European Institute of Knowledge & Innovation

Journal of Effective Teaching Methods (JETM)
ISSN: 2755-399X

Research Article

Laboratory, University, Training, and Experimental Schools in Europe: A Comparative Institutional Mapping Study

Konstantinos T. Kotsis [1,*]

[1] Lab of Physics Education and Teaching, Department of Primary Education, University of Ioannina, Greece
* Correspondence: kkotsis@uoi.gr

https://doi.org/10.59652/1574sj06

Abstract: This study provides the first systematic comparative mapping of laboratory, university, training, and experimental schools across Europe, addressing a significant gap in the literature on research-embedded schooling. Although these institutional forms are frequently grouped under shared labels, the analysis demonstrates that they represent structurally distinct configurations of governance, research intensity, and links to teacher education. Drawing on documentary analysis and secondary sources, the study develops a multidimensional typology encompassing institutional type, legal status, grade span, and degree of research embeddedness. The findings reveal four dominant European configurations: research-intensive ecosystems concentrated in Germany, the Netherlands, and the Nordic countries; medium-intensity systems centred on university-affiliated teacher-training schools, such as in Finland, Austria, and Belgium; low-intensity experi-mental-school systems across Southern, Eastern, and Balkan Europe; and hybrid models exempli-fied by Greece and Luxembourg. These variations highlight profound asymmetries in the structural capacity of education systems to support design-based research, longitudinal inquiry, and re-search-informed teacher education. The analysis further shows that training-oriented practice schools, despite their strengths in clinical preparation, rarely evolve into autonomous research in-stitutions without explicit university governance and sustained research mandates. Overall, the study positions research-embedded schools as a crucial but unevenly distributed component of European educational infrastructure, with important implications for teacher education, discipline-based education research, and evidence-informed school development.

Keywords: laboratory schools; university schools; teacher-training schools; experimental schools; model schools

Received: January 17, 2026
Accepted: March 29, 2026
Published: March 31, 2026

1. Introduction

Laboratory schools, university schools, and other research-embedded school types have recently regained prominence in European debates on teacher education, school development, and educational research. While historically rooted in Deweyan notions of the school as a 'laboratory' for democratic education, contemporary European initiatives reinterpret this idea in contexts marked by accountability, performativity, and pressures to compare internationally (Kurz & Zenke, 2024). These international comparison pressures are strongly shaped by large-scale assessments such as PISA, whose socio-economic measures and methodological choices influence national debates on equity and system design (Avvisati, 2020; Enchikova et al., 2024). Across countries, labels such as laboratory school (LS), university school (US), teacher training school (TS), and experimental/pilot or model school (ES) are used to denote institutions that mediate between universities and compulsory schooling. However, these labels mask substantial variation in legal status, governance, grade range, and research embeddedness.

Recent work shows that "laboratory schools travelling the world" are entangled in processes of policy borrowing and branding; they are promoted as innovative solutions while simultaneously constrained by national traditions and regulatory systems (Kurz & Zenke, 2024). The LabSchoolsEurope project has conceptualized European lab schools as sites of participatory research for democratic education, arguing that they can function as

"experimental stations" where teachers, researchers, and pupils collaboratively explore new forms of learning and school life (Zenke & Kurz, 2023; Zenke & Kurz, 2021). At the same time, studies of US outside Europe highlight how such institutions support high-quality teacher learning but also face tensions between experimentation, quality assurance, and everyday school pressures (Alghofaili, 2021; McGee & Lin, 2020). Together, these contributions underline that research-embedded schools are not a homogeneous category but a family of institutional forms shaped by historical and political trajectories.

Parallel to the revival of LS, a growing body of literature addresses university-school partnerships more broadly. Systematic reviews show that well-designed partnerships can improve teaching and learning practices, but that their evaluation remains methodologically challenging and conceptually fragmented (Sarmiento-Márquez et al., 2023). More recent conceptual work emphasises the importance of leadership, mutual trust, and distributed epistemic authority if universities and schools are to co-construct educational knowledge rather than reproduce hierarchical relationships (Heinz & Fleming, 2019; Sarmiento-Márquez et al., 2023). In this literature, research schools such as LS and US appear as one possible, but by no means the only, organisational form of university–school partnership.

In some national contexts, especially Finland, the institutional backbone of university–school relations is provided by TS (normaalikoulut). These schools are formally part of universities, host intensive practicum experiences, and are increasingly discussed as "university training schools" that embody research-based teacher education (Chung, 2021). Empirical work on Finnish normaalikoulut suggests that they function as multi-purpose institutions where teaching, supervision of student teachers, small-scale pedagogical experimentation, and collaboration with researchers coexist, but where research is not always the primary mission (Maaranen et al., 2019). Comparable practice-school models exist in Austria, Belgium, Poland, Hungary, and other European systems, yet they are labelled and governed in different ways and are unevenly linked to systematic research programmes (Kink-Hampersberger et al., 2023; Zenke, 2025).

Alongside these training-oriented institutions, a newer wave of explicitly designated 'university schools' has emerged in countries such as Germany and the Nordic region. Recent analyses highlight that this shift from practice schools to US represents a structural evolution in the organisation of teacher-education sites across Europe, reflecting deeper changes in governance, research embeddedness, and institutional hybridity (Kotsis & Tsiouri, 2025). The Universitätsschule Dresden, for example, is conceived as a long-term school experiment that integrates multi-age project-based learning, intensive cooperation with a research centre (ForUS), and a mandate to act as an innovation laboratory for school development, school research, and teacher education (Langner & Heß, 2020; Zenke, 2025).

Similar US initiatives in Cologne, Essen, Potsdam, Sweden, and Norway are described as 'innovation laboratories' where design-based research, participatory school development, and clinical teacher education are structurally intertwined (Ødegaard et al., 2023). These developments also suggest that, in certain parts of Europe, research-embedded schools are being reimagined as a distinct layer of educational infrastructure rather than isolated pilot projects.

At the same time, a broader strand of work on democratic and experimental schooling warns that the rhetoric of innovation can obscure structural constraints. Recent analyses of democratic LS argue that the promise of participation and co-agency must be understood against the background of existing school cultures, accountability regimes, and material conditions (Perfetti, 2024).

Comparative work on the diffusion of LS concepts highlights the risk that "lab school" becomes a branding device detached from robust research and teacher-researcher collaboration (Cutler et al., 2012; Kurz & Zenke, 2024). This tension between borrowed labels and local institutional realities is central for understanding why similarly named schools may differ radically in their functions, resources, and potential contributions to educational research.

Despite this rich and expanding literature, there is still no systematic, comparative mapping of LS, US, TS, and ES across European countries at the system level. Existing studies tend to focus on single institutions, national case studies, or conceptual analyses of university-school partnerships, without differentiating institutional subtypes or making visible the infrastructural possibilities that national education systems provide for research-embedded schooling (Chung, 2021; Hall et al., 2017; Sarmiento-Márquez et al., 2023). As a result, we lack a comparative overview of (a) which European systems operate research-intensive LS or US, (b) which rely primarily on teacher-training schools, and (c) which institutionalize

experimentation mainly through policy-designated pilot or model schools.

