quality improvement (West & Moore, 2015).

The curriculum received a mean score of 4.22, indicating general satisfaction, though slightly lower than that for accreditation and teacher resources. This suggests that while students are largely content with the curriculum, there is room for improvement. The moderate variation in responses, indicated by the standard deviation of 0.91, suggests that some students may feel that the curriculum could be more aligned with their specific needs or expectations. The curriculum's design to meet both national and international standards, as well as its focus on enhancing employability, is in line with findings from Schwartz and Diliberti (2021), Bermúdez-Edo, Hurtado-Torres, and Ortiz-de-Mandojana (2017), who emphasize the importance of global perspectives and industry relevance in curriculum design.

Teacher Resources and Methodology received the highest mean score of 4.42, reflecting strong satisfaction with the instructional methods and materials. The high level of satisfaction suggests that students appreciate the resources provided, such as textbooks, multimedia tools, and the innovative teaching methods employed by the university. This is supported by existing literature, with Arif, Afnan, Usmiyatun, and Lestari (2023) and Febria (2021) emphasizing the importance of effective teaching resources and dynamic pedagogical strategies in enhancing student engagement and learning outcomes. The use of technology-enhanced teaching methods, noted by Gao (2022), aligns well with the positive feedback from students in this area.

Professional Staff also received a high mean score of 4.30, indicating that students are

satisfied with the support provided by the university's staff. This includes academic advisors, administrative staff, and other personnel who offer essential academic and non-academic support. The friendly and approachable nature of the staff contributes to an inclusive and supportive environment, as emphasized by Smith and Byrne (2016) and Wong and Chapman (2022). The findings reinforce the notion that professional staff play a crucial role in fostering student satisfaction and retention by offering timely assistance and creating a welcoming atmosphere.

Regarding Buildings and Facilities, students reported a mean score of 4.30, suggesting general satisfaction with the university's physical infrastructure. Modern and well-maintained facilities are vital in supporting both academic and extracurricular activities, and the positive feedback from students highlights the importance of investing in infrastructure. O'Flaherty and Phillips (2015) and An, Ma, and Wu (2023) support this view, noting that well-designed and state-of-the-art facilities contribute significantly to student satisfaction and overall academic success. While the satisfaction with infrastructure is high, there may be opportunities to further enhance these facilities to meet evolving educational needs.

The area with the lowest satisfaction was Main Course Books and Learning Materials, which received a mean score of 4.16. While students are generally satisfied with the course materials, the lower score suggests that some students feel that the textbooks and learning resources could be improved or updated. The relatively high standard deviation (0.85) indicates variability in responses, implying that while some students may be very satisfied, others may feel that the materials do not fully meet their expectations. Makhene (2022) highlights the importance of textbooks in providing foundational knowledge, and Römheld and Holleder (2023) suggest that access to up-to-date materials is critical to student success. Therefore, addressing this area by providing more current and diverse learning resources may help improve overall satisfaction in the future.

6. Conclusions and Implications

The research findings reveal that students express a high level of satisfaction across various aspects of Build Bright University, Siem Reap Campus's quality services, which are integral to the overall academic experience. Accreditation, granted by the Accreditation Committee of Cambodia, is a significant factor, with a mean score of 4.33, indicating that students are confident in the university's adherence to recognized standards for quality education. The curriculum, with a mean score of 4.22, demonstrates a strong alignment with national higher education and postgraduate standards, offering an international scope that enhances students' employment prospects. Teacher Resources and Methodology (mean score of 4.42) reflect effective teaching materials and instructional strategies, which contribute to a positive learning experience. The Professional Staff (mean score of 4.30) is appreciated for its approachability, friendliness, and sense of responsibility, creating a supportive environment for students. The university's Buildings and Facilities (mean score of 4.30) provide the necessary infrastructure to facilitate academic activities, though some variability in responses suggests areas for potential improvement. Main Course Books and Learning Materials (mean score of 4.16) received slightly lower satisfaction levels, highlighting the need for continual review and enhancement of core textbooks and supplementary resources. These results emphasize the importance of ongoing improvements across all service areas at Build Bright University, Siem Reap Campus, ensuring alignment with global standards, enhancing student satisfaction, and supporting the university's mission to provide a high-quality educational experience.

