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Developing integrated teaching skills in primary education: Insights from pedagogical training

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ABSTRACT

Developing integrated teaching skills is essential for primary school teachers to effectively deliver interdisciplinary content and support holistic student learning, and pedagogical training programs play a key role in preparing pre-service teachers for this task. This study examines the perceptions of lecturers and undergraduate students regarding the extent to which pedagogical training in primary education programs develops integrated teaching competence. A quantitative survey was conducted with 65 lecturers and 544 third- and fourth-year undergraduate students from four universities using a standardized questionnaire with multiple-choice and Likert-scale items, and the data were analyzed using descriptive statistics. The results indicate that both groups view the development of integrated teaching competence as a purposeful process involving lecturers and students. Students rated their knowledge of integrated teaching highly, followed by their ability to design integrated lessons, while classroom implementation received the lowest rating. Lecturers reported a similar pattern, with strong emphasis on knowledge and weaker performance in practical classroom application. Overall, the findings show alignment between lecturers' and students' views but highlight a clear gap between theoretical understanding and practical implementation, underscoring the need to strengthen experiential learning and curriculum integration strategies in teacher education programs.

1. Introduction

The global education landscape increasingly acknowledges the necessity of equipping students for the challenges of the 21st century. Conventional teaching models, defined by subject-specific knowledge dissemination and memorization, are progressively being contested by more comprehensive, multidisciplinary, and competency-oriented methodologies. An approach that has garnered significant attention is integrated teaching. Integrated teaching denotes the intentional arrangement of curriculum content across various disciplines to foster significant learning experiences that mirror real-world contexts (Krogh and Morehouse, 2020). Students are encouraged to investigate interdisciplinary connections, cultivate critical and creative thinking, and apply knowledge to address real-world problems instead of studying subjects in isolation. This method not only improves cognitive comprehension but also fosters social, emotional, and collaborative skills that are vital in contemporary communities.

As global education systems endeavor to cultivate adaptable, innovative learners proficient in interdisciplinary thinking, integrated teaching has emerged as a pivotal pedagogical approach. Basic school is particularly relevant as it fosters the development of essential abilities for lifetime learning. Young learners gain advantages from theme and interdisciplinary training that reflects the interconnection of the world beyond the classroom (Heimer and Winokur, 2015). By synthesizing disciplines such as science, reading, mathematics, and social studies around common themes or real-world problems, educators can cultivate enhanced comprehension and involvement among learners. Integrated teaching corresponds with modern educational objectives, including the promotion of global citizenship, sustainability awareness, and digital literacy (Gibson et al., 2008; Sari et al., 2024).

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Implementing integrated teaching effectively necessitates a significant transformation in teacher training and pedagogical perspective. Educators must have the ability to evaluate curricular standards, see interdisciplinary connections, create cohesive lesson plans, and navigate intricate classroom interactions (Roehrig et al., 2021). They must implement a learner-centered methodology that promotes inquiry, collaboration, and the co-creation of knowledge. The transition from information delivery to learning facilitation poses a considerable problem for numerous educators, especially those educated within conventional frameworks (Taylor and Colet, 2023). Consequently, teacher education programs are essential in developing the skills necessary for integrated instruction.

Fostering integrated teaching competence in preservice teachers necessitates a synthesis of theoretical foundations and practical application (Admiraal et al., 2017). Student-teachers must initially comprehend the philosophical underpinnings of integration, encompassing constructivist learning theories, multiple intelligences, and the sociocultural aspects of knowledge building. They must thereafter participate in practical activities, including the design of interdisciplinary units, collaboration with colleagues from diverse subject areas, observation of professional educators, and the implementation of integrated instruction during teaching placements. This transition from knowledge to practice is crucial to guarantee that future educators comprehend the integrated teaching conceptually and can execute it effectively in actual classrooms (Harris et al., 2009; Verloop et al., 2001).