This study addresses this gap by providing a system-level, comparative institutional mapping of LS, US, TS, and ES across Europe. Drawing on documentary analysis and secondary sources, and operationalizing institutional type, governance, legal status, grade span, and research embeddedness, the study develops a multidimensional typology of research-embedded school infrastructures. Rather than evaluating individual schools, the analysis makes visible the uneven distribution of institutional conditions for sustained educational research and research-based teacher education, thereby providing a structural baseline for future comparative, empirical, and policy-oriented work.

2. Materials and Methods

To map and compare the institutional arrangements of LS, US, TS, and ES across Europe, the study adopts a comparative-institutional research design rooted in the epistemology of comparative pedagogy. Comparative pedagogy insists that meaningful comparison should be based on what is realistically comparable. Institutional types, governance modes, and clearly defined structural features. Rather than on loosely defined programmatic labels or outcome data (Milošević & Maksimović, 2020). Following this tradition, the present study examines each national education system in the European Union and in selected non-EU European states from Scandinavia, the Balkans, and the British Isles. As a single "unit of analysis," it identifies, for each, the presence or absence of institutional school types corresponding to four ideal-typical forms, LS, US, TS, and ES in particular.

To ensure conceptual clarity across diverse national terminologies, the four institutional categories were operationalized using structural criteria rather than country-specific labels. Firstly, LS, they are schools formally embedded within universities or research institutions that have a permanent and primary mandate for educational research. They function as long-term research infrastructures, typically host embedded research staff or units, and are institutionally recognized (de jure or de facto) as scientific institutions within the high-er-education system. Their core organizational logic is that of a research site in school form, within which teaching, school development, and teacher education are structurally subordinated to sustained research agendas (e.g., design-based research, longitudinal inquiry).

Secondly, US are schools jointly governed by universities and public authorities in which research, school development, and teacher education are structurally intertwined, but where the school is not primarily constituted as a scientific institution. Their core organizational logic is a hybrid governance arrangement: the school remains part of the public school system while being structurally coupled to universities through stable partnerships, innovation mandates, and recurring research collaborations. Unlike LS, US typically do not host permanent research units or hold formal scientific-institution status, even though they may support intensive, long-term research activity.

Analytically, the distinction between LS and US lies not in the presence of research, but in its institutional primacy: in LS, research constitutes the defining organizational mandate of the school, whereas in US, research is one of several co-equal in-stitutional functions alongside schooling and teacher education. This distinction becomes empirically visible when comparing classical LS such as the Laborschule Bielefeld with more recent US initiatives such as the Universitätsschule Dresden. The former is formally constituted as a scientific institution within the university system, with dedicated research staff, permanent research mandates, and long-term data infrastructures that position schooling as part of a sustained research programme.

The latter operates as a public school co-governed with a university, designed as an innovation laboratory for school development and teacher education, but without formal status as a scientific institution or permanently embedded research units. Both models support intensive research-practice integration, yet they differ in their institutional logics, governance arrangements, and epistemic positioning within the education system.

TS legally affiliated with universities or teacher-education institutions for the primary purpose of practicum, clinical preparation, and supervised teaching practice. While they may participate in pedagogical research, their core mandate is training and supervision rather than research production. At the same time, ES are designated by ministries or re-gional authorities to pilot curriculum reforms, assessment innovations, governance models, or pedagogical approaches. Their experimental status is typically policy-driven and time-bound, and they may engage in evaluation activities, but they are not structurally embedded in research infrastructures nor governed by universities.

It should be noted that the label "experimental school" carries heterogeneous legal and cultural meanings across national contexts, ranging from highly selective model schools embedded in national reform strategies to loosely designated pilot sites for specific policy initiatives. In this study, the ES category is therefore operationalized in functional rather than semantic terms, capturing schools whose experimental status is primarily policy-driven and not anchored in permanent research infrastructures, regardless of local terminology or symbolic prestige. These operational definitions served as the basis for classifying institutional types inde-pendent of local terminology, allowing cross-national comparability.

Data collection was based on documentary and secondary-source analysis. The "school-system mapping" involved a systematic search and review of publicly available national education legislation, university statutes, official school directories, and specialised reports about university-school partnerships or lab-school initiatives. In addition, peer-reviewed literature, institutional websites, and reports from European networks (e.g., networks promoting lab-schools or training-school models) were used to verify the legal and governance status, ownership (public/municipal/university), and grade range of each institution type in each country.

Where available, national education policy documents and reform proposals were also consulted to identify emerging ES schemes. The aim was not to exhaustively list every single school, but to ascertain whether each of the four ideal-typical institutional forms exists as a system-level possibility in each country. Schools that appeared only as isolated private initiatives or unverified private projects were excluded. The resulting mapping therefore captures the institutional availability of different research-embedded school types within national education systems, rather than their prevalence, scale, or effectiveness. Consequently, countries are coded based on the existence of structurally recognized institu-tional forms, not on the number of schools operating under each model or the intensity with which these models are implemented across the system.

The documentary basis for this mapping varies across countries, reflecting differences in the transparency, accessibility, and comprehensiveness of public records. Nordic and Continental European systems typically provide detailed, centralized documentation on school types, governance structures, and university partnerships, whereas in several Southern, Eastern, and Balkan contexts, public information is more fragmented, dispersed across ministerial portals, or embedded in project-based reports.

To mitigate these asymmetries, only authoritative and verifiable documents were used, and all national profiles were cross-checked against multiple source types whenever possible. Nevertheless, the uneven availability of public documentation introduces variation in the depth of verification achievable across cases, a structural limitation common to comparative-institutional research relying on secondary materials.

To enhance transparency and replicability, the selection of national policy documents, legal frameworks, and institutional sources followed a structured three-stage procedure. First, relevant materials were identified through targeted searches of national legislation databases, ministerial portals, university statutes, school registries, and institutional directories, complemented by backward and forward citation tracing in the peer-reviewed literature. Second, all retrieved documents were screened using explicit inclusion criteria: (i) provision of system-level information on governance, legal status, or official designation of LS, US, TS, and ES; (ii) origin from authoritative ministerial, statutory, or institutional sources; and (iii) reference to formally recognized or legally grounded school types. Documents describing unaccredited, one-off, or private initiatives without system-level relevance were excluded.

Third, all country profiles were validated through triangulation: legal documents were cross-checked against university statutes, official directories, and secondary literature to ensure consistency in terminology, research functions, and operational status. Policy reform proposals were used to document emerging tendencies but were coded as institutional types only when formally enacted. This approach ensured that the comparative mapping rests on convergent, authoritative, and publicly verifiable evidence.

To operationalize the dimension of research embeddedness, a three-level scale (High/Medium/Low) was developed using explicit structural indicators. A country was coded as High if at least one institutional school type fulfilled the following criteria: (a) formal embedding in a university or research institution; (b) an explicit and permanent mandate for educational research (e.g., design-based research, longitudinal inquiry); (c) stable institutional support, including dedicated research staff or units; and (d) the presence of sustained data infrastructures enabling cumulative research.

Medium research embeddedness was assigned when countries operated TS, or ES, with

documented and recurrent cooperation with universities, participation in pedagogical research or evaluation projects, and partial structural support for research activities, but without the legal or institutional status of schools as research infrastructures in their own right.

