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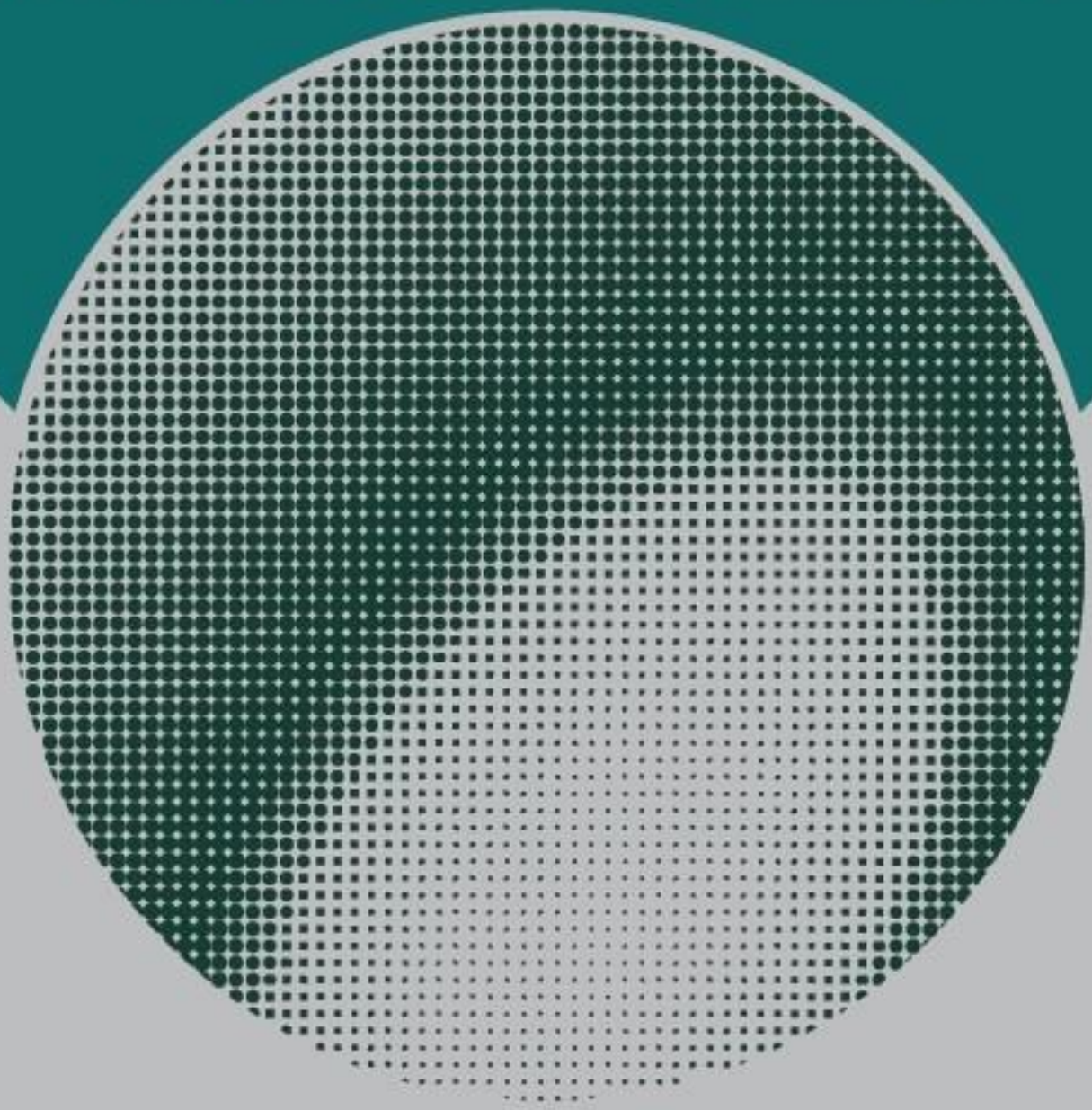

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Table of Contents

Yuko Iwai
Preservice teachers' culturally responsive teaching practices in ELA lessons in elementary school field experiences 75-90

Vildan Burulday
The Effect of Perceived University Support on Reasons for Pursuing Higher Education: The Parallel Mediating Roles of Leisure Time Management and Academic Reputation Perception 91-106

Supot Rattanapun
Development and Validation of a Multidimensional Innovation Management Scale for Educational Organizations: An Exploratory and Confirmatory Factor Analysis Approach 107-128

Vicky Wing Kei Wong
Teacher-Led Initiatives Associated with EE in Kindergartens: A Case Study in Hong Kong 129-140

Eray Eğmir
From Curriculum Beliefs to Teaching Preparedness: Examining the Role of Democratic Tendency in Pre-Service Teachers 141-156

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Preservice Teachers' Culturally Responsive Teaching Practices in ELA Lessons in Elementary School Field Experiences

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Abstract
This study examines the experiences of 38 preservice teachers as they engaged with Culturally Responsive Teaching (CRT) practices in their English Language Arts (ELA) lessons. Preservice teachers learned about CRT practices in a literacy methods course, developed ELA lessons that incorporated these practices, and taught the ELA lessons to elementary school students at their field placements. They reflected on both their delivery of lessons and the implementation of CRT practices. Data were collected using multiple instruments, including pre- and post-surveys, lesson plans, and edTPA planning and instruction commentaries. Analysis showed that preservice teachers most frequently planned and implemented three specific CRT practices: CRT 5 modeling high expectations for all students; CRT 6 promoting respect for student differences; and CRT 4 bringing real-world issues in the classroom. Their experiences of learning about CRT practices and incorporating them into their lessons prepared them to become culturally responsive teachers.

Keywords: Teacher education preparation, Preservice teachers, Culturally responsive teaching, Elementary field experience

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Introduction

Teacher education preparation programs play an essential role in providing future teachers with skills and knowledge they need to teach all students in K-12 schools effectively (Darling-Hammond, 2017). Scholars address the importance of the teacher education preparation programs because preservice teachers learn content and pedagogical knowledge and practice pedagogical skills they need for their future teaching through their programs (Putman, Cash, & Polly, 2022).

As the student population in K-12 schools diversifies, teacher education preparation programs must respond to this ever-increasing diversity demand. The student demographics within public schools in the United States changed from fall 2010 to fall 2021. During this period, the percentages of White, Black, and American Indian/Alaska Native students decreased from 52 to 45%, from 16 to 15%, and from 1.1 to 0.9%, respectively (Irwin et al., 2023). In contrast, in the same period, the percentages of Hispanic, Asian, and students who were of two or more races increased from 23 to 28%, from 4.6 to 5.4%, and from 2 to 5%, respectively (Irwin et al., 2023). The population of English learners enrolled in public schools in the United States also increased from 9.2% (4.5 million students) to 10.3% (5.0 million students) from fall 2010 to fall 2020; and more than 75% of English learners were Hispanic students in fall 2020 (Irwin et al., 2023).

Furthermore, the population of White, Black, and American Indian/Alaska Native students in public elementary and secondary schools in the United States is projected to continuously decrease by 3% for White, by 1%for Black, and by 0.1% for American Indian/Alaska Native students from fall 2021 to fall 2031 (National Center for Education Statistics [NCES], 2022). On the other hand, the Hispanic student population is projected to increase from 28 to 30%; and during the same period, the populations of Asian students and students with two or more races are projected to increase from 5 to 6% for each group (NCES, 2022).

Contrasted to the diverse student population, the teacher population lacks diversity in its demographics. In the 2020-2021 school year, 80% of public-school teachers were White and 70% of them were female (Irwin et al., 2023). During the same school year, the percentages of teachers with other race and ethnic backgrounds were as follows: Hispanic (9%), Black (6%), Asian (2%), two or more races (2%), American Indian/Alaska Native (less than 1%), and Pacific Islander (less than 1%) (Irwin et al., 2023). These statistics present a serious racial and ethnic gap between the student and teacher population. Teachers of color contribute to better academic performance and social and emotional outcomes among students with similar racial and ethnic backgrounds (Smith et al., 2023). In addition, scholars argue that all students benefit from teachers of color (Carver-Thomas, 2018; Mikulyuk & Braddock, 2018).

Scholars document that teachers must understand diverse students' backgrounds, experiences, characteristics, and perspectives and must incorporate these into their teaching (Gay, 2000; Ladson-Billings, 1995, 2021). Teachers need not only pedagogical and content knowledge, but also advanced knowledge of how to incorporate students' various cultures into their instruction (Allen at al., 2017). Despite this documented need, teacher education preparation programs do not provide preservice teachers with adequate preparation in this area (Andrews, 2021). Preservice and inservice teachers often feel unprepared to teach students with culturally, linguistically, and ethnically diverse backgrounds (Taylor, 2010). Teacher educators should equip preservice teachers with culturally responsive teaching practices (Young & Young, 2021). Research on how preservice teachers engage with culturally responsive teaching principles in literacy instruction is limited (Adams & Kaczmarczyk, 2023). Compared to other subjectes, a literacy course offers a great platform to teach preservice teachers in cultrally responsive teaching practices. Preservice teachers have opportunities to engage in reflecting and analyzing these practices through text selections for children, making connections between prior knowledge and new information and cultural experiences, examining narrative voices, and developing critical literacy skills in literacy and English Language Arts (ELA) courses (Chenowith, 2014; Yang & Ward, 2025).

Therefore, this study attempts to close this gap and aims to support preservice teachers by equipping them with knowledge and skills to use culturally responsive teaching practices. This study addresses the following research questions:

1. How do preservice teachers plan, implement, and reflect on their culturally responsive teaching practices through their English Language Arts (ELA) lessons for elementary school students?

2. How does their learning about culturally responsive teaching impact their preparation to become culturally responsive teachers?

Literature Review

Frameworks of Culturally Responsive Teaching

A few key foundational studies related to culturally responsive teaching exist. Ladson-Billings (1995, 2014, 2021) developed a concept of *culturally relevant pedagogy* and advocated for engaging learners who come from the under marginalized groups. This teaching approach encouraged teachers "to ask about the nature of the student-teacher relationship, the curriculum, schooling, and society" (Ladson-Billings, 1995, p.483). She outlined three areas of focus by educators: student learning success, cultural competence, and sociopolitical consciousness. First, teachers must support students to achieve their academic success. Second, teachers need to support students by including and celebrating their cultures of origin and of others' cultures of origin. Teachers must incorporate integrative instruction, so students learn beyond the classroom and apply their knowledge and skills to solve real-world problems.

Gay (2000) developed a framework of *culturally responsive teaching*. She described it as "using the cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively" (Gay, 2002, p.106). She addressed that culturally responsive teaching must include students with different ethnic backgrounds. She broadened a concept of culturally responsive teaching and proposed that educators support students by including their cultural knowledge, lived experiences, and differences of students with diverse ethnic backgrounds. Gay (2000) describes six characteristics of culturally responsive teaching. Culturally responsive teaching is validating as teachers must use cultural knowledge, lived experiences, and learning styles of students with ethnically diverse backgrounds. Culturally responsive teaching is comprehensive as students need to internalize the concept that learning is reciprocal. Culturally responsive teaching is multidimensional as teaching and learning include various elements such as academic content, the teacher-student relationship, and instructions. Culturally responsive teaching is empowering as this type of teaching approach develops student confidence. Culturally responsive teaching is transformative because it leads all students to become more active in social consciousness to better respond to prejudice and discrimination. Lastly, Gay's culturally responsive teaching is emancipatory as students develop the knowledge and skills necessary to express their voices and engage in a larger society.

Reexamining the frameworks of *culturally relevant pedagogy* (Ladson-Billings, 1995) and *culturally responsive teaching* (Gay, 2000), and the dynamic linguistic aspects in society, Paris (2012) coined a term, *culturally sustaining pedagogy*. To respond to an essential question of "What is the purpose of schooling in a pluralistic society?" (Paris, 2012, p.95), Paris developed the culturally sustaining pedagogy while considering best practices in a dynamic multiethnic and multilingual society. Paris and Alim (2014) further noted that the culturally sustaining pedagogy model offers ways for students to sustain "linguistic, literate, and cultural pluralism" to be accountable to the communities, and to respond to social change (p.88). Recently, as racial injustice and unfair treatment of the minority groups escalate, Paris (2021) reexamined culturally sustaining pedagogy in the global context. Renaming her framework as *culturally sustaining pedagogies* with the plural of pedagogy, she argued that culturally sustaining teaching and learning require "different forms across different cultural contexts with different communities in different times" (Paris, 2021, pp.366-367).

Muñiz (2020) also offered a guideline for educators to practice eight key competencies of culturally responsive teaching. She outlined the following competencies for educators: (1) reflect on their experiences and backgrounds in contexts and how they impact their beliefs and behaviors, (2) understand the impacts of one's biases on intuitional decisions and policies and advocate for solutions on behalf of all students, (3) understand students' cultures and integrate them into the curriculum, (4) apply real world connections in teaching, (5) model high expectations for all students, (6) respect student differences, (7) collaborate with families and communities, and (8) use different ways of communication and modalities for students to express their opinions. Synthesizing the major culturally responsive teaching (CRT) frameworks above, teachers incorporate students' assets, characteristics, and experiences to guide their instruction.

Field Experiences for Preservice Teachers

Teacher education preparation programs should offer opportunities for preservice teachers to practice and apply content they learned from their education courses within clinical and field experience settings. The Council for the Accreditation of Education Preparation (CAEP, n.d.) defines field experience as "early and ongoing practice opportunities to apply content and pedagogical knowledge in P-12 settings to progressively develop and

demonstrate their knowledge, skills, and dispositions." Standard 2 in the set of the initial level standards by the CAEP (2022) clearly states the expectation for teacher education preparation programs to ensure effective partnerships with schools as well as high-quality clinical practice, so preservice teachers can develop "knowledge, skills, and professional dispositions to demonstrate positive impact on diverse students' learning and development" (p. 1).
Darling-Hammond, L. (2010, 2014, 2017) highly values that teacher education programs partner with schools in their communities for clinical and field experiences where preservice teachers practice their lesson delivery, learn from their mentor teachers, and participate in the schools' activities. This is where preservice teachers can make connections between theory and practice.

Putman, Cash, and Polly (2022) conducted a study to examine the impact of intensive, structured field experiences in a local partnered school. They set up two types of field experiences and student teaching assignments for preservice teachers. Among 84 of them, 18 undergraduate students in the teacher education programs participated in the structured clinical experiences (the City Schools Initiative [CSI] program), which offered a year-long internship in a school where the university maintained a strong partnership. The rest of 66 preservice teachers completed their field experiences and student teaching in the traditional program. The researchers assessed preservice teachers' skills and knowledge in the last two semesters (third and fourth semesters) using the Class Assessment Scoring System (CLASS). The results indicated that preservice teachers who were in the intensive, structured field experience setting performed better in the domains of Emotional Support, Instructional Support, and Student Engagement. However, no statistically significant differences were found for the Classroom Organization domain among the two groups of preservice teachers (CIS and traditional students). The authors explain the CIS students had more privilege in getting support from their mentor teachers, spending more time and establishing relationships with students than the students in the traditional program.

Zhang at el. (2023) conducted a study to compare two types of clinical experiences. Eighteen preservice teachers participated in the Clinical Experiences and Practices in Teaching (CEPT) model. The first CEPT group participated in the field experience at a high school near the university where the study was conducted. The second CEPT group participated in field experience at a high school in a rural area. Mentor teachers for the CEPT groups received training regarding how to support preservice teachers in appropriate ways. Twenty-two preservice teachers completed traditional field experiences in 17 different high schools. The researchers collected the survey data from the participants to examine their evaluation of the effectiveness of their teacher education programs in five areas: (a) meeting 12 teaching standards; (b) frequencies of participation in teaching strategies; (c) benefits of Professional Growth and Effectiveness System (PGES) elements in improving teaching; (d) frequencies of participation in collaboration, networking, and mentoring; and (e) benefits of teacher-student relationship. The researchers also conducted four focus group interview sessions, two sessions with two CEPT groups and two sessions with two traditional groups. The results showed that no statistical difference was found in the area of meeting the teaching standards between the CEPT and non-CEPT groups. However, CEPT preservice teachers reported more positive perceptions in the other four areas and developed more self-efficacy than the non-CEPT preservice teachers.

Singh (2017) examined the impact of field experience for 28 elementary education preservice teachers. They spent approximately 45 hours over 15 weeks (three hours per week) at elementary schools. During their field experience, they observed their cooperating teachers' teaching, learned about the school environment, and considered how teaching and planning impact students' learning. They wrote a reflection to make connections between what they learned from university courses and what they saw and learned during their field placements. In addition, the participants engaged in one-on-one reading instruction with one student at their field placements. They reflected on their instructional experiences and discussed their reflection with their peers in class. They completed pre- and post-surveys in the beginning and at the end of their field experience. The surveys included 21 Likert-type questions and one-open-ended question to learn preservice teachers' perceptions on different areas in the field experience, such as effective teaching, classroom management skills, content knowledge, and disposition. The results showed that the field experience positively impacted preservice teachers. They reported that the field experience helped them understand the realities of school and classroom, provided them with opportunities to reflect on their professional knowledge and skills, and offered them opportunities to witness effective instructional practices in classrooms.

Putting together, field experiences in teacher education programs play a key role in preparing preservice teachers. They provide preservice teachers with opportunities to build their foundational knowledge, such as culturally responsive teaching practices, to apply their knowledge and skills, and to critically reflect on their practices.

Method

Context

This study took place at a mid-size university in the Midwest of the United States. In Fall 2023, the percentage of undergraduate students was 91.1%; 8.9% of students was graduate students. The university was a predominantly white institution where approximately 88.1 % of students were white. The second major race/ethnicity category was U.S. students of color (10.2%), followed by Hispanic (4.0%). The next two major categories were students with two or more races (3.0%) and Asian (2.2%). The university offered more than 20 undergraduate teacher education programs for four state licensure ranges: Early Childhood Education (ECE) (birth-grade 3), Elementary/Middle Education (EME) (k-9), Middle and High School (Secondary Teacher Education Program) (grades 4-12), and Kindergarten through Grades 12 (k-12).
Participants in this study were ECE and EME undergraduate majors and took an advanced literacy methods course when the study was conducted. The author of this study was their instructor. This advanced literacy methods course was the last course in a three-literacy course sequence. Prior to this course, they took an introductory literacy course and a literacy methods course where they studied the basics of literacy knowledge and skills. The setting of this study is appropriate to investigate preservice teachers' culturally responsive teaching because they have foundational knowledge of literacy through previous literacy courses, have opportunities to learn about developing ELA lesson plans in an advanced literacy methods course and to apply their lessons in real school settings.

In addition to the advanced literacy methods course, the participants were required to take field experience at a public elementary school, a Professional Development School (PDS) site where the university had partnership with, in the same semester. All EME and ECE majors went to one of four PDS sites for their field experience. In the school year when the study was conducted, Elementary School A consisted of 64 % white students, 19.2% Asian students, and 9.4 % students with two or more races. Approximately 49% of the total student population was identified economically disadvantaged, and approximately 8% of them were English learners. Elementary School B consisted of 40% white students, 22.7% students with two or more races, and 17.5% Black or African American students. Approximately 84% of the total student population was identified economically disadvantaged. English learners represented approximately 5% of the student population. Elementary School C is a public charter school and consisted of approximately 82% white students, approximately 8% Hispanic or Latino students, and approximately 8% students with two or more races. Approximately 36% of the total student population was identified economically disadvantaged. English learners represented less than one percent of the total student population. At Elementary School D, approximately 85% of the total student population was white students, and approximately 9% were Asian students. The percent of economically disadvantaged students was approximately 31 %. English learners represented 5.5% of the total student population. The author of this study served as a field supervisor for Elementary School A. As a field supervisor for 24 particiapnts and a literacy methods course instructor for all participants, the researcher acknowledges positionality in this research. To protect data integrity and reduce the power dynamics among the researcher's role and participants, the researcher kept the research data collection seperate from course grading and conducted data analysis anonymously post-course completion.

Among 38 participants, 24 preservice teachers completed their field experience at Elementary School A, nine were placed at Elementary School B, and three were placed at Elementary School C. Two ECE majors completed their field experience at Elementary School D (See Table 1).

Participants spent approximately 10-12 hours per week in their assigned field placements throughout the semester. They observed their cooperating teachers' teaching and delivered small group instruction. During the field experience, they were required to develop and teach two sequenced ELA lessons to children and to complete their edTPA planning and instruction commentaries with these two lessons. As a part of their field experience, they were enrolled in a one-credit field experience lecture where they discussed various field related topics such as classroom management skills and diversity.

Table 1. Participants' Demographics

Major	Early Childhood Education	Elementary/Middle Education	Total

	5		33		38
Academic Level	Junior		Senior		
	26		12		38
Field Experience Placement	Elementary School A	Elementary School B	Elementary School C	Elementary School D	
	24	9	3	2	38

Participants

Thirty-eight preservice teachers participated in this study. They were recruited in an advanced literacy course after the IRB approval by the institute where the study was conducted. They were five early childhood education (ECE) majors and 33 Elementary/Middle Education (EME) majors. Among 38 participants, 26 were juniors and 12 were seniors (See Table 1). All were enrolled in an advanced literacy methods course, which was the last required literacy course in the three-literacy-course sequence in their ECE and EME programs. Participants in this study were 100% white. Before they took the advanced literacy methods course, they had taken all foundations courses in education including multicultural education and a curriculum and pedagogy course. After their field experience at an elementary school, they would enroll in another field experience either at a middle school for EME majors or at another school setting for ECE majors; they would student teach in the following semester.

Instruments

In this study, the researcher collected the following data from the participants: pre- and post-survey responses about culturally responsive teaching, two ELA lesson plans, edTPA planning commentary, and edTPA instruction commentary.

Pre- and Post-Surveys

Participants in this study took pre- and post-surveys topically centered on culturally responsive teaching practices in the beginning and at the end of the semester. For validity purposes, questions in the surveys were developed after carefully consulting with a review of literature (see Hu et al., 2021; Moore et al., 2021; Muñiz, 2020; Taylor, 2010). Along with the evaluation of the previous literature on culturally responsive teaching, the surveys in this study intentionally included key elements of culturally resonsive teaching that appeared in previous relatent studies (e.g., Gay, 2000; Hu et al., 2021; Moore et al., 2021; Muñiz, 2020; Taylor, 2010). These elements included developing cultural diverse awareness, desigining, analyzing, and using culturally relevant curricula, creating an inclusive learning environment, setting high expectations, and using strategies culturally responsive ways. The survey consisted of two parts. The first part requested demographic information such as participants' major, and academic level. The second part included 5 questions. The participants self-rated their confidence levels (four-point Likert scale, 1 = not competent at all, 4 = highly competent) to develop and implement ELA lessons using the Muñiz's (2020) eight culturally responsive teaching (CRT) competencies. They also ranked eight CRT competencies from the easiest to the most challenging one when they planned and implemented ELA lessons. As a follow-up prompt, they were asked to provide their reasons why they identified top three CRT competencies they identified as easy and the top three CRT competencies they identified as the most challenging. The pre- and post-surveys were paralleled in format with one exception; the post-survey included three additional open-ended questions asking the participants about how the literacy methods course helped them to develop their awareness, knowledge, and skills when they developed and implemented ELA lessons with CRT practices, how the literacy methods course supported them to become culturally responsive teachers, and their overall assessment of CRT practices. Reliabilities for pre- and post-surveys were .85 and .86.

Literacy Lesson Plans

The second instrument for this study included two sequential ELA lesson plans. Participants developed two sequential lessons and delivered them to children in their field experience classroom at the PDS site. The lesson plan included general information about a lesson such as a lesson title, grade level, English Language Arts (ELA) standards, lesson objective(s), lesson materials, lesson procedures, differentiated instruction/accommodations, and assessment. Participants needed to include CRT practices from the Muñiz's (2020) guideline in their lessons.

edTPA Planning Commentary

Along with two literacy lesson plans, the participants completed their teacher performance assessment (edTPA) using the elementary literacy handbook. The edTPA is a portfolio-based teacher performance assessment to

demonstrate preservice teachers' knowledge and skills to teach content to children in authentic teaching settings. In the edTPA planning commentary, the participants responded to the prompts to describe: (1) the ELA lessons' main focus, (2) knowledge of students to inform teaching, (3) support for students' literacy learning, (4) support for literacy development through language, and (5) monitor of student learning. In addition, the researcher added another prompt which asked the participants to describe how and why they planned culturally responsive teaching practices in their lessons while considering their students in their assigned field experience classroom.

edTPA Instruction Commentary

Participants in this study taught two ELA lessons in their individual field experience classrooms and videorecorded their delivery of lessons. They reviewed their teaching videos and reflected on their teaching by completing the edTPA instruction commentary. They described how they provided a positive learning environment, how they engaged students in learning, how they deepened student learning through teaching, and how they could improve lesson delivery. The researcher also asked the participants to share their overall reactions on CRT practices, describe what CRT competencies they implemented in their lessons, and identify changes they could make to improve culturally responsive teaching practices for all students.

Data Collection and Analysis

The researcher collected the data identified in the above section through the literacy methods course. To analyze the quantitative data in the pre- and post-surveys, the researcher used the Wilcoxon signed rank test (significance level .05, p-value <.01). For qualitative data in the open-ended questions in the pre- and post-surveys and other instruments, the researcher used the content analysis approach. This research method is selected in this study because it provides "knowledge and understanding of the phenomenon under study" she examined (Downe-Wamboldt, 1992, p.314). Qualitative content analysis is not merely counting words from the collected data such as speech/texts to examine meanings, themes, and patterns; rather, researchers critically analyze the meanings and relationships of certain words, themes, and patterns (Zhang & Wildemuth, 2005). The researcher in this study used the inductive content analysis method. She first organized the qualitative data and examined them multiple times until she developed a clear understanding of the overall data. Next, she generated a coding scheme to analyze the data. She reread the data several additional times and took notes about key words/phrases and patternes and developed codes based on the patternes and themes. She coded all the texts and revisited the coding to verify the coding was consistent over time. After all coding was completed, she rechecked coding consistency. She also checked themes that were identified from the data to make sure she could present meanings and interpretations to address the research questions derived from the data.

Results

Pre- and Post-Survey Results

Preservice teachers ranked their confidence levels to plan and implement Muñiz's (2020)'s eight Culturally Responsive Teaching (CRT) competencies using the four-point Likert scale in the pre- and post-surveys. For planning ELA lessons to incorporate CRT competencies, the results showed statistical significances between the pre- and post-surveys for seven CRTs; the exception was CRT 7 *Collaborate with families and local community*. This indicated that the literacy methods course and field experience increased preservice teachers' competencies in planning lessons incorporating seven CRTs. The means of seven CRTs increased with a range of 0.29 to 0.95 from the pre-survey to the post-survey for planning ELA lessons (see Table 2). In particular, preservice teachers developed the following CRT competencies at the end of the study: CRT 6 P*rompting respect for student differences*, CRT 5 *Modeling high expectations*, and CRT 4 *Connecting real-world issues*.

Table 2. Results of Pre- and Post-Surveys on Development of Lesson Plans

Culturally Responsive Teaching (CRT) Competencies	Pre-Survey M	Post-Survey M	*p*	Effect Size
CRT 1. Reflect on One's Cultural Lens	2.55	3.18	<.001	0.68
CRT 2. Recognize and Redress Bias in the System	2.53	2.95	.009	0.46
CRT 3. Draw on Students' Culture to Shape Curriculum & Instruction	2.34	3.29	<.001	1.32
CRT 4. Connect Real-World Issues	2.71	3.50	<.001	1.20

CRT 5. Model High Expectations	3.24	3.79	.001	0.65
CRT 6. Promote Respect for Student Differences	3.58	3.87	.008	0.48
CRT 7. Collaborate with Family and the Community	2.58	2.45	.382	-0.14
CRT 8. Communicate in Linguistically and Culturally Responsive Ways	2.45	3.08	<.001	0.66

For implementing CRT practices in ELA lessons, the results showed statistical significances between pre- and post-surveys for the following three CRT competencies: CRT 4 *Bringing real-world issues into the classroom*; CRT 5 *Modeling high expectations for all students*; and CRT 8 *Communicate in linguistically and culturally responsive ways*. The results indicated the literacy methods course and field experience increased preservice teachers' competencies in these three CRT competencies. The means of seven CRTs (CRT 1, 2, 3, 4, 5, 6, and 8) increased, with a range from 0.39 to 0.66, from the pre-survey to the post-survey for implementing ELA lessons (see Table 3). The three highest post-survey scores for implementing ELA lesson plans were for CRT 6 *Promoting respect for student differences*, CRT 5 *Modeling high expectations*, and CRT 4 *Connecting real-world issues*. They were the same three CRT competencies that preservice teachers reported as the highest confidence levels of planning lesson plans.