To enhance student satisfaction at Build Bright University, Siem Reap Campus, several recommendations are proposed. First, the university should focus on improving course materials and learning resources, as students expressed slightly lower satisfaction with the main course books and learning materials. Regular updates and reviews of textbooks, supplementary resources, and digital learning tools will ensure that the materials remain relevant and engaging. Additionally, although the university's buildings and facilities received a satisfactory rating, there is variability in responses that suggests the need for further investment in upgrading classrooms, laboratories, and study spaces. Strengthening professional development programs for faculty and staff will maintain the high standard of teaching, as reflected in the positive satisfaction scores for teacher resources and professional staff. The university should also continue to uphold its strong accreditation status, ensuring alignment with both national and international quality standards. Furthermore, enhancing the adaptability of the curriculum to meet evolving industry demands and incorporating practical

learning experiences, such as internships, will better prepare students for the workforce. Finally, while students are satisfied with the professional staff, improving student support services, including career counseling and academic advising, can contribute to a more personalized academic experience. By addressing these areas, the university can elevate its academic offerings and create a more supportive environment that enhances student satisfaction and success.

References

- Adewusi, O. E., Al Hamad, N. M., Adeleke, I. J., Nwankwo, U. C., Chinenye, G., & Nwokocha, G. C. (2023). Adaptive teaching strategies in early childhood education: A review for Nigeria and the UK. *International Journal of Applied Research in Social Sciences*, 5(8), 255-271. <https://doi.org/10.51594/ijarss.v5i8.575>
- An, M., Ma, X., & Wu, H. (2023). Medical students' academic satisfaction: Social cognitive factors matter. *Medical Education*, 57(12), 1239–1247. <https://doi.org/10.1111/medu.15070>
- Arif, V. R., Afnan, M., Usmiyatun, U., & Lestari, C. Y. (2023). Development of social studies animation video (S2AV) teaching materials on the material “plurality of Indonesian society” for junior high school students. *Asyifa Learning Journal*, 1(1), 1-11. <https://doi.org/10.61650/alj.v1i1.2>
- Bennett, C. (2019). Human remains from the Khmer Rouge regime, Cambodia: Ethical approaches to human remains. *Ethical Approaches to Human Remains*, 1(1), 567-582. https://doi.org/10.1007/978-3-030-32926-6_27
- Bermúdez-Edo, M., Hurtado-Torres, N., & Ortiz-de-Mandojana, N. (2017). The influence of international scope on the relationship between patented environmental innovations and firm performance. *Business & Society*, 56(4), 523-556. DOI:10.1177/0007650315576133
- Duarte, N., & Vardasca, R. (2023). Literature review of accreditation systems in higher education. *Education Sciences*, 13(6), 582. <https://doi.org/10.3390/educsci13060582>
- Ek, E., & Muth, S. (2023). University and graduate issues in Cambodian higher education. *Cambodian Journal of Educational Research*, 3(1), 122-131. <https://doi.org/10.62037/cjer.2023.03.01.07>
- Febria, D. (2021). English students' perception on critical thinking pedagogical techniques. *Journal Smart*, 7(1), 7-14. <https://doi.org/10.52657/js.v7i1.1332>
- Gao, W.-N. (2022). Designing an interactive teaching model of English language using the Internet of Things. *Soft Computing*, 26(4), 10903–10913. DOI:10.1007/s00500-022-07156-y
- Gu, Z., Eils, R., & Schlesner, M. (2016). Complex heatmaps reveal patterns and correlations in multidimensional genomic data. *Bioinformatics*, 32(18), 2847–2849. <https://doi.org/10.1093/bioinformatics/btw313>