Low research embeddedness was used for contexts in which ES existed primarily as policy instruments, with time-bound experimental mandates, limited or ad hoc university collaboration, and no stable research units, data infrastructures, or permanent research roles embedded in schools.

The three-level scale was chosen as a methodologically parsimonious compromise between analytical differentiation and cross-national comparability. Given the heterogeneity and uneven documentation of research-school infrastructures across European systems, a more fine-grained metric would risk spurious precision. The scale, therefore, functions as an infrastructural proxy for the capacity of national education systems to support cumulative, school-based educational research rather than as a measure of research quality or output. A methodologically acceptable compromise under a "fitness for purpose" logic (Cohen et al., 2017).

To enhance reliability and transparency, the coding process followed explicit decision rules and iterative cross-checking procedures. Research-intensity assignments were based on convergent evidence from three source types: (i) national legislation defining the legal status and mandate of institutional school types; (ii) university statutes, governance documents, or partnership agreements specifying formal research responsibilities; and (iii) documented research activity, such as the existence of long-term projects, permanent research centres, or institutionalized teacher-researcher roles.

Coding was conducted iteratively, with provisional classifications reviewed in light of additional documentary sources until internal consistency across cases was achieved. Borderline cases were treated conservatively and coded at the lower of the two plausible levels unless multiple independent sources supported a higher level of research embeddedness. For example, systems such as Greece and Denmark exhibit dense ES or US networks with selective research collaboration; however, in the absence of permanent school-based research units or formal designation of schools as research institutions, these cases were coded as Medium rather than High research intensity.

Although the study relies on single-team documentary analysis rather than independent coders, the use of explicit coding criteria, multi-source triangulation, and conservative classification rules was intended to enhance replicability and reduce the risk of overattributing research embeddedness to isolated flagship initiatives. To ensure consistency across countries, codes were assigned through iterative comparison, revisiting borderline cases, and rechecking national profiles against multiple documentary sources. Coding decisions were retained only when supported by at least two independent document types to avoid misclassification based on single-source claims.

As a robustness check, borderline cases were subjected to a sensitivity recoding under stricter criteria (i.e., requiring evidence of permanent school-based research units and formalized data infrastructures for assignment to the "High" category). This conservative recoding did not alter the overall cluster structure and resulted in only minor downward shifts in a small number of cases (primarily from Medium to Low), while no cases moved from Medium to High. This stability suggests that the high-/medium-/low-intensity typology is robust to plausible alternative threshold specifications.

Legal status (public/municipal/university/mixed) and grade range (primary, secondary, or continuous K-12) were recorded as additional descriptive variables to sharpen comparability. These variables matter because institutional type alone does not determine research capacity: a publicly-run ES serving only primary grades will have a different structural profile than a university-owned K-12 LS. The above is summarized in table 1.

The study's analytical framework thus becomes a multidimensional typology: for each country, the presence/absence of each of the four institutional types, coupled with legal status, grade range, and research-embeddedness. Countries are thereby placed in a comparative institutional map rather than a performance or outcome map. This typology allows not only to document where different school types exist but also to analyse patterns of con-vergence and divergence across Europe, to identify "research-school cores," "training-school systems," and "policy-experiment zones."

Table 1. Operational definitions of school types.

Institutional type	Core mandate	Governance / Ownership	Research embeddedness	Defining structural features
Laboratory School (LS)	Educational research, design experiments, and long-term innovation	University-owned or cogoverned	High	Formal research mandate; scientific institution status; embedded research staff; permanent data infrastructures
University School (US)	Integrated research-practice-teacher education ecosystem	Joint university public authority governance	Medium High	Stable research partnerships; innovation labs; DBR cycles; mixed governance
Training Practice School (TS)	Clinical teacher education, practicum, supervision	University or teacher education institution	Medium	Structured practicum; mentoring; limited but documented research collaboration
Experimental Pilot School (ES)	Policy pilots, curriculum trials, governance experiments	Ministry or re-gional authority	Low Medium	Time-bound experimental designation; evaluation studies; no stable research units

Because the study is based entirely on secondary and public-domain documentary sources, it does not engage in primary data collection, nor does it attempt to measure educational outcomes or effectiveness. Its aim is strictly descriptive-analytical to provide a systematic overview and typology of institutional forms across Europe, thus creating a foundation for future empirical or longitudinal research. The strength of the method lies in its comparative epistemology, which emphasizes clarity, replicability, and structural transparency over con-textual idiosyncrasy.

This methodological approach aligns with developments in comparative education re-search that call for transparent, multidimensional mapping rather than oversimplified cross-national rankings or ineffectively homogenized comparative categories (Rodrigues et al., 2025). By providing such a mapping, this study aims to contribute a structural baseline for future research on school-based educational infrastructures, research capacity, and teacher education across Europe.

3. Results

The comparative mapping reveals a highly differentiated European landscape in the institutionalization of LS, US, TS, and ES. Rather than forming a coherent or uniform system, these school types are distributed unevenly across national contexts, forming recognizable regional clusters that differ markedly in research intensity, governance, and structural integration with higher education. Across the mapped countries, four dominant configurations emerge: research-intensive LS and US ecosystems, training-school-dominated systems, ES-based systems with limited research capacity, and hybrid configurations combining elements of training and experimentation.

The comparative mapping of LS, US, TS, and ES across Europe is presented in table 2. The table synthesizes the results of the documentary analysis for European Union member states, England, the Nordic countries, and the Balkans, indicating for each country the presence or absence of the four institutional types, their dominant local and English terminology, grade range, legal status, and level of research embeddedness. To enhance analytical readability, countries can be classified into three broad research-intensity clusters (high, medium, low), with hybrid cases occupying intermediate positions. Together, these dimensions provide a structural overview of national research-school infrastructures rather than a catalogue of individual institutions.

Table 2. Laboratory, university, training, and experimental schools in europe.

Country	Local term	English term	Grade range	Legal status	Research intensity
Albania	Shkollë eksperimentale	Experimental school	Primary / Secondary	Public	Low
Austria	Übungsschule, Praxisschule	Training practice school	Primary / Secondary	University / Public	Medium