Table 3. Results of Pre- and Post-Surveys on Implementation of Lesson Plans

Culturally Responsive Teaching (CRT) Competencies	Pre-Survey M	Post-Survey M	*p*	Effect Size
CRT 1. Reflect on One's Cultural Lens	2.53	2.97	.018	0.42
CRT 2. Recognize and Redress Bias in the System	2.50	2.89	.029	0.38
CRT 3. Draw on Students' Culture to Shape Curriculum & Instruction	2.66	3.16	.022	0.43
CRT 4. Connect Real-World Issues	2.87	3.42	<.001	0.65
CRT 5. Model High Expectations	3.24	3.79	.001	0.65
CRT 6. Promote Respect for Student Differences	3.45	3.79	.019	0.43
CRT 7. Collaborate with Family and the Community	2.50	2.37	.387	-0.14
CRT 8. Communicate in Linguistically and Culturally Responsive Ways	2.45	3.11	<.001	0.67

Qualitative Data Results

Qualitative data results indicated several emergent themes when preservice teachers planned and implemented two literacy lesson plans and reflected on their lesson delivery. Overall, the results showed that preservice teachers planned culturally responsive teaching-aligned literacy instruction and delivered these lessons to students in the classroom. This section will present emergent themes in the following five categories: (a) modeling high expectations for all students, (b) promoting respect for student differences, (c) bringing real-world issues into the classroom, (d) reflecting on effective use of culturally responsive teaching practices, and (e) preparing for culturally responsive teaching.

Model High Expectations for All Students

The first category was CRT 5 modeling high expectations for all students. When preservice teachers in this study developed and implemented their literacy lesson plans, they included this CRT competency at the greatest degree. Three major themes emerged within this CRT competency. The first theme was that preservice teachers planned to model behavior expectations for students before having them work on tasks. Many preservice teachers gave explanations of how students should listen to speakers quietly and respect others when planning their lessons. One preservice teacher, Bob, placed in a fourth and fifth grade combined classroom, wrote:

> *I plan on implementing this competency by modeling acceptable behavior through my own actions. Some of these actions include eye contact, letting others talk without interruption, giving speakers full attention, and staying on task. I will also be reminding the students of the classroom expectations and what it means to be safe, responsible, and respectful.*

The second theme that emerged in this CRT competency was preservice teachers' high expectations on students' academic learning. Ella, a preservice teacher placed in a second-grade classroom, reported that she modeled how to pay attention to the ending punctuation and read sentences fluently based on the ending punctuation. She then modeled "*the application activity by reading their [students'] sentence to the class and having the class guess the ending punctuation*." When presevice teachers delivered their lessons in the classroom, they also intentionally modeled academic expectations. Michelle in a second-grade classroom "*modeled how students should be analyzing a book to understand the different points of view that characters may have.*" She further explained that she modeled high expectations "*by showing the students how they should be filling out the given worksheets.*" Another preservice teacher, Abigail from a fourth-grade classroom, modeled high expectations for all students and encouraged her students to complete the tasks, and she and the class "*had sufficient practice together so that they felt comfortable to do it alone*."

The third theme that emerged within CRT 5 competency was that preservice teachers offered tools students needed for their learning or completing tasks. These tools included clarifying tasks explicitly, answering questions before having students work on tasks, and offering learning strategies/guidance. For example, Charlotte taught a lesson on "citing sources" to fourth graders. She described that to implement CRT 5 *Model high expectations for all students*, she used several tools for students. She included introductory videos, an anchor chart for the classroom displays as a visual support and as a resource, and a handout of the anchor chart for students to put in their notebooks for future referencing. These academic tools helped students correctly cite sources.

Promote Respect for Student Differences

The second category was CRT 6 promoting respect for student differences. Preservice teachers intentionally planned to use this particular CRT practice in their literacy lesson plans and delivered them to students. Below are two themes found in this category.

The first emergent theme was inviting students to share during class their own opinions, ideas, and work. Preservice teachers reported that it was essential for students to freely share their different ideas, thoughts, and work and to listen to others as they shared. Preservice teachers wrote that by learning different ideas and opinions, students could realize that there were different ways to interpret the same information, which promotes respect for student differences. Bob, the same preservice teacher above, reported that:

> *I will achieve this competency…by reminding students that their peers may have different thoughts than you. I will remind them that it is important that we are welcoming of all ideas and that there are no wrong answers. This will help to promote the differing opinions that the students may have during the lessons and activities.*

The second emergent theme within this CRT competency was encouraging students to listen to different opinions and ideas without negative judgment. For example, Jackson in a second-grade classroom wrote: *"Students sharing their different answers allowed them to see that people construct different answers from the same information. Allowing them to see this helps introduce them to the idea of differing opinions and can be applied* across disciplines*."* Similar comments appeared in other preservice teachers' lesson delivery. Audrey taught her lessons on "finding the main idea using key details" to second graders. She shared that she incorporated CRT 6 "*by explaining that students may have different ways of stating the key details and main ideas and that that's okay, it doesn't mean one person is right or wrong*."

Bring Real-World Issues into the Classroom

The third category found in qualitative data results was that preservice teachers used CRT 4 competency, bringing real-world issues into the classroom, in their lesson planning and delivery. Two themes emerged in this category.

The first theme was that preservice teachers planned to use reading materials and books that include issues current in society. Abigail, a preservice teacher who taught lessons on nonfiction text features to fourth graders, included this CRT competency in her reading materials. She carefully selected news articles and explained:

> *These articles bring real, current issues into the classroom. I pre-read a number of Scholastic News to find the most appropriate and relevant articles for my class. Since we are currently looking at informational texts, I thought that Scholastic News articles would be beneficial to talk about recent events like protecting the bees, what scientists are doing in space, and migrant workers.*

Many preservice teachers also incorporated reading passages to examine current special issues. For example, David in a fourth-grade classroom taught lessons to analyze multiple perspectives and identify key details that support a main idea. He carefully selected a children's book, "*We Are Water Protectors*" by Carole Lindstrom (2020). The book is about a young Ojibwe girl learning about the importance of water from her grandmother and fighting against an oil pipeline to protect the water supply for her people. He wrote that he provided "*a wide variety of perspectives on the issue that encompassed passages from activists, Native American Tribe members, owners of the pipeline project, concern homeowners, etc.*" He further described that with his students were able to "*critically develop their own perceptions/attitudes to the pipeline controversy itself*."

The second theme found in CRT 4 competency was that preservice teachers planned to integrate real-world issues into their teaching by discussing these issues and making personal connections between them and students. For example, Caleb, a preservice teacher placed in a combined classroom for fourth and fifth graders, planned to use a local news article about a solar panels project at the school where he was doing his field experience. His ELA lessons focused on key information and details in informational texts. As part of a project in the school district, this school added solar panels to the school roof, which was to prompt sustainability for to the next generation. He wrote that many of his students "*expressed interest in learning more about what exactly happened and why*." Therefore, after he taught how to identify key information and details in another informational passage, he included a local news article about this solar panels project and enhanced students' learning.

In terms of delivering lessons, Anna in her fourth and fifth combined grade classroom taught lessons on compare and contrast using primary and secondary sources. When she introduced primary and secondary sources, she used "*a few examples of real-world scenarios of stretching the truth*." She used a historical fiction book, *Levi Strauss Gets a Bright Idea: A Fairly Fabricated Story of a Pair of Pants* by Tony Johnson (2011), as an example of a secondary source because this book includes both true information and stretched/false information. After she read the book, she further "*gave the examples of social media and the news*" to her students, so they could learn about how to determine truth and false information that appear in the social media in their daily lives. This helped them understand primary and secondary sources to support information with real-life examples at their personal levels.

Reflections on Effective Use of CRT Practices

After preservice teachers taught ELA lessons in their field experience classroom, they reflected on their delivery of lessons. Two themes emerged from their reflections. The first theme was reflections on well-delivered lessons of CRT practices. The second theme was reflections for improvement in using CRT competencies.

When preservice teachers were asked to reflect on their lesson delivery and implementation of culturally responsive teaching practices, they shared that they incorporated such practices professionally. Madison taught her lessons on main idea and supporting details to third graders. She implemented CRT 5 *Modeling high expectations for all students* and CRT 6 *Promoting respect for student differences*. Reflecting on her lesson delivery, she shared that she was satisfied with her implementation of culturally responsive teaching practices and was intentional about implementing these two CRT competencies during her teaching. She wrote:

> *Whenever I asked a question…, I reminded myself to take the time to thoroughly listen to each student's response to promote respect for them and model the high expectations I have for my students, and this was directly specified in my lesson*.

Other preservice teachers also noted that they ensured that their elementary students listened to their peers for different opinions with respect to promoting respect for student differences. They also created a safe learning space for all students so they could feel valued and welcomed in their classrooms.

While preservice teachers acknowledged that they successfully delivered some CRT competencies in their lessons, they critiqued other CRT competencies to improve for future teaching. Michelle who taught her lessons to second graders, including a few multilingual learners, noted that she would like to put more emphasis on drawing upon

students' cultures. She realized how important it is for students to relate their learning to their own cultures. She wrote "*I wish I incorporated their background cultures into my lesson. These students would have created more of a personal connection drawn on their cultures*."

Anna taught lessons on compare and contrast using primary and secondary sources in the fourth and fifth combined grade classroom. She reflected that she could have used primary and secondary sources examples that were personal to students. She had many Hmong students in her classroom; she noted that she could have incorporated and had her students analyze "*a Hmong poem and an article about Hmong poetry*" because she thought this approach "*would have made a lot of students feel more supported*."

Preparedness toward Culturally Responsive Teaching

Preservice teachers planned, implemented, and reflected on delivery of their lessons including CRT practices in their elementary school field placements. Toward the end of the semester, they reflected on how the literacy methods course and their field experience at the elementary PDS sites impacted their views and preparations for future teaching. Two main themes emerged. First, the preservice teachers felt prepared to plan and implement CRT practices, especially through actually teaching lessons in their field experience classrooms. Second, they intended to use CRT practices in their future teaching.

Preservice teachers learned about CRT practices through the literacy methods course, interacted with elementary school age students through their field experience at their PDS sites, developed ELA lessons, and incorporated CRT practices in their teaching. At the end of the semester, they felt prepared to plan lessons including CRT practices and to deliver them in the future as they actually practiced a few CRT competencies in a classroom. One particular preservice teacher reflected on her experience of learning and implementing CRT practices in her lessons. She stated that she developed her awareness, knowledge, and skills to develop and implement CRT practices because she developed "*a better overall understanding of what each of the 8 competencies appeared like in the classroom and potential means to encompass each one*." Another preservice teacher reflected on her lessons, saying "*I do not feel anxious about incorporating those [CRT] practices into my teaching, like I felt in the beginning of the semester*."

Preservice teachers noted that their experience in actual planning and delivering lessons to elementary school students made a positive impact on understanding what it means to become culturally responsive teachers. Another preservice teacher validated the value of field experience in the real elementary school classroom and opportunities for preservice teachers to discuss their teaching experiences with their peers in their field experience lecture. She wrote:

> *We were able to talk through culturally responsive teaching practices in class as well as work on implementation in our lessons. It helped that we got feedback on our lessons [from our field supervisor] so we could truly see where we stood in doing so*.

Another preservice teacher echoed that all experience in developing and teaching CRT lessons in the real classroom helped her develop her knowledge and awareness of these issues. She wrote that opportunities to talk with her peers and field supervisors about her teaching CRT lessons and interaction with students as well as to "*actually plan lessons and include several [CRT] competencies were really helpful*."

Not only were preservice teachers highly satisfied with their implementation of lessons including CRT practices, but they also indicated that they plan to use CRT practices in their future teaching. One preservice teacher noted "*I hope to include all of the CRT practices, especially through incorporating my students' culture into the curriculum, modeling high expectations for all students, and respect all students' differences*."

Many preservice teachers realized that by incorporating CRT practices in their future teaching, they may better be able to develop a safe and inclusive learning environment. One preservice teacher reflected as follows: "*I do see myself using culturally responsive teaching practices in the future because of the benefits. This helps to create a much more inclusive and welcoming environment for all*." Another preservice teacher wrote: "*Every student should be respected and heard, and I think that using these [CRT] competencies really aids in creating an environment that supports each and every student*."

Discussion

In this study, the researcher addressed two research questions. The first research question was "*How do preservice teachers plan, implement, and reflect on their culturally responsive teaching practices through their ELA lessons?*" Overall, preservice teachers planned three CRT competencies: CRT 5 *Model high expectations for all students*; CRT 6 *Promote respect for student differences*; and CRT 4 *Bring real-world issues in the classroom*. In the lesson planning stage, they intentionally set aside class time so they could share their expectations with their students. They planned to remind their elementary school students of the importance of respecting peers' different opinions. Preservice teachers also prepared their lessons by providing as many students as possible with opportunities to share their ideas, answers, thoughts, and questions. In their lesson plans, they also selected reading materials and sources that were relevant to real-life issues and/or students' lives. Preservice teachers carefully planned ELA lessons based on students' needs such as interests and academic levels. The quantitative results support these findings as statistically significances were found in these particular three CRT practices when preservice teachers planned ELA lessons. The results of this study is aligned with Adams and Kaczmarczyk's study (2023) where they reported that preservice teachers demonstrated elements of CRT practices in their read-alouds lesson plans for elementary school students.
While implementing CRT practices in lessons, preservice teachers also used the same three CRT practices as they did in their planning their ELA lessons. This result demonstrated that there was consistency between how preservice teachers planned their lessons and how they actually implemented the lessons. The quantitative results also supported these findings as statistically significances were found on CRT 4 *Bring real-world issues in the classroom* and CRT 5 *Model high expectations for all students*.

However, the researcher found a discrepancy between the survey results for self-reported implementation of CRT practices and preservice teachers' actual use of CRT competencies in their teaching. A statistically significant difference was found on CRT 8 *Communicate in linguistically and culturally responsive ways* when preservice teachers implemented ELA lessons on the post-survey; yet, this CRT practice did not appear in preservice teachers' actual delivery of lessons in the classroom. One explanation of why this discrepancy occurred is that preservice teachers may have communicated with students in linguistically and culturally responsive ways using gestures, body movement, eye contact, and other means. However, they may not recognize they were doing this practice because it already became natural for them to use this practice after they spent over 80 hours in their field experience classroom. They may have not clearly thought about articulating and documenting this practice in their lesson plans and/or reflections of their lesson delivery. Kruger and Dunning (1999) explain that while unskilled learners may overestimate their abilities, skillful learners may underestimate their abilities. As the Dunning-Kruger effect shows, skillful and knowledgeable participants in this study may have underestimated their implementations of CRT practices. As the student population becomes diverse in K-12 schools, it is important for teacher educators to teach preservice teachers how to support students with linguictially and culturally diverse backgrounds in thier courses.

One noteworthy point for discussion is that the post-survey scores on CRT 7 *Collaborate with family and the community* for both planning and implementing lesson plans decreased from the pre-survey scores. In the beginning of the semester, preservice teachers thought they could plan and implement this CRT practice into their ELA lessons, which was explained in the scores for CRT 7 on the pre-surveys. However, at the end of the semester, they did not report they planned and implemented this CRT practices as they expected. The decreases of these scores over the semester make sense because they had very limited opportunities to engage with family and the communities in their field experience. They participated in their field experience only for three mornings per week, and they realized they did not engage in this CRT practice as much as they had hoped and planned. It is challenging for preservice teachers to actually address these complex issues when only developing and teaching a few full lessons.

In addition, teacher education preparation programs globally have not kept pace with the growing emphasis on developing school, family, and community partnerships (Ryan, Walsh, & Liston, 2025). The National Association for Family, School, and Community Engagement (NAFSCE) (2022) in the U.S. calls for the need of family, school, and community partnerships in the teacher education preparation programs. Therefore, teacher educators must address this important need to better equip future teachers through their teacher education preparation programs.

Preservice teachers reflected on their experience of planning and implementing ELA lessons including CRT practices. They reflected that overall, their lessons were successful because they were able to incorporate some

CRT practices and because students actively responded to their lessons. Preservice teachers also critiqued their lesson delivery and planned to improve their teaching for the future.

While the researcher found a statistically significance in CRT 2 *Recognize and Redress Bias in the System* in preservice teachers' develpement of lesson plans, qualitative data analysis did not apper to have distinct or emergent themes around CRT 2. The literacy methods course covered institutional and systemic biases that could advantage or disadvantage certain groups of students. However, the limited time of field experience (three mornings per week for one semester) and resources may have challenged preservice teachers in this study to critically analyze biases in the system and advocate for all learners. The researcher found a statistically significance in CRT 3 *Draw on Students' Culture to Shape Curriculum & Instruction* from the pre- and post-surveys when preservice teachers evaluated their development of lesson plans. An effect size for CRT 3 in developing lesson plans was also considered large effect. The qualitative data analysis revealed some patterns (e.g., planning to use textbooks or reading passages that depict different family dynamics, culture, or students' backgrounds; planning to draw students' culture and experience in teaching) in CRT 3. However, these partterns in CRT 3 were not as evident as other CRTs with stronger evidence (i.e., CRT 4, 5, and 6). Therefore, preservice teachers may have more of a challenge to integrate complex CRT practices (CRT 2, 3, and 7) than in other areas.

The second research question in this study was *"How does their learning about culturally responsive teaching impact their preparation to become culturally responsive teachers?"* Overall, they felt prepared to become culturally responsive teachers. They developed awareness, knowledge, and skills of CRT practices through the literacy methods course because they had opportunities to analyze each CRT competency and to carefully plan their lessons while incorporating various CRT competencies.

In particular, preservice teachers found the opportunities to apply what they learned from the literacy methods course into their field experience classrooms extremely helpful and powerful. This result demonstrates the necessity of field experience and hands-on experience for preservice teachers. Field experience offers preservice teachers opportunities to apply theoretical aspects of their course work to the real classroom (Choy et al., 2014; Hillman et al., 2012). Preservice teachers can also enhance their pedagogical knowledge and subject matter knowledge through field experience (Singh, 2017). In this study, through interaction with elementary school students, hands-on, first-hand experience, and immediate and frequent feedback from mentor teachers and field supervisors, preservice teachers grew in their abilities to select strategies to support their students, to establish a rapport with these students, and to deliver and adjust lessons as needed. The result of this finding in this study aligns with the one from the study by Putman, Cash, and Polly (2022), which concluded an intensive, structured field experience was beneficial for preservice teachers to better engage in teaching.

In addition, preservice teachers recognized the power of CRT practices that could positively impact students' learning for a longer period of time. The Council for the Accreditation of Education Preparation (CAEP) (2022) states that high-quality clinical practice is an essential element to teacher preparation and that preservice teachers must develop their knowledge, skills, and dispositions to demonstrate positive impacts on diverse students' learning. Preservice teachers in this study appreciated CRT competencies after they incorporated these CRT competencies into their teaching at elementary school field experiences. The positive impact of their experiences was that they planned to further use these CRT practices in future teaching. Teacher preparation programs must incorporate culturally responsive teaching practices (Moore et al., 2021). In their study, they found that education majors/preservice teachers developed CRT practices and awareness after field experience and that they advocate for CRT practices to better prepare teacher candidates. Worldwide, while student diversity varies from one country to another, the Programme for International Student Assessment (PISA) reports that 13 % of students in the OECD (Organisation for Economic Co-opertation and Development) countries remained with immigration backgrounds (OECD, 2023). Within this global context, teachers, regardless of thier location, must implement cultually responsive practices to support students with diverse bacgkgrounds (Santoro & Kennedy, 2015). Therefore, this study offers an important implication for teacher educators to emphasize culturally responsive teaching in thier teacher education preparation programs.

Conclusion

This study examined how preservice teachers planned and implemented their ELA lessons while incorporating CRT competencies in elementary PDS sites and how they reflected on their lesson delivery. They planned lessons including three major CRT practices: CRT 5 *Model high expectations for all students*; CRT 6 *Promote respect for student differences*; and CRT 4 *Bring real-world issues into the classroom*. They taught their lessons while incorporating these CRT practices. Because these preservice teachers were able to practice important CRT

competencies through their interaction with students at elementary schools, this study positively impacted them to become more aware of and condifent in integrating culturally responsive teaching practices.
This study offers insights about how preservice teachers develop their awareness, knowledge, and skills for CRT practices. The researcher offered detailed analyses of what kinds of CRT competencies preservice teachers planned and used in specific lesson contexts. She also revealed their reflection processes as they critically analyzed their lesson deliveries and how they practiced CRT competencies. There are a few limitations in this study. The first one is a small sample size with homogeneous participant demographics from the single-institution sample. The results of this study may not be able to generate for other groups of preservice teachers. The second limitation is that the pre- and post-survey data from the preservice teachers were self-reported responses. There may be discrepancies between their self-evaluation and actual lesson planning and implementation. This point leads to recommend to future researchers that they observe and analyze actual delivery of CRT practices among preservice teachers. This will strengthen their ability to document actual implementation of preservice teachers culturally responsive teaching practices.

In this study, the positive impact of CRT 7 *Collaborate with Family and the Community* remained minimal. As explained above, the teacher education preparartion programs must design the curriculum and programs by intentionally and structualy embeding diversity research, school, family, and community partnerships. Literacy instructors must intergrate culturally responsive teaching practiecs by introducing culturally responsive teaching practices, giving concrete examples of how to apply culturally responsive teaching practices to literacy/ELA lessons, and having preservice teachers practice how to use these approaches in their own teaching. Field supervisors also need to support preservice teachers by observing their lesson delivery and interaction with children and by giving them opportunities to reflect on their teaching with guided, intentional feedback on culturally responsive teaching practices.

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Ethical Approval

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Perceived University Support and Students' Motivation for Higher Education: The Parallel Mediating Roles of Leisure Time Management and Academic Reputation

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Abstract
The purpose of this study is to examine the relationships among perceived university support, leisure time management, academic reputation perception, and students' reasons for pursuing higher education within the framework of the Social Exchange Theory. In addition, the parallel mediating roles of leisure time management and academic reputation perception in the relationship between perceived university support and reasons for pursuing higher education were tested. The study was conducted using a quantitative research design, and the data were obtained from 406 students studying at Bingöl University. The data were collected through self-report scales with established validity and reliability and analyzed using structural equation modeling (SEM). The results of the mediation analysis revealed that this relationship was fully mediated by leisure time management and academic reputation perception, indicating a full mediation structure in the model.
Overall, the findings suggest that university support influences students' motivations not directly, but through behavioral and perceptual processes. By offering a process-oriented perspective within the context of higher education, this study contributes to the literature and provides practical implications.

Keywords: Perceived university support, Leisure time management, Academic reputation perception, Reasons for pursuing higher education, Parallel mediation

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Introduction

Higher education is regarded as an important stage of education that shapes individuals' future life opportunities and supports their academic, professional, and personal development. For this reason, the factors influencing students' preferences for higher education institutions have become a significant area of inquiry in educational research in recent years (Özkan & Gizir, 2013). A review of the literature indicates that students' reasons for pursuing higher education are generally shaped by various factors such as future expectations, social environmental influences, economic conditions, and educational opportunities (Bataeineh, 2022). In this process, students' motivational dynamics are also emphasized as an important determinant of university choice. Indeed, Jackson et al. (2023) stated that personal expectations, career development opportunities, and the desire to gain social status play important roles among students' reasons for choosing university education. Similarly, Seksan et al. (2025) revealed that students' learning motivations influence their perceptions of higher education and their level of attachment to the university. Taken together, these findings suggest that students' reasons for pursuing higher education are largely associated with individual motivational processes.

Reasons for preferring higher education constitute a multidimensional structure that encompasses a wide range of factors, from individual demands to socioeconomic conditions. Students' orientation toward university education may be influenced by the quality of the academic environment they experience as well as the academic support and institutional services they perceive within that environment (Duong et al., 2023). Therefore, examining institution-based and psychosocial factors that shape students' decision-making mechanisms is considered an important necessity in higher education research (Perna, 2006; Paulsen & St. John, 2002).

University life is a multidimensional experience that encompasses not only students' academic development but also their psychological and social adjustment processes (Öztürk, 2020). In this context, how students perceive the university environment emerges as one of the fundamental factors determining the quality of the higher education experience (Avcı & Doğan, 2020). The academic, social, and psychological support provided by universities can facilitate students' adaptation to university life and positively influence their academic achievement (Bayar & Tuzgöl Dost, 2018; Eker et al., 2020). Accordingly, perceived university support is considered a critical variable shaping students' higher education experiences.

The concept of perceived university support is grounded in social support and institutional support approaches. While social support is defined as the individual's perception of the social, emotional, and psychological assistance received from the environment (Yıldırım, 1997), within the university context this concept refers to how students perceive the support provided in academic and administrative processes (Avcı & Doğan, 2020). The literature indicates that perceived university support is associated with students' psychological resilience, life satisfaction, motivation, and academic adjustment (Bayar & Tuzgöl Dost, 2018; Eker et al., 2020).

To explain these relationships, the theoretical framework of the present study is based on Social Exchange Theory (Blau, 1964). Social Exchange Theory suggests that relationships between individuals and institutions are shaped by reciprocal benefits and expectations (Cropanzano & Mitchell, 2005). According to this theory, when individuals perceive the support provided by an institution positively, they tend to develop more positive attitudes and behaviors in return (Eisenberger et al., 1986). In this context, it is assumed that students' perceived university support may influence their behavioral and cognitive processes. From the perspective of Social Exchange Theory, perceived university support is expected to affect students' leisure time management skills and academic reputation perceptions. Indeed, it has been reported that the support provided by universities shapes how students organize their time and form perceptions about their universities (Amado et al., 2023; Lepp et al., 2014).

Leisure time management is defined as an individual's ability to use time outside of mandatory responsibilities in a planned and purposeful manner (Demir & Alpullu, 2020). During university years, students' increasing academic and social responsibilities make the effective use of time even more important (Aeon et al., 2021). The literature has demonstrated that leisure time management is associated with individuals' academic achievement, motivation, and various behavioral tendencies (Arslankoç & Koçak, 2023; Akıncı, 2025). In this regard, leisure time management is considered to play an important role in students' evaluations of higher education.

Another important variable is academic reputation perception. Academic reputation refers to the overall evaluation formed by stakeholders regarding a university's academic performance, educational quality, and institutional strength (Herman, 2018). The academic reputation of a university is regarded as an important determinant in students' evaluations of their university experiences and their perceptions of higher education (Miotto et al., 2020).

A review of the literature indicates that studies directly examining the effect of perceived university support and structure on students' reasons for pursuing higher education are limited. In particular, there appears to be insufficient research explaining this relationship through leisure time management and academic reputation perception. This situation highlights the need to address these variables within a holistic model.

Accordingly, the present study examines the effect of perceived university support on students' leisure time management skills and academic reputation perceptions, as well as the role of these variables in explaining students' reasons for pursuing higher education. From the perspective of Social Exchange Theory, it is assumed that the academic and social support provided by universities may influence students' behavioral and perceptual processes, which in turn may shape their motivations for pursuing higher education.
Within this framework, the study investigates the direct and indirect effects of perceived university support on students' reasons for pursuing higher education and tests whether leisure time management and academic reputation perception serve as parallel mediators in this relationship.
In this respect, the study aims to contribute to the literature by examining the effect of perceived university support on motivations for pursuing higher education not only through direct relationships but also through students' behavioral and perceptual processes, addressing these variables within a holistic model framework.

Theoretical Background and Hypotheses

Social Exchange Theory is a theory suggesting that individuals maintain relationships based on the principle of reciprocity and evaluate benefits and costs throughout this process. According to the theory, individuals tend to respond to positive, supportive, and trustworthy behaviors with similar attitudes and behaviors. Cropanzano and Mitchell (2005) argued that social relationships become stronger over time through mutual trust and commitment, and that increases in perceived support significantly shape individuals' attitudes and behaviors.