Notwithstanding these principles, numerous obstacles remain in the training of educators for integrated instruction. A commonly referenced topic is the disparity between academic coursework and practical application in schools. Although teacher education courses may theoretically encompass integration, opportunities for genuine, field-based learning are frequently constrained. Student-teachers have challenges in implementing integration principles during practicum placements, attributed to time limitations, insufficient assistance, or opposition from mentor teachers who prefer conventional teaching approaches (Fletcher et al., 2021). Moreover, there frequently exists a deficiency of consistency among professors within teacher education institutes. For instance, subject-area instructors may persist in teaching in isolation, failing to exemplify the integration they anticipate students adopting. This disconnection compromises the coherence and reliability of integrated instruction as an educational objective.

Furthermore, the preparedness and capability of teacher educators are essential elements affecting the advancement of integrated teaching competencies. Faculty members who have minimal experience with interdisciplinary curriculum design may struggle to supervise student-teachers in this arena. Research demonstrates that the effective modeling of teacher educators—via their teaching practices, feedback, and mentorship—is crucial in influencing student-teachers' instructional methodologies (Chizhik et al., 2018). In the absence of such modeling, student-teachers may complete their studies with theoretical knowledge yet lack the practical expertise to implement integrated teaching in varied and evolving classrooms. Therefore, teacher educators require support in their professional development to adopt integrated pedagogies and coach students proficiently.

Given these complications, it is crucial to comprehend the current development of integrated teaching ability through pedagogical training from the viewpoints of both lecturers and students (Nguyen and Bui, 2024; Postareff et al., 2007). Their observations can provide a thorough assessment of the strengths, shortcomings, and areas in need of improvement within teacher education programs. The perceptions of lecturers are crucial as they design and implement teacher training curricula. They can discern structural obstacles, instructional dilemmas, and institutional impediments to integration. Conversely, student-teachers' perspectives encapsulate the experiential journey of teacher preparation—encompassing acquired knowledge, internalized concepts, and aspects that remain unclear or inadequately developed.

By examining these perceptions, educational stakeholders can attain a greater comprehension of whether existing pedagogical training programs are adequately preparing future educators with the requisite skills for delivering integrated instruction. This comprehension is essential for curriculum developers, policymakers, and teacher educators aiming to improve their educational methodologies. It can guide modifications in course content, delivery techniques, assessment procedures, and practical components of teacher education. Ultimately, developing integrated teaching capability is not a solitary undertaking; it necessitates a systematic approach that harmonizes theory, pedagogy, and practice throughout all tiers of teacher development (Matinho et al., 2022).

This study examines the cultivation of integrated teaching competencies through pedagogical training in primary school programs. It seeks to investigate the perceptions of lecturers and undergraduates concerning the characteristics of integrated teaching, the degree of development of essential competences, and the efficacy of current training approaches. The research concentrates on fundamental aspects, including knowledge acquisition, curricular integration, lesson planning, and classroom execution. This investigation aims to enhance the conversation on teacher education reform and provide ideas for improving the preparation of teachers in delivering high-quality, integrated instruction. The novelty of this study lies in its dual-perspective approach. While previous works in Vietnam and elsewhere have predominantly examined either lecturers' or students' perceptions

in isolation (e.g., Nguyen and Bui (2024) and Fletcher et al. (2021)), our research provides a comparative analysis of both groups across four universities. By juxtaposing the views of lecturers and pre-service teachers, this study contributes new insights into the alignment and divergence of expectations in developing integrated teaching competencies in primary education.

2. Methods

2.1. Participants

This study's participants comprised lecturers and undergraduates in elementary education programs. Sixty-five lecturers and five hundred forty-four undergraduates participated in the survey. The student sample comprised third- and fourth-year students from four distinct universities providing elementary education degrees. In particular, 273 students were in their third year of study, while 271 were in their fourth year. All student participants were officially registered in teacher education programs focused on primary education. The instructors participating in the study were those directly accountable for delivering pedagogical and subject-specific courses within these programs. The participation of both students and lecturers was to offer a holistic perspective on the evolution of integrated teaching ability via pedagogical training from both instructional and learner viewpoints.