Belgium	Oefenschool, École d'application	Training school	Primary / Secondary	University / Public	Medium
Bosnia and Herzegovina	Eksperimentalna škola	Experimental school	Primary / Secondary	Public / Cantonal	Low
Bulgaria	Опитно училище	Experimental school	Primary / Secondary	Public	Low
Croatia	Eksperimentalna škola	Experimental school	Primary / Secondary	Public	Low
Cyprus	Πειραματικό Σχολείο	Experimental school	Primary / Secondary	Public	Low
Czech Republic	Laboratorní škola	Laboratory school	K–12	University	High
Denmark	Forsøgsskole	Experimental school	Primary / Secondary	Public / Municipal	Medium
England	University Training School	University school Training school	Primary / Secondary	University / Public	Medium
Estonia	Katsekool	Experimental school	Primary / Secondary	Public / Municipal	Medium
Finland	Normaalikoulu	Teacher training school	K–12	University	Medium
France	Lab School, École expérimentale	Laboratory experimental school	Primary / Secondary	Public / University	High
Germany	Laborschule, Universitätsschule	Laboratory school university school	K–12	Public / University / Municipal	High
Greece	Πειραματικό, Πρότυπο-Πειραματικό	Experimental model school	K–12	Public	Medium
Hungary	Gyakorlóiskola	Training experimental school	Primary / Secondary	University	Medium
Iceland	Tilraunaskóli	Experimental school	Primary / Secondary	Public	Low
Ireland	University Training School	University school Training school	Primary / Secondary	University / Public	Medium
Italy	Scuola sperimentale	Experimental school	Primary / Secondary	Public	Medium
Kosovo	Shkollë eksperimentale	Experimental school	Primary / Secondary	Public	Low
Latvia	Eksperimentālā skola	Experimental school	Primary / Secondary	Public / Municipal	Low
Lithuania	Eksperimentinė mokykla	Experimental school	Primary / Secondary	Public	Low
Luxembourg	École pilote	Pilot experimental school	Primary / Secondary	Public	Medium
Malta	Teaching Practice School	Teaching Practice School	Primary / Secondary	University	Low
Montenegro	Eksperimentalna škola	Experimental school	Primary / Secondary	Public	Low
Netherlands	Universiteitschool	Laboratory university training school	K-12	University / Municipal	High
North Macedonia	Експериментално училиште	Experimental school	Primary / Secondary	Public	Low
Norway	Universitetsskole	University experimental school	K-12	University / Municipal	High
Poland	Szkoła ćwiczeń	Training experimental school	Primary / Secondary	University / Public	Medium
Portugal	Escola experimental	Experimental school	Primary / Secondary	Public	Medium

Romania	Şcoală de aplicaţie	Training experimental school	Primary / Secondary	University / Public	Medium
Serbia	Eksperimentalna škola	Experimental school	Primary / Secondary	Public	Low
Slovakia	Experimentálna škola	Experimental School	Primary / Secondary	Public	Low
Slovenia	Eksperimentalna šola	Experimental school	Primary / Secondary	Public	Low
Spain	Centro experimental	Experimental school	Primary / Secondary	Public / Regional	Medium
Sweden	Universitetsskola	University training school	K-12	University / Municipal	High

The first cluster comprises countries with fully institutionalized research-embedded school infrastructures, in which LS and/or US serve as permanent components of the educational research ecosystem. Germany occupies a structurally unique position within Europe in this respect. It is the only system in which all four institutional forms coexist at scale: Laborschulen as formally recognised scientific institutions of universities, Universitätsschulen as large-scale research-practice partnerships in cooperation with municipalities and state authorities, Übungsschulen as traditional teacher-training schools, and Versuchsschulen as state-authorised ES. The analytical distinction between LS and US is particularly evident when comparing classical LS, such as the Laborschule Bielefeld, with more recent US initiatives, such as the Universitätsschule Dresden. The former operates as a university-embedded research institution with dedicated scientific staff and long-term research programmes, whereas the latter is organised as a public school co-governed with a university, designed to function as an innovation laboratory for school development and teacher education without being formally constituted as a scientific institution. This contrast illustrates that both models support intensive research–practice integration, yet differ in their institutional logics, governance arrangements, and epistemic positioning within the education system. The Laborschule Bielefeld represents the classical European laboratory-school model, with a permanent research mandate, dedicated scientific staff, and long-term data infrastructures, and is internationally documented as an example of teacher research in a democratically organised school community (Beadle et al., 2023). In contrast, newly founded Universitätsschulen, such as those in Dresden, Cologne, and Essen, are explicitly designed as innovation laboratories for design-based educational research and teacher-education reform (Zenke & Kurz, 2021; Zenke, 2025). A comparable degree of institutional research embedding is observed in the Netherlands, where Universiteitscholen combine laboratory, university, and training functions within a single organisational structure, and where municipalities and universities jointly govern long-term research-practice infrastructures. Sweden and Norway also belong to this group through the establishment of Universitetsskolor and Universitetsskoler, which are explicitly framed as research-intensive school–university partnerships with high levels of design-based research, teacher inquiry, and curriculum innovation. In Central Europe, the Labyrinth Lab School Brno exemplifies a research-intensive LS oriented toward social responsibility, participatory learning, and community-based inquiry (Chocholatá et al., 2023). Selected French initiatives, especially those associated with the Lab School Paris movement, similarly approximate the laboratory-school model by situating democratic education, participatory research, and teacher education within a permanent institutional framework (Haag & Martin, 2023; Zenke & Kurz, 2023).

A second major cluster comprises teacher-training–centred systems with medium research embeddedness, in which the dominant institutional backbone is formed by practice schools formally affiliated with universities. In contrast, LS or US in the strict sense are absent. Finland constitutes the paradigmatic case. The Finnish normaalikoulut are legally integrated units of universities that provide extensive practicum placements for student teachers, structured induction for novice teachers, and selective engagement in pedagogical research. Although research activities are present, empirical studies indicate that these schools primarily function as training and supervision environments rather than as autonomous research institutions (Maaranen et al., 2019; Chung, 2021). Highly comparable arrangements exist in Austria (Übungsschulen and Praxisschulen), Belgium (Oefenscholen and écoles d'application), Poland (szkoły ćwiczeń), Hungary (gyakorlóiskolák), Romania (şcoli de

aplicație), Malta, Ireland, and England. In the Austrian context, the University College of Teacher Education Vienna represents a particularly well-documented model of structured school–university cooperation with an explicit focus on democratic education (Kulhanek-Wehlend et al., 2023). In all of these systems, university–school cooperation is structurally stabilized through teacher education, but research engagement tends to depend on project-based initiatives rather than on permanent research mandates. Consequently, these systems exhibit medium research intensity: they support educational research and innovation, yet they do not operate schools as long-term research infrastructures.

A third, numerically dominant configuration is formed by ES-based systems with low research embeddedness, particularly across large parts of Southern, Eastern, and Balkan Europe. In these contexts, ES are primarily policy instruments used by ministries or regional authorities to pilot curriculum reforms, governance innovations, assessment models, or digitalization strategies (Kotsis & Tsiouri, 2026). Spain, Portugal, Italy, Cyprus, Bulgaria, Croatia, Slovakia, Slovenia, Latvia, and Lithuania all follow this pattern, as do most Balkan countries, including Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. In these contexts, ES are usually publicly administered, are frequently limited to either primary or lower-secondary education, and are rarely embedded in structured, long-term research cooperation with universities. Although the local designation of "experimental" may carry varying degrees of symbolic status or selectivity, the common structural feature across these cases is the predominance of policy-driven experimentation over permanent research embedding. While small-scale evaluations may accompany reform pilots, the absence of stable research infrastructures and permanent university governance results in consistently low research intensity. These systems, therefore, function as policy-experiment zones rather than as strict educational research ecosystems.

In both the Balkan and broader Eastern European contexts, the predominance of ES is closely tied to structural legacies in educational governance, funding, and university-school cooperation. In many of these countries, experimental or pilot schools historically emerged as mechanisms to pilot centrally designed reforms, particularly curriculum modernization, assessment models, and organizational innovations, rather than as institutions designed for long-term educational research. As a result, their mandates tend to be policy-driven and intermittently activated in response to ministerial priorities.