Perceived University Support and Leisure Time Management
Perceived university support is considered an important variable shaping students' behavioral patterns within university life. From the perspective of Social Exchange Theory, when individuals perceive the institutional support provided to them positively, they tend to develop more positive behaviors in return (Blau, 1964; Gouldner, 1960; Cropanzano & Mitchell, 2005). In addition, perceived institutional support plays an important role in individuals' processes of regulating their behaviors and organizing their daily lives (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002). It has been suggested that the academic and social support provided by universities may influence how students plan and manage their time (Astin, 1984; Kahu & Nelson, 2017). In this context, perceived university support is expected to influence students' leisure time management skills.

H^1. *Perceived university support positively affects leisure time management.*
Perceived University Support and Academic Reputation Perception
Perceived university support is an important factor shaping students' evaluations and perceptions of their universities. When students believe that they receive sufficient academic and institutional support from their universities, they tend to develop more positive evaluations toward their institutions. Indeed, it has been demonstrated that the quality of services and student support elements provided in higher education directly affect student satisfaction, and that this satisfaction shapes students' overall perceptions of the institution (Bahadur et.al., 2024). The academic and administrative support services offered by universities increase students' levels of satisfaction, which in turn strengthens their perceptions of the university's academic reputation (Amado et al., 2024). Furthermore, it is emphasized that students' perceptions of their university experiences are closely related to the quality of institutional services provided, and that these experiences play a decisive role in the formation of university reputation (Amado et al., 2023). Accordingly, perceived university support is expected to positively influence academic reputation perception.

H^2. *Perceived university support positively affects academic reputation perception.*
Leisure Time Management and Reasons for Pursuing Higher Education
Leisure time management is defined as an individual's ability to use time in a planned and purposeful manner (Aeon et al., 2021). Recent studies have demonstrated that time management and self-regulation skills are strongly associated with students' academic achievement, motivation, and goal-oriented behaviors (Broadbent & Poon, 2015). In particular, self-regulation-based time management skills are reported to increase students' active participation in learning processes and strengthen their orientation toward academic goals (Panadero, 2017; Wong et al., 2021). Effective time management helps students establish a balance between academic and social responsibilities and contributes to their engagement in higher education in a more conscious and goal-oriented manner (Kahu & Nelson, 2017). Moreover, students with strong time management skills tend to focus more effectively on their academic goals, demonstrate higher intrinsic motivation, and possess clearer educational

objectives (Aeon et al., 2021; Richardson et al., 2012). In this context, leisure time management skills are expected to influence students' reasons for pursuing higher education.

Students who manage their leisure time effectively can allocate more time and effort to activities that support their educational and career goals. Time management and self-regulation skills have been associated with academic motivation, goal commitment, and purposeful behaviour among university students (Panadero, 2017; Aeon et al., 2021). In addition, students' reasons for pursuing higher education are shaped by educational aspirations, career expectations, and personal development goals (Bogler & Somech, 2002; Jackson et al., 2023). Effective leisure time management may help students maintain a stronger focus on these goals and increase the importance they attribute to higher education as a means of achieving them.

H^3. ***Leisure time management positively affects reasons for pursuing higher education.***

Academic Reputation Perception and Reasons for Pursuing Higher Education

Academic reputation refers to the overall evaluation formed by stakeholders regarding a university's academic performance, educational quality, and institutional strength (Herman, 2018). Recent studies have shown that students' perceptions of a university's academic reputation significantly influence their institutional commitment, satisfaction, and motivation (Amado et al., 2023; Amado et al., 2024). University reputation is regarded as a determining factor in students' processes of choosing higher education institutions and shaping their educational expectations (Pucciarelli & Kaplan, 2016). Furthermore, a strong academic reputation contributes to students' ability to define their educational goals more clearly and develop stronger reasons for pursuing higher education (Amado et al., 2024). Accordingly, academic reputation perception is expected to influence students' reasons for pursuing higher education.

H^4. ***Academic reputation perception positively affects reasons for pursuing higher education.***

The Mediating Role of Leisure Time Management and Academic Reputation Perception

Within the framework of Social Exchange Theory, it is suggested that indirect relationships exist between the level of support individuals perceive and the attitudes and behaviors they develop (Blau, 1964; Cropanzano & Mitchell, 2005). Recent studies have demonstrated that perceived institutional support in higher education indirectly influences students' self-regulation skills, academic engagement, and learning processes (Kahu & Nelson, 2017; Wong et al., 2018). When students perceive themselves as being supported by their universities, this perception contributes primarily to the development of time management and self-regulation skills while simultaneously shaping their perceptions of the university in a positive manner (Broadbent & Poon, 2015; Panadero, 2017).

Furthermore, it has been shown that university experiences and perceived value create indirect effects through students' evaluations of university reputation, with student satisfaction and experience playing mediating roles in this process (Amado et al., 2024). These processes emerge as fundamental mechanisms shaping students' reasons for pursuing higher education. Accordingly, it is assumed that the effect of perceived university support on students' reasons for pursuing higher education may occur through leisure time management and academic reputation perception.

H^5. ***Leisure time management mediates the relationship between perceived university support and reasons for pursuing higher education.***

H^6. ***Academic reputation perception mediates the relationship between perceived university support and reasons for pursuing higher education.***

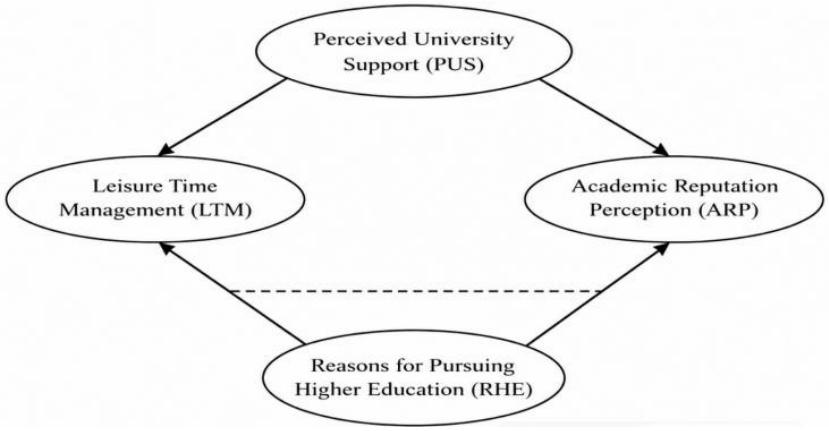

Figure 1. Conceptual model

Method

Research Design

In this study, a quantitative research design was employed to examine the relationships among perceived university support, leisure time management, academic reputation perception, and reasons for pursuing higher education. Quantitative research is defined as a systematic approach that enables the testing of relationships among variables through statistical methods (Fraenkel et al., 2012). Accordingly, structural equation modeling (SEM) was used in the present study to examine the direct and indirect relationships among the variables.

Research Model

In this study, the relationships among perceived university support, leisure time management, academic reputation perception, and reasons for pursuing higher education were examined within the framework of structural equation modeling. The research model was developed based on Social Exchange Theory (Blau, 1964; Cropanzano & Mitchell, 2005).

Within the model, the effects of perceived university support on students' leisure time management skills and academic reputation perceptions, as well as the effects of these variables on reasons for pursuing higher education, were investigated.

The research model assumes that leisure time management and academic reputation perception play parallel mediating roles in the relationship between perceived university support and reasons for pursuing higher education. Accordingly, the indirect effects among the variables were examined, and the relationships were tested within a holistic framework.

Population and Sample

The study was conducted with undergraduate students enrolled at Bingöl University and participants were selected using a stratified sampling approach. The adequacy of the sample size was evaluated with respect to the complexity of the structural equation model. The proposed model consisted of four latent constructs represented by a total of 11 observed indicators. To obtain a more parsimonious and stable measurement model, a parceling approach was employed during the analysis process. Previous research has suggested that sample size adequacy in structural equation modeling should be evaluated by considering model complexity, the number of observed indicators, and the number of estimated parameters (Wolf et al., 2013). Accordingly, the final sample of 406 participants was considered adequate for testing the proposed model.

Data Collection Instruments

In this study, four different scales were used as data collection instruments: perceived university support, leisure time management, academic reputation perception, and reasons for pursuing higher education. The scales were selected from instruments with established validity and reliability in the literature.
It was observed that some of the confirmatory factor analyses of the scales used in the study did not achieve the expected fit values; therefore, a parceling approach was adopted during the analysis process. Within this scope, observed variables were created by combining the subdimensions of each construct.

Leisure Time Management Scale
The Leisure Time Management Scale was developed by Wang et al. (2011) and adapted into Turkish by Akgül and Karaküçük (2015). The scale consists of 15 items and four subdimensions: goal setting, attitude, technique, and scheduling. A five-point Likert-type scale (1 = Strongly disagree, 5 = Strongly agree) is used. The items in the scheduling subdimension are reverse-coded. Higher scores obtained from the scale indicate that individuals manage their leisure time more effectively. In the present study, the Cronbach's alpha coefficient of the scale was found to be .85. In the Turkish adaptation study, confirmatory factor analysis revealed that the four-factor structure demonstrated acceptable fit indices ($\chi^2/df = 1.44$, GFI = .90, CFI = .97, NFI = .90, NNFI = .96, SRMR = .076, RMSEA = .056) (Akgül & Karaküçük, 2015).

Reasons for Pursuing Higher Education Scale
The Reasons for Pursuing Higher Education Scale was developed by Shapira and Eva Etzioni-Halevy (as cited in Bogler & Somech, 2002) and adapted into Turkish by Özkan (2011). The scale consists of 9 items and three

subdimensions: educational, instrumental, and social. Responses are rated on a five-point Likert scale. In the Turkish adaptation study, construct validity was examined through principal component factor analysis. The KMO value was reported as .823 and Bartlett's Test of Sphericity was found to be significant. The three-factor structure explained 64.75% of the total variance, with factor loadings ranging from .596 to .839. Although confirmatory factor analysis (CFA) fit indices were not reported in the adaptation study, the three-dimensional structure of the scale was retained in the present study and incorporated into the measurement model. Accordingly, the educational, instrumental, and social dimensions were used as indicators of the latent construct representing reasons for pursuing higher education. The Cronbach's alpha coefficient of the scale was calculated as .83 in the current study.

Academic Reputation Perception Scale

The Academic Reputation Perception Scale was developed by Apaydın and Seçkin Kapucu (2017). The scale is administered using a five-point Likert-type rating system and includes the dimensions of academic quality and institutional reputation. In the scale development study, construct validity was examined through exploratory and confirmatory factor analyses, and the two-factor structure was found to demonstrate acceptable fit. The confirmatory factor analysis results indicated the following fit indices: RMSEA = .076, NFI = .98, CFI = .98, GFI = .92, AGFI = .89, SRMR = .049, and RMR = .096. The development study also reported that approximately 60% of the total variance was explained by the scale. Based on the preliminary analyses conducted in the present study, the scale was evaluated using 17 items, and the Cronbach's alpha coefficient was calculated as .95. This value indicates a high level of internal consistency for the scale within the current sample. Academic Reputation Perception was represented in the measurement model by the two theoretically derived subdimensions of the original scale.

Perceived University Support Scale

The Perceived University Support Scale was originally developed by Wintre et al. (2009) and adapted into Turkish by Avcı and Doğan (2020). The scale consists of 21 items, and its original as well as Turkish-adapted versions employ a nine-point Likert-type response format. In the present study, however, a five-point Likert-type format was used to ensure consistency across all measurement instruments included in the survey and to facilitate participant responses. Higher scores obtained from the scale indicate that students perceive the university as a more supportive institution. Although classical CFA fit indices were not reported in the original study, the scale demonstrated satisfactory psychometric properties in the present sample. The Cronbach's alpha coefficient was calculated as .82, while the composite reliability (CR) and average variance extracted (AVE) values were .80 and .57, respectively.

Ethical Considerations

Ethical approval for this study was obtained from the Social and Human Sciences Research Ethics Committee of Fırat University (Approval Date: September 12, 2022; Approval Number: 10441/43). Participation in the study was entirely voluntary, and informed consent was obtained from all participants prior to data collection. Participants were informed about the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. The study was conducted in accordance with established ethical principles for research involving human participants.

Data Analysis

In this study, the data were obtained through self-report scales. It has been suggested that self-report data may be susceptible to common method bias (Podsakoff & Organ, 1986; Podsakoff et al., 2003). Therefore, Harman's single-factor test was conducted as an initial diagnostic procedure. The results indicated that a single factor accounted for less than 50% of the total variance. However, consistent with recent methodological recommendations, Harman's single-factor test alone is not sufficient to conclusively rule out common method bias. Therefore, although the findings do not indicate the presence of a dominant common factor, the possibility of common method bias cannot be completely excluded given the cross-sectional nature of the study and the use of self-report measures collected from a single source.

During the analysis process, the dataset was first examined for missing data and outliers, and observations that did not meet the analysis assumptions were removed from the dataset (Tabachnick & Fidell, 2013). The normality of the data distribution was evaluated through skewness and kurtosis values. According to the analysis results, the skewness values of the variables ranged between -0.807 and 0.450, while kurtosis values ranged between 0.046

and 1.604. Since these values fall within the acceptable limits recommended in the literature, the data were considered to demonstrate normal distribution (George & Mallery, 2010; Hair et al., 2022). In addition, Q-Q plots were examined, and the data were observed to conform to normal distribution assumptions (Field, 2013).

The multicollinearity problem was evaluated by examining correlations among variables, variance inflation factor (VIF), and tolerance values, and the results indicated that there was no multicollinearity issue among the variables. In the literature, VIF values below 10 and tolerance values above .10 are considered acceptable thresholds (Hair et al., 2022; Kline, 2016).
The reliability of the scales used in the study was evaluated using Cronbach's alpha coefficients, and all scales were found to demonstrate acceptable levels of reliability. Cronbach's alpha coefficients of .70 or higher indicate that scales are reliable (Nunnally & Bernstein, 1994). The structural validity of the scales was tested through confirmatory factor analysis (Brown, 2015; Kline, 2016).

Structural equation modeling (SEM) was employed to examine the relationships among the variables included in the research model. SEM is a powerful statistical technique that allows the testing of relationships among multiple variables within the same model (Kline, 2016; Hair et al., 2022). Within this scope, the measurement model was tested first, followed by the structural model analysis. The model examined the effects of perceived university support on leisure time management and academic reputation perception, as well as the effects of these variables on reasons for pursuing higher education. In addition, indirect effects among the variables were also evaluated.

To assess model fit, the fit indices χ^2/df, RMSEA, CFI, TLI, and SRMR were taken into consideration. The evaluation of these indices was based on threshold values recommended in the literature (Hu & Bentler, 1999; Kline, 2016; Hair et al., 2022). The construct validity of the scales used in the study was evaluated based on the validity findings reported in the related scale development and adaptation studies. In addition, to test the measurement structure within the current sample, a confirmatory factor analysis-based measurement model was examined using parcel indicators. Since some fit problems were observed at the item level in the initial analyses, the parceling approach recommended in the literature was adopted during the structural equation modeling process (Little et al., 2002). Accordingly, the variables were included in the model through subdimension/parcel indicators, and the structural model was subsequently tested.

Results

Descriptive Statistics, CR, AVE, and Correlation Analysis

Table 1. Demographic Characteristics of Participants (N = 406)

Variable	Category	n	%
Gender	Female	275	67.7
	Male	131	32.3
Educational Level	Associate Degree	214	52.7
	Bachelor's Degree	189	46.6
	Graduate Degree	3	0.7
Field of Study	Social Sciences	104	25.6
	Natural Sciences	70	17.2
	Health Sciences	203	50.0
	Sports Sciences	29	7.1
Residence Type	Student House	142	35.0
	Family Home	109	26.8
	State Dormitory (KYK)	134	33.0
	Private Dormitory	21	5.2

The demographic characteristics of the participants are presented in Table 1.

Table 2. Descriptive Statistics and Correlation Values of the Research Variables

Variables	*M*	*SD*	*CR*	*AVE*	1	2	3	4
1. Reasons for Pursuing Higher Education (RPHE)	3.80	0.75	.76	.52	1			
2. Leisure Time Management (LTM)	3.38	0.67	.72	.51	.297**	1		
3. Academic Reputation Perception (ARP)	3.23	0.91	.84	.78	.300**	.314**	1	
4. Perceived University Support and Structure (PUSS)	3.21	0.56	.80	.57	.066	.213**	.458**	1

Note: Since the Academic Reputation Perception variable was represented by a two-indicator structure, CR and AVE values were not additionally reported.

According to the analysis results, the mean scores of reasons for pursuing higher education (M = 3.80, SD = 0.75), leisure time management (M = 3.38, SD = 0.67), academic reputation perception (M = 3.23, SD = 0.91), and perceived university support (M = 3.21, SD = 0.56) were found to be above the moderate level.
The results of the correlation analysis indicated a positive and significant relationship between reasons for pursuing higher education and leisure time management ($r = .297$, $p < .01$). Similarly, a positive and significant relationship was found between reasons for pursuing higher education and academic reputation perception ($r = .300$, $p < .01$). In contrast, the relationship between reasons for pursuing higher education and perceived university support was found to be weak and non-significant ($r = .066$, $p > .05$).

While a positive and significant relationship was identified between leisure time management and academic reputation perception ($r = .314$, $p < .01$), perceived university support was also found to have significant and positive relationships with leisure time management ($r = .213$, $p < .01$) and academic reputation perception ($r = .458$, $p < .01$).

Model Testing

To examine the construct validity of the scales used in the study within the current sample, a confirmatory factor analysis-based measurement model was tested using parcel indicators. Since some fit problems were observed at the item level in the initial analyses, the parceling approach recommended in the literature was adopted (Little et al., 2002). Accordingly, the variables of perceived university support and structure (PUSS), leisure time management (LTM), academic reputation perception (ARP), and reasons for pursuing higher education (RPHE) were included in the model through subdimension/parcel indicators.

The fit indices of the measurement model were found to be $\chi^2 = 214.895$, $df = 39$, $\chi^2/df = 5.51$, CFI = .904, TLI = .865, RMSEA = .105, and SRMR = .084. These values indicate that the measurement model did not demonstrate optimal fit, particularly with respect to RMSEA and TLI. Therefore, the findings should be interpreted with caution. Nevertheless, because the hypothesized relationships were theoretically grounded and the parceling approach was employed to reduce model complexity, the structural model was retained for exploratory examination of the proposed relationships. Consistent with recommendations in the SEM literature, model fit was evaluated by considering multiple fit indices together rather than relying on a single criterion (Hu & Bentler, 1999; Hair et al., 2022; Kline, 2016). Future studies should re-examine the proposed model using item-level indicators and alternative measurement specifications to provide stronger evidence regarding the measurement structure.

As shown in Figure 1, perceived university support had positive and significant effects on leisure time management ($\beta = 0.270$, $p < .001$) and academic reputation perception ($\beta = 0.554$, $p < .001$). In addition, leisure time management ($\beta = 0.236$, $p < .01$) and academic reputation perception ($\beta = 0.349$, $p < .001$) were found to have significant effects on reasons for pursuing higher education.

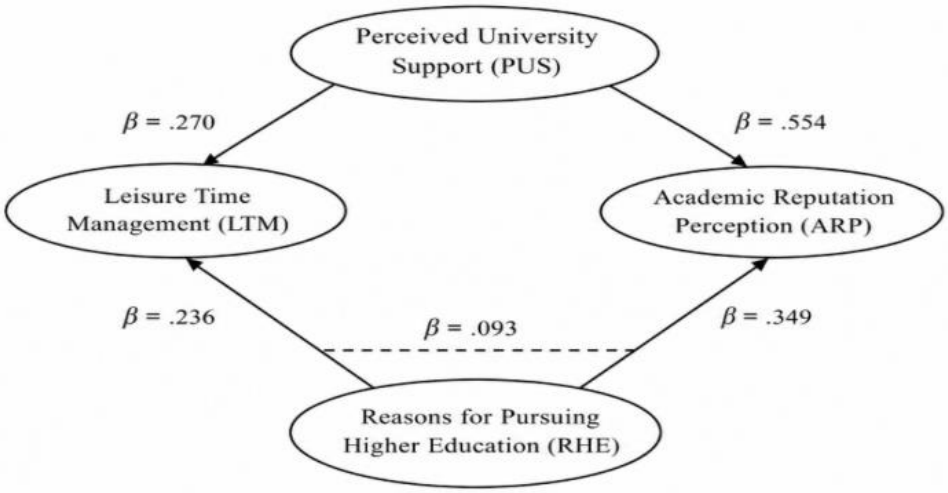

Figure 1. Research model and standardized path coefficients

The path coefficients related to the structural model are presented in Table 3.

Table 3. Structural Path Analysis Results of the Research Model

Path	β	SE	t	p
PUSS → LTM	.270	.057	4.733	<.001
PUSS → ARP	.554	.046	12.143	<.001
LTM → RPHE	.236	.063	3.769	<.001
ARP → RPHE	.349	.066	5.260	<.001
PUSS → RPHE	-.093	.073	-1.278	.201

When the structural model results were examined, perceived university support was found to have positive and significant effects on both leisure time management and academic reputation perception. The findings indicated that the effect of perceived university support on academic reputation perception was stronger ($\beta = .554$, $p < .001$), whereas its effect on leisure time management was at a moderate level ($\beta = .270$, $p < .001$). In addition, leisure time management and academic reputation perception were found to have significant and positive effects on reasons for pursuing higher education. In particular, academic reputation perception demonstrated a stronger effect on reasons for pursuing higher education ($\beta = .349$, $p < .001$).

However, the direct effect of perceived university support on reasons for pursuing higher education was not found to be statistically significant ($\beta = -.093$, $p > .05$). These findings indicate that the effect of perceived university support on reasons for pursuing higher education occurs indirectly through leisure time management and academic reputation perception, suggesting the existence of full mediation relationships within the model.

Mediation Analysis

Bootstrap analysis was conducted to examine the indirect effects of perceived university support on reasons for pursuing higher education. The findings obtained are presented in Table 4.

Table 4. Indirect Effects (Mediation Effects)

Path	β	SE	95% BCI Lower	95% BCI Upper
PUSS → LTM → RPHE	.064	.020	.015	.141
PUSS → ARP → RPHE	.193	.043	.108	.315
Total Indirect Effect	.257	.049	.170	.392

Note. Bootstrap confidence intervals were estimated using 5,000 bootstrap samples. Indirect effects were considered significant when the 95% bootstrap confidence interval did not include zero.

When the indirect effects were examined, the effect of perceived university support on reasons for pursuing higher education was found to be significant through leisure time management and academic reputation perception. The findings indicated that both mediation pathways were statistically significant. In particular, the indirect effect through academic reputation perception was found to be stronger ($\beta = .193$, $p < .001$). In contrast, the indirect effect occurring through leisure time management was determined to be relatively lower ($\beta = .064$, $p < .001$).

The significance of the total indirect effect demonstrates that the effect of perceived university support on reasons for pursuing higher education occurs largely through indirect pathways. These findings support the existence of full mediation relationships within the research model.

Discussion

This study examined the effect of perceived university support on students' reasons for pursuing higher education and evaluated the mediating roles of leisure time management and academic reputation perception in this relationship. The findings suggested that perceived university support was not directly associated with students' reasons for pursuing higher education; rather, the relationship appeared to operate through leisure time management and academic reputation perception. This finding indicates that the association between university support and students' motivational processes may occur through students' behavioral and perceptual processes rather than through a direct pathway.

The literature frequently emphasizes that institutional support is positively associated with student motivation and satisfaction (Amado et al., 2024). However, the present findings demonstrate that this relationship is shaped through indirect mechanisms rather than a direct structure. Students do not transform the support they receive from the university directly into motivation; instead, this support becomes meaningful insofar as it enhances their time management skills and positively shapes their perceptions of the university. In this respect, the findings suggest that the effects of support mechanisms in higher education are more complex and multilayered.

One of the important findings of the study is that perceived university support has a significant and positive effect on students' leisure time management skills. This result indicates that the academic, social, and cultural support provided by universities contributes to students' ability to use their time in a more planned and efficient manner. This finding is also consistent with studies emphasizing the determining role of the university environment in students' academic and social adjustment processes (Schneider & Preckel, 2017).

Similarly, the significant and positive effect of perceived university support on academic reputation perception indicates that students' evaluations of their universities are largely influenced by the support processes they experience. It may be argued that the academic and administrative support provided by universities strengthens students' feelings of trust and belonging, which in turn positively shapes their perceptions of the university's academic reputation (Nguyen & LeBlanc, 2001; Patriche et al., 2025).

The findings of the study also demonstrated that one of the variables influencing reasons for pursuing higher education is leisure time management. Students who are able to use their time in a planned and effective manner appear to develop more conscious and goal-oriented motivations toward higher education (Yuwono & Mastuti, 2025). This finding is consistent with studies emphasizing the role of time management and self-regulation skills in students' academic engagement and motivational processes (Kuykendall et al., 2015; Lepp et al., 2014).

Furthermore, the stronger effect of academic reputation perception on reasons for pursuing higher education indicates that perceptions regarding the university's academic strength and prestige play a determining role in students' motivational processes. When students perceive the university as a reputable and high-quality institution, they tend to attribute greater meaning to their educational experiences and develop stronger motivations toward higher education (Amado et al., 2024; Patriche et al., 2025). This finding is in line with studies emphasizing the influence of university reputation on students' preferences and institutional commitment processes (Brewer & Zhao, 2010; Nguyen & LeBlanc, 2001).

One of the most important contributions of the study emerges from the mediation findings. The results revealed that the relationship between perceived university support and reasons for pursuing higher education occurs entirely through leisure time management and academic reputation perception. The non-significant direct effect and significant indirect effects indicate the existence of a full mediation structure within the model. This finding suggests that university support affects students not by directly generating motivation, but rather by enhancing students' behavioral regulation skills and shaping their perceptions of the university.

These findings provide a meaningful explanation when evaluated within the framework of Social Exchange Theory (Blau, 1964; Cropanzano & Mitchell, 2005). According to Social Exchange Theory, individuals reshape their attitudes and behaviors in response to the support and resources provided to them. In this context, when students perceive themselves as being supported by the university, this support does not directly transform into motivation; instead, it indirectly influences students through internal processes such as time management and institutional perceptions. This finding demonstrates that the principle of reciprocity operates not directly, but through indirect mechanisms.

Practical Implications

The findings of this study reveal several important practical implications for higher education institutions. The results indicate that university support influences students' reasons for pursuing higher education not directly, but indirectly through processes such as leisure time management and academic reputation perception. This finding suggests that the support services provided by universities should not be limited solely to academic areas; rather, they should also be designed to support students' personal development and their perceptions of the university.
Within this scope, making academic advising services more functional, increasing training programs aimed at improving students' time management and self-regulation skills, and expanding practices that encourage participation in social and cultural activities may be beneficial. In particular, practices that support students' active participation in university life may positively influence their motivation toward higher education.

One of the noteworthy findings of the study is the effect of academic reputation perception on students' reasons for pursuing higher education. The findings suggest that when students perceive their university as an academically strong, reliable, and reputable institution, the meaning they attribute to higher education and their motivation become stronger. Therefore, it is important for universities not only to focus on academic achievement but also to create a campus environment that enhances student satisfaction, strengthens the sense of belonging, and supports student–university interaction.

Overall, this study demonstrates that the effect of support provided to students in higher education is shaped not directly, but through students' behavioral and perceptual processes. Accordingly, it may be argued that universities should adopt a more holistic approach when planning student support policies by addressing academic, social, and psychological dimensions together.

Theoretical Implications

This study makes an important contribution to the literature by revealing that the effect of perceived university support on students' reasons for pursuing higher education occurs not directly, but through behavioral and perceptual processes such as leisure time management and academic reputation perception. This finding provides an alternative to the direct-effect approaches frequently assumed in the higher education literature by demonstrating that support mechanisms operate through indirect processes.

In this respect, the study addresses the university–student relationship from a more process-oriented perspective within the framework of Social Exchange Theory and contributes theoretically to the literature.