2.2. Measurements

The measurement utilized in this investigation was a standardized questionnaire with two primary components. The initial component examined participants' comprehension of integrated teaching capacity development. This was evaluated via a multiple-choice question inquiring: “How should the advancement of integrated teaching capacity for undergraduate students in primary education be comprehended?” Participants were directed to choose the statement that most accurately reflected their perception from four predetermined response options (designated A, B, C, and D). Each alternative represented a unique vision of integrated teaching capacity development, varying from a broad comprehension of progressive skill enhancement to more specific accounts involving pedagogical transformation and competency amalgamation.

The second component of the questionnaire assessed the perceived level of accomplishment in four essential content areas pertaining to integrated teaching competency. The items were evaluated using a 5-point Likert scale, with 5 representing “Very Good,” 4 “Good,” 3 “Fair,” 2 “Average,” and 1 “Poor.” This portion enabled participants to self-assess (for students) or evaluate (for lecturers) the degree to which particular skills, such as curriculum integration, lesson design, and classroom implementation, had been successfully cultivated through pedagogical training. Before administration, the questionnaire was evaluated by educational specialists to guarantee content relevance and clarity. A pilot test was done with a limited sample of participants to enhance item phrasing and structure. The final version was thereafter disseminated to both instructors and students for data gathering.

2.3. Procedures

This research was executed over a three-year span, from January 2018 to December 2020, utilizing a quantitative survey methodology. This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and the guidelines of the American Psychological Association (APA). Participation was entirely voluntary and anonymous, with no identifiable or sensitive personal data collected. The authors disclose this context transparently and affirm that all procedures were ethically designed and implemented. Data gathering occurred at four universities providing primary education programs. The researchers disseminated the questionnaire in both paper and digital formats to meet the diverse schedules and preferences of participants. Third- and fourth-year undergraduates were invited to engage during designated class sessions or through university communication platforms, with assistance from academic personnel. Lecturers were approached directly via departmental offices or professional academic networks and invited to complete the survey voluntarily. Participants were provided with explicit instructions for the questionnaire to guarantee that all responses reflected personal comprehension devoid of external influence. The data collection procedure was meticulously organized to reduce interference with teaching and learning activities. Finalized responses were evaluated for thoroughness and subsequently saved securely for analysis. All data was encoded and inputted into statistical software for processing and analysis. The confidentiality of all participants was preserved throughout the research procedure. The prolonged data collection period enabled the researchers to compile a comprehensive and representative dataset, hence ensuring the dependability of the findings across several academic years and institutional contexts.

2.4. Data analysis

The data obtained from lecturers and undergraduate students were inputted and analyzed utilizing SPSS version 22.0. Descriptive statistics were utilized to condense and analyze the participants' responses. Frequencies and percentages were computed for the multiple-choice question concerning the nature of integrated teaching capacity development to demonstrate participants' comprehension of the idea. The results offered a transparent representation of the

predominant perceptions held by both professors and students.

Mean scores and standard deviations were calculated for items rated on the 5-point Likert scale to characterize the central tendency and variability of responses regarding the attainment of integrated teaching competencies. The mean values were the average ratings for each skill area, illustrating participants' overall evaluation of the success of pedagogical training. Standard deviations conveyed insights into the consistency or variety in participants' perceptions. Descriptive analyses were performed independently for lecturers and undergraduates to facilitate comparison between the two groups. This comparison facilitated the identification of concordances or discrepancies in their perspectives about the advancement of integrated teaching competence. The findings gave us important information about the perceptions of many stakeholders on the outcomes of pedagogical training programs in primary school.

The utilization of percentages, averages, and standard deviations provided a clear and thorough comprehension of the data, allowing the study team to draw inferences on the perceived efficacy and characteristics of integrated teaching capacity development. The present study was designed primarily as a descriptive survey. Accordingly, analyses were limited to frequencies, means, and standard deviations, which provided a clear overview of both lecturers' and students' perceptions. Although inferential tests such as t-tests or ANOVAs could offer additional insights into group differences, these were beyond the scope of the current research design. Future studies may incorporate such analyses to further strengthen the robustness of findings.

3. Results

Table 1 encapsulates the perspectives of lecturers and undergraduates regarding the development of integrated teaching competence via pedagogical training. There was a significant convergence between the two groups about the developing aspect of integrated teaching capacity, while some variances in focus were noted.