A second structural factor shaping these systems is the limited institutional autonomy of schools and universities in educational research. In countries such as Albania, Kosovo, Serbia, Montenegro, North Macedonia, Bulgaria, and Bosnia & Herzegovina, universities generally do not operate school-level infrastructures comparable to LS and US. Comparative analyses of teacher academic-training systems in Greece and Serbia show that these structural constraints extend deeply into the organization of initial teacher education, affecting institutional capacity, research integration, and the coherence of university–school partnerships (Kotsis et al., 2025a; Marušić et al., 2019). Teacher education institutions often lack the authority, legal mandate, or resources to establish research-intensive partnerships, resulting in weak or irregular collaboration between schools and higher education.

Furthermore, several Balkan and Eastern European systems continue to operate within constrained research-funding environments, where educational research remains largely project-based, short-term, or externally funded (e.g., EU structural programmes). This funding model encourages evaluation-oriented studies rather than the cumulative, longitudinal, or design-based research characteristics of Nordic and Continental research-school ecosystems.

Despite these constraints, some countries show emerging hybrid dynamics. In Romania and Poland, for instance, training or practice schools integrated into teacher-education universities offer pockets of medium research embeddedness, even if not yet aligned with the laboratory-school model. Similarly, in Croatia, Bulgaria, and Lithuania, reform-oriented pilot school networks have increasingly collaborated with universities for curriculum innovations, though still without the structural features of research-intensive ecosystems. Comparative analyses of science curricula in Greece and Serbia further highlight how national curricular traditions shape the possibilities for integrating research-based practices into primary education, reinforcing the broader pattern of uneven research embeddedness across the region (Kotsis et al., 2025b). These cases suggest a gradual but uneven movement toward more formalised university–school cooperation, although the broader region remains shaped by low-intensity, policy-driven experimentation rather than research-embedded infrastructures.

Between these three dominant configurations, several hybrid systems emerge. Greece occupies a particularly important transitional position. Its dense national network of Πειραματικά and Πρότυπα-Πειραματικά schools spans the full K-12 spectrum and is formally linked to universities, especially through teacher education and educational evaluation. Recent research highlights that these ES play a central role in piloting and implementing the new national curricula, functioning as testing grounds for pedagogical innovation and curricular reform within a reconfigured regulatory framework that has introduced new governance arrangements while leaving key tensions unresolved (Kotsis & Tsiouri, 2024; Kotsis & Tsiouri, 2026). Although Greek ES are not LS in the classical sense, their strong legal integration into the public education system and sustained collaboration with higher-education institutions result in a medium level of research embeddedness, positioning Greece between the training-school cluster and the research-intensive laboratory-school cluster. A similarly hybrid position is observable in Luxembourg and parts of Italy, where pilot schools are embedded in national reform strategies while maintaining selective cooperation with university research groups.

From a regional perspective, the comparative mapping reveals distinct clusters in the distribution of institutional school types and research embeddedness. Nordic countries exhibit dense networks of university-affiliated schools with high research embeddedness, whereas Continental systems, such as Germany, the Netherlands, France, and the Czech Republic, combine LS and US as structurally differentiated forms. In Southern Europe, ES constitute the dominant institutional form, with Greece representing a hybrid configuration that combines ES and formal links to higher education. Eastern and Balkan systems are characterized primarily by ES with low research embeddedness. England and Ireland show highly developed university-school partnerships in teacher education, predominantly through training-school models rather than LS or US in the strict sense. A prominent exception is the University of Cambridge Primary School, which has been explicitly conceptualized as a democratic US oriented toward imagination, community engagement, and research-informed innovation in primary education (Adams, 2014; Biddulph et al., 2023).

Taken together, the mapping demonstrates that research-embedded schools in Europe are not evenly distributed but are structurally concentrated within a small number of national systems. At the same time, the majority of countries rely on ES or TS with limited, and often project-based, research integration. Methodologically, this uneven distribution justifies the analytical distinction between high, medium, and low research intensity as a meaningful indicator of educational research infrastructure. Substantively, the findings imply that the capacity for longitudinal, design-based, and discipline-based education research, including education research, is strongly conditioned by national institutional arrangements rather than by isolated school-level initiatives. The European landscape of LS, US, TS, and ES, therefore, reflects not merely different terminologies but fundamentally different structural conditions for the production of educational knowledge.

4. Discussion

The European mapping demonstrates that the institutional capacity to support research-embedded schooling is not primarily a matter of local innovation or individual school leadership, but is structurally determined by national frameworks of governance, teacher education organization, and research funding. The stark contrast between countries operating permanent LS and US and those relying almost exclusively on policy-oriented ES indicates that Europe currently offers highly unequal structural conditions for the systematic production of educational knowledge. This unevenness confirms earlier concerns that the rhetoric of innovation in schooling often far exceeds the actual infrastructural capacity for sustained educational research (Sarmiento-Márquez et al., 2023; Kurz & Zenke, 2024). In this sense, the mapping does not merely catalogue institutional diversity but also exposes a fundamental asymmetry in how European education systems invest in knowledge production rather than policy implementation.

The three-level scale functions as an infrastructural proxy for the capacity of national education systems to support cumulative, school-based educational research rather than as a measure of research quality or output. High-intensity contexts, such as Germany, the Netherlands, and parts of Scandinavia, operate schools as long-term research infrastructures in which design-based research, participatory inquiry, and longitudinal data collection are structurally anchored. These systems approximate what Hoadley and Campos (2019) conceptualize as "networked improvement infrastructures," where stable institutional

arrangements enable cumulative knowledge building rather than fragmented project cycles. Medium-intensity systems, particularly those based on teacher-training schools, show strong clinical orientations and offer excellent conditions for professional learning, yet they only partially support large-scale educational research. Low-intensity systems, dominated by ES, function primarily as policy laboratories rather than research laboratories, thereby limiting their contribution to theory-driven or discipline-based education research.

From the perspective of teacher education, the typology highlights a persistent tension between training logics and research logics. Practice-school models across Europe successfully integrate student teachers into authentic classroom environments and contribute substantially to professional socialization and the development of instructional competence (Maaranen et al., 2019; Darling-Hammond, 2017). However, the mapping indicates that these models rarely evolve into autonomous research institutions unless accompanied by explicit university gov-ernance and sustained research mandates. This finding supports earlier critiques that clinical teacher education, while pedagogically powerful, does not automatically generate re-search-productive environments unless epistemic authority and research resources are co-located within schools (Zeichner, 2017; Heinz & Fleming, 2019). US and LS represent precisely this structural co-location and thus mark a qualitative shift in how teacher education and research may be institutionally intertwined.

The results also have direct implications for discipline-based education research (DBER). DBER relies not only on access to classrooms but also on the ability to conduct iterative, theory-driven research over extended periods. High-intensity research-school ecosystems (LS and US) structurally enable research designs such as design-based research cycles, longitudinal studies of conceptual change, learning progressions in disciplinary domains (e.g., scientific modelling or core concepts in physics), and sustained classroom-based intervention studies that require stable instructional contexts and cumulative data infrastruc-tures. For example, the iterative development and validation of learning progressions in physics (e.g., students' conceptual change regarding force, energy, or modelling practices) typically requires multi-year access to comparable cohorts, repeated cycles of curriculum design and refinement, and stable data governance arrangements that allow cumulative analysis across cohorts. Such research designs are structurally difficult to sustain in low-intensity experi-mental-school systems, where access is often limited to short-term policy pilots or evaluation projects aligned with reform cycles rather than with theory-driven DBER programmes.