Limitations

Although this study has several strengths, it also includes certain limitations. First, since the data were collected through self-report scales, participants' responses may have been influenced by subjective evaluations and social desirability tendencies. Although common method bias was tested during the analysis process and found to be at a low level, it is not possible to completely eliminate biases that may arise from such data collection methods.

Another limitation of the study is that the Perceived University Support Scale was administered using a five-point response format rather than the original nine-point format. Although this modification was made to ensure consistency across the measurement instruments included in the survey and the scale demonstrated acceptable psychometric properties in the present sample, the potential influence of this adaptation on participants' response patterns cannot be entirely ruled out.

Another limitation of the study is that the data were collected from a single university. This situation limits the generalizability of the findings. Future studies conducted at different universities and within different socio-cultural contexts may contribute to evaluating the findings within a broader framework.

In addition, the study employed a cross-sectional design. Therefore, although relationships among the variables were identified, causal inferences remain limited. Future longitudinal studies may provide stronger evidence by examining changes in the relationships among variables over time.

The variables included in the study were selected within the framework of a specific theoretical perspective and do not encompass all factors that may influence student motivation. In particular, the exclusion of variables such as academic engagement, psychological well-being, student experience, and perceived value may be considered an important limitation.

Finally, another important limitation of the study concerns the measurement model. Although the parceling approach was employed to reduce model complexity and obtain a more parsimonious representation of the latent constructs, the measurement model did not fully satisfy all recommended fit criteria, particularly with respect to RMSEA and TLI values. Therefore, the findings should be interpreted with appropriate caution, especially when evaluating the mediation relationships identified in the study. Future studies are encouraged to re-examine the proposed model using item-level confirmatory factor analyses and alternative measurement specifications to provide stronger evidence regarding the robustness and stability of the findings. Furthermore, the measurement model demonstrated less-than-optimal fit indices (RMSEA = .105; TLI = .865). Although the model was retained based on theoretical considerations and parcel indicators, these results suggest that the measurement structure should be interpreted cautiously and re-evaluated in future studies using item-level analyses.

Recommendations

Based on the findings of the study, several recommendations can be proposed for both practitioners and researchers. From a practical perspective, the findings suggest that merely increasing the academic and social support services offered to students may not be sufficient. It is also important to consider how these supports are perceived by students and how they are reflected in students' behavioral and perceptual processes. Accordingly, universities should structure support services in ways that are more visible, accessible, and integrated into students' daily lives.

The findings also indicate that academic reputation perception has a strong effect on students' reasons for pursuing higher education. Therefore, universities should focus on strategies aimed at improving educational quality, supporting academic productivity, and increasing the visibility of institutional achievements. Strengthening institutional reputation may positively influence students' perceptions of the university and their motivations.
Furthermore, the finding that leisure time management is a significant predictor highlights the importance of practices aimed at improving students' time management and self-regulation skills. In this regard, training programs and guidance services organized by universities may contribute to students' academic and personal development.

From the perspective of researchers, future studies are recommended to examine the relationship between perceived university support and student motivation through different mediating variables. In particular, including variables such as academic engagement, psychological well-being, and student experience in future models may contribute to a more comprehensive explanation of these relationships. Additionally, studies conducted with longitudinal designs and different samples may enhance the generalizability of the findings.

Conclusion

In this study, the relationships among perceived university support, leisure time management, academic reputation perception, and reasons for pursuing higher education were examined through structural equation modeling. The findings suggested that perceived university support was indirectly associated with reasons for pursuing higher education through leisure time management and academic reputation perception.. This finding indicates that the effect of university support on students' motivation is shaped not directly, but rather through behavioral and perceptual processes.

The results of the study demonstrate that the academic and social support provided by universities alone is insufficient to increase students' motivation toward higher education. The effectiveness of such support is closely related to how students perceive these supports and how they reflect these processes in their own behaviors. In this

context, university support enables students to use their time in a more planned and efficient manner while also positively shaping their perceptions regarding the academic quality of the university. These processes, in turn, indirectly strengthen students' reasons for pursuing higher education.

The findings also indicate that academic reputation perception has a stronger effect on reasons for pursuing higher education. This result demonstrates that institutional prestige, academic quality, and educational opportunities play a determining role in students' evaluations of universities. Perceiving the university as an academically strong and reputable institution contributes to students' attributing greater meaning to their educational experiences and strengthens their motivation toward higher education. In this respect, academic reputation emerges as one of the fundamental factors shaping students' higher education preferences and the meaning they attribute to this process. On the other hand, the significant effect of leisure time management indicates that students' ability to plan and manage their time effectively is important in terms of motivational processes. Students who can manage their time effectively appear to establish a balance between academic and social life, which in turn strengthens their goal-oriented behaviors and reasons for pursuing higher education. This finding suggests that not only academic competencies but also individual life skills play a determining role in higher education processes.

Overall, this study clearly demonstrates that the effect of university support on students occurs through indirect mechanisms rather than direct pathways. This result suggests that higher education research should move beyond the direct-effect approach frequently assumed in the literature and recognize that student motivation is shaped through more complex processes. In this respect, the study contributes to the literature from a more holistic perspective by examining the effect of perceived university support not only through an outcome variable but also through students' behavioral and perceptual processes.

Ethical Approval

Ethical approval (Date and approval number: 12.09.2022, 10441/43) was obtained from the Fırat University Social and Human Sciences Research Ethics Committee for this research.

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Measuring Innovation Management in Educational Organizations: Development and Validation of a Multidimensional Scale

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Abstract

This research constructs and evaluates a multidimensional scale for assessing innovation management inside educational institutions. A five-dimensional construct is proposed, informed by innovation management, organizational theory, and higher education research, encompassing strategic innovation planning, innovation process and project management, human and knowledge capabilities, external networks and partnerships, and digital, data, and governance capabilities. A quantitative scale creation process was utilized, incorporating a multi-phase design that encompassed item generation, expert validation, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) with independent samples. The findings exhibit robust psychometric characteristics. The Exploratory Factor Analysis (EFA) validated a distinct five-factor structure, whilst the Confirmatory Factor Analysis (CFA) demonstrated a satisfactory model fit (CFI = .956, RMSEA = .054, SRMR = .041). All constructs demonstrated good reliability (CR ≥ .89) and convergent validity (AVE ≥ .55). Discriminant validity was affirmed by the Fornell–Larcker criterion and HTMT ratios (less than .85). A second-order confirmatory factor analysis further validated that the five dimensions significantly contribute to a higher-order innovation management construct (loadings = .78–.91). The results offer strong empirical support for a validated measurement tool relevant to research, institutional leadership, and policy assessment. The scale enhances the philosophy of innovation management in education and facilitates data-driven transformation inside higher education systems.

Keywords: Innovation management; Educational organizations; Psychometric validation; Scale development; Higher education; SEM

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Introduction

Higher education is now in a digital era, characterised by the arrival of digital transformation, the use of artificial intelligence (AI) and a new and ever-changing global competitive landscape, as well as the expectations of students, parents, and other stakeholders, which have evolved (OECD, 2023; UNESCO, 2023). In the context of global education industry, innovation management has implications for institutional sustainability, academic competitiveness, operation efficiency and institutional legitimacy in the long term (Cai & Mehari, 2021). The technology disruption, demographic change, international rankings, and the demand for flexible and digitally integrated learning methods and spaces are all areas that universities must adjust to.

Educational organisational transformation has been faster than usual, thanks to the use of artificial intelligence, learning analytics, digital platforms and data-driven governance (Selwyn, 2022). Agencies of education have begun to facilitate each other, the platforms have emerged, smart administration has been introduced and cross-border academic cooperation is helping universities compete and gain global awareness (Marginson, 2018). Complementing teaching and curriculum design, it is essential that educational organizations innovate governance and leadership, the involvement of stakeholders, research ecosystems and digital management processes (Fullan, 2020). Thus, innovation management is becoming a major issue that education administrators are concerned with. Although innovation is becoming increasingly important in education, measurement and evaluation of educational organizations' innovation are limited and conceptually disorganized. The innovation practices in many organizations are project-driven, small-scale, and lack organizational practices and processes (Tidd & Bessant, 2021). There are a number of differences between educational institutions and firms in terms of governance structure, degree of professional autonomy, public responsibility, and the number of institutions involved in a "stakeholder structure" which make it difficult to simply transfer industrial innovation models and frameworks to the education sector (Mintzberg, 2009). So there is a need for context-specific and theoretically grounded frameworks of innovation measuring in Education institutions.

There are several studies that have investigated various innovation-related factors such as technology adoption, organizational change, digital transformation and research productivity but few have yielded multidimensional scales, which are psychometrically validated to measure innovation management in educational organizations. Existing studies are limited in their conceptual accuracy, contextual relevance, and empirical applicability by only using proxy rather than full latent constructs (Salerno et al., 2015). Most models of early innovation measurement were devised for corporate or industrial context and were productivity, market competitiveness and technology based.

Educational institutions are different from business organizations in terms of governance systems, mission of institutions, complexity of its stakeholders, academic autonomy and public accountability (Mintzberg, 2009; Cai and Mehari, 2021). Innovation in schools and universities can be observed in the reform of school curricula, pedagogical innovations, collaborative governance, research ecosystems, ethical digital practices, and student-centred development. The ease of implementation of corporate innovation frameworks is insufficient conceptually because of the bureaucracies, shared governance and the resistance of organizations in academic institutions (Fullan, 2020).

As a result, the focus on strategic leadership, collaborative networks, governance systems, and digital ethics, which are more relevant to educational administration, were not considered by many of the older assessment practices. The timely development of a theoretically and contextually oriented scale to measure the innovation capability of educational institutions and their transformation is required to more accurately and comprehensively evaluate their innovation capacity and organizational changes in higher education.

To address these shortcomings, this study develops and tests a multidimensional scale of Innovation Management for Educational Enterprises. Strategic innovation, process and operational innovation, human and organizational capability, collaborative network management and digital governance are included in the concept. Reliable and valid Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are employed to determine the construct validity, reliability and structural adequacy of the proposed measurement model.

The methodological transparency was ensured by the application of psychometric criteria to purify and reject items in the EFA, namely low factor loadings (<.50), cross-loadings across multiple factors and poor communalities. Tidy up models and get construct clarity by systematically discarding non-statistical and non-theoretical items. It made sure that the final scale contained only conceptually relevant and empirically valid indicators.

This study is valuable to the literature because it presents a validated and education-specific instrument of measuring the innovation management, which combines four aspects of governance: strategic, process, human, and network, all into a single instrument. The findings present theoretical contribution to educational innovation research and practical implications for assessment of institutions as well as for strategic planning and educational management based on innovation.

Research objective
This research undertaking seeks to formulate and establish a multi-dimensional scale that would measure the innovation management of educational institutions using a rigorous exploratory and confirmatory factor analysis to ensure that this scale forms a credible tool in research, leadership and policy evaluation.

Literature reviews

This research undertaking seeks to formulate and establish a multi-dimensional scale that would measure the innovation management of educational institutions using a rigorous exploratory and confirmatory factor analysis to ensure that this scale forms a credible tool in research, leadership and policy evaluation.

Literature reviews

Strategic Innovation Planning
Strategic innovation planning helps organizations set an innovation agenda, synchronize innovation efforts with institutional goals, and sustain the organization in the long run. The literature on innovation management shows that strategic direction impacts on the ability of the organization to adapt, on innovation governance, on the allocation of resources, and on the decision-making process (Crossan & Apaydin, 2010; OECD, 2023). Good innovation strategies support the shift from creative ideas to measurable institutional results by establishing governance, implementation and evaluation cycles.

Educational institutions face special challenges with strategic innovation planning, as academic governance, public accountability, and stakeholder expectations are intertwined. While corporate organisations are mainly focused on competitiveness and profitability, schools and universities can be seen to have wider objectives associated with knowledge generation, societal development, research progress and educational quality (Cai and Mehari, 2021). In the field of education, therefore, an innovation plan should address the flexibility of the institution, the values of the academic community, the involvement of stakeholders and the ethical management of innovation.

More recent research also shows that higher education institutions are increasingly seeking new adaptive and entrepreneurial governance models to meet the demands of digital transformation, global competition and technological disruption (Deem et al., 2020; Selwyn, 2022). Strategic innovation planning, therefore, becomes an important contributor in boosting institutional resilience, the development of digital competence, collaborative partnerships and responsible innovation management in today's education systems.

Innovation and Project Management
Innovation process and project management describe the implementation of ideas in companies. Traditional innovation management systems focus on systematic procedures to assess opportunities, choose initiatives, deal with uncertainty, and provide implementation and learning (Tidd and Bessant, 2018). Process-oriented approaches emphasize stage-by-stage growth, portfolio management, and disciplined implementation, particularly in complex organizations with conflicting projects over resources (Cooper, 2021; PMI, 2021). Using systematic innovation processes will minimise waste, enhance coordination, and likelihood of outcomes because they define decision points, roles, and performance requirement (Cooper, 2021; Crossan and Apaydin, 2010).

The innovation of educational institutions is carried out in the form of curricular reform, pedagogical change, commercialization of research, service innovation and administrative reengineering. Project governance and procedural clarity are required to organize these efforts by academic leaders, professors, professional staff, and external stakeholders. Innovation in education involves high levels of autonomy and contentious change, which demand professional work, and the management of projects through organization balances the involvement, transparency, and responsibility (Mintzberg, 2009; Deem et al., 2020). Process management is very essential as educational digital transformation requires repetitive testing, assessment, and scaling of units (Selwyn, 2022). Therefore, an educational innovation management scale must measure not just the existence of projects, but also processes of repeatable selection, monitoring, evaluation, and continuous improvement.

Manage Human Capital and Knowledge

Innovation is a people, knowledge and organization-based process, therefore human capital and knowledge management are important enablers of innovation in educational organizations. Previous studies highlight that knowledge sharing, professional development, collaborative culture, and continuous learning processes are vital to the enhancement of innovation capability (Nonaka & Takeuchi, 1995; Fullan, 2020). Academic knowledge, intellectual cooperation, and knowledge sharing are crucial to the innovation of academic programs, development of academic research, and improvement of educational institutions.

However, the innovation environment of educational organizations must be focused on academic autonomy, psychological protection, creative and professional trust (Deem et al., 2020), which is different from the corporate organizations, which tend to focus on operational efficiency and performance on the market. Good human capital management entails leadership support, staff capacity building, incentive systems, and mechanisms to promote experimentation and inter-disciplinary cooperation. Additionally, the continuous complexity of digital transformation and the integration of AI in education demands that practices be constantly improved and that the knowledge management landscape must be advanced in order to enable sustainable innovation and organizational adaptability (Selwyn, 2022).

Networked Innovation, External Collaboration

The innovation is being pushed beyond organizations by partners, alliances, and ecosystems via networked innovation and external cooperation. The proponents of open innovation theory believe that knowledge inflows and outflows, partnering, and co-developing solutions across boundaries are to be used to enhance innovation outcomes (Chesbrough, 2003). Network analysis indicates that inter-organizational relationships offer specific expertise, resources and complementary resources to creativity (Powell et al., 1996). Collaboration speeds learning, decreases uncertainty, and promotes experimentation in multi-actor breakthroughs like technology adoption and service redesign (Inkpen & Tsang, 2005).

Outside partnership enhances research in education, relevance of the curriculum, job performance, and social participation. The Triple Helix proposes that universities affect knowledge production, commercialization, and social innovation via interaction with industry and government (Mascarenhas et al., 2021; Etzkowitz and Leydesdorff, 2000). Partnerships with business, government, schools and overseas organizations enhance experiential learning, research, funds, and policy impact. The governance issues in collaboration involve protection of intellectual property, alignment of objectives, fairness and trust between organisations (Inkpen & Tsang, 2005). Therefore, the education innovation management is to evaluate the capacity of the institution to identify partners, coordinate collaboration, develop agreements, organize collaborative processes, and transform the outside participation into the inside learning and enhancement.

Data, Governance, and Digital Infrastructure

Modern innovation is facilitated by digital infrastructure, data and governance through platforms, analytics, cybersecurity, and responsible decision-making. Information systems research indicates that digital capability pertains to governance structures that tie IT investments to organisational objectives, define decision-making authorities and risk management (Weill and Ross, 2004). Businesses require laws to guarantee the quality of data, ownership, access, privacy and ethical use since data is needed to aid innovation and performance assessment (Khatri and Brown, 2010). The new digital infrastructure can enable modern organisations to experiment, customise services, and employ evidence-based management quickly (OECD, 2023).

Learning technologies, student information systems, research data platforms, AI-enabled services, and administrative automation are becoming connected to digital infrastructure and governance in educational institutions. Without governance, data quality, or ethical controls, technology-driven change may fail to offer fairness, privacy, security, and trust challenges (OECD, 2023; Selwyn, 2022). Management of higher education innovation necessitates online readiness (trustworthy systems, interoperability, user friendliness), knowledge-based decision-making processes, and administrative frameworks that promote transparency, responsibility, and accountable innovation (Janssen et al., 2020). They include privacy, ethical use of AI, cybersecurity and institutional oversight of digital transformation programs (Khatri and Brown, 2010; Weill and Ross, 2004).

Validated scales should assess innovation management capabilities such technology availability, governance maturity, data quality management, and ethical safeguards (OECD, 2023).

Table 1. Summary of Domains of Innovation Management in Educational Organizations

Domain	Sub-domains	Definition (Operational)	Theory Bases	Key Criteria / Indicators	Citations
M1 Strategic Innovation Planning	Strategy & Direction; Portfolio & Resource Allocation; Governance & Oversight; Stakeholder Value & Alignment	The organization's capability to formulate, align, govern, and evaluate innovation strategies that support institutional mission, stakeholder needs, and long-term competitiveness.	Innovation Strategy Theory; Dynamic Capabilities Theory; Strategic Management Theory	Clear innovation vision; strategic alignment; prioritized innovation portfolio; governance structures; stakeholder value assessment	Tidd & Bessant (2018); Mintzberg (2009); Crossan & Apaydin (2010); OECD (2023)
M2 Innovation Process & Project Management	Idea Management; Project Execution; Evaluation & Scaling; Implementation Support System	The capability to manage innovation as a structured, repeatable process from idea generation to implementation, evaluation, and sustainable scaling.	Process Innovation Theory; Project Management Theory; Organizational Learning Theory	Idea capture systems; disciplined project execution; risk management; post-implementation review; scaling and support mechanisms	Tidd & Bessant (2018); PMI (2021); Cooper (2019); Hall & Hord (2014)
M3 People & Knowledge Capability	Innovation Skills; Knowledge Management; Culture & Psychological Safety; Incentives & Capability Systems	The organization's capacity to develop human capital, manage organizational knowledge, and foster a learning culture that supports creativity, experimentation, and innovation sustainability.	Knowledge-Based View of the Firm; Human Capital Theory; Organizational Learning Theory	Innovation skill development; knowledge sharing systems; psychological safety; incentive and capability-building mechanisms	Nonaka & Takeuchi (1995); Amabile (1996); Grant (1996); Edmondson (1999)
M4 External Networks & Partnerships	Collaboration; Co-creation & Joint Projects; Partnership Governance; Boundary-Spanning Capability	The capability to engage, govern, and leverage external partnerships and networks to co-create innovation and enhance organizational impact.	Open Innovation Theory; Triple Helix Model; Network Theory	External collaboration; joint innovation projects; partnership governance; boundary-spanning roles; network utilization	Chesbrough (2003); Etzkowitz & Leydesdorff (2000); Knight (2012); OECD (2023)
M5 Digital, Data & Governance Capability	Digital Infrastructure; Data Governance & Privacy; Ethical Technology / AI Use; Compliance & Accountability	The organization's ability to deploy digital infrastructure and data governance systems that enable innovation while ensuring ethical use, privacy protection, and accountability.	Digital Governance Theory; Information Systems Governance; Responsible Innovation Theory	Robust digital systems; data governance and privacy controls; ethical AI practices; compliance and accountability mechanisms	Weill & Ross (2004); Khatri & Brown (2010); UNESCO (2021); Selwyn (2019); OECD (2023)

As shown in Table 1, innovation management in educational organizations involves five interrelated domains: strategic innovation planning, innovation process and project management, people and knowledge capability, external networks and partnerships, and digital, data, and governance capability. Each innovation management area has four subdomains that cover strategic, procedural, human, relational, and technological factors. These domains and sub-domains provide a comprehensive framework for designing measurement questions and verifying innovation management concept validity through exploratory and confirmatory factor analyses.

Table 2. Summary of Domains and Sub-domains of Innovation Management in Educational Organizations

Domain	Sub-domain	Definition (Operational)	Key Criteria / Indicators	Citations
M1 Strategic Innovation Planning	M1.1 Strategy & Direction	The organization's capability to articulate a clear innovation vision and align innovation goals with institutional mission and long-term strategy.	Clear innovation vision; alignment with mission; communicated strategy; periodic strategic review.	Tidd & Bessant (2018); Crossan & Apaydin (2010); OECD (2023)
	M1.2 Portfolio & Resource Allocation	The ability to prioritize, fund, and balance innovation initiatives through systematic allocation of financial, human, and organizational resources.	Adequate budgets; transparent selection criteria; balanced risk–return portfolio; monitoring of resource use.	Tidd & Bessant (2018); Cooper (2019); OECD (2023)
	M1.3 Governance & Oversight	Structures and processes that guide, monitor, and ensure accountability of innovation initiatives across the organization.	Dedicated committees; executive oversight; defined project ownership; transparent reporting.	PMI (2021); Mintzberg (2009); OECD (2023)
	M1.4 Stakeholder Value & Alignment	The extent to which innovation initiatives address stakeholder needs and generate measurable educational and organizational value.	User feedback; co-design; service quality improvement; systematic value evaluation.	Crossan & Apaydin (2010); OECD (2023); Freeman (1984)
M2 Innovation Process & Project Management	M2.1 Idea Management	Mechanisms that enable systematic collection, screening, and development of ideas from internal and external sources.	Idea channels; fair selection; prototyping; feedback loops; tracking systems.	Tidd & Bessant (2018); Edmondson (1999); OECD (2023)
	M2.2 Project Execution	The capability to plan, implement, monitor, and control innovation projects effectively.	Clear plans; milestones; risk management; efficient resource use; goal achievement.	PMI (2021); Cooper (2019)
	M2.3 Evaluation & Scaling	Processes for assessing innovation outcomes and scaling successful initiatives based on evidence.	Post-implementation review; learning from results; scale-up decisions; sustainability tracking.	Hall & Hord (2014); OECD (2023)
	M2.4 Implementation Support System	Organizational support mechanisms that enable consistent and high-fidelity implementation of innovations.	Training; coaching; manuals; help channels; fidelity monitoring.	Hall & Hord (2014); Fullan (2016)
M3 People & Knowledge Capability	M3.1 Innovation Skills	The organization's capacity to develop staff competencies necessary for innovation and problem solving.	Skill development; cross-functional work; time/resources for innovation; incentives.	Amabile (1996); Mumford (2007); Tidd & Bessant (2018)
	M3.2 Knowledge Management	Systems and practices that capture, share, and apply organizational knowledge to support innovation.	Knowledge repositories; communities of practice; tacit-to-explicit conversion; efficiency gains.	Nonaka & Takeuchi (1995); Grant (1996)
	M3.3 Culture & Psychological Safety	A climate that encourages learning, experimentation, and open expression of ideas without fear.	Psychological safety; learning from failure; leadership reflection; collaborative support.	Edmondson (1999); Fullan (2016)
	M3.4 Incentives & Capability Systems	HR and organizational systems that sustain innovation through evaluation, recognition, and career pathways.	Innovation-aligned appraisal; innovation champions; resource support; sustainability mechanisms.	Amabile (1996); OECD (2023); Tidd & Bessant (2018)

Domain	Sub-domain	Definition (Operational)	Key Criteria / Indicators	Citations
M4 External Networks & Partnerships	M4.1 Collaboration	Engagement with external actors to jointly develop and deliver innovations.	Access to expertise; co-delivery; quality enhancement; evaluation of partnerships.	Etzkowitz & Leydesdorff (2000); Knight (2012); OECD (2023)
	M4.2 Co-creation & Joint Projects	Collaborative innovation through shared design, implementation, and outcomes with partners.	Joint projects; clear roles; knowledge exchange; reputational impact; continuity.	Etzkowitz & Leydesdorff (2000); Chesbrough (2003)
	M4.3 Partnership Governance	Formal and informal rules that regulate collaboration, IP, data sharing, and accountability.	MOUs/MOAs; IP policies; secure data sharing; transparency; auditability.	OECD (2023); UNESCO (2021); Inkpen & Tsang (2005)
	M4.4 Boundary-Spanning Capability	The ability to connect internal and external networks to accelerate innovation.	Boundary spanners; opportunity access; systematic communication; expectation management.	Knight (2012); Yukl (2013); OECD (2023)
M5 Digital, Data & Governance Capability	M5.1 Digital Infrastructure	Digital systems and platforms that enable innovation, collaboration, and decision-making.	Robust IT systems; analytics; dashboards; data standards; interoperability.	Williamson (2017); Weill & Ross (2004); OECD (2023)
	M5.2 Data Governance & Privacy	Policies and structures ensuring responsible, secure, and transparent data use.	Privacy protection; role-based access; data audits; security risk management.	Khatri & Brown (2010); UNESCO (2021); OECD (2023)
	M5.3 Ethical Technology / AI Use	Ethical oversight of advanced technologies to ensure fairness, transparency, and human control.	Ethical AI guidelines; bias mitigation; transparency; human oversight; impact assessment.	UNESCO (2021); Selwyn (2019)
	M5.4 Compliance & Accountability	Mechanisms that ensure adherence to digital policies and enhance organizational trust.	Compliance audits; accountability indicators; reporting systems; policy updating.	OECD (2023); Weill & Ross (2004)

Table 2 lists educational innovation management's domains, subdomains, operational definitions, and key metrics. The table lists strategy orientation, process execution, human and knowledge capabilities, external collaboration, and digital governance as innovation management. Translating conceptual dimensions into observable indicators improves content validity, instrument development, and empirical testing through exploratory and confirmatory factor analyses.

Strategic direction, organisational procedures, human capital, external collaboration, and digital governance comprise innovation management (OECD, 2023; Tidd & Bessant, 2018). Strategic innovation planning guides resource allocation and organisational priorities based on institutional and environmental goals (Crossan & Apaydin, 2010). From ideation to implementation and scalability, process and project management emphasise structured innovation pipelines (Cooper, 2019).Learning, psychological safety, and knowledge integration support creativity within human and knowledge capabilities (Nonaka & Takeuchi, 1995; Edmondson, 1999). Network-based viewpoints emphasise open innovation ecosystems and external cooperation (Chesbrough, 2003; Etzkowitz & Leydesdorff, 2000).

Finally, digital and data governance competencies are crucial for data-driven decision-making and ethical usage of emerging technologies (OECD, 2023; UNESCO, 2021).

However, empirical integration of these aspects into a validated measuring paradigm is restricted, especially in education. This work develops a thorough, factor-validated scale to fill this gap.

Method

This research utilized a quantitative scale development methodology through a multi-phase design. Measurement items were derived from existing literature and validated by specialists. Data were gathered from administrators and academic leaders in Doctoral programs in Educational Administration at higher education institutions through standardized questionnaires.

A two-sample methodology was employed to improve methodological rigor. The first sample (n = 111) was used in Exploratory Factor Analysis (EFA), and the second sample (n =302) was used in Confirmatory Factor Analysis (CFA) as per the accepted guidelines (Hair et al., 2019; Kline, 2016).

Exploratory Factor Analysis (EFA) was done using primary axis factoring with oblique rotation. The Confirmatory Factor Analysis was done through maximum likelihood estimate in AMOS. The scores on reliability and validity were checked using the Cronbachs alpha, composite reliability (CR), average variance extracted (AVE), and HTMT ratios.

Results

Respondent Profile

Table 3. Demographic Profile of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	68	61.3%
	Female	43	38.7%
Age	35–44 years	21	18.9%
	45–54 years	49	44.1%
	55 years and above	41	36.9%
Academic Rank	Lecturer	32	28.8%
	Assistant Professor	41	36.9%
	Associate Professor	27	24.3%
	Professor	11	9.9%
Years of Leadership Experience	1–5 years	26	23.4%
	6–10 years	48	43.2%
	More than 10 years	37	33.3%
Type of Institution	Public University	72	64.9%
	Autonomous University	23	20.7%
	Private University	16	14.4%

The sample included 111 Thai educational management PhD program heads. The bulk of respondents (44.1%) were 45–54 years old, indicating mature and experienced leadership. The majority of participants were assistant professors (36.9%), followed by lecturers (28.8%), associate professors (24.3%), and professors (9.9%). A majority of the respondents (more than 76 percent) had more than six years of management experience in leadership, implying greater expertise in higher education innovation management. The majority were connected to state institutions (64.9%), which implies that there have been well-established governance and policy-driven processes of innovation.