- Guo, F. (2022). Research on China's higher education delivery offshore in the post-pandemic era. *International Education Studies*, 15(4), 123-129. DOI:10.5539/ies.v15n2p123
- Harefa, D., Sarumaha, M., Telaumbanua, K., Telaumbanua, T., Laia, B., & Hulu, F. (2023). Relationship student learning interest to the learning outcomes of natural sciences. *International Journal of Educational Research & Social Sciences*, 4(2), 240-246. <https://doi.org/10.51601/ijersc.v4i2.614>
- Jia, K., Zhu, T., Zhang, W., Rasool, S. F., Asghar, A., & Chin, T. (2022). The linkage between ethical leadership, well-being, work engagement, and innovative work behavior: Empirical evidence from the higher education sector of China. *International Journal of Environmental Research and Public Health*, 19(15), 5414. <https://doi.org/10.3390/ijerph19095414>
- Kayyali, M. (2023). An overview of quality assurance in higher education: Concepts and frameworks. *International Journal of Management, Sciences, Innovation, and Technology*, 4(2), 1–4. <https://ijmsit.com/volume-4-issue-2/>
- Li, H., Cui, C., & Jiang, S. (2022). Strategy for improving the football teaching quality by AI and metaverse-empowered in a mobile internet environment. *Wireless Networks*, 1-10. <https://doi.org/10.1007/s11276-022-03000-1>
- Lundvall, B. (2012). *National systems of innovation: Towards a theory of innovation and interactive learning*. Anthem Press. DOI:10.7135/UPO978184318903
- Makhene, A. (2022). Use of foundational knowledge as a basis to facilitate critical thinking: Nurse educators' perceptions. *Nursing Research and Practice*, 2022, 3736322. <https://doi.org/10.1155/2022/3736322>
- O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *Internet and Higher Education*, 25, 85–95. <https://doi.org/10.1016/j.iheduc.2015.02.002>
- Oxley, E., & McGeown, S. (2023). Reading for pleasure practices in school: children's perspectives and experiences. *Educational Research*, 65(3), 375–391. <https://doi.org/10.1080/00131881.2023.2236123>
- Pandita, A., & Kiran, R. (2023). The Technology Interface and Student Engagement Are Significant Stimuli in Sustainable Student Satisfaction. *Sustainability*, 15(10), 7923. <https://doi.org/10.3390/su15107923>
- Römhild, A., & Holleder, A. (2023). Effects of disability-related services, accommodations, and integration on academic success of students with disabilities in higher education. A scoping review. *European Journal of Special Needs Education*, 39(1), 143–166. <https://doi.org/10.1080/08856257.2023.2195074>
- Schwartz, H., & Diliberti, M. (2021). School districts have expanded their nonacademic services for 2021–2022, while academic offerings remain much the same: Selected findings from the third American School District Panel Survey. RAND Corporation. https://www.rand.org/pubs/research_reports/RRA1055-1.html
- Smith, M. A., & Byrne, A. (2016). ‘Help! I need somebody’: Getting timely assistance in clinical practice. *Anaesthesia*, 71, 418–421. <https://doi.org/10.1111/anae.13497>
- Tabassum, N., Rahman, S. U., Zafar, M., & Ghaffar, M. (2023). Institutional Quality, Employment, Trade Openness on Environment (Co2) Nexus From Top Co2 Producing Countries; Panel ARDL Approach. *Review of Education, Administration & Law*, 6(2), 211-225. <https://doi.org/10.47067/real.v6i2.325>



- West, S., & Moore, J. L. (2015). Council for Accreditation of Counseling and Related Educational Programs (CACREP) at Historically Black Colleges and Universities (HBCUs). *Journal of Negro Education*, 84(1), 56-65. <https://doi.org/10.7709/jnegroeducation.84.1.0056>
- Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, 8, 1-13. <https://doi.org/10.33151/ajp.8.3.93>
- Wong, W. H., & Chapman, E. (2023). Student satisfaction and interaction in higher education. *Higher Education*, 85, 957–978. <https://doi.org/10.1007/s10734-022-00874-0>