Table 1: Teachers' and students' perceptions of developing integrated teaching capacity through pedagogical training

No.	The nature of developing an integrated teaching capacity	Lecturer		Undergraduates	
		N	%	N	%
1	It is the process of quantitative change leading to qualitative change in students' abilities.	3	4.61	60	11.02
2	This process involves developing the components that constitute the integrated teaching capacity of university students in primary education to meet established output standards.	7	10.76	89	16.36
3	It is a process of purposeful impact from the lecturer and the students themselves to transform from not having to having the competencies; from incomplete and unclear to complete and clear elements that make up the integrated teaching competency to effectively implement integrated teaching in primary schools.	55	85.61	395	72.61

A significant majority of lecturers (n = 55, 85.61%) and undergraduate students (n = 395, 72.61%) concurred that the enhancement of integrated teaching capacity constitutes "a deliberate influence from both the lecturer and the students to transition from a lack of competencies to possessing them; from incomplete and ambiguous to comprehensive and The explicit components that make up integrated teaching competency are essential for effectively implementing integrated teaching in primary schools. This statement conveys a comprehensive perspective on competency development, highlighting the importance of both external facilitation by the lecturer and internal work by students to attain pedagogical preparedness. The unanimous agreement from both groups indicates a collective acknowledgment of the extensive and dynamic characteristics of integrated teaching capacity.

The second most supported statement—that the process entails "developing the components that comprise the integrated teaching capacity of university students in primary education to fulfill established output standards"—was chosen by 10.76% of lecturers (n = 7) and 16.36% of students (n = 89). This option emphasizes a standards-based and componential methodology for capacity building. The elevated percentage among students may suggest a marginally more pragmatic perspective on pedagogical training, potentially shaped by their awareness of program outcomes and performance evaluations.

A minor fraction of participants endorsed the perspective that capacity development constitutes "the process of quantitative change leading to qualitative change in students' abilities," with 4.61% of lecturers (n = 3) and 11.02% of students (n = 60) supporting this assertion. This reaction reflects a broader, potentially less sophisticated, understanding of educational growth. The comparatively low endorsement indicates that the majority of respondents choose more comprehensive and process-focused interpretations of integrated teaching capacity.

The statistics suggest that both lecturers and students view the enhancement of integrated teaching capacity as a deliberate, transformative process encompassing cognitive restructuring and skill acquisition. Nevertheless, a minority of students seem to possess a more linear or outcome-oriented comprehension, maybe indicative of varying experiences or phases in their professional development.

Table 2 displays the mean scores and standard deviations provided by lecturers and undergraduates concerning the level of performance in several aspects of integrated teaching capacity development in elementary education.

Table 2: The levels of achievement of integrated teaching capacity development content for primary education university students through pedagogical training

No.	Contents	Lecturers		Undergraduates	
		M	SD	M	SD
1	Knowledge of integrated teaching in primary school	4.65	0.774	4.86	0.786
2	Competencies in program analysis, topic/content selection integration in primary school	3.87	0.871	3.57	0.878
3	Competence to design lectures and topics in an integrated manner	3.72	0.876	3.64	0.786
4	Integrated learning competencies in the classroom	3.51	0.883	3.37	0.915

M: Mean; SD: Standard deviation

Both lecturers and undergraduates identified "knowledge of integrated teaching in primary school" as the most effectively developed area among the four curriculum domains. Instructors indicated a high mean score (M = 4.65, SD = 0.774), while students rated it even higher (M = 4.86, SD = 0.786), implying a robust consensus that foundational knowledge in integrated teaching has been successfully imparted and assimilated.

The area with the lowest rating was "integrated learning competencies in the classroom," with lecturers reporting a mean of 3.51 (SD = 0.883) and students reporting a lower mean of 3.37 (SD = 0.915). This data indicates that the practical application and classroom implementation of integrated learning are perceived as inadequately developed, either due to constraints in experiential teaching or contextual classroom difficulties.