Measurement Model Assessment and EFA

The measurement model was found to fit well in the first-order and the second-order CFA models. Each factor loading was significant ($p < .001$) and more than recommended values. Reliability and convergent validity were confirmed ($CR \geq .89$; $AVE \geq .55$). FornellLarcker and HTMT criteria were used to support the use of discriminant validity. The fifth-order CFA endorsed that the five constructs are a higher-order construct of innovation management.

Table 4. Measurement Scale for Innovation Management in Educational Organizations

Sub-domain	Code	Item	M	SD	@	T
Domain M1: Strategic Innovation Planning						
M1.1 Strategy & Direction	IM1_1	The organization has a distinct innovation vision and approach.	4.21	0.62	.81	12.45

	IM1_2	Innovation objectives are consistent with the organization's mission and strategy.	4.18	0.65	.83	13.02
	IM1_3	Innovation projects are deliberately prioritized.	4.05	0.71	.78	11.87
	IM1_4	The innovation approach is well communicated and widely understood.	4.12	0.68	.80	12.66
	IM1_5	The innovation plan is revised on a frequent basis to reflect new data and contextual changes.	4.09	0.70	.79	12.21
M1.2 Portfolio & Resource Allocation	IM1_6	Adequate funding and staff are dedicated to innovative efforts.	4.02	0.73	.77	11.54
	IM1_7	Transparent criteria are utilized to choose innovative projects.	4.08	0.69	.80	12.33
	IM1_8	Innovation portfolios are managed to strike a balance between risk and reward.	4.11	0.67	.82	12.91
	IM1_9	Resource allocation is in line with strategic innovation objectives.	4.06	0.70	.79	12.12
	IM1_10	Resource consumption in innovation projects is systematically tracked.	3.98	0.75	.75	10.98
M1.3 Governance & Oversight	IM1_11	Formal structures or committees manage innovative activity.	4.10	0.68	.81	12.70
	IM1_12	Top management uses specific indicators to track project success.	4.07	0.70	.79	12.20
	IM1_13	Innovation governance ensures the continuity of innovation efforts.	4.12	0.66	.82	12.88
	IM1_14	The roles and duties of project owners are clearly defined.	4.05	0.71	.78	11.95
	IM1_15	Stakeholders receive transparent reporting on innovation outcomes.	4.00	0.74	.76	11.10
M1.4 Stakeholder Value & Alignment	IM1_16	Innovation projects cater to the demands of learners and stakeholders.	4.15	0.65	.83	13.05
	IM1_17	Prior to development, users or stakeholders provide comments.	4.09	0.69	.80	12.45
	IM1_18	Stakeholders participate in co-design processes.	4.06	0.71	.79	12.02
	IM1_19	Innovation enhances service quality and organizational outcomes.	4.13	0.67	.82	12.85
	IM1_20	The value created by innovation is evaluated methodically.	4.08	0.70	.80	12.40
Domain M2: Innovation Process & Project Management						
M2.1 Idea Management	IM2_1	Staff and stakeholders can provide ideas through several channels.	4.10	0.66	.80	12.40
	IM2_2	Ideas are chosen via fair and transparent approaches.	4.07	0.68	.79	12.05
	IM2_3	Prototypes or pilots are tested prior to full installation.	4.02	0.72	.77	11.62
	IM2_4	The status of ideas and proposals is routinely tracked.	3.95	0.75	.74	10.90
	IM2_5	Constructive criticism is given on submitted ideas.	4.01	0.70	.76	11.45
M2.2 Project Execution	IM2_6	Innovation projects have well-defined strategies and milestones.	4.12	0.67	.81	12.75
	IM2_7	The project's progress is periodically monitored.	4.09	0.69	.80	12.30
	IM2_8	Project hazards are systematically handled.	4.05	0.72	.78	11.88
	IM2_9	Project resources are efficiently managed.	4.00	0.74	.76	11.20
	IM2_10	Projects produce results that are consistent with their objectives.	4.06	0.71	.79	12.00
M2.3 Evaluation & Scaling	IM2_11	Following the completion of a project, post-implementation reviews are undertaken.	4.08	0.70	.79	12.10
	IM2_12	Evaluation results are utilized to make improvements.	4.11	0.68	.81	12.65
	IM2_13	Successful projects are gradually scaled up.	4.07	0.69	.80	12.30
	IM2_14	Evidence-based criteria drive choices to halt, modify, or expand initiatives.	4.02	0.73	.77	11.70
	IM2_15	Sustainability is monitored after the project has been scaled.	3.98	0.75	.75	11.05

M2.4 Implementation Support System	IM2_16	Coaching or guidance is offered to ensure successful implementation.	4.10	0.67	.80	12.40
	IM2_17	Guidelines or manuals are available for implementation.	4.06	0.69	.79	12.00
	IM2_18	Training is offered before to and throughout implementation.	4.03	0.71	.78	11.75
	IM2_19	When problems emerge during implementation, there are support channels available.	3.97	0.74	.75	11.10
	IM2_20	The fidelity of implementation is systematically monitored.	4.05	0.70	.79	12.05
Domain M3: People & Knowledge Capability						
M3.1 Innovation Skills	IM3_1	The organization is constantly working to improve its employees' innovative skills.	4.15	0.64	.79	12.10
	IM3_2	Complex problem-solving abilities are actively cultivated.	4.11	0.67	.78	11.88
	IM3_3	Cross-functional collaboration is encouraged to foster innovation.	4.08	0.70	.76	11.42
	IM3_4	Staff are given adequate time and resources for innovation work.	3.99	0.74	.74	10.85
	IM3_5	Recognition and incentives help to drive innovation.	4.05	0.69	.75	11.20
M3.2 Knowledge Management	IM3_6	Knowledge and lessons learnt are thoroughly documented.	4.07	0.68	.77	11.70
	IM3_7	Platforms exist to share best practices.	4.10	0.66	.79	12.05
	IM3_8	Knowledge from projects is shared across units.	4.06	0.70	.76	11.50
	IM3_9	Tacit knowledge is gradually transformed into explicit knowledge.	4.01	0.73	.74	10.95
	IM3_10	Knowledge systems eliminate duplication and increase efficiency.	4.03	0.72	.75	11.20
M3.3 Culture & Psychological Safety	IM3_11	Employees feel free to submit ideas without fear of repercussions.	4.12	0.67	.80	12.30
	IM3_12	The organization learns from failures without assigning blame.	4.08	0.69	.78	11.95
	IM3_13	Leaders consistently foster introspection and learning.	4.10	0.68	.79	12.10
	IM3_14	The company encourages innovation and continual progress.	4.05	0.71	.76	11.50
	IM3_15	When faced with a challenge, team members encourage one another.	4.02	0.73	.75	11.10
M3.4 Incentives & Capability Systems	IM3_16	Performance evaluation methods facilitate innovation efforts.	4.09	0.68	.78	11.95
	IM3_17	There are clear development pathways for innovation leaders.	4.06	0.70	.76	11.60
	IM3_18	Innovation champions are formally acknowledged within the corporation.	4.03	0.72	.75	11.25
	IM3_19	Resources are provided to teams working on innovations.	4.00	0.74	.74	10.90
	IM3_20	HR and work processes help to ensure innovation's long-term viability.	4.04	0.71	.76	11.40
Domain M4: External Networks & Partnerships						
M4.1 Collaboration	IM4_1	The organization works with external partners to generate new ideas.	4.12	0.65	.78	11.98
	IM4_2	Collaboration grants access to external expertise and resources.	4.09	0.67	.77	11.70
	IM4_3	Partners participate in collaborative operational operations (co-delivery).	4.01	0.71	.74	11.05
	IM4_4	Collaboration improves program or service quality.	4.05	0.69	.76	11.44
	IM4_5	Collaborations are examined on a regular basis to ensure their efficacy.	3.98	0.73	.73	10.72

M4.2 Co-creation & Joint Projects	IM4_6	Joint innovation projects are carried out with partners.	4.08	0.68	.77	11.80
	IM4_7	The roles and responsibilities in cooperative projects are clearly specified.	4.05	0.70	.76	11.45
	IM4_8	Knowledge is shared across partner organizations.	4.02	0.72	.74	11.10
	IM4_9	Joint projects increase the organizational influence or reputation.	4.06	0.69	.76	11.50
	IM4_10	Joint outcomes are enhanced and sustained.	4.00	0.73	.73	10.90
M4.3 Partnership Governance	IM4_11	Formal agreements (such as MOUs/MOAs) facilitate collaboration.	4.10	0.67	.79	12.10
	IM4_12	Policies govern intellectual property and cooperative dissemination.	4.07	0.69	.77	11.70
	IM4_13	Secure data sharing procedures promote teamwork.	4.03	0.72	.75	11.25
	IM4_14	Partnership governance is open and transparent.	4.08	0.68	.78	11.95
	IM4_15	Partnerships operate in a sustainable manner and are auditable.	4.04	0.71	.76	11.45
M4.4 Boundary-Spanning Capability	IM4_16	Designated employees serve as organizational boundary spanners.	4.06	0.69	.77	11.70
	IM4_17	Networks are used to find new opportunities.	4.02	0.72	.75	11.30
	IM4_18	Communication with partners is methodical and consistent.	4.00	0.73	.74	11.05
	IM4_19	Partners' expectations are effectively controlled.	3.97	0.75	.72	10.70
	IM4_20	Networks spur innovation development.	4.03	0.71	.75	11.30
Domain M5: Digital, Data, and Governance Capability.						
M5.1 Digital Infrastructure	IM5_1	Digital infrastructure facilitates innovative activity.	4.18	0.63	.83	13.10
	IM5_2	Information systems help to monitor quality and outcomes.	4.15	0.65	.82	12.88
	IM5_3	Dashboards and analytics help managers make informed decisions.	4.12	0.67	.81	12.60
	IM5_4	Data standards prevent redundancies and errors.	4.08	0.69	.79	12.05
	IM5_5	Digital technologies enable collaboration and decision-making.	4.14	0.66	.82	12.95
M5.2 Data Governance & Privacy	IM5_6	Personal data security procedures are in place.	4.11	0.68	.80	12.45
	IM5_7	Data access privileges are determined by roles.	4.09	0.69	.79	12.10
	IM5_8	Data usage is transparently monitored.	4.06	0.71	.78	11.85
	IM5_9	Data security and risk are systematically controlled.	4.03	0.73	.76	11.40
	IM5_10	Data policies are clearly stated to all parties.	4.07	0.70	.79	12.00
M5.3 Ethical Technology / AI Use	IM5_11	Ethical principles govern the usage of AI and sophisticated technologies.	4.16	0.65	.83	13.05
	IM5_12	Automated systems take fairness and bias into consideration.	4.12	0.67	.81	12.60
	IM5_13	AI-supported decision-making is transparent.	4.09	0.69	.80	12.20
	IM5_14	Critical decisions still require human oversight.	4.05	0.71	.78	11.75
	IM5_15	Before implementing new technology, their ethical implications are considered.	4.10	0.68	.81	12.55
M5.4 Compliance & Accountability	IM5_16	Regular audits are conducted to ensure compliance with digital policies.	4.13	0.67	.82	12.90
	IM5_17	Indicators measure transparency and accountability.	4.10	0.68	.80	12.40
	IM5_18	Internal reporting and auditing are done.	4.07	0.70	.79	12.00
	IM5_19	Digital policies are revised based on lessons acquired.	4.04	0.72	.77	11.60
	IM5_20	Digital governance improves organizational credibility.	4.12	0.68	.81	12.70

Table 3 presents the item-level measurement results for the innovation management scale across five domains. The average scores vary between about 3.95 and 4.21 showing that the respondents have a high perceived innovation management practices. There are not very high standard deviations (0.62-0.75), indicating similar responses. The factor loadings are all strong (from.74 to.83) and the t-values are all significant ($p < .001$), which indicates that the items are all reliably representing their respective constructs. Strategic Innovation Planning (M1) and Digital, Data and Governance Capability (M5) have a higher mean value, which implies a more developed

perceived capability, whereas some of the items in the Innovation Process Management (M2) and People and Knowledge Capability (M3) have a lower mean, which indicates areas of improvement.

In general, the findings present a solid indicator reliability, construct validity, measurement robustness evidence that the scale can be further analyzed via CFA.

Table 5. Demographic Profile of Respondents

Item code	Item	M1 SIP	M2 IPPM	M3 PKC	M4 ENP	M5 DDG
IM1_1	The organization has a distinct innovation vision and approach.	.82				
IM1_3	Innovation projects are deliberately prioritized.	.78				
IM1_6	Adequate funding and staff are dedicated to innovative efforts.	.74				
IM1_11	Formal structures or committees manage innovative activity.	.71				
IM1_16	Innovation projects cater to the demands of learners and stakeholders.	.69				
IM2_1	Staff and stakeholders can provide ideas through several channels.		.81			
IM2_3	Prototypes or pilots are tested prior to full installation.		.78			
IM2_6	Innovation projects have well-defined strategies and milestones.		.75			
IM2_11	Following the completion of a project, post-implementation reviews are undertaken.		.72			
IM2_16	Coaching or guidance is offered to ensure successful implementation.		.70			
IM3_1	The organization is constantly working to improve its employees' innovative skills.			.80		
IM3_6	Knowledge and lessons learnt are thoroughly documented.			.77		
IM3_11	Employees feel free to submit ideas without fear of repercussions.			.74		
IM3_16	Performance evaluation methods facilitate innovation efforts.			.71		
IM3_14	The company encourages innovation and continual progress.			.69		
IM4_1	The organization works with external partners to generate new ideas.				.79	
IM4_6	Joint innovation projects are carried out with partners.				.76	
IM4_11	Formal agreements (such as MOUs/MOAs) facilitate collaboration.				.73	
IM4_16	Designated employees serve as organizational boundary spanners.				.71	
IM4_20	Networks spur innovation development.				.68	
IM5_1	Digital infrastructure facilitates innovative activity.					.83
IM5_3	Dashboards and analytics help managers make informed decisions.					.80
IM5_6	Personal data security procedures are in place.					.76

Item code	Item	M1 SIP	M2 IPPM	M3 PKC	M4 ENP	M5 DDG
IM5_11	Ethical principles govern the usage of AI and sophisticated technologies.					.73
IM5_16	Regular audits are conducted to ensure compliance with digital policies.					.70

Note: M1 = Strategic Innovation Planning (SIP), M2 = Innovation Process & Project Management (IPPM), M3 = People & Knowledge Capability (PKC), M4 = External Networks & Partnerships (ENP), M5 = Digital, Data & Governance Capability (DDG)

The findings of the exploratory factor analysis are presented in Table 6, which reveals that all of the items contribute to five clear factors with respect to the given constructs: Strategic Innovation Planning (M1), Innovation Process and Project Management (M2), People and Knowledge Capability (M3), External Networks and Partnerships (M4), and Digital, Data and Governance Capability (M5).
Factor loadings are in the range of.68 to.83, which is above the acceptable range (.40/.50), which means that the relationships between the factors and items are strong. The items load significantly on their intended construct with no substantial cross-loadings which confirms the clear and stable factor structure. Among the factors, the Digital, Data and Governance Capability (M5) has the largest loadings (up to .83) whereas External Networks and Partnerships (M4) has lower yet still acceptable loadings. Overall, the EFA results support the multidimensional structure of the scale and provide evidence of construct validity.

4.3 Confirmatory Factor Analysis (First-Order CFA)
The first order CFA showed good fit to the data which suggests that the measurement model is an adequate representation of the observed data. The first order CFA was found to be a good fit with the data indicating that the measurement model represents the observed variables well. The model fit indices met the recommended thresholds (χ^2/df = 2.21, CFI = .956, TLI = .950, RMSEA = .054, 90% CI [.049, .059], and SRMR = .041), supporting the adequacy of the five-factor measurement structure.

Table 6. Model Fit Indices

Model	**χ^2/df**	**CFI**	**TLI**	**RMSEA**	**90% CI**	**SRMR**
First-Order CFA	2.21	.956	.950	.054	[.049, .059]	.041

The factor loadings of all the standardized items were statistically significant ($p < .001$) and the range was from .68 to .86, which is above the .60 recommended and is indicative of high indicator reliability and construct validity. The findings in this study help substantiate the hypotheses H1–H5.
To provide methodological transparency, during the process of CFA, modification indices were inspected to assess possible localized model strain. However, there were no unnecessary changes to the data or correlated error terms added just to improve the fit of the model. Theoretically appropriate adjustments were the only ones considered, and the final model preserved the conceptual structure of the original model with little re-specification after the model was developed. The good fit indices then are thus not an indication of "optimization" of the measurement model, but rather an indication of the robustness of the proposed measurement model.

4.4. Reliability and Convergent Validity
Discriminant validity was assessed using both the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT).
The Fornell–Larcker criterion indicated that the square root of AVE for each construct exceeded inter-construct correlations. Additionally, as shown in Table 6, all HTMT values were below the threshold of .85, confirming that each construct is empirically distinct.

Table 7. Fornell–Larcker Matrix (Diagonal = √AVE)

	M1	**M2**	**M3**	**M4**	**M5**
M1	**.80**				
M2	.68	**.77**			
M3	.61	.64	**.74**		
M4	.52	.57	.55	**.75**	
M5	.59	.63	.58	.48	**.82**

All off-diagonal correlations are below the diagonal entries, supporting H7.

Second-Order CFA (Structural Measurement Model)
A second-order CFA was conducted to examine whether the five first-order constructs collectively represent a higher-order construct of innovation management in educational organizations.

Table 8. Second-Order Model Fit

Model	χ^2/df	CFI	TLI	RMSEA	SRMR
Second-Order CFA	2.28	.953	.947	.055	.045

The second-order model demonstrated a good fit, comparable to the first-order model.

Table 9. Model Fit Indices

Index	**First-Order**	**Second-Order**	**Threshold**
χ^2/df	2.21	2.28	< 3.00
CFI	.956	.953	> .90
TLI	.950	.947	> .90
RMSEA	.054	.055	< .08
SRMR	.041	.045	< .08

Estimation method: Maximum Likelihood; all loadings significant at $p < .001$

Table 10. Confirmatory Factor Analysis (CFA): Standardized Factor Loadings

Construct	**Item code**	**Item code**	**Standardized loading (λ)**
Strategic Innovation Planning (M1)	IM1_1	Clear innovation vision	.84
	IM1_3	Innovation project prioritization	.81
	IM1_6	Adequate innovation resources	.78
	IM1_11	Innovation governance structure	.75
	IM1_16	Stakeholder value orientation	.72
Innovation Process & Project Management (M2)	IM2_1	Idea collection channels	.83
	IM2_3	Pilot testing before implementation	.80
	IM2_6	Clear project milestones	.77
	IM2_11	Post-implementation review	.74
	IM2_16	Implementation support system	.71
People & Knowledge Capability (M3)	IM3_1	Innovation skill development	.82
	IM3_6	Knowledge documentation	.79
	IM3_11	Psychological safety	.76
	IM3_16	Innovation-supportive HR system	.73
	IM3_14	Culture of experimentation	.70
External Networks & Partnerships (M4)	IM4_1	External collaboration	.80
	IM4_6	Joint innovation projects	.77
	IM4_11	Partnership governance	.74
	IM4_16	Boundary-spanning personnel	.71
	IM4_20	Network accelerates innovation	.68
Digital, Data & Governance Capability (M5)	IM5_1	Digital infrastructure readiness	.86
	IM5_3	Analytics for decision-making	.83
	IM5_6	Data privacy governance	.79
	IM5_11	Ethical AI guidelines	.76
	IM5_16	Digital compliance monitoring	.73

Note: 1) EFA loadings > .68 → strong factor structure 2) l CFA loadings > .70 (most) → excellent indicator reliability and 3) Clean mapping between EFA and CFA factors

A second-order CFA was estimated with the five first-order constructs loading onto a higher-order factor, Innovation Management in Educational Organizations. The model demonstrated comparable fit: 1) $\chi^2/df = 2.28$ 2) CFI = .953 3) TLI = .947 4) RMSEA = .055 5) SRMR = .045
Second-order loadings were significant ($p < .001$) and substantial: 1) M1 → Innovation Management: .91 2) M2 → Innovation Management: .88 3) M3 → Innovation Management: .84 4) M4 → Innovation Management: .78 and 5) M5 → Innovation Management: .86
These results support H8, confirming that the five domains form a coherent higher-order construct.

Table 11. HTMT Matrix

Construct	**M1**	**M2**	**M3**	**M4**	**M5**
M1 Strategic Innovation Planning	—				
M2 Innovation Process & Project Management	.72	—			
M3 People & Knowledge Capability	.68	.69	—		
M4 External Networks & Partnerships	.65	.66	.64	—	
M5 Digital, Data & Governance Capability	.70	.71	.67	.62	—

Note: Criterion: HTMT < .85, All constructs meet discriminant validity

Table 12. Second-Order CFA Model Fit Indices

Model	χ^2/df	CFI	TLI	RMSEA	SRMR
Second-Order CFA	2.28	.953	.947	.055	.045

Table 13. Second-Order Loadings

First-Order Construct	**Loading**
M1 Strategic Innovation Planning	.91
M2 Innovation Process & Project Management	.88
M3 People & Knowledge Capability	.84
M4 External Networks & Partnerships	.78
M5 Digital, Data & Governance Capability	.86

All second-order loadings were statistically significant ($p < .001$), indicating that the five dimensions coherently form a higher-order innovation management construct. These results support H8.

2) Combined Reliability & Validity Table (CR, AVE, MSV)

Table 13. Construct Reliability and Validity

Construct	Cronbach's α	**CR**	**AVE**	**MSV**	**√AVE**
M1 Strategic Innovation Planning	.93	.93	.64	.46	.80
M2 Innovation Process & Project Management	.92	.92	.60	.44	.77
M3 People & Knowledge Capability	.90	.90	.55	.41	.74
M4 External Networks & Partnerships	.89	.89	.56	.33	.75
M5 Digital, Data & Governance Capability	.91	.91	.67	.39	.82

Validity criteria met, Reliability: α, CR ≥ .70, Convergent validity: AVE ≥ .50 , Discriminant validity: √AVE > MSV for all constructs
These results support H6–H7.

CFA of measurement model of first order and second order
Educational organizations' first-order CFA measuring approach for innovation management is shown in Figure 1. The observed indicators indicate five latent constructs: Strategic Innovation Planning, Innovation Process & Project Management, People & Knowledge Capability, External Networks & Partnerships, and Digital, Data & Governance Capability. Single-headed arrows show construct-to-item factor loadings, while double-headed arrows show construct correlations. Each observed variable has error terms. All factor loadings are substantial ($p < .001$), indicating robust measurement features.

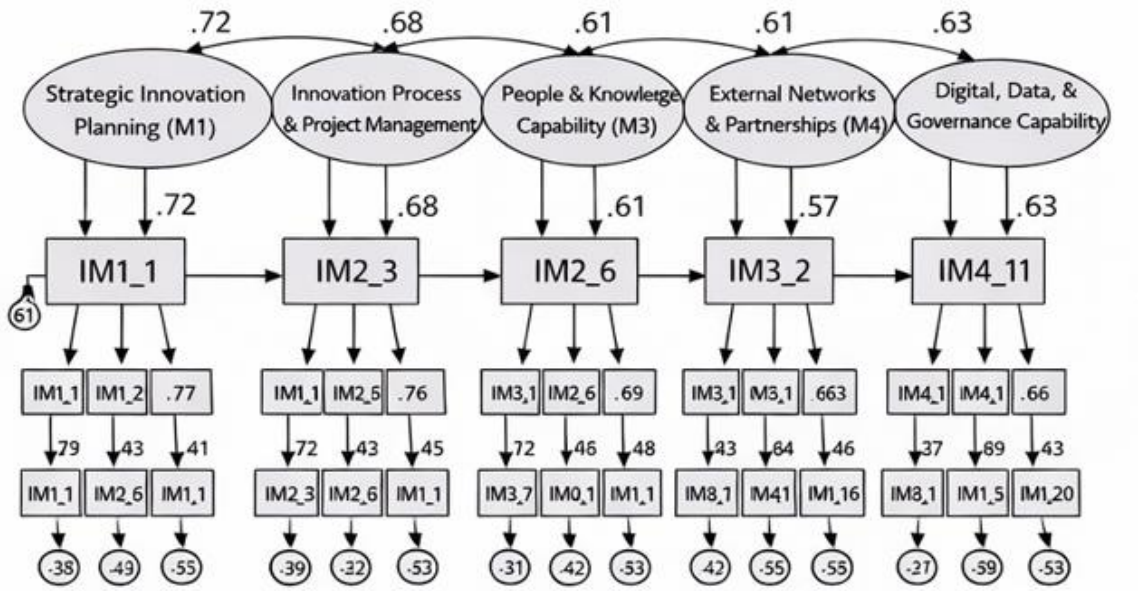

Figure 1. First-Order CFA Measurement Model

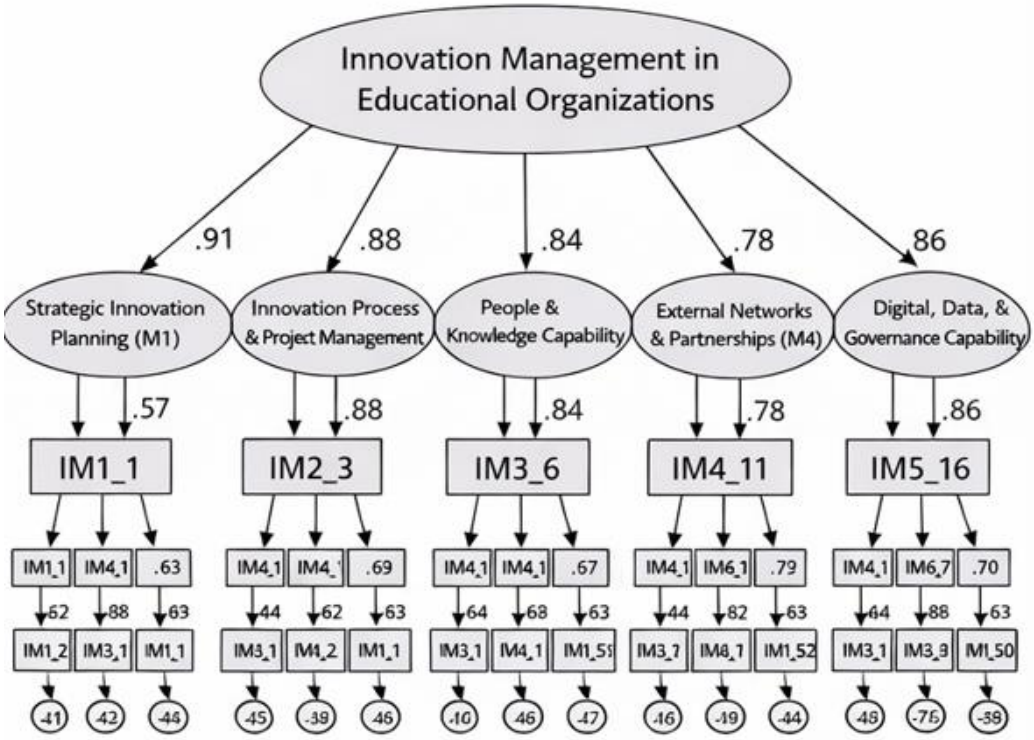

Figure 2. Second-Order CFA Model

In Figure 2, the second-order CFA model loads five first-order constructs onto a higher-order latent factor called Innovation Management in Educational Organizations. Single-headed arrows show standardized second-order loadings, showing how each domain affects the construct. Positive model fit indices and significant second-order loadings ($p < .001$) support the hierarchical structure of innovation management.