In low-intensity systems dominated by ES, research access is more often mediated through time-bound projects aligned with ministerial reform priorities. This structural constraint limits DBER to short-term evaluation studies or single-cycle in-terventions, thereby reducing opportunities for theoretical refinement, replication across cohorts, and the cumulative development of domain-specific learning theories. As a result, differences in DBER productivity and maturity across European contexts can be understood not only as a function of academic traditions or funding levels, but as outcomes of national differences in the institutional availability of research-embedded schools as long-term research environments. The mapping, therefore, suggests that national differences in DBER productivity are not solely a function of academic traditions or funding levels, but are deeply rooted in the presence or absence of research-embedded school infrastructures.

Beyond these structural patterns, the findings should also be interpreted through the lens of critical perspectives on university-school partnerships. Recent scholarship cautions that labels such as "laboratory school" or "university school" increasingly serve as branding mechanisms that signal innovation while masking uneven research capacity or limited epistemic autonomy (Kurz & Zenke, 2024). In systems governed by strong accountability and per-formativity pressures, schools may be required to present themselves as experimental while simultaneously adhering to rigid evaluation regimes, thereby restricting the scope for genuine pedagogical or organizational innovation. Furthermore, power asymmetries persist between universities and schools: universities typically shape research agendas, control data infra-structures, and hold epistemic authority, whereas schools absorb the practical risks of experimentation, visibility, and compliance. These tensions underscore that research-embedded schools are not inherently democratic or experimental spaces, but contested institutional sites where competing logics of accountability, innovation rhetoric, and epistemic control intersect.

The regional clustering identified in the mapping indicates that European integration in education has not produced convergence in research-school infrastructures, but rather the stabilization of distinct institutional regimes. Nordic and Continental systems increasingly in-

stitutionalize university-school partnerships with explicit research mandates, whereas Southern, Eastern, and Balkan Europe continue to rely predominantly on ES as policy instruments for piloting reforms. This divergence aligns with broader analyses of European education governance that point to persistent core-periphery dynamics in research capacity, innovation diffusion, and institutional stability. Interpreted in infrastructural terms, these patterns suggest that national education systems differ not only in policy orientations but in their long-term investment in the institutional conditions for educational knowledge production (Grek, 2009; Vieluf et al., 2012). From this perspective, LS and US appear not merely as educational innovations, but as indicators of a system's long-term in-vestment in educational knowledge production.

At the same time, the discussion must acknowledge that the mere existence of LS or US does not guarantee epistemic quality or democratic participation. Recent critical analyses of democratic LS warn that participatory rhetoric may mask power asymmetries between universities and schools, as well as tensions between experimental freedom and accountability regimes (Perfetti, 2024; Zenke & Kurz, 2021). The structural embeddedness of research can therefore generate new forms of institutional control as much as it enables educational innovation.

This duality underscores that research-embedded schooling should not be understood as an inherently progressive form, but as a field of institutional negotiation shaped by political, administrative, and epistemic forces.

The Greek case, situated between medium-intensity training-experimental systems and high-intensity research ecosystems, is particularly instructive in this regard. The national network of ES provides broad K-12 coverage and strong legal anchoring within the public system. Recent analyses of science teacher-education reform in Greece show that the country is moving toward a more integrated model that seeks to align disciplinary preparation, pedagogical formation, and school-based research infrastructures (Kotsis, 2025).

However, the absence of permanent school-based research units limits the transition toward full laboratory-school status. This intermediate position suggests that structural transformation toward research-intensive schooling is not a binary shift but a gradual process requiring not only legislative change but also sustained investment in school-based research cultures, data infrastructures, and hybrid teacher-researcher roles. Similar transitional dynamics can be observed in parts of Southern Europe and in selected reform initiatives in Eastern Europe, indicating that the European research-school map is better understood as a dynamic field than as a fixed typology.

Finally, the discussion highlights a central paradox in current European education policy. While evidence-based policymaking, innovation, and research-informed teaching are rhetorically promoted across Europe, only a minority of systems provide the institutional infrastructures required for the sustained co-production of educational knowledge in schools. This paradox reinforces earlier critiques of the "precertification" of educational research, where short-term innovation cycles replace long-term institutional learning (Furlong & Whitty, 2017). The mapping presented in this study, therefore, not only describes institutional diversity but also raises normative questions about the future of research-based schooling in Europe and the conditions under which educational research can meaningfully contribute to sustainable school development.

The implications for teacher education are substantial. Training-school systems offer powerful environments for clinical preparation, mentoring, and professional socialization. However, the mapping shows that they rarely evolve into autonomous research institutions without explicit university governance and long-term research mandates. This supports earlier arguments that the integration of practice and theory in teacher education requires not only school-university cooperation, but also institutional co-ownership of epistemic authority (Darling-Hammond, 2017; Zeichner, 2017). US and LS represent precisely such a shift, as they structurally align teacher education, school development, and research within a single organizational framework. The gradual emergence of these models in Scandinavia and parts of Continental Europe may therefore signal a longer-term transformation in the architecture of European teacher education.

For discipline-based education research, the consequences of the present mapping are equally significant. High-quality DBER depends on enduring access to classrooms, stable instructional contexts, and the possibility of iterative intervention over extended time spans (Irving et al., 2020; Dancy & Henderson, 2010). The concentration of research-embedded schools in a small number of countries implies that the structural preconditions for DBER are highly uneven across Europe. Where LS and US are absent, research is often forced into

short-term project formats shaped by ministerial priorities rather than by disciplinary theory development. This helps to explain why DBER fields tend to mature more rapidly in systems that operate stable research-school infrastructures, and it underscores the importance of institutional design for the long-term accumulation of domain-specific educa-tional knowledge.

At the level of educational governance, the findings expose a persistent policy paradox. Across Europe, evidence-based policymaking, innovation, and research-informed teaching are consistently promoted as strategic objectives. Yet only a minority of systems provide the in-stitutional infrastructure required for the sustained co-production of educational knowledge within schools. This disjunction reinforces critiques of the "precertification" of educational innovation, in which short-term pilot initiatives substitute for long-term institutional learning (Furlong & Whitty, 2017). From this perspective, the expansion of US and LS should not be understood as isolated reforms, but as a broader reorientation of educational governance toward research capacity-building.

5. Conclusions

This study set out to provide a descriptive-analytical mapping of LS, US, TS, and ES across Europe. The comparative analysis demonstrates that these institutional forms are not simply different labels for similar arrangements, but represent fundamentally different structural configurations of educational research, teacher education, and school governance. The European landscape is characterized by a pronounced asymmetry: only a limited number of national systems have developed research-embedded schools as permanent infrastructures. At the same time, the majority rely on either training-oriented practice schools or policy-driven ES with limited research capacity. This finding confirms that the production of educational knowledge remains structurally concentrated in a small group of countries, rather than evenly distributed across Europe.