The content category "competencies in program analysis and topic/content integration" garnered somewhat favorable assessments. Instructors assigned a mean rating of 3.87 (SD = 0.871), whereas students rated it lower at 3.57 (SD = 0.878), suggesting that while educators view these competencies as adequately developed, students may lack confidence in their capacity to conduct curriculum analysis and content integration.

Likewise, the "competence to design lectures and topics in an integrated manner" demonstrated a strong concordance between groups, with lecturers evaluating it at M = 3.72 (SD = 0.876) and students at M = 3.64 (SD = 0.786). The results indicate a relatively successful advancement of design-related competencies; however, there remains potential for enhancement in both instruction and learning outcomes.

The findings indicate a prevailing trend where theoretical knowledge of integrated teaching is regarded as well-developed; however, practical competences, particularly in classroom integration and instructional design, are less effectively attained. Discrepancies in perception between lecturers and students—particularly regarding curriculum analysis and classroom integration—may indicate a necessity for improved practical training, mentorship, or field-based experience in teacher education programs.

4. Discussion

The findings provide significant insights into the cultivation of integrated teaching competence among primary education students via pedagogical training. Students and lecturers alike acknowledge that the conceptual framework of integrated teaching is proficiently cultivated inside teacher education programs. This signifies that theoretical knowledge—encompassing integrated teaching concepts, models, and objectives—is being effectively conveyed. Barrie (2007) and Feiman-Nemser (1989) asserted that a robust conceptual framework is essential for equipping future educators with an understanding of the rationale underlying the tactics they are anticipated to implement in classrooms. In environments such as Vietnam, where curriculum reforms increasingly prioritize learner-centered and competency-based education, this theoretical clarity offers an essential foundation for the implementation of novel instructional methods (Huy et al., 2025; Nguyen and Bui, 2024).

Nonetheless, the results indicate a significant disparity between theoretical understanding and the practical implementation of integrated teaching competencies. Both respondent groups indicated that the capacity to execute integrated learning in actual classroom environments is still insufficiently developed. This indicates a continual disparity between theoretical learning and practical experience, an issue extensively recorded in teacher education literature (Korthagen, 2010). Inadequate opportunities for genuine teaching practice may hinder student-teachers in effectively managing the challenges of integrating several curriculum areas while accommodating diverse learning demands. This discovery substantiates the assertion that effective teacher training should extend beyond mere knowledge dissemination to encompass experiential, practice-oriented learning.

A further issue identified in the investigation is the disparity between students' self-assessed readiness and instructors' evaluations of their proficiency in curricular integration and lesson design (Zhang et al., 2022). Although teacher educators may perceive themselves as imparting crucial analytical and design competencies, students may lack comparable confidence in their capacity to utilize those talents. This misalignment can be elucidated through Knox's (1980) concept of pedagogical content knowledge, which posits that teaching proficiency encompasses not just mastery of subject matter but also the ability to adapt and deliver it effectively. Students lacking sufficient structured chances for curriculum analysis, interdisciplinary planning, and reflective evaluation may struggle to convert content into significant learning experiences for their future students (Welsh and Dehler, 2013).

The potential to create integrated lessons and thematic units is another domain that seems to be in

the developmental phase. Although its significance is widely acknowledged, both students and professors perceive opportunities for enhancement. Designing integrated instruction necessitates a comprehensive understanding of the subject matter, the capacity to relate knowledge to real-world contexts, the establishment of interdisciplinary connections, and the coordinated sequencing of learning activities. These demands underscore the necessity for teacher education programs to offer structured opportunities for lesson planning, collaborative teaching, and constructive feedback—methods recognized to enhance the development of design-based pedagogical competency (Wu et al., 2021). Collaborative design experiences and peer-review processes may enable students to transition from disjointed lesson planning to more cohesive and contextualized teaching methods.