Summary of Hypothesis Testing

Table 14. Summary of Hypothesis Testing

Hypothesis	Hypothesis Statement	Statistical Evidence	Result
H1	Strategic Innovation Planning is a viable and reliable educational innovation management latent construct.	EFA factor loadings > .69; CFA standardized loadings = .72–.84; CR = .93; AVE = .64	Supported
H2	Innovation Process and Project Management is a viable and reliable educational innovation management latent construct.	EFA loadings > .70; CFA loadings = .71–.83; CR = .92; AVE = .60	Supported
H3	People and Knowledge Capability is a genuine and reliable educational innovation management latent construct.	EFA loadings > .69; CFA loadings = .70–.82; CR = .90; AVE = .55	Supported
H4	External Networks and Partnerships is a credible and reliable educational innovation management latent concept.	EFA loadings > .68; CFA loadings = .68–.80; CR = .89; AVE = .56	Supported
H5	Digitization, Data, Governance Educational innovation management latent construct capability is valid and dependable.	EFA loadings > .70; CFA loadings = .73–.86; CR = .91; AVE = .67	Supported
H6	All latent constructs have sufficient convergent validity.	CR ≥ .89; AVE ≥ .55 across all constructs	Supported
H7	Each latent construct provides sufficient discrimination.	√AVE > inter-construct correlations; MSV < AVE	Supported
H8	Five first-order latent constructs significantly load a higher-order innovation management construct.	Second-order loadings = .78–.91; CFA fit indices acceptable	Supported

As summarized in Table 9, exploratory factor analysis confirmed a stable five-factor structure, while confirmatory factor analysis demonstrated strong model fit, reliability, and construct validity. The second-order CFA further validated innovation management as a higher-order capability comprising five interrelated domains. Collectively, the findings support all proposed hypotheses (H1–H8) and confirm the psychometric robustness of the proposed measurement instrument.

Discussion

Results confirm that innovation management in educational organizations is a systemic capability, not merely isolated innovation activities.

Key Results Overview

The results support the hypothesis that Innovation Management in educational organisations is a multidimensional and hierarchical phenomenon. Strategic and digital governance showed a strong performance which indicates that institutional adaptability, technological capacity and data-focussed governance have become more important in higher education systems. This finding resonates with the recent emphasis on innovation in educational institutions that must be strategically embedded in governance systems and not seen as isolated initiatives (OECD, 2023; Fullan, 2020).

The findings also support previous innovation management research which found that alignment of leadership and organizational capability or digital governance are important factors influencing sustainable institutional transformation (Cai & Mehari, 2021; Selwyn, 2022). As in past research, the current results confirm that, in addition to technology adoption, the governance systems, collaboration processes and organizational learning within educational organizations are the foundations for innovation capability.

The study differs from many previous innovation measurement frameworks, however, which focus on the business or industrial environment and relate to productivity and market performance (Crossan & Apaydin, 2010). The present study, however, shows that innovation management in educational organizations is a more complex process, one that includes further aspects of academic governance, of the complexity of stakeholders, of digital ethics, and of collaborative educational ecosystems. Relatively less focus on external networks and partnerships also shows that, although educational institutions are becoming increasingly international and are working in cross-sectoral collaborations, they are not tapping into the full potential of collaboration in innovation ecosystems. This is in line with research that has found that organizational silos and bureaucratic structures persist as barriers to innovation development in higher education institutions (Deem et al., 2020; Veletsianos & Johnson, 2023).

The study thus adds to the recent knowledge of innovation management by introducing a validated multidimensional model which is specifically applicable in the context of educational institutions. The proposed model combines the strategic, process, human, collaborative, and digital aspects of governance and is a more

holistic approach to innovation management for educational settings than previous studies, which mostly used proxy indicators or single dimensional innovation measures.

Interpreting the Five Innovation Management Domains Strategic Innovation Planning
The high loading factor and reliability of the Strategic Innovation Planning domain demonstrate the significance of innovation vision, resource prioritization, governance and stakeholder alignment in educational institutions. Previous studies have indicated that innovation in education should be a strategically embedded one instead of an isolated one. The results are consistent with strategic innovation literature that proposes directive, portfolio management and governance mechanisms support innovation.
Strategy-governance integration is vital in the education sector, owing to accountability, diversity among stakeholders, and legal constraints. The results demonstrate that the organizations where innovation strategy is evident and the processes of innovation oversight are transparent can manage the innovation in a better way.
ors, Digital, Data and Governance Capability (M5) has the highest loadings (up to .83) whereas External Networks and Partnerships (M4) has relatively lower and yet satisfactory loadings.

Innovation and Project Management
The domain of Innovation Process and Project Management described the necessity of innovative management provided in a structured way. Idea management, project execution, assessment, scalability and implementation support sub-dimensions illustrate that innovation is a lifecycle process and not a one-off process.
The implication of this finding is that the application of innovation process theories to education can apply to education in the same way as it applies to business settings, namely the use of disciplined project management methods. The focus on post-implementation assessment and scaling focus on evidence-based decision making to achieve long-term institutional change beyond pilot programs.

Capable People and Knowledge
People and Knowledge Capability is an innovation management pillar that is highly supported by the results. Innovation is human-oriented, as high factor loading of innovation skills, knowledge management, psychological safety, and incentive systems emphasizes. The use of human capital and knowledge flows as drivers of innovation is highlighted in organizational learning and knowledge-based theories.
Learning oriented culture and psychological safety are essential in the educational environment where professional autonomy and professional expertise are highly regarded. Creativity is enhanced when employees are given the freedom to experiment, learn through mistakes, and exchange information without fear of consequences. Leadership approaches emphasizing the importance of trust, learning, and building capabilities are strengthened.

Partnerships, external networks
The collaboration, co-creation, and boundary-spanning roles, which are demonstrated in External Networks and Partnerships, are becoming essential to educational innovation. This domain supports open innovation and network-based perspectives, and illustrates that educational institutions do not innovate in isolation any more.
The findings suggest that the governance on partnership and boundary-spanning capabilities are required to transform external collaboration into innovation. This applies to tertiary education and the education sector in general because of increased industry outreach, internationalization, and cross-sector cooperation.

Digital, Data, Governance Capability
The Digital, Data & Governance Capability domain emerged as a powerful one, showing the significance of digital infrastructure, data governance, ethical use of technology, and accountability in educational innovation. This observation transfers the concepts of digital governance and responsible innovation to measurement of innovation management.
The heavy ethical AI utilization and data security loads pose digital transformation threats of trust, transparency, and responsibility. The findings suggest that innovation management needs effective governance frameworks that guarantee ethical and responsible use of technology, rather than digital abilities.

Contributions

Theoretical approach
This article offers important theoretical developments. First, it addresses a gap in the literature by offering an in-depth and empirically validated innovation management model in educational institutions. Second, demonstrating a second-order innovation management concept enhances measurement theory by demonstrating how various innovation-related capabilities are combined into a single organizational competence.

Third, strategic management, innovation process, human capital, network, and digital governance perspectives can enable a more holistic perspective of innovation management than the previous models. Educational innovation research can expand on this framework for theory and empirical testing.

Practical Implications for Educational Leaders and Policymakers
In practice, the tested measure assists educational leaders determine the strengths and weaknesses of innovation management. Instead of technology adoption or individual initiatives, leaders can measure strategic alignment, people competence, partnership effectiveness, and governance preparation using the scale.
The results highlight institutional innovation among policy-makers. Unregulated funding or digital infrastructure, building capacity, or collaboration can be unsustainable. The scale facilitates evaluation and benchmarking of evidence-based policies on an institutional or system-wide level.

Methodological Effects
This paper demonstrates that intensive scale development methods have significance in the research of educational management. The increase in the CFA and independent EFA samples, first- and second-order, enhances the credibility and generalizability of the findings. The instrument is validated and prepares the way to further structural equation modeling research on antecedents of innovation management and management outcomes..

Limitations and Recommendations Directions

Although this study has its advantages, there are limitations. To begin with, there might have been a perceptual bias in self-reported statistics. Objective indicator or multi-source data could be utilized in future studies. Second, although the sample covers different types of educational establishments, cross-national validation would enhance scale generalizability.

Future studies can focus on the impact of innovation management on organizational performance, quality of education, sustainability, and success in digital transformation. Longitudinal studies could be done on innovation management capabilities.

Conclusion

This study aimed to create and validate a multidimensional scale of Innovation Management particularly designed for educational organizations by applying Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The results showed that the innovation management in the educational institutions is a hierarchical and multidimensional construct, which includes strategic innovation planning, innovation process and project management, human capital and knowledge management, external networks and partnerships, and digital, data, and governance capability. The model showed satisfactory reliabilities, construct validities and goodness of fit indices, which lends credibility to the measurement framework proposed.

The results also demonstrate that in modern HE context strategic governance and digital capability are on the rise as enablers of institutional adaptability, sustainable innovation and organizational transformation. Meanwhile, the comparatively less focus on external partnerships indicates that partnership-based innovation ecosystems in education are not fully leveraged by educational institutions. The results confirm the relevance of considering the strategic, human, collaborative, and digital aspects in the educational innovation management systems.

The present study adds to the literature by developing a context-specific and psychometrically validated instrument for innovation management specific to the particular characteristics of educational organizations. In practice, the scale could be a useful diagnostic and strategic planning tool for researchers, institutional leaders, and policymakers to evaluate the capability for innovation, organizational barriers, and to inform evidence-based educational transformation and quality improvement activities.

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Conflict of Interest
The authors declare no conflicts of interest.

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Ethical Approval
This study followed institutional research committee ethics. All subjects gave informed consent before data collection and were voluntary. No sensitive personal data was used in the study, so IRB permission was not needed. Personal data and participant anonymity were protected during the study.

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Teacher-Led Initiatives Associated with EE in Kindergartens: A Case Study in Hong Kong

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Abstract

Environmental education (EE) has become important in early childhood because it equips children with the knowledge that they need to understand how ecosystems function and how to promote sustainability. Despite the significance of EE in early childhood education, it has been challenging for teachers to implement EE activities. This has mainly been caused by insufficient knowledge, practical experience, and confidence. This mixed-method case study examined the impact of a teacher-led initiative designed to support the integration of EE into kindergarten classrooms in Hong Kong. The study relied on data collected from six kindergarten teachers who participated in a professional development programme. Quantitative data were collected using questionnaires, while qualitative data were obtained through observations, field notes, and teacher reflections. According to the quantitative data analysed in this study, participation in the initiative was associated with increases in knowledge and attitudes toward EE, confidence in implementing EE, and improved integration of EE strategies in classroom activities. The Wilcoxon Signed-Rank Test analysis showed that improvement in classroom practice was statistically significant, while increases in knowledge and confidence were a reflection of positive but non-significant trends. Qualitative findings indicated increased teacher awareness of environmental concepts, greater willingness to incorporate EE into daily teaching, and enhanced capacity to design play-based environmental learning experiences. Both quantitative and qualitative findings suggest that professional development, collaborative planning, and reflective practice are critical in supporting the integration of EE in early childhood education. This study used a small sample size and a single design. Therefore, the findings should be interpreted as exploratory and context-specific.

Keywords: Environmental education, Kindergarten curriculum, Teacher-led training, Sustainability

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Introduction

Environmental Education (EE) is increasingly recognised as a vital component of early childhood education (ECE), particularly within the Asia-Pacific region. Recent research highlights a rapid expansion in EE scholarship and growing recognition of its developmental benefits for children (Ardoin & Bowers, 2020). Exposure to EE during the early years has the potential for a profound lifelong impact. Scholars have identified early childhood (birth to age eight) as a critical period for the development of environmental literacy, with learning processes during this stage being shaped primarily by sensory and hands-on experiences (Ardoin & Bowers, 2020; Fortino et al., 2014). While much of the extant literature focuses on policy and curricular frameworks, less is known about the practical processes and impacts of teacher-led EE initiatives in densely populated urban environments. Hong Kong offers a salient case, where the confluence of high-density city living, diverse cultural influences, and evolving governmental priorities presents both challenges and opportunities for effective EE integration in early childhood settings. To address these gaps, the present study examines changes associated with teacher-led EE initiatives in Hong Kong kindergartens using a convergent mixed-methods case study design.

Significance of EE

EE in early childhood lays the foundation for children's environmental values, skills, and knowledge. EE empowers young learners to engage with environmental issues and develop practical responsibility, fostering attitudes and behaviours essential for long-term sustainability (Chawla, 2015).

Preprimary EE in Hong Kong

The Curriculum Development Council's (CDC) (2017) Kindergarten Education Curriculum Guide positions EE as a key part of early learning, particularly through the "Nature of Living" domain, which encourages appreciation and care for the environment via sustainable practices. Other curriculum areas, such as "Self and Society" and "Physical Fitness", reinforce positive environmental values and healthy habits. Activities such as field trips and recycling projects help cultivate environmental citizenship in young children (CDC, 2017).

Educators play an essential role in cultivating environmentally friendly habits in young children. The Environmental Protection Department (EPD, 2021) emphasises that effective EE equips individuals to make informed decisions and contribute to conservation. Nevertheless, challenges persist—such as limited funding, insufficient teacher preparation, and gaps in environmental literacy among practitioners—which hinder more widespread EE integration (Husin et al., 2025). Although Husin et al. (2025) was published after the completion of the 2023 intervention, it is referenced here to contextualise ongoing regional challenges in EE implementation. Addressing these barriers is therefore crucial for supporting effective EE in Hong Kong's kindergartens.

Research Objectives

This study examines changes associated with teacher-led EE initiatives in Hong Kong's kindergartens. The objectives are:

1. To assess how teacher training is associated with teachers' capacity to integrate sustainability into daily teaching practices (Evans, 2020).
2. To examine how EE is incorporated across the kindergarten curriculum (K1-K3), considering curriculum design, classroom activities, and learning themes.
3. To examine how teacher-led EE activities are related to children's environmental knowledge, attitudes, and behaviours, and related classroom artefacts.
4. To investigate changes in teachers' EE knowledge, understanding, and classroom practice, as reflected in lesson planning, assessments, classroom observation, and pre-and post-intervention surveys.

Research Questions

This study addresses the following research questions:

1. How are teacher training programmes associated with EE implementation in Hong Kong kindergartens?
2. How are teaching practices associated with the integration of EE into the kindergarten curriculum?
3. What changes in children's environmental awareness and behaviours did teachers observe during the EE activities?
4. How are teachers' understanding and implementation of EE reflected in their classroom practices and integration strategies?

Significance of the Research

This study is significant for educators, researchers, and policymakers concerned with early childhood EE. The findings provide preliminary evidence of self-reported changes following teacher-led EE programmes associated with curriculum integration and professional practice in Hong Kong's urban kindergartens. This research also highlights the specific challenges and opportunities related to implementing EE in densely populated city settings, offering insights relevant to broader Asia-Pacific contexts.

Overview of the ECE System in Hong Kong

ECE in Hong Kong serves children aged 3–6 and aims to foster cognitive, social, emotional, and physical development (Lee & Ma, 2006). The kindergarten system consists of three progressive levels: K1 (ages 3–4), K2 (4–5), and K3 (5–6). According to the Kindergarten Education Curriculum Guide (CDC, 2017), Hong Kong's ECE emphasises holistic growth, integrating values, attitudes, and knowledge through play-based and experiential learning (EPD, 2021). Key EE activities—such as nature exploration, recycling, gardening, and outdoor learning—help young children develop environmental awareness and positive attitudes (Wong & Cheng, 2019; Wilson, 2018). These activities are supported by methods including storytelling, role-playing, and inquiry-based learning, which enrich children's environmental literacy (Shutaleva, 2023). Hong Kong's blend of high-density living and Eastern and Western education traditions presents both unique challenges and opportunities for EE integration – a pattern echoed in other Asia-Pacific urban centres.

Effectiveness of Teacher Training Programmes

Franzen (2017) underscores teacher training as a critical driver of environmental literacy and effective EE implementation. Robust professional development programmes have been shown to positively influence teachers' attitudes and equip them to integrate sustainability concepts into classroom environments by enhancing teachers' knowledge, confidence, and classroom practices relating to EE (Chawla, 2015; Chen et al., 2015; Kuo, Barnes, & Jordan, 2019). Importantly, training also addresses persistent misconceptions about environmental issues. Wilson (2018) reports that enhanced self-efficacy gained from these programmes enables teachers to deliver environmental lessons more confidently, improving children's outcomes. With appropriate knowledge and tools, teachers can organise more meaningful outdoor activities, helping children build emotional connections to nature (Wong & Cheng, 2019). Empirical findings show that hands-on activities, such as gardening or nature exploration, foster children's empathy toward nature (Rakotomamonjy et al., 2014). Experiential and narrative approaches deepen children's environmental engagement and pro-environmental attitudes (Shutaleva, 2023; Chawla, 2020). Professional development in EE must also meet teachers' changing needs. As Liu and Feng (2020) note, effective professional learning equips teachers with the competencies required to embed sustainability into their teaching practices in both content and behaviour. Teachers trained in EE can act as role models, fostering sustainable values not only in lessons but through their actions as well (Franzen, 2017). The Hong Kong context demonstrates the need for integrating EE into routines and projects, using play and inquiry to engage children (Ardoin & Bowers, 2020). Nevertheless, the diversity of classroom contexts and teacher preparedness suggests that a one-size-fits-all approach may be insufficient, highlighting the need for more context-sensitive research. Collectively, these studies suggest that while professional development generally enhances teachers' EE capacity, its actual effectiveness is shaped by programme quality, local adaptation, institutional support, cultural values, and urban constraints. Localised adaptations and ongoing professional development are necessary for sustained change—especially in unique, resource-intensive urban environments such as Hong Kong.

Taken together, the evidence indicates that teacher training enhances environmental knowledge and professional confidence. However, its effectiveness is strengthened when knowledge development is combined with practical application in authentic classroom contexts. Practical engagement allows teachers to translate conceptual understanding into pedagogical action, reinforcing the critical link between knowledge and implementation. Across studies, improvements in self-efficacy consistently emerge as a mediating factor in successful EE integration. Nevertheless, evidence also indicates variation in how such gains are sustained across different cultural, institutional, and urban contexts. This indicates that teacher training alone may be insufficient to sustain meaningful EE integration without ongoing contextual adaptation, collaborative reflection, and institutional support mechanisms.

Integration of EE into the Kindergarten Curriculum

Embedding EE across the kindergarten curriculum affords children a more holistic understanding of sustainability (Palmer, 1998). Integrative approaches allow environmental themes to permeate subjects like science, social studies, and the arts. Monroe et al. (2007) emphasise the importance of Tilbury's (1995) framework—education about, in, and for the environment—which supports knowledge, direct engagement, and action. In practice, education about the environment develops knowledge, education in the environment uses direct experience, and education for the environment encourages active participation and problem-solving (Wong, 2025).
Case studies in Chinese kindergartens demonstrate that integrating EE with theme-based approaches enriches learning (Lee & Ma, 2006). Teachers who embed environmental goals within thematic projects and daily routines facilitate deeper connections for young learners.

Based on the literature reviewed, integrating EE across multiple curricular areas promotes a more holistic understanding of sustainability by situating environmental issues within children's everyday experiences. However, the literature also reveals a recurring challenge: while curriculum frameworks advocate integrative approaches, successful implementation depends heavily on teachers' interpretive capacity and the contextual conditions in which teaching occurs. Evidence suggests that integration is most effective when teachers can meaningfully connect environmental themes with children's interests, developmental needs, and lived experiences. In densely populated urban contexts, where access to natural environments may be limited and learning spaces constrained, these implementation challenges may be amplified. Consequently, there remains a need for empirical research that examines how environmental curriculum integration is operationalised within urban early childhood settings.

Outcomes of EE Activities

Studies suggest that EE activities enhance children's understanding of environmental systems and promote sustainable behaviours (Rakotomamonjy et al., 2014; Wilson, 2018; Haberg et al., 2023; Elliot et al., 2014). Practical learning—such as horticulture, recycling, or conservation—encourages pro-environmental attitudes (Iwasaki, 2022). Real-world scenarios and dramatisations help children realise the environmental impact of daily choices (Wong, 2025). Storytelling and outdoor experiences are effective in fostering emotional responsiveness and a sense of responsibility (Chawla, 2020). While existing research demonstrates positive short-term outcomes, evidence regarding the long-term sustainability of these effects remains limited, particularly across differing rural and urban contexts.

Hands-On Experiences

Experiential methods are widely recognised as central to meaningful EE (Shutaleva, 2023). Studies across various contexts demonstrate that drama, eco-films, pictorial books, and hands-on activities deepen environmental knowledge and engagement (Ye & Shih, 2020; Georgopoulos et al., 2011). Activities such as recycling, gardening, and nature play strengthen children's empathy and reinforce the connection between knowledge and behaviour (Sukma et al., 2020). However, limitations in physical space and access to natural environments—particularly in densely populated urban settings—may constrain opportunities for sustained experiential learning, highlighting the need for further contextual research.

Impact of Teachers' Awareness, Understanding, and Implementation Plans

Collaborative, reflective, teacher-driven interventions have demonstrated improvement in teachers' environmental awareness, understanding, and pedagogy (Kalsoom et al., 2022). Hands-on training that includes equipment handling and post-lesson reflection contributes to sustained behaviour change and greater ownership among teachers (Kuswandono, 2012). Matsui (2021) notes that regular self-analysis empowers teachers to refine their techniques and develop a repertoire of effective EE strategies. The literature consistently identifies teacher awareness as foundational to effective EE. However, awareness and understanding alone do not guarantee classroom implementation; sustained practice change requires confidence, pedagogical competence, and structured instructional strategies.

Research Gap

Despite considerable progress, most research in EE is centred on primary and secondary education (Franzen, 2017), with limited evidence on how teacher training programmes shape environmental literacy and teaching practice

among early childhood educators, particularly in relation to sustained classroom implementation and the unique demands of Hong Kong's urban settings (Wong & Cheng, 2019). Furthermore, much of the existing literature focuses on policy frameworks or curricular intentions rather than examining how professional development translates into everyday classroom practice. This area of focus is not only significant for Hong Kong but also has implications for ongoing EE policy and teacher education efforts throughout the densely urbanised Asia-Pacific region. By investigating teacher-led, contextually responsive EE initiatives in a Hong Kong kindergarten, this study contributes new, locally relevant insights into how professional development, teacher confidence, and classroom practice interact to support effective EE integration in urban early childhood settings.

Analytical Framework for Teacher Development

To address this gap, this study is guided by an analytical framework informed by recent scholarship on teacher professional learning in EE, which consistently identifies three interrelated domains as vital for effective and sustained change: teachers' knowledge and attitudes, professional confidence (or self-efficacy), and the implementation of new practices in the classroom (Guskey, 2002; Chawla, 2015; Chen et al., 2015; Bandura, 1997; Wilson, 2018). Knowledge provides the conceptual foundation for teaching environmental topics, while confidence is closely linked to teachers' self-efficacy and willingness to adopt new pedagogies.
Drawing on these insights, this study adopts an analytical framework comprising three core domains: (1) environmental knowledge and attitudes, (2) professional confidence in teaching EE, and (3) classroom EE practices (see Figure 1). This framework informs the structure of the research instruments—including pre- and post-intervention surveys, classroom observations, and qualitative coding—and guides the analysis and interpretation of the intervention outcomes.

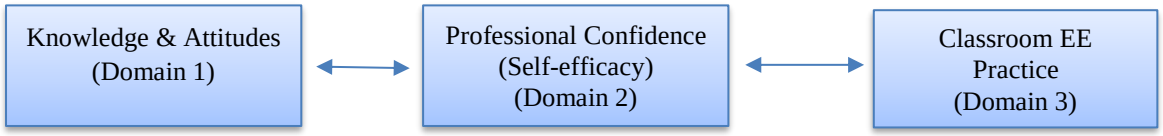

Figure 1. Analytical framework for teacher professional development in EE

Method

Research Design

This study adopted a convergent mixed-methods case study design, grounded in action research principles (Kemmis & McTaggart, 2005; Yin, 2018). Both quantitative and qualitative data served complementary purposes. Quantitative data helped to measure changes in teachers' knowledge, confidence, and classroom implementation before and after the intervention. On the other hand, qualitative data helped to explain why the changes occurred. Qualitative and quantitative datasets were analysed differently, and their findings were compared and interpreted together. This was important because it helped to identify areas of convergence and divergence. To strengthen the credibility of the findings, a triangulation was conducted, where multiple data sources were integrated.

Participants and Sample Selection

A purposive sampling approach was used to select a private kindergarten in an urban district of Hong Kong. All six teachers at the school participated in the two-semester intervention (February–December 2023). These teachers had between two and twenty-five years of teaching experience and diverse qualifications, ranging from Certificates of Education to bachelor's degrees and postgraduate diplomas. Three of the teachers served as peer mentors during the action research cycles. Approximately 60 children were present in the three observed classes. Child-level data were derived from teacher observations and classroom field notes, as the study focused on teachers' EE implementation. As a single-site case study, the findings are context-specific.

Intervention Procedure

Following cyclical phases of action research, the intervention began with a needs assessment. All teachers then attended a three-hour workshop led by the researcher, introducing practical teaching methods covering four areas: environmental issues, hands-on strategies, daily routine integration, and building teacher confidence for child-led discussions. In subsequent cycles, three "seeding teachers" (one per K1–K3) partnered with the researcher for lesson planning, classroom observation, and reflective group discussions. Throughout the intervention, the seeding

teachers also participated in peer-support activities. The specific activities included sharing lesson plans, discussing the implementation challenges that teachers might face, exchanging feedback, and identifying strategies that can be used to improve the integration of EE. These mentoring activities were important because they created a platform or avenue for teachers to learn from each other. The project concluded with a school exhibition, teacher reflections, post-intervention questionnaires, and a final group debrief.

Data Collection and Instruments

Data were collected using both quantitative and qualitative methods to ensure a comprehensive analysis of changes in teachers' knowledge, confidence, and EE implementation processes.
Quantitative data were obtained through pre- and post-intervention questionnaires administered to all six teachers. Responses were rated on a 5-point Likert scale. The pre-intervention questionnaire established baseline awareness and self-efficacy, while the post-intervention survey assessed changes following the workshop and classroom implementation.

Qualitative data provided further insight into the practical integration of EE at various levels of school life. Collaborative lesson plans were developed by the three seeding teachers in partnership with the researcher. Across the intervention period, the researcher conducted nine structured classroom observations (three with each seeding teacher), using both checklists and open field notes to document implementation fidelity and evidence of effective EE strategies. Each observation was recorded using a standardised assessment form covering four domains: teaching plan, environment setup, activity implementation, and teacher self-reflection. Observation ratings were based on predefined criteria. Classroom observations were assessed using a standardised observation rubric that covered four different dimensions, namely: teaching plan, environment setup and resource utilisation, implementation of activities, and teacher self-reflection. A Five-point rating scale was used to evaluate each of the dimensions, where 1 indicated very limited evidence while 5 indicated strong and consistent evidence. The researcher played two different roles in this study: primary observer and professional development facilitator. The researcher conducted this study with the awareness of researcher bias. To reduce the potential of researcher bias, the researcher triangulated observation findings with field notes, reflective discussions, questionnaire results, written teacher reflections, and project artefacts.

Open field notes were also taken to capture classroom dialogue and teacher-child interactions. Additionally, three reflective group discussions were held with only the seeding teachers, focusing on their experiences and challenges. Artefacts generated throughout the project offered further qualitative evidence of project outcomes and teacher collaboration. At the conclusion of the project, written self-reflections were submitted by all six teachers, providing insight into their learning and reflections on the professional development process. Observation data were analysed using thematic analysis alongside teacher reflections and focus group transcripts, focusing on EE integration and child engagement.

The primary quantitative instrument, the teacher questionnaire, was developed specifically for this study. To ensure content validity, a panel of two early childhood education specialists reviewed all questionnaire items for clarity, relevance and alignment with the study objectives. The instrument was refined based on their feedback. The 25 items were organised into three subscales: (1) knowledge and attitudes toward EE (Q1, Q2, Q6, Q10, Q13, Q17, Q20); (2) confidence in implementing EE practices (Q4, Q7, Q8, Q11, Q14, Q15, Q18, Q21, Q24); and (3) integration of EE strategies in classroom activities (Q3, Q12, Q16, Q19, Q22, Q23, Q25). Higher scores represented stronger agreement or confidence. All subscales demonstrated satisfactory internal consistency, with Cronbach's alpha values exceeding 0.80. The full questionnaire is provided in Appendix A.