From a comparative perspective, the distinction between high-, medium-, and low-intensity research embeddedness emerges as a powerful analytical lens. High-intensity systems, such as those found in parts of Germany, the Netherlands, and the Nordic region, operate schools as long-term research environments in which educational inquiry is not episodic but institutionally normalized. Medium-intensity systems, dominated by teacher-training schools, provide strong clinical foundations for professional learning but are only partially able to support cumulative research programmes. Low-intensity systems, which prevail across large parts of Southern, Eastern, and Balkan Europe, use ES primarily as policy instruments rather than as components of a sustainable research infrastructure. This typology suggests that cross-national differences in educational research productivity and innovation capacity are deeply rooted in institutional design rather than only in funding levels or academic traditions.

Beyond its descriptive value, the institutional typology developed in this study provides a conceptual scaffold for future empirical, longitudinal, and policy-oriented research. For em-pirical studies, the typology offers a basis for systematically selecting cases across different research-intensity settings, enabling comparative designs that examine how institutional con-ditions shape teacher learning, research productivity, and innovation capacity. For longitudinal research, the distinctions between high-, medium-, and low-intensity systems create a framework for tracing institutional evolution over time, including transitions from train-ing-school models to university-school or laboratory-school configurations. For policy analysis, the typology supports structured comparisons of governance arrangements, resource allocation, and accountability mechanisms, helping policymakers assess the infrastructural requirements for sustainable research-practice partnerships. In this way, the typology functions not only as a mapping device but as a generative framework for guiding future inquiry into the organizational conditions of educational knowledge production."

The study also highlights that the development of research-embedded schools is not a binary transformation but a gradual institutional process. Systems such as Greece, Luxembourg, and parts of Southern Europe illustrate intermediate configurations where strong legal anchoring of ES coexists with emerging research functions. These cases demonstrate that transitions toward research-intensive schooling require cumulative investment not only in physical infrastructure and legal status, but also in teacher-researcher hybridity, school-based data cultures, and long-term university–school partnership structures. Without such investments, ES risk remaining confined to short-lived policy cycles rather than evolving into durable research environments.

Several limitations of the present study must also be acknowledged. The mapping is based on documentary and secondary-source analysis and therefore reflects national system-level possibilities rather than the detailed functioning of individual schools. Local variation within countries, especially in federal or highly decentralized systems, could not be fully captured. In addition, operationalizing research intensity necessarily simplifies complex institutional realities. Nevertheless, the typology offers a robust comparative baseline that can be refined through future empirical investigations at the school level.

In conclusion, this study provides the first systematic institutional mapping of LS, US, TS, and ES across Europe at the level of national education systems and their institutional infrastructures. The analysis does not assess the quality, effec-tiveness, or innovativeness of individual schools, but rather makes visible the structural con-ditions of possibility under which research-embedded schooling can emerge and be sustained. The findings indicate that research-embedded schooling constitutes a scarce but structurally significant infrastructure for educational knowledge production. For policymakers, the findings suggest that efforts to strengthen educational innovation are more likely to be sustainable when accompanied by long-term investment in institutional research capacity, rather than relying primarily on short-term experimental projects. For researchers, especially in discipline-based education research, the mapping clarifies where structurally favourable environments for sustained inquiry currently exist. For teacher education, the results underscore the importance of governance arrangements that unite training, school development, and research within coherent institutional frameworks. Future research should therefore move beyond single-institution case studies and investigate how emerging US and LS reshape the epistemic, organizational, and professional landscape of European education over time.

Funding: This research received no external funding.

Informed Consent Statement: Not applicable.

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

Note: The author, K. T. Kotsis, serves more than ten years as Head of the Scientific Supervisory Committee within the network of Experimental Primary Schools in Ioannina, Greece. Before that was the Head of the Scientific Supervisory Committee within the network of Model High Schools in Ioannina, Greece.

References

Adams, K. (2014). What is a child? Children's perceptions, the Cambridge Primary Review and implications for education. Cambridge Journal of Education, 44(2), 163-177. https://doi.org/10.1080/0305764X.2013.860082

Alghofaili, J. F. (2021). The university laboratory school: The benefits of quality practices. *European Journal of Education Studies, 8*(5), 165-179. https://oapub.org/edu/index.php/ejes/article/view/3722

Avvisati, F. (2020). The measure of socio-economic status in PISA: A review and some suggested improvements. *Large-scale Assessments in Education, 8*(1), 8. https://doi.org/10.1186/s40536-020-00086-x

Beadle, K., Dieckmann, J. W., Drah, C., Freke, N., Hofmann, C., Kurz, B., Textor, A., & Zenke, C. T. (2023). Laborschule Bielefeld: Doing teacher research in an embryonic society. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 25-52). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-03

Biddulph, J., Rolls, L., Durning, A., Natale, E., & Millar, E. (2023). The University of Cambridge Primary School: Releasing the imagination of a new democratic education. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 103-130). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-06

Chocholatá, J., Mandelíčková, M., Oaklandová, G., & Svozil, B. (2023). Labyrinth Lab School Brno: Creating a socially responsible learning community. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 75-102). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-05

Chung, J. (2021). *The impact of Finnish teacher education on international policy: Understanding university training schools.* Palgrave Pivot. https://doi.org/10.1007/978-3-030-89518-1

Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education* (8th ed.). Routledge. https://doi.org/10.4324/9781315456539

Cutler, K., Bersani, C., Hutchins, P., Bowne, M., Lash, M., Kroeger, J., … Black, F. (2012). Laboratory Schools as Places of Inquiry: A Collaborative Journey for Two Laboratory Schools. *Early Education and Development, 23*(2), 242-258. https://doi.org/10.1080/10409289.2012.647609

Dancy, M., & Henderson, C. (2010). Pedagogical practices and instructional change of physics faculty. *American Journal of Physics, 78*(10), 1056-1063. https://doi.org/10.1119/1.3446763

Darling-Hammond, L. (2017). Teacher education around the world: What can we learn from international practice? *European Journal of Teacher Education, 40*(3), 291-309. https://doi.org/10.1080/02619768.2017.1315399

Enchikova, E., Neves, T., Toledo, C., & Nata, G. (2024). Change in socioeconomic educational equity after 20 years of PISA: A systematic literature review. *International Journal of Educational Research Open, 7*, 100359. https://doi.org/10.1016/j.ijedro.2024.100359