Moreover, the comprehensive pattern of responses indicates that integrated teaching competencies evolve progressively and necessitate continuous reinforcement during various phases of teacher training. Initial knowledge acquisition must be succeeded by significant chances for guided practice, constructive feedback, and reflective enhancement. Feiman-Nemser (1989) observed that a primary drawback of the inadequate alignment between university coursework and practical application in schools characterizes conventional teacher education programs. When the two components function independently, students frequently struggle to recognize the applicability of theoretical models to classroom realities. An integrated approach, wherein coursework is closely connected to practicum experiences and informed by real-world difficulties, can more effectively foster the comprehensive development of teaching competencies. To augment integrated teaching capacity, it is necessary to fortify the practice-based elements of teacher education (Janssen et al., 2015; Zeichner, 2012). This may encompass enhanced practicum experiences, augmented utilization of teaching simulations, and organized reflection exercises that facilitate the connection between theoretical concepts and classroom application. Facilitating chances for student-teachers to devise and execute integrated classes during their training, under the guidance of seasoned educators, is very beneficial. These experiences enhance confidence and cultivate a profound comprehension of how integration facilitates active learning, critical thinking, and interdisciplinary problem-solving in elementary education. The results of this study present significant implications for the design and enhancement of teacher education programs, especially those focused on cultivating integrated teaching competencies for elementary school. The study emphasizes the necessity of improving practice-oriented training. Although the conceptual understanding of integrated teaching is robust, prospective educators may lack the confidence and competencies to implement this knowledge in actual classroom environments. Consequently, teacher preparation programs ought to prioritize experiential learning via prolonged practicum placements, simulation-based instruction, and project-oriented coursework. These methodologies enable student-teachers to use theoretical concepts in practical settings and to enhance their pedagogical techniques through feedback and introspection, consistent with international standards in teacher training. The divergence between student self-assessment and lecturer evaluation on curriculum integration and lesson design indicates a necessity for improved alignment of instructional expectations and learning outcomes. This can be resolved by implementing collaborative planning meetings, formative peer evaluations, and rubrics co-created by instructors and students to guarantee mutual comprehension and clarity in competency advancement. This study endorses national and institutional reform initiatives in countries such as Vietnam, where educational policy is transitioning toward competency-based and integrated learning frameworks. Teacher education programs must synchronize their curriculum with these policies by including interdisciplinary learning objectives, cross-curricular evaluations, and collaborative teaching frameworks into both academic coursework and practical field experiences.

Notwithstanding its merits, the study possesses numerous shortcomings that warrant acknowledgment. The statistics were derived from self-reported perceptions, which are intrinsically subjective and may not accurately represent actual teaching competency. Students and lecturers may exhibit biases in their evaluations due to influences such as social desirability, restricted teaching experience, or varying perceptions of skill levels. Subsequent study ought to augment perceptual data with classroom observations, teaching portfolios, or performance-based evaluations to achieve a more holistic understanding. The study concentrated on a particular situation within primary education teacher training, thereby constraining the generalizability of the results. Integrated instruction can differ markedly between educational tiers and cultural contexts. Consequently, prudence must be exercised while implementing these insights in secondary education programs or teacher training systems in different countries. Comparative analyses across institutions and national contexts may provide more comprehensive insights. Third, the study did not examine longitudinal outcomes, namely whether students who undergo integrated teaching training sustain or enhance their competencies in their initial years of professional teaching. Future longitudinal studies may monitor the evolution and sustainability of integrated teaching competencies from preservice training to early-career practice.

5. Conclusion

This research illustrates the vital role of pedagogical training in cultivating integrated

teaching competencies among elementary school students. Although students have a robust understanding of theoretical concepts, their practical application is constrained, especially in domains like curriculum integration and classroom execution. The results indicate that teacher education programs have to prioritize experiential learning, encompassing practicum opportunities and reflective teaching practices. Connecting theory and practice is essential to prepare future educators to provide integrated instruction effectively. Integrating courses with practical teaching experiences helps bolster students' confidence and proficiency in creating and executing interdisciplinary classes. These ideas are especially pertinent to educational changes that emphasize competency-based methodologies. Consequently, augmenting the practical elements of teacher preparation is essential for cultivating a responsive and proficient teaching workforce.

Compliance with ethical standards

Ethical considerations

This study was approved by the Education and Research Council of Hanoi National University of Education, under protocol number (9995/QĐ-ĐHSPHN), dated December 20, 2017. Informed verbal consent was obtained from all participants, and all data were anonymized to protect participant confidentiality.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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