To supplement self-reported data, structured classroom observations provided an objective account of how EE strategies were applied in practice. These observations, along with the data from the semi-structured reflective group discussions (conducted with the seeding teachers only) and written self-reflections submitted by all teachers, enriched the qualitative dataset and enabled a nuanced analysis of the professional development outcomes.

Data Analysis

Quantitative and qualitative data were analysed both separately and jointly, providing a comprehensive assessment of self-reported changes associated with the intervention. Quantitative analysis was performed using the Statistical Package for the Social Sciences (SPSS). Pre- and post-intervention teacher responses were summarised using descriptive statistics to illustrate trends. Qualitative analysis was conducted on data from joint lesson plans,

classroom observations, transcripts of reflective sessions, exhibition records, and teacher self-reflective comments. All qualitative data were transcribed, reread, and inductively coded. Member checking further ensured the trustworthiness of the themes. Qualitative findings provided insight into the cultural and institutional factors underlying these increases in post-test scores. Due to the small sample size (n = 6) and the paired pre–post design, a non-parametric analysis was adopted using the Wilcoxon Signed-Rank Test to compare pre- and post-intervention questionnaire scores. Both qualitative and quantitative findings were interpreted together to identify similarities and differences between the findings.

Trustworthiness and Ethics

Credibility was supported through triangulation of data sources (questionnaires, observations, reflections, and artefacts) and member checking, allowing participants to validate the interpretations. Confirmability was addressed through researcher reflexivity and collaborative interpretation with teachers to minimise bias. Informed consent was obtained from all participants, and the study received approval from the institutional review board. The researcher acted as both the facilitator and data collector. This could raise credibility concerns due to the potential of researcher bias. To address potential bias, researcher reflexivity was used. The researcher compared interpretations against multiple sources of evidence. Similarly, participants were allowed to verify the accuracy of emerging themes.

Results and Discussion

Qualitative Research Relating to the EE Programme

The qualitative analysis of the EE project draws on comprehensive field notes, teacher reflections, and records from collaborative lesson planning sessions. Three key and interconnected themes emerged: (1) transformation in teaching practice, (2) development of child-centred environmental agency, and (3) the cultivation of a collaborative professional culture among teachers.

Change in Teaching Practice

The project was associated with a shift from traditional, directive teaching toward experiential and inquiry-based approaches. For example, K1 teachers used story content and hands-on activities to help young children connect environmental protection to daily life. In K2, children learned to make environmentally friendly enzymes from fruit peels, with enthusiastic parental participation.

As the intervention progressed, teachers increasingly adopted hands-on and child-centred pedagogies. The K3 teacher used stories like “Summer is Here” and real-life weather chart observations to guide children in exploring how human activity relates to environmental issues such as the greenhouse effect and global warming. The teacher in K2 also leveraged culturally relevant events, using recycled paper to make eco-friendly lanterns instead of disposable glow sticks, and engaging children in practical comparisons of different types of lanterns and their environmental impact. As one teacher reflected: "I used to rely heavily on storybooks, but planning with my colleagues gave me the courage to try letting children experiment with real materials. I saw them develop ownership of the project in a way I hadn’t before."

Despite these advances, some lessons still reflected gaps, particularly in fostering critical thinking and addressing broader environmental issues. This highlights a need for more structured facilitation of ecological discussions to deepen conceptual integration (Melis et al., 2020). These findings align with Ernst and Tornabene (2012), who emphasise that inquiry-driven EE enhances conceptual understanding and engagement (Tilbury, 1995).

Across the nine classroom observations, assessment form ratings consistently showed satisfactory to excellent scores (4 or 5 out of 5) in child engagement and activity implementation. Field notes documented specific shifts, such as K1 children actively picking up rubbish from a sand pit, K2 children successfully making enzymes from fruit peels, and K3 children generating environmental protection charter items. These observations triangulate teacher-reported changes and illustrate EE integration in practice.

Child-Centred Environmental Agency Development

Classroom observation documented that children were observed participating actively in environmental decision-making. In K1, children reflected on the impact of garbage on beaches and marine life. In K2, children discussed

reducing food waste, bringing fruit peels from home for enzyme-making. In K3, after weather and environmental discussions, children articulated connections between energy use and climate change and developed strategies for daily conservation. Teachers noted children's ability to propose solutions: "Children suggested opening windows instead of using air conditioning, taking public transport, and reducing single-use plastics."

Collaborative Culture of Professional Teachers

Growing collaboration and reflection among teachers emerged. The mentoring model promoted lesson sharing and peer support. Seeding teachers reported that sharing lesson plans and regular meetings allowed all colleagues to adopt EE strategies: "Through lesson plans, I can pass on this knowledge to teachers who were not involved in the training. Other teachers can then incorporate the elements of EE into their teaching content and design relevant materials." Teachers described "supporting each other through sharing mentor suggestions and comments during regular teaching reviews, allowing everyone to learn together."

This aligns with professional learning community models, highlighting collaboration as central to professional growth (Stoll et al., 2006). Teachers also noted challenges in skillfully integrating EE themes across diverse topics and ensuring systematic curriculum organisation,

Quantitative Research Relating to the EE Programme

The quantitative findings from pre- and post-intervention questionnaires reinforce and extend the qualitative results. Analysis centred on three domains: (1) teachers' knowledge and attitudes towards EE, (2) confidence in implementing EE practices, and (3) the integration of EE strategies into classroom activities.

Reliability of Measurement Instruments

The internal consistency of each questionnaire subscale was evaluated using Cronbach's alpha. All scales demonstrated strong reliability (Table 1).

Table 1. Cronbach's Alpha Reliability Coefficients for Questionnaire Subscales

Construct	Pre-Test Alpha	Post-Test Alpha
Knowledge	0.89	0.93
Confidence	0.90	0.92
Practice	0.76	0.87

Summary of Quantitative Findings

According to the Wilcoxon Signed-Rank Test, after the intervention, teachers' knowledge and attitudes toward EE increased. At pre-test, the mean score was 3.02, and at post-test, the mean score increased to 3.21. This increase suggested a positive impact on teacher-led initiatives. However, the increase did not attain the statistical significance level ($p = 0.102$). These results suggest a positive trend in teachers' environmental knowledge and awareness. In regard to teachers' confidence, the participants reported higher levels of confidence when implementing EE practices and participating in the programme. The mean scores during the pre-test were 2.57. After the intervention, the mean scores increased to 3.02. Despite this improvement, the scores did not achieve a favourable statistical significance ($p = 0.080$). The findings indicate a positive shift in teachers' self-reported confidence and willingness to implement EE activities. The most significant improvement was evident in classroom practice. This was evident in the significant change of mean scores, from 2.95 to 3.26. This increment was statistically significant ($p = 0.031$), indicating measurable improvements following the intervention. This suggests that teachers' ability to implement EE strategies in classroom settings improved meaningfully.

Table 2. Pre- and Post-Intervention Comparisons of Teacher EE Outcomes Using the Wilcoxon Signed-Rank Test

Domain	Pre-Test Mean	Post-Test Mean	Mean Difference	Wilcoxon p-value
Knowledge & Attitudes	3.02	3.21	+0.19	0.102
Confidence	2.57	3.02	+0.45	0.080
Classroom Practice	2.95	3.26	+0.31	0.031*

Integrating Quantitative and Qualitative findings

Quantitative trends in knowledge and confidence aligned with qualitative evidence of increased hands-on implementation and collaborative planning. Teachers with higher post-intervention confidence were more likely to facilitate child-led inquiry and environmental discussions, demonstrating convergence across data sources.

Specifically, the qualitative theme of transformation in teaching practice was reflected in the quantitative gains in classroom practice scores. Teachers expressed uncertainty about the integration of environmental concepts at the outset, but as the intervention progressed, their confidence grew alongside their observed use of inquiry-based approaches. The qualitative finding of child-centred environmental agency was supported by quantitative increases in teacher confidence, as more confident teachers were more likely to facilitate child-led decisions and decision-making. Finally, the theme of collaborative professional culture was evident. It was reflected in teachers' shared planning, peer support, and reflective discussions. Collaboration positively influenced multiple aspects of teacher development.

These findings align with previous research (e.g., Chen et al., 2015; Kalsoom et al., 2022), which emphasises the value of experiential professional learning and collaborative reflection in supporting teachers' use of interactive, sustainability-focused teaching strategies.

Conclusion

The current study evaluated the self-reported changes following a teacher-led EE training programme in a Hong Kong kindergarten, examining shifts in teacher awareness, understanding, classroom practice, and related children's outcomes. Results revealed that after the intervention, teachers' confidence, knowledge, and classroom practice improved. However, only classroom practice achieved statistical significance. This indicates that the intervention was more effective in strengthening classroom integration of environmental concepts than in significantly increasing teachers' knowledge and confidence. Instructional practices were strengthened, and teachers observed children engaging more actively with environmental topics, though challenges persisted in teaching complex concepts such as energy conservation and the greenhouse effect. Both qualitative and quantitative evidence indicate that frequent, interactive, experiential EE activities were associated with more positive environmental attitudes and behaviours among participating children. As one of the few mixed-methods EE interventions reported in Hong Kong kindergartens, this study offers locally grounded insights that may be relevant to other high-density urban contexts in Asia. The findings suggest that with the help of teacher-driven EE, it is possible to foster climate literacy among children in childhood education.

Limitations

Several limitations should be acknowledged. The sample was small and drawn from a single kindergarten, limiting generalizability and restricting transferability to similar contexts. As a context-bound urban case study, findings are shaped by local institutional and curricular conditions; application elsewhere requires consideration of contextual differences. Although the action research extended across two terms, its focus was primarily on medium-term outcomes, and long-term sustainability remains unknown. The scope of the EE training was relatively narrow, mainly emphasising local recycling, with less attention given to broader environmental topics and resources essential for comprehensive community engagement. There was also significant reliance on self-reported teacher data and indirect assessment of children's outcomes, raising the risk of response bias. The researcher's dual role as both facilitator and data collector may have introduced additional bias, though reflexivity and triangulation measures were taken to help mitigate this concern.

Further Research

To address these limitations, future research should adopt a broader and more methodologically rigorous approach. Studies that include a larger and more diverse sample of kindergartens—across multiple districts and varying community contexts—would greatly enhance the generalisability of results. Implementing longitudinal designs is recommended to assess the long-term effectiveness and sustainability of EE training, particularly in terms of lasting changes to teachers' practices and children's environmental behaviours. Future investigations should also expand the scope of training content to encompass a wider array of environmental themes and promote deeper community engagement. Researchers are encouraged to employ validated, robust assessment instruments and independent observational protocols to systematically evaluate both teacher and children's outcomes. Incorporating direct, objective measures of children's environmental knowledge, attitudes, and behaviours—such as pre- and post-intervention child interviews, standardised tasks, or independent classroom observations—will

enable more reliable attribution of effects to teacher-led interventions. Future studies should minimise research bias by involving independent evaluators in data collection and analysis. Further studies examining how shifts in teachers' competencies translate into changes in children's attitudes, behaviours, and ecological awareness would clarify the mechanisms underlying EE interventions.

Recommendations

The findings of this study suggest several ways to enhance environmental EE training programmes in kindergartens. Training programmes should be comprehensive, sustainable, and extended over the long term, incorporating both foundational knowledge and reflective practice. Specifically, targeted professional development should address knowledge gaps on more complex topics, such as the greenhouse effect and local recycling systems, to equip teachers with the conceptual depth required for effective EE integration. Sustained training should include continuous opportunities for skill refinement through peer mentoring, collaborative lesson planning, and regular workshops. Reflective practices, such as self-evaluation, peer discussions, and the use of professional journals, should be embedded to foster ongoing professional growth.

Furthermore, teachers are encouraged to adopt interactive and experiential instructional methods, which can increase engagement and environmental awareness among young learners. Schools should prioritise access to outdoor learning spaces and eco-friendly materials to support these interactive methods. Strengthening parent and community involvement—through activities such as recycling drives, tree planting, and family-oriented environmental projects—can reinforce environmental values both in school and at home. Finally, longitudinal research is recommended to evaluate the sustained impact of EE training on teachers and children alike, deepening understanding of its long-term efficacy. Importantly, these findings suggest that even small-scale, teacher-focused professional development may contribute to improvements in EE practices at the school level. Therefore, educational leaders and policymakers should consider supporting the expansion of collaborative professional development models and allocating resources to extend these efforts to a broader range of kindergartens.

Ethical Approval

Ethical approval for this study was obtained from the Research Coordination and Development Committee, HKCT Institute of Higher Education Approval Date: 29.12.2024; Approval Number: Not applicable).

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From Curriculum Beliefs to Teaching Preparedness: Examining the Role of Democratic Tendency in Pre-Service Teachers

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Abstract
Understanding how pre-service teachers' curriculum belief orientations relate to their professional preparedness is important for teacher education. This study examined the structural relationships among curriculum design orientations, democratic tendency, and teaching preparedness. Data were collected from 287 teacher candidates enrolled in a faculty of education in Türkiye. Participants completed measures of subject-centered curriculum orientation, constructivist curriculum orientation (combining learner-centered and problem-centered orientations), democratic tendency, and teaching preparedness. Structural equation modeling was conducted using Jamovi (Version 2.6.44) to examine the structural relationships among the variables. The results showed that constructivist curriculum orientation positively predicted democratic tendency, whereas subject-centered orientation negatively predicted democratic tendency. Democratic tendency showed a limited and non-significant association with teaching preparedness. Neither constructivist nor subject-centered orientation demonstrated a significant direct effect on preparedness, and democratic tendency did not function as a mediating mechanism. The model explained substantial variance in democratic tendency but relatively limited variance in teaching preparedness. Overall, the findings suggest that constructivist curriculum beliefs are closely aligned with democratic dispositions, while democratic values appear to be associated with broader professional orientations rather than with immediate perceptions of teaching preparedness. The study contributes to the literature by clarifying the distinct roles of curriculum belief orientations and democratic tendency in pre-service teacher development. Practically, the findings suggest that teacher education programs may benefit from integrating democratic participation, reflective dialogue, and learner-centered experiences alongside curriculum-related coursework in order to support broader aspects of professional readiness.

Keywords: Constructivist orientation, Curriculum orientations, Democratic tendency, Pre-service teachers, Structural equation modeling, Subject-centered orientation, Teaching preparedness.

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Introduction

In contemporary educational systems, the role of teachers extends beyond the transmission of subject matter knowledge to include the cultivation of democratic values, critical thinking, and active participation. Education is increasingly understood as a social and moral endeavor in which teachers play a central role in shaping learners' capacities for meaningful participation in democratic societies (Dewey, 1916; Apple & Beane, 2007; Biesta, 2011, pp. 1-5). Accordingly, teachers are expected not only to implement prescribed curricula but also to design learning environments that reflect democratic principles and learner-centered practices.

Within this context, teachers' approaches to curriculum design have gained renewed attention. Curriculum design orientations reflect underlying philosophical beliefs about knowledge, learning, and the purposes of education (Tyler, 1949; Schiro, 2013; Ornstein & Hunkins, 2018). These orientations shape how teachers interpret curricular goals, select instructional strategies, and interact with students. For teacher candidates, curriculum design preferences constitute a core component of developing professional belief systems during pre-service education and may be related to emerging perceptions of teaching preparedness. Importantly, the present study does not assume that subject-centered and constructivist curriculum orientations are mutually exclusive belief systems. Teacher candidates may simultaneously endorse elements of both orientations to varying degrees, depending on their educational experiences and pedagogical preferences. Accordingly, the structural model treats these orientations as theoretically distinct but potentially coexisting dimensions of curriculum belief rather than as opposite ends of a single continuum (Schiro, 2013; Ornstein & Hunkins, 2018).

Educational reforms emphasizing constructivist and student-centered approaches have further highlighted the importance of aligning teachers' beliefs with curricular expectations (OECD, 2020; UNESCO, 2021). Internationally, constructivist curriculum orientations have been reflected in reforms emphasizing inquiry-based learning, student agency, collaboration, and authentic problem solving, whereas subject-centered orientations continue to play an important role in many educational systems through their emphasis on disciplinary knowledge, academic standards, and content mastery. Contemporary teacher education programs increasingly seek to balance these orientations by combining strong subject knowledge with learner-centered pedagogical approaches. However, research consistently indicates that the success of curriculum reforms depends largely on teachers' belief systems rather than on formal policy changes alone (Pajares, 1992; Fullan, 2007). When teacher candidates do not internalize the pedagogical principles underlying such reforms, implementation often remains superficial and inconsistent.

Teacher education programs therefore face the challenge of preparing candidates who are not only pedagogically competent but also capable of fostering democratic classroom environments. Teaching preparedness—understood as teachers' perceived readiness to meet professional demands—has emerged as a key developmental outcome within this process (Darling-Hammond, 2006). At the same time, democratic tendency, including valuing participation, respect for diversity, and shared decision-making, is widely regarded as an essential attribute of effective teaching in democratic societies (Dewey, 1916; Biesta, 2011, pp. 16-20). Recent studies conducted in the Turkish teacher education context have similarly emphasized the importance of democratic values and participatory orientations among pre-service teachers. Existing research has examined democratic attitudes in relation to emotional intelligence, multicultural self-efficacy, educational beliefs, and tolerance tendencies, highlighting the multidimensional nature of democratic dispositions in teacher education (Özaslan et al., 2020; Tican, 2020; Sıvacı & Altaş, 2024; Çelik et al., 2024). Nevertheless, preparedness is a multifaceted construct shaped not only by beliefs but also by practicum experiences, instructional opportunities, and processes of professional socialization.

Although curriculum design orientations, democratic tendency, and teaching preparedness have each been examined in prior research, they have rarely been investigated within a single integrative framework. Contemporary curriculum scholarship further suggests that curriculum beliefs tend to cluster into two broader traditions: traditional, subject-centered orientations emphasizing content transmission, and progressive, constructivist orientations emphasizing learner participation, inquiry, and engagement with meaningful problems (Schiro, 2013; Ornstein & Hunkins, 2018). However, empirical evidence remains limited regarding how these broader belief systems relate to democratic dispositions and how such dispositions, in turn, are associated with teacher candidates' perceptions of preparedness.

Accordingly, the present study examines the structural associations among teacher candidates' curriculum belief orientations, democratic tendency, and teaching preparedness. Using structural equation modeling, the study

adopts a relational rather than causal perspective to explore how subject-centered and constructivist curriculum orientations are linked to democratic dispositions and how these dispositions relate to perceived professional preparedness during pre-service teacher education. Understanding these relationships may help teacher education programs better align curriculum beliefs, democratic values, and professional development experiences in ways that support the preparation of future teachers.

Literature Review

Teaching Preparedness

Teaching preparedness refers to teachers' perceived readiness to engage effectively in professional practice, encompassing pedagogical competence, confidence in classroom management, and alignment with professional values (Darling-Hammond, 2006). Rather than representing a purely technical construct, preparedness also involves affective and belief-related dimensions that shape how teachers interpret instructional challenges, make pedagogical decisions, and assume professional responsibility.

Research indicates that teachers' beliefs are among several psychological factors associated with perceptions of preparedness, although beliefs alone are insufficient to account for variation in professional readiness. Teachers who perceive coherence between their pedagogical beliefs and instructional practices tend to report higher levels of professional confidence and instructional effectiveness, whereas misalignment between beliefs and curricular expectations may undermine perceived preparedness (Pajares, 1992). Preparedness has also been linked to related constructs such as teaching self-efficacy and professional identity, suggesting that it reflects a broader psychological orientation toward teaching rather than a direct outcome of any single belief system (Tschannen-Moran & Hoy, 2001).

Within teacher education, teaching preparedness is increasingly conceptualized as a developmental outcome shaped through coursework, practicum experiences, institutional conditions, and reflective engagement with practice (Darling-Hammond, 2006). From this perspective, preparedness is best understood as a distal and context-sensitive construct that emerges through the interaction of pedagogical beliefs, experiential learning, and institutional support over time. Examining preparedness in relation to curriculum design orientations therefore offers insight into how foundational belief systems may be associated with, but do not fully determine, pre-service teachers' perceptions of professional readiness.

Curriculum Design Orientations

Curriculum design refers to the systematic organization of educational goals, content, learning experiences, and assessment processes. Classical curriculum theory distinguishes among subject-centered, learner-centered, and problem-centered design orientations, each reflecting distinct philosophical assumptions about knowledge, learning, and the purposes of education (Tyler, 1949; Schiro, 2013; Ornstein & Hunkins, 2018).

Subject-centered curriculum design prioritizes disciplinary knowledge and structured content progression. While this orientation supports systematic coverage of subject matter, it is commonly associated with teacher-centered instructional practices and a stronger emphasis on content mastery than on student participation (Tyler, 1949; Schiro, 2013). In contrast, learner-centered and problem-centered orientations are situated within a broader progressive and constructivist tradition. Learner-centered design emphasizes students' needs, interests, and active engagement, conceptualizing learning as an interactive process of meaning making (Dewey, 1938; Darling-Hammond, 2006). Problem-centered design extends this perspective by focusing on real-life and socially relevant problems, encouraging critical thinking, collaboration, and inquiry within authentic contexts, and is frequently linked to democratic and social learning aims (Dewey, 1916; Apple & Beane, 2007).

Although learner-centered and problem-centered designs are conceptually distinct, both share core constructivist assumptions and are often treated as complementary dimensions within progressive curriculum frameworks. Empirical research indicates that teachers who endorse these orientations are more likely to adopt participatory, dialogic, and flexible instructional practices, whereas subject-centered orientations tend to align with more transmission-based approaches (Baş, 2013; Schiro, 2013). Owing to this empirical overlap, several studies have modeled learner-centered and problem-centered orientations as closely related or higher-order constructivist belief structures in structural analyses of teacher beliefs. Similar tendencies have also been observed in studies conducted with Turkish pre-service teachers, where learner-centered educational beliefs were positively associated with democratic values and participatory teaching orientations (Çelik et al., 2024; Kaya et al., 2023).

Recent empirical studies have further linked constructivist educational orientations with learner agency, participation, collaboration, reflective inquiry, civic engagement, and democratic classroom practices. Research conducted across teacher education and problem-based learning contexts suggests that learner-centered and problem-centered approaches may contribute to the development of participatory and democratically oriented learning environments (Alsalihi, 2024; Demirci-Ünal et al., 2024; Riddle, 2024; Rohman et al., 2023).

Curriculum design orientations also shape how teachers interpret and enact curricular reforms, influencing the extent to which reform initiatives are implemented in meaningful and authentic ways rather than at a superficial level (Fullan, 2007). Understanding teacher candidates' curriculum design preferences is therefore essential for examining belief systems that support pedagogical innovation and democratic classroom practices during teacher education.

Democratic Tendency in Teacher Education

Democratic tendency refers to teachers' dispositions toward democratic values such as participation, equality, respect for diversity, and shared decision-making. Democratic education positions schools as key contexts for fostering civic engagement and social responsibility, with teachers serving as central agents in translating democratic ideals into classroom practice (Dewey, 1916; Apple & Beane, 2007).

Research suggests that democratic teaching practices are closely associated with pedagogical approaches that emphasize student voice, dialogue, collaboration, and shared responsibility for learning (Biesta, 2011; Hess & McAvoy, 2014). Teachers who value democratic principles are more likely to create inclusive classroom environments that support autonomy, deliberation, and critical inquiry. However, studies also point to discrepancies between teachers' democratic beliefs and their enacted practices, indicating that democratic tendency frequently operates as a broader value orientation that requires sustained practice, reflective engagement, and supportive institutional contexts to be fully realized (Akbaşlı et al., 2010). From this perspective, democratic tendency is best understood as a dispositional orientation rather than a direct instructional outcome, reflecting teachers' normative commitments more than their immediate pedagogical competence.

Despite its widely acknowledged significance, democratic tendency has rarely been examined within integrative structural models that consider its positioning alongside pedagogical belief orientations and professional perceptions. Examining democratic tendency within such a framework may deepen understanding of how democratic values align with broader curriculum belief systems and how these value-based dispositions are associated with teacher candidates' perceptions of preparedness over time, without assuming a direct or causal explanatory role.

Curriculum Design Orientations, Democratic Tendency, and Teaching Preparedness

Theoretical perspectives in curriculum studies suggest that curriculum design orientations are closely associated with differing conceptions of teaching preparedness. Progressive orientations grounded in learner-centered and problem-centered traditions are commonly linked to preparedness through their emphasis on flexible instructional thinking, reflective practice, and responsiveness to learners. In contrast, traditional subject-centered orientations prioritize content transmission and curricular coverage, often placing less emphasis on adaptive pedagogy and participatory classroom processes (Schiro, 2013; Darling-Hammond, 2006; Ornstein & Hunkins, 2018). These orientations reflect broader pedagogical belief systems that shape how teacher candidates interpret instructional demands, exercise professional judgment, and construct their sense of readiness for teaching (Pajares, 1992).

Democratic tendency may further intersect with teaching preparedness by influencing how teacher candidates conceptualize professional roles, classroom authority, and relationships with learners. From a democratic education perspective, teachers' commitments to participation, dialogue, and shared decision-making are theorized to inform how they approach classroom practice and professional responsibility (Dewey, 1916; Biesta, 2011, pp. 16-20). However, democratic tendency is often conceptualized as a value-oriented disposition rather than as an immediately operational pedagogical competence, suggesting that its relationship with preparedness may be indirect, developmental, or context-dependent.

Despite these theoretical linkages, empirical research examining curriculum orientations, democratic tendency, and teaching preparedness within a single integrative framework remains limited. Existing studies have typically addressed these constructs in isolation or through pairwise associations, leaving their joint structural relationships

underexplored (Zeichner, 2010; Darling-Hammond, 2006). In particular, there is limited empirical evidence clarifying how democratic tendency is positioned alongside curriculum belief systems in relation to teacher candidates' perceptions of preparedness, without presupposing direct or causal relationships.

Accordingly, the present study examines a structural model that situates teacher candidates' curriculum design orientations, democratic tendency, and teaching preparedness within a unified analytical framework. Using structural equation modeling, the study explores how traditional subject-centered and progressive constructivist belief systems are associated with democratic dispositions and how these dispositions relate to perceived professional preparedness. The model is approached from a relational perspective and does not assume direct, causal, or mediating effects among the constructs.

Method

Research Design

This study employed a correlational research design to examine the structural associations among teacher candidates' curriculum design orientations, democratic tendency, and teaching preparedness. Structural equation modeling (SEM) was selected because it enables the simultaneous estimation of multiple latent constructs, accounts for measurement error, and allows theoretically informed examination of complex relational patterns among variables (Kline, 2016; Hair, Babin, Anderson, & Black, 2019). Although the study adopted a correlational rather than causal perspective, SEM was preferred as a confirmatory analytic framework for evaluating the proposed pattern of relationships among the study variables.

The structural model was specified to explore how traditional subject-centered and progressive constructivist curriculum belief systems are associated with democratic dispositions and how these dispositions relate to teacher candidates' perceptions of preparedness for teaching. In line with the cross-sectional nature of the data, all estimated paths were interpreted as associative rather than causal relationships. Although the model included theoretically specified relations among the variables, the results were not interpreted as evidence of causal or statistically substantiated mediating processes.

Participants

The target population of the study consisted of pre-service teachers enrolled in undergraduate teacher education programs at the Faculty of Education of a medium-sized state university located in western Türkiye during the 2024–2025 academic year. Participants were recruited through convenience sampling based on accessibility and voluntary participation. Data were collected during regularly scheduled class sessions, and teacher candidates who were present and willing to participate were invited to complete the study instruments. The study was conducted with 287 pre-service teachers enrolled in teacher education programs at the Faculty of Education of this institution. The sample included 251 females and 36 males, reflecting the gender distribution commonly observed in teacher education programs.

Participants represented several academic departments, including Early Childhood Education, Primary Education, Elementary Mathematics Education, Social Studies Education, Turkish Language Education, and Science Education. Grade-level distribution also varied, with 105 first-year, 74 second-year, 57 third-year, and 51 fourth-year students. The inclusion of participants from all grade levels was intentional, as the study aimed to examine general patterns of association among curriculum beliefs, democratic tendency, and perceived teaching preparedness across different stages of pre-service teacher education rather than focusing exclusively on candidates with extensive practicum experience. This diversity reflects the typical structure of pre-service teacher populations in faculties of education and was considered appropriate for examining general patterns of association among belief- and value-based constructs.