Furlong, J., & Whitty, G. (2017). Knowledge traditions in the study of education. In G. Whitty and J. Furlong (Eds.), Knowledge and the study of education: An international exploration (pp. 13-57). Symposium.
Grek, S. (2009). Governing by Numbers: The PISA 'Effect' in Europe. *Journal of Education Policy, 24*(1), 23-37. https://doi.org/10.1080/02680930802412669
Haag, P., & Martin, M. (2023). Lab School Paris: An educational living lab. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 53-74). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-04
Hall, A. H., Peden, J. G., & Maurer, T. W. (2017). Assessing Birth to Age 5 Teaching Methods at a University Laboratory School. *Journal of Research in Childhood Education, 31*(2), 270-280. https://doi.org/10.1080/02568543.2016.1273286
Heinz, M., & Fleming, M. (2019). Leading change in teacher education: Balancing on the Wobbly Bridge of school-university partnership. *European Journal of Educational Research, 8*(4), 1295-1306. https://doi.org/10.12973/eu-jer.8.4.1295
Hoadley, C., & Campos, F. C. (2022). Design-based research: What it is and why it matters to studying online learning. *Educational Psychologist, 57*(3), 207-220. https://doi.org/10.1080/00461520.2022.2079128
Irving, P. W., McPadden, D., & Caballero, M. D. (2020). Communities of practice as a curriculum design theory in an introductory physics class for engineers. *Physical Review Physics Education Research, 16*(2), 020143. https://doi.org/10.1103/PhysRevPhysEducRes.16.020143
Kink-Hampersberger, S., Scheer, L., & Mendel, I. (2023). Between Academia and School: Habitus Reflexivity as One Way of Dealing with the Theory-Practice Tension in Teacher Education. *Center for Educational Policy Studies Journal, 13*(4), 63-85. https://doi.org/10.26529/cepsj.1652
Kotsis, K. T. (2025). Toward an integrated model of science teacher education in Greece. *European Journal of Contemporary Education and E-Learning, 4*(1), 45-58. https://doi.org/10.59324/ejceel.2026.4(1).04
Kotsis, K. T., & Tsiouri, E. (2024). The Important Role of the Greek Experimental Model Schools for the New Curricula in Education. *European Journal of Contemporary Education and E-Learning, 2*(6), 44-60. https://doi.org/10.59324/ejceel.2024.2(6).03
Kotsis, K. T., & Tsiouri, E. (2025). From Practice Schools to University Schools: Structural Evolution of Teacher-Education Sites in Europe. *European Journal of Contemporary Education and E-Learning, 4*(1), 3-14. https://doi.org/10.59324/ejceel.2026.4(1).01
Kotsis, K. T., & Tsiouri, E. (2026). The Regulatory Framework of Experimental and Model Schools in Greece: What Has Changed and What Remains Unresolved. *European Journal of Contemporary Education and E-Learning, 4*(1), 118-132. https://doi.org/10.59324/ejceel.2026.4(1).10
Kotsis, K. T., Randjelovic, B. M., Tsiouri, E., & Ilibašić, S. (2025a). Teacher academic training systems in Greece and Serbia. *EIKI Journal of Effective Teaching Methods, 3*(1), 1-14. https://doi.org/10.59652/jetm.v3i1.311
Kotsis, K. T., Randjelovic, B. M., Tsiouri, E., & Ilibašić, S. (2025b). Comparing science curriculum for primary education in Greece and Serbia. *Journal of Studies in Education, 15*(1), 57-77. https://doi.org/10.5296/jse.v15i1.22528
Kulhanek-Wehlend, G., Wagner, S., Knecht, H., Wagner, O., & Schnitzler, A. (2023). University College of Teacher Education Vienna: Cooperation between schools and university with a focus on democratic education. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 131-150). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-07
Kurz, B., & Zenke, C. T. (2024). Laboratory schools travelling the world: between borrowing and branding. *Compare: A Journal of Comparative and International Education*, 1-17. https://doi.org/10.1080/03057925.2024.2429827
Langner, A., & Heß, M. (2020). Die Universitätsschule Dresden: Das Schulkonzept. *WE_OS Jahrbuch – Jahresbericht Forschungs- Und Entwicklungsplan Der Wissenschaftlichen Einrichtung Oberstufen-Kolleg Der Universität Bielefeld, 3*(1), 11-36. https://doi.org/10.4119/we_os-3340
Maaranen, K., Kynäslahti, H., Byman, R., Jyrhämä, R., & Sintonen, S. (2019). Teacher education matters: Finnish teacher educators' concerns, beliefs, and values. *European Journal of Teacher Education, 42*(2), 211-227. https://doi.org/10.1080/02619768.2019.1566317
Marušić, M., Pejatovic, A., & Štemberger, T. (2019). Teacher education and career cycle: Educational level and pathways effects in Serbia and Greece. *Zbornik Instituta za pedagoska istrazivanja, 50*(2), 189-208. DOI:10.2298/ZIPI1802189M
McGee, J. J., & Lin, F. Y. (2020). Focus on alternative education: An exploratory case study. *Preventing School Failure: Alternative Education for Children and Youth, 64*(2), 183-190. https://doi.org/10.1080/1045988X.2020.1716676
Milošević, D. ., & Maksimović, J. (2020). Methodology of Comparative Research in Education: Role and Significance. *International Journal of Cognitive Research in Science, Engineering and Education, 8*(3), 155-162. https://doi.org/10.23947/2334-8496-2020-8-3-155-162
Ødegaard, E. E., Oen, M., & Birkeland, J. (2023). Success of and Barriers to Workshop Methodology: Experiences from Exploration and Pedagogical Innovation Laboratories (EX-PED-LAB). In C. Wallerstedt, E. Brooks, E. Eriksen Ødegaard, and N. Pramling (eds), *Methodology for Research with Early Childhood Education and Care Professionals. International Perspectives on Early Childhood Education and Development*, vol 38. Springer. https://doi.org/10.1007/978-3-031-14583-4_5
Perfetti, S. (2024). Towards a democratic laboratory school. *European Journal of Social Science Education and Research, 11*(1), 1-12. https://doi.org/10.26417/ejser.v6i1.p44-50
Rodrigues, C., Neto-Mendes, A., Santos, M., & Gouveia, A. (2025). Mapping Problems and Approaches in Educational Governance: A Systematic Literature Review. *Education Sciences, 15*(8). https://doi.org/10.3390/educsci15081048
Sarmiento-Márquez, E. M., Pishtari, G., Prieto, L. P., & Poom-Valickis, K. (2023). The evaluation of school-university partnerships that improve teaching and learning practices: A systematic review. *Educational Research Review, 39*, 100509. https://doi.org/10.1016/j.edurev.2023.100509
Vieluf, S., Kaplan, D., Klieme, E., & Bayer, S. (2012). *Teaching practices and pedagogical innovation: Evidence from TALIS*. OECD Publishing. https://doi.org/10.1787/9789264123540-en
Zeichner, K. M. (2017). *The struggle for the soul of teacher education.* Routledge. https://doi.org/10.4324/9781315098074
Zenke, C. T. (2025). Universitätsschulen als Innovationslabore der Schulentwicklung, Schulforschung und Lehrer:innenbildung. *Schulpraxis Entwickeln – Journal für Forschungsbasierte Schulentwicklung, 5*(1), 1-17. https://doi.org/10.58652/spe.2025.5.p1-17
Zenke, C. T., & Kurz, B. (2021). School as an "experimental station": On the principle of the laboratory school and its spread in Europe. *Bildung und Erziehung, 74*(1), 51-66. https://doi.org/10.13109/buer.2021.74.1.51

Zenke, C. T., & Kurz, B. (2023). Laboratory schools: A new approach towards participatory research and democratic education in Europe. In B. Kurz and C. T. Zenke (Eds.), *LabSchoolsEurope: Participatory research for democratic education* (pp. 13-24). Verlag Julius Klinkhardt. https://doi.org/10.35468/6040-02