The sample size exceeded commonly recommended guidelines for SEM applications, including the minimum N > 200 criterion and recommendations suggesting at least 10–20 participants per estimated parameter. Given the complexity of the structural model and the presence of multiple latent constructs, a sample of 287 participants was considered adequate for estimating the proposed model and examining the structural associations among the study variables (Kline, 2016; Hair et al., 2019).

Instruments

Curriculum Design Orientation Preferences Scale

Curriculum design orientations were measured using the scale developed by Baş (2013). The instrument consists of 30 items representing subject-centered, learner-centered, and problem-centered curriculum orientations, scored on a five-point Likert scale. In this study, internal consistency analyses indicated strong reliability across sub-dimensions, with Cronbach's alpha coefficients of .768 for the subject-centered orientation, .831 for the learner-centered orientation, and .867 for the problem-centered orientation. McDonald's omega coefficients (.767, .844, and .876, respectively) provided further support for dimensional reliability. Confirmatory factor analysis generally supported the three-factor structure, with all standardized factor loadings exceeding .50; however, incremental fit indices suggested notable shared variance among the constructivist dimensions.

Given the substantial conceptual overlap between learner-centered and problem-centered orientations, both of which are grounded in constructivist assumptions about learning, these dimensions were modeled as indicators of a broader constructivist curriculum orientation in the structural model. This approach is consistent with curriculum theory and prior empirical studies suggesting that these orientations frequently co-occur and function as an integrated belief system rather than as fully independent constructs.

Democratic Tendency Scale

Democratic tendency was assessed using the scale developed by Akbaşlı, Yanpar-Yelken, and Sünbül (2010). Although the instrument encompasses four conceptual subcomponents, the developers conceptualize it as representing a single overarching construct. Consistent with this theoretical conceptualization and prior empirical applications, democratic tendency was treated as a unidimensional construct in the present study. Reverse-coded items were recoded prior to analysis, and all items were retained as indicators of the latent democratic tendency construct.

Internal consistency analyses yielded a Cronbach's alpha of .796 and a McDonald's omega coefficient of .829, demonstrating strong reliability. CFA results also supported the single-factor representation, with factor loadings above .40 and acceptable model fit statistics. Treating democratic tendency as a unidimensional latent construct aligns with its conceptualization as a value-based disposition rather than a set of discrete instructional competencies.

Teaching Preparedness Scale

Teaching preparedness was measured using the "Preparedness to Teach Scale," adapted into Turkish by Yıldırım and Kalman (2017). The Turkish adaptation confirmed a 20-item, four-factor structure with strong psychometric properties. However, for analytical parsimony and in line with prior SEM applications that have operationalized teaching preparedness as a global professional readiness construct, the scale was represented as a single latent factor in the present study.

Reliability analyses indicated excellent internal consistency (Cronbach's $\alpha = .950$; McDonald's $\omega = .951$). CFA results indicated that the items loaded strongly on a single latent preparedness factor, providing an acceptable representation for the purposes of structural analysis.

Although multidimensional structures have been proposed for democratic tendency and teaching preparedness in prior research, these constructs were modeled as global latent factors in the present study. This decision was guided by the study's focus on overall pedagogical orientation, democratic disposition, and perceived professional readiness, consistent with SEM research that conceptualizes teacher belief systems at a holistic level rather than emphasizing subcomponent-specific effects.

Data Collection Procedure

Data were collected during the 2024–2025 academic year following ethical approval obtained from the Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee (Decision No: 2026/100, Approval Date: 18 February 2026). Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Participants were informed about the purpose of the study, their rights as participants, and the confidentiality and anonymity of their responses. They were also informed that they could withdraw from the study at any time without any consequences. Prior to analysis, the dataset was screened for missing data, outliers, and violations of normality.

Data Analysis

Preliminary analyses included examination of skewness and kurtosis, both of which indicated acceptable levels for robust estimation. Missing data were handled using Full Information Maximum Likelihood (FIML). Multi-collinearity was examined using variance inflation factors, and the results indicated no collinearity concerns among the variables. To address potential common method bias, both procedural and statistical precautions were considered. Statistically, Harman's single-factor test indicated that no single factor accounted for the majority of variance. In addition, a latent-method factor test yielded no evidence of substantial common variance, suggesting that common method bias was unlikely to threaten the validity of the results.

Confirmatory factor analyses (CFA) were conducted to evaluate the measurement structures of the multi-item instruments. Factor loadings, residuals, and modification indices were examined to ensure construct validity. The measurement models demonstrated acceptable overall fit based on conventional criteria (CFI, TLI, RMSEA, SRMR). Composite reliability and average variance extracted (AVE) values provided evidence for convergent validity, while discriminant validity was examined using AVE-based criteria and HTMT ratios, which indicated acceptable levels of construct distinctiveness given the theoretical relatedness of the constructs.

Following validation of the measurement models, the structural model was estimated using the robust maximum likelihood estimator (MLR), which provides stable parameter estimates under mild deviations from normality. The structural analysis focused on examining the associations among curriculum design orientations, democratic tendency, and teaching preparedness within a correlational framework. Although paths were specified to reflect theoretically informed ordering among the constructs, no causal or mediating interpretations were assumed. Indirect associations were examined descriptively to better understand the positioning of democratic tendency within the model, rather than to test formal mediation effects.

Indirect effects were evaluated using a product-of-coefficients approach and were reported together with bootstrapped 95% confidence intervals. Given the cross-sectional and correlational nature of the study, the indirect associations were interpreted cautiously and were not treated as evidence of causal mediation.

Results

Descriptive Statistics and Correlations

Descriptive statistics and inter-correlations among the study variables are presented in Table 1. Learner-centered and problem-centered curriculum orientations demonstrated a strong positive association ($r = .798$, $p < .001$), consistent with their shared grounding in constructivist curriculum theory. Subject-centered orientation showed a small but significant negative correlation with democratic tendency ($r = –.159$, $p < .01$) and a trivial, non-significant negative correlation with teaching preparedness ($r = –.069$, $p = .247$). Both learner-centered ($r = .451$, $p < .001$) and problem-centered orientations ($r = .447$, $p < .001$) were positively associated with democratic tendency. Democratic tendency exhibited a small but statistically significant positive association with teaching preparedness ($r = .211$, $p < .001$).

Although the magnitude of this correlation is high, it aligns with curriculum theory that conceptualizes learner-centered and problem-centered orientations as closely related dimensions within a broader constructivist belief system, thereby supporting the use of latent-variable modeling to examine their shared and unique contributions.

Table 1. Descriptive Statistics and Inter-Correlations Among Study Variables (N = 287)

Variable	M	SD	1	2	3	4	5
1. Subject-centered	2.89	0.56	—				
2. Learner-centered	4.21	0.49	.045	—			
3. Problem-centered	4.26	0.48	.181**	.798***	—		
4. Democratic tendency	4.31	0.42	–.159**	.451***	.447***	—	
5. Teaching preparedness	3.86	0.63	–.069	.208***	.130*	.211***	—

Note. *Values represent Pearson correlation coefficients. Learner-centered and problem-centered orientations are conceptually related dimensions within constructivist curriculum theory. Their relatively high correlation is therefore theoretically expected; however, they were retained as distinct constructs in accordance with the original scale structure and subsequent validity analyses. *p < .05, **p < .01, ***p < .001.*

Measurement Model

The revised measurement model, which conceptualized curriculum orientations under two broader belief systems—subject-centered and constructivist orientation—demonstrated an overall acceptable approximation to the data. Given the substantial empirical overlap between learner-centered and problem-centered orientations, these dimensions were modeled as indicators of a broader constructivist orientation rather than as fully independent latent constructs. This specification was informed by both curriculum theory and the strong shared variance observed between the two dimensions. Although the incremental fit indices (CFI = .816; TLI = .807) remained below commonly recommended thresholds, the RMSEA (.061, 90% CI [.058, .065]) and SRMR (.089) values suggested an acceptable level of approximate fit. Given the theoretically driven nature of the measurement structure and the large number of observed indicators, the model was retained for substantive interpretation. Nevertheless, the measurement model should be interpreted with caution, and future research may benefit from examining alternative measurement specifications and more parsimonious factor structures.

Beyond global model fit, item-level evidence supported the construct validity of the measures. All standardized factor loadings were statistically significant ($p < .001$) and in the expected direction. Factor loadings ranged from moderate to high across subject-centered items ($\beta = .20–.67$), constructivist items ($\beta = .37–.79$), and teaching preparedness indicators ($\beta = .48–.84$), indicating substantively interpretable relationships between latent constructs and their observed indicators.

Composite reliability values and average variance extracted were examined to evaluate reliability and convergent validity. All constructs demonstrated satisfactory internal consistency ($CR \geq .78$). Although some AVE values fell below the conservative .50 criterion, they exceeded .30 and were accompanied by strong composite reliability coefficients and theoretically coherent factor structures. In the context of complex latent-variable models with conceptually related constructs and multiple indicators, convergent validity may be reasonably inferred from the combined evidence of factor loadings, reliability estimates, and theoretical coherence (Hair et al., 2019).

Discriminant validity was examined using multiple criteria. The constructivist and subject-centered belief systems, while situated within the same curricular domain, demonstrated empirical distinctiveness at an acceptable level given their theoretical relatedness, with interconstruct correlations remaining below unity and HTMT values below recommended liberal thresholds. Taken together, these findings suggest that the revised measurement model was sufficiently coherent to support subsequent structural analyses, with results interpreted cautiously in light of model complexity.

Table 2. Measurement Model Fit Indices for the Revised Latent Structure

Fit Index	Value
χ^2 (df = 1215)	2406***
CFI	.816
TLI	.807
RMSEA	.061
RMSEA 90% CI	.058–.065
SRMR	.089

Although incremental fit indices fell below conventional cutoff values, error-based indices (RMSEA and SRMR) indicated acceptable model approximation. Given the conceptual breadth of the constructs and the large number of observed indicators, the measurement model was retained as theoretically coherent rather than optimized solely for incremental fit indices.

Structural Model

The structural model illustrating the relationships among curriculum orientations, democratic tendency, and teaching preparedness is presented in Figure 1. This figure provides a visual representation of the hypothesized and estimated associations among the latent constructs.

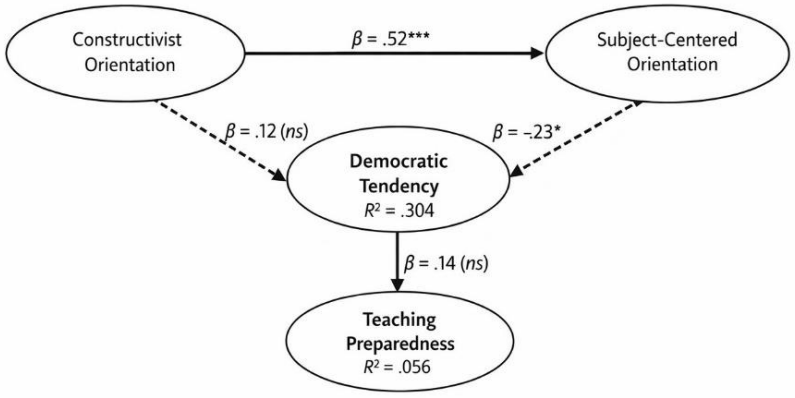

Figure 1. Structural model of relationships among curriculum orientations, democratic tendency, and teaching preparedness (standardized estimates)

As illustrated in Figure 1, constructivist curriculum orientation demonstrated a strong positive association with democratic tendency (β = .52, p < .001), indicating that teacher candidates who endorsed progressive, learner- and problem-centered curriculum beliefs reported stronger democratic dispositions. In contrast, subject-centered curriculum orientation demonstrated a statistically significant negative association with democratic tendency (β = −.23, p = .007), suggesting that traditional content-focused orientations were associated with lower endorsement of democratic values. With respect to teaching preparedness, democratic tendency exhibited a small positive association; however, the relationship did not reach statistical significance (β = .14, p = .063). Accordingly, democratic tendency did not emerge as a statistically supported correlate of perceived teaching preparedness in the present model. Neither constructivist curriculum orientation (β = .12, p = .157) nor subject-centered curriculum orientation (β = −.07, p = .321) demonstrated a statistically significant direct association with teaching preparedness.

Taken together, the results indicate that curriculum belief orientations are strongly associated with democratic dispositions, whereas their direct associations with perceived teaching preparedness are limited. The marginal association between democratic tendency and preparedness suggests that democratic values may be related to perceptions of readiness in a more gradual or developmental manner rather than functioning as an immediate competence-related factor.

The structural model accounted for a substantial proportion of variance in democratic tendency (R^2 = .305), whereas the variance explained in teaching preparedness was considerably lower (R^2 = .058). The standardized path coefficients for the structural model are presented in Table 3.

Table 3. Standardized Path Coefficients for the Structural Model (Associational Estimates)

Outcome	Predictor	β	SE	z	p
Democratic Tendency	Subject-centered orientation	−0.232	0.090	−2.68	.007
Democratic Tendency	Constructivist orientation	0.519	0.113	4.80	< .001
Teaching Preparedness	Democratic tendency	0.140	0.112	1.86	.063
Teaching Preparedness	Subject-centered orientation	−0.074	0.116	−0.99	.321
Teaching Preparedness	Constructivist orientation	0.117	0.129	1.41	.157

Note. Coefficients represent standardized associations estimated within a correlational structural equation modeling framework. Given the cross-sectional design, coefficients should not be interpreted as causal effects. The structural model explained 30.5% of the variance in Democratic Tendency (R^2 = .305) and 5.8% of the variance in Teaching Preparedness (R^2 = .058).

Mediation Analysis

Indirect associations among curriculum design orientations, democratic tendency, and teaching preparedness were examined using a product-of-coefficients approach. Statistical inference was based on bootstrapped 95% confidence intervals and associated significance tests.

The indirect association between constructivist curriculum orientation and teaching preparedness through democratic tendency was positive but did not reach statistical significance (β = .072, 95% CI [−0.018, 0.254], p = .087). Similarly, the indirect association between subject-centered curriculum orientation and teaching preparedness through democratic tendency was negative and non-significant (β = −.032, 95% CI [−0.138, 0.008], p = .184). Because both confidence intervals included zero, the indirect effects were not statistically supported. These findings indicate that democratic tendency did not emerge as a statistically substantiated explanatory factor linking curriculum belief orientations to perceived teaching preparedness within the present model.

Taken together, the pattern of findings suggests that while curriculum belief systems are closely associated with democratic dispositions, perceived teaching preparedness is likely shaped by a broader constellation of experiential, contextual, and developmental factors. Given the cross-sectional design of the study and the dispositional nature of democratic values, any indirect associations between beliefs, values, and preparedness should be interpreted cautiously and may become more evident in longitudinal or practice-based research contexts.

Table 4. Indirect Effects of Curriculum Orientations on Teaching Preparedness Through Democratic Tendency

Path	Estimate	SE	95% CI	β	z	p
Subject-centered → Democratic Tendency → Teaching Preparedness	−0.051	0.038	[−0.138, 0.008]	−0.032	−1.330	.184
Constructivist orientation → Democratic Tendency → Teaching Preparedness	0.113	0.066	[−0.018, 0.254]	0.072	1.711	.087

Note. Indirect effects were estimated within the structural equation model. Confidence intervals including zero indicate non-significant indirect effects.

Discussion

The present study examined the structural associations among pre-service teachers' curriculum design orientations, democratic tendency, and teaching preparedness. By integrating pedagogical belief systems and value-oriented dispositions within a single structural model, the study contributes to the literature by clarifying how curriculum-related beliefs and democratic values relate to pre-service teachers' perceptions of preparedness during initial teacher education.

A central contribution of the study is the clarification of how traditional subject-centered and progressive constructivist curriculum orientations relate differently to democratic tendency and teaching preparedness within a single structural model. The findings indicated that constructivist curriculum orientation was strongly and positively associated with democratic tendency, whereas subject-centered orientation showed a negative association. This pattern suggests that curriculum beliefs emphasizing participation, inquiry, and engagement with meaningful problems are more closely aligned with democratic values than content-oriented perspectives. These findings are consistent with theoretical accounts that associate learner-centered and problem-centered pedagogical principles with democratic educational practices (Dewey, 1916; Apple & Beane, 2007; Darling-Hammond, 2006). Comparable patterns have also been reported in recent studies conducted within the Turkish teacher education context, where democratic values and participatory orientations were positively associated with learner-centered beliefs and reflective teaching tendencies (Kaya et al., 2023; Tican, 2020).

Recent empirical research further supports this distinction by conceptualizing learner-centered and problem-centered orientations as interrelated components of a broader constructivist belief system aligned with democratic educational aims. Studies conducted in experimental and quasi-experimental contexts have shown that learner-centered instructional environments foster learner agency, participation, collaboration, and engagement—pedagogical features associated with dialogic interaction and shared responsibility for learning (Alsalihi, 2024).

Within teacher education contexts, such environments have been reported to encourage pre-service teachers to assume more active instructional roles, attend more closely to student voice, and engage in reflective inquiry processes (Demirci-Ünal et al., 2024). Rather than implying immediate instructional outcomes, this body of research highlights how constructivist learning environments may support the gradual development of participatory dispositions that align with democratic classroom values.

Problem-centered approaches can be understood as extending constructivist pedagogy into socially meaningful and civically oriented learning contexts. By situating learning around real-life issues and shared problems, problem-based learning environments invite deliberation, negotiation of meaning, and collective decision-making, allowing democratic principles to be experienced in practice rather than treated as abstract ideals (Dewey, 1916; Apple & Beane, 2007). Prior research has associated such contexts with outcomes related to critical thinking, civic engagement, and social responsibility (Riddle, 2024; Westheimer, 2022). Across diverse educational levels, engagement with authentic problems—such as considering multiple perspectives, justifying positions, and working cooperatively toward shared solutions—has been linked to the development of civic awareness and participatory orientations (Lim, 2011; Erdem & Eğmir, 2020; Rohman et al., 2023).

In the present study, however, the association between problem-centered orientation and democratic tendency was not statistically significant. This finding should be interpreted in light of the very strong overlap between learner-centered and problem-centered orientations. The high shared variance suggests that their common constructivist core may already be captured within higher-order pedagogical belief structures, limiting the ability to detect distinct effects at the structural level. Such shared-variance dynamics are frequently observed in models of teacher belief systems and do not necessarily contradict theoretical expectations regarding the democratic potential of problem-centered pedagogy.

In contrast, subject-centered curriculum orientation was negatively associated with democratic tendency. This finding aligns with theoretical arguments suggesting that transmission-oriented and content-oriented pedagogical approaches are less compatible with participatory and dialogic classroom practices (Apple & Beane, 2007; Biesta, 2011; Suissa, 2023). Subject-centered approaches typically prioritize curricular coverage, teacher control, and adherence to predetermined content, potentially constraining opportunities for student agency, shared decision-making, and open dialogue. Critical curriculum scholarship has similarly linked highly standardized and centrally controlled curricula to reduced teacher autonomy, limited student participation, and constrained dialogic interaction (Cantoni et al., 2017; Fitz & Nikolaidis, 2020; Wahlström, 2020). The negative association observed in the present study is therefore consistent with broader critiques highlighting tensions between content-focused curriculum structures and democratic educational purposes.

At the same time, these findings should not be interpreted as suggesting that subject-centered curriculum orientations are inherently less valuable for teacher preparation. In many professional and technical fields, strong disciplinary knowledge, structured instruction, and content mastery are regarded as essential foundations for competence, professional responsibility, and instructional effectiveness. Subject-centered orientations may therefore contribute to dimensions of teacher development that were not directly captured in the present model, particularly those related to content expertise, academic rigor, and professional preparedness. The present findings merely indicate that such orientations were less strongly aligned with democratic tendency within this sample of pre-service teachers.

With respect to democratic tendency, the results indicated a small positive association with teaching preparedness; however, this relationship did not reach statistical significance. While democratic values are often regarded as central to inclusive and supportive learning environments (Darling-Hammond, 2006), the present findings suggest that democratic tendency was not significantly associated with pre-service teachers' perceptions of teaching preparedness within the current sample. This result may indicate that the relationship between democratic values and perceived preparedness is more complex and may depend on additional contextual, experiential, or developmental factors. As Pajares (1992) notes, value-oriented beliefs often operate at a more abstract level and may not translate immediately into perceived instructional competence.

This interpretation is consistent with research emphasizing the contextual and practice-dependent nature of democratic dispositions in teacher education. Although democratic values are frequently endorsed at an attitudinal level, their relevance for professional confidence and classroom practice appears to become more salient through sustained engagement in teaching contexts, reflective opportunities, and supportive institutional environments (Darling-Hammond, 2006; Zeichner, 2010). Research on democratic citizenship education similarly suggests that democratic sensitivity does not necessarily correspond to high levels of perceived instructional preparedness in the absence of targeted preparation and structured program experiences (Grubišić & Rajić, 2015; Biseth et al., 2018; Westheimer, 2022). Accordingly, democratic tendency may be understood as a normative and developmental orientation rather than an immediately operational belief system.

Contrary to the hypothesized model, democratic tendency did not function as a statistically supported mediator between curriculum design orientations and teaching preparedness. This pattern is consistent with prior research

indicating that value-oriented constructs often show limited explanatory power for proximal indicators of professional readiness, particularly in cross-sectional designs (Zeichner, 2010). From a methodological perspective, the absence of indirect effects should be interpreted in relation to the design and analytic scope of the study rather than as a rejection of the underlying theoretical framework. Mediation processes involving distal predictors may require longitudinal or practice-based data to capture developmental and delayed associations (Darling-Hammond, 2006).

Finally, the modest proportion of variance explained in teaching preparedness underscores that perceptions of readiness are shaped by a broader constellation of factors beyond curriculum design orientations and democratic tendency. Prior research has highlighted the importance of teaching self-efficacy, practicum experiences, mentoring quality, and reflective capacity as contributors to preparedness (Tschannen-Moran & Hoy, 2001; Darling-Hammond, 2006). Taken together, the findings suggest a differentiated pattern in which constructivist curriculum orientations are closely aligned with democratic tendency, whereas democratic values relate to preparedness in more indirect and developmental ways. This distinction carries important implications for teacher education, indicating that while pedagogical orientations may be addressed through coursework and instructional design experiences, the cultivation of democratic dispositions may depend on sustained, practice-based learning environments and supportive institutional cultures.

Conclusion

This study examined the relationships among pre-service teachers' curriculum design orientations, democratic tendency, and teaching preparedness using a structural equation modeling framework. By integrating pedagogical beliefs and value-oriented dispositions within a unified analytical model, the study aimed to clarify how different dimensions of teacher belief systems are positioned relative to perceived professional preparedness during initial teacher education.

The findings indicate that constructivist curriculum orientation is strongly associated with democratic tendency, highlighting its role in supporting participatory and value-oriented dispositions among pre-service teachers. However, its direct association with teaching preparedness was limited, indicating that constructivist beliefs may not translate directly into perceived instructional readiness within the context of the present study.

In contrast, democratic tendency demonstrated only a marginal direct association with preparedness and did not function as a mediating mechanism linking curriculum orientations to perceived readiness. From a theoretical perspective, democratic values may become more salient through sustained pedagogical practice and professional experience; however, longitudinal research would be needed to examine this possibility directly.

Taken together, the findings underscore the multidimensional nature of teacher belief systems. Pedagogical orientations related to curriculum design and broader democratic value orientations appear to be associated with different aspects of teacher development and professional formation. By empirically situating these belief dimensions within a single structural model, the study offers a more nuanced understanding of how pedagogical and value-based orientations intersect during the early stages of teacher formation. Although the proposed model explained a substantial proportion of variance in democratic tendency, its explanatory power for teaching preparedness was more limited. Future research should examine these relationships using longitudinal designs, more diverse teacher education contexts, and alternative measurement approaches in order to better understand how educational beliefs, democratic values, and professional readiness develop over time.

Recommendations

Practical and Policy Implications

The findings of this study offer several implications for teacher education programs. First, the strong association between constructivist curriculum orientation and democratic tendency underscores the importance of pedagogical approaches that emphasize active participation, inquiry, and learner engagement. Teacher education programs may therefore benefit from systematically integrating constructivist instructional practices—such as collaborative learning, inquiry-based activities, and reflective coursework—to support the development of participatory dispositions.

Democratic values remain an important dimension of teacher professionalism and may contribute to the development of inclusive, participatory, and supportive learning environments. Teacher education programs may therefore benefit from providing sustained and practice-based opportunities—such as practicum experiences, collaborative projects, and participatory classroom tasks—that allow candidates to enact democratic principles in authentic teaching contexts. This recommendation is particularly relevant given the present findings that constructivist curriculum orientations were strongly associated with democratic tendency, whereas democratic tendency showed only a limited association with perceived teaching preparedness. Creating opportunities to translate democratic values into enacted teaching practices may help bridge the gap between value-oriented dispositions and perceptions of professional readiness.

The negative association between subject-centered beliefs and democratic tendency further highlights the need for critical engagement with transmission-oriented pedagogical assumptions. Encouraging teacher candidates to critically examine the strengths and limitations of different curriculum orientations while exploring dialogic and participatory practices may contribute to the development of a more balanced and democratically informed professional identity. Such reflection should not be interpreted as a rejection of content-focused approaches, which remain essential in many disciplines requiring strong subject-matter knowledge, professional competence, and adherence to established standards.

Beyond teacher education programs, the findings suggest that curriculum frameworks and teacher education standards may benefit from giving greater attention to democratic dispositions alongside pedagogical competencies. Policies that encourage participatory learning environments, reflective practice, and democratic engagement throughout teacher preparation may support the development of both professional and civic dimensions of teaching.

Limitations and Future Research

Several limitations of this study should be acknowledged. First, the exclusive reliance on self-report measures may increase susceptibility to social desirability bias and may not fully capture behavioral or performance-based aspects of teaching preparedness. Future studies could incorporate observational data, supervisor evaluations, or performance-based assessments to strengthen validity.

Second, the cross-sectional design limits causal interpretation, particularly for developmental constructs such as democratic tendency. Longitudinal research designs would be better suited to examining how curriculum orientations, democratic values, and preparedness evolve over time and interact dynamically.

Third, the study was conducted within a single institutional context using convenience sampling, which may limit the generalizability of the findings across different institutional and regional contexts in Türkiye. In addition, the predominance of female participants in the sample reflects the gender distribution commonly observed in teacher education programs; however, this imbalance may still restrict the representativeness of the findings across gender groups. Replicating the proposed model across diverse teacher education programs and cultural contexts would enhance external validity.

Finally, the modest proportion of variance explained in teaching preparedness suggests that additional factors—such as teaching self-efficacy, practicum quality, mentoring support, and program structure—should be incorporated into future models to develop a more comprehensive understanding of teacher preparedness.

The relatively weak association between democratic tendency and perceived teaching preparedness may also reflect the conceptual distinction between value-oriented dispositions and self-perceptions of instructional competence. Teacher candidates may evaluate their preparedness primarily in terms of pedagogical skills, subject-matter knowledge, and teaching experience rather than democratic values. In addition, the predominance of early-year students in the sample may have limited the extent to which democratic dispositions are reflected in perceptions of professional readiness. Future research should examine whether this relationship becomes stronger as candidates accumulate greater practicum and classroom experience.

An additional limitation concerns the measurement model fit. Although RMSEA and SRMR values indicated acceptable approximate fit, the CFI and TLI values remained below commonly recommended thresholds. Accordingly, the structural relationships reported in this study should be interpreted with appropriate caution, and future research should explore alternative measurement specifications and more parsimonious factor structures to improve overall model fit.

Several methodological issues also warrant consideration in future research. First, measurement invariance across gender, program, or year level was not examined, and future studies should assess whether the measurement and structural relations operate equivalently across subgroups. Second, the use of global latent factors may have obscured subdimension-specific relationships, and alternative measurement approaches such as bifactor or ESEM models could provide further insight into shared and unique variance components.

Ethical Approval

Ethical approval (Decision No: 2026/100, Approval Date: 18 February 2026) was obtained from the Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee for this research.

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