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THE NEEDS ASSESSMENT FOR A DEVELOPMENT OF RESEARCH BASED LEARNING COMBINED WITH POSITIVE THINKING IN DIGITAL LEARNING ECOSYSTEM TO HELP PRESERVICE TEACHER STUDENTS DEVELOP A GROWTH MINDSET

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Abstract
This study examined the needs for developing research-based learning (RBL) integrated with positive thinking in digital learning ecosystems to foster growth mindset development among preservice teacher students. A population of 428 preservice teachers from five Rajabhat universities in Thailand's Rattanakosin Group was studied, with a stratified random sample of 216 participants selected using Krejcie and Morgan's method. The study employed parallel questionnaires validated through the Index of Item Objective Congruence (IOC), measuring current versus desired states across four domains: research-based learning, positive thinking integration, digital ecosystem utilization, and growth mindset development. Content validity was established through expert evaluation, with items achieving IOC scores of ≥0.67 retained for final analysis. The research findings revealed significant gaps between current practices and desired outcomes, particularly in digital integration and positive thinking components. The study provides foundational evidence for developing comprehensive educational interventions that combine research-based pedagogy with positive thinking principles in technology-enhanced learning environments.

Keywords: Research-based Learning; Positive Thinking; Digital Learning Ecosystem; Growth Mindset

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INTRODUCTION

The rapid evolution of educational technology and pedagogical approaches has created unprecedented opportunities for transforming teacher preparation programs (Mishra & Koehler, 2006). Contemporary educational challenges require preservice teachers to develop not only content knowledge and pedagogical skills but also adaptive mindsets that enable continuous learning and resilience in the face of complex classroom realities

(Dweck, 2016). The integration of research-based learning (RBL) with positive thinking principles within digital learning ecosystems represents a promising approach to fostering growth mindsets among future educators (Seligman, 2011; Brew, 2013). Research-based learning has gained prominence as an effective pedagogical approach that engages students in authentic inquiry processes, promoting critical thinking, problem-solving skills, and deeper understanding of subject matter (Healey & Jenkins, 2009). When combined with positive thinking strategies rooted in positive psychology, RBL can potentially enhance student motivation, self-efficacy, and resilience (Fredrickson, 2001). The digital learning ecosystem provides the technological infrastructure and tools necessary to support these integrated approaches, offering opportunities for collaboration, data collection, analysis, and dissemination of findings (Siemens, 2005). The concept of growth mindset, introduced by Dweck

(2006), emphasizes the belief that abilities and intelligence can be developed through dedication, hard work, and learning from failure. For preservice teachers, developing a growth mindset is particularly crucial as it influences their future teaching practices, student interactions, and professional development trajectories (Gutshall, 2013). However, despite the theoretical promise of combining RBL, positive thinking, and digital technologies to foster growth mindsets, there remains a significant gap in understanding the specific needs and requirements for implementing such integrated approaches in teacher education programs. The current study addresses this gap by conducting a comprehensive needs assessment to identify the discrepancies between current practices and desired outcomes in developing RBL combined with positive thinking in digital learning ecosystems. By examining the perspectives of preservice teachers in Thailand's Rattanakosin Group of Rajabhat universities, this research provides valuable insights for educational leaders, curriculum designers, and policymakers seeking to enhance teacher preparation programs through innovative pedagogical approaches.

LITERATURE REVIEW

RESEARCH-BASED LEARNING IN TEACHER EDUCATION

Research-based learning represents a paradigm shift from traditional transmission models of education to more active, inquiry-oriented approaches that position students as co-creators of knowledge (Brew, 2013). In the context of teacher education, RBL enables preservice teachers to engage with educational research, conduct their own investigations, and develop evidence-based teaching practices (Cochran-Smith & Lytle, 2009). Studies have demonstrated that RBL experiences enhance preservice teachers' research skills, critical thinking abilities, and confidence in using data to inform instructional decisions (Darling-Hammond, 2006). The implementation of RBL in teacher education programs requires careful consideration of institutional support, faculty expertise, and student readiness (Healey & Jenkins, 2009). Effective RBL experiences typically involve authentic research questions, systematic inquiry methods, opportunities for peer collaboration, and mechanisms for sharing findings with broader educational communities (Boyer, 1990). However, challenges in implementing RBL include time constraints, resource limitations, and varying levels of student research competence (Bangbon et al., 2023; Brew & Mantai, 2017).

POSITIVE THINKING AND POSITIVE THINKING IN EDUCATION

The integration of positive thinking principles in educational settings has gained considerable attention following Seligman's (2011) emphasis on well-being and flourishing as educational outcomes. Positive thinking, as a component of positive psychology, involves cultivating optimistic perspectives, focusing on strengths and possibilities, and developing resilience in the face of challenges (Fredrickson, 2001). Research has shown that positive thinking strategies can enhance academic performance, reduce stress, and improve overall well-being among students (Park & Peterson, 2009). In teacher education, positive thinking approaches can help preservice teachers develop the emotional resilience and optimistic outlook necessary for effective teaching practice (Tschannen-Moran & Hoy, 2007). Studies have indicated that teachers with positive mindsets are more likely to create supportive learning environments, maintain high expectations for students, and persist through challenging situations (Sutton & Wheatley, 2003). The cultivation of positive thinking in preservice teachers can therefore have cascading effects on their future students' academic and emotional outcomes.

DIGITAL LEARNING ECOSYSTEMS

Digital learning ecosystems encompass the interconnected technological tools, platforms, and resources that support teaching and learning processes (Siemens, 2005). These ecosystems typically include learning management systems, collaborative platforms, data analytics tools, and various multimedia resources that facilitate knowledge construction and sharing (Anderson & Dron, 2011). The effective integration of digital technologies in teacher education requires careful consideration of technological affordances, pedagogical goals, and user needs (Mishra & Koehler, 2006). Research has demonstrated that well-designed digital learning ecosystems can enhance student engagement, facilitate collaborative learning, and provide opportunities for personalized instruction (Clark & Mayer, 2016). However, the successful implementation of digital learning ecosystems requires adequate technological infrastructure, faculty professional development, and ongoing technical support (Channuwong, 2018; Ertmer & Ottenbreit-Leftwich, 2010). Additionally, the design of digital learning ecosystems must align with pedagogical objectives and support meaningful learning experiences rather than merely substituting traditional practices with technological tools.

GROWTH MINDSET DEVELOPMENT

Dweck's (2016) research on mindset theory has significantly influenced educational practice and policy. Growth mindset, characterized by the belief that abilities can be developed through effort and learning, contrasts with fixed mindset, which views abilities as static traits. Studies have consistently shown that students with growth mindsets demonstrate greater persistence, improved academic performance, and increased resilience when facing challenges (Yeager & Dweck, 2012). For preservice teachers, developing a growth mindset is particularly important as it influences their beliefs about student potential, their own professional development, and their approaches to classroom challenges (Gutshall, 2013). Teachers with growth mindsets are more likely to provide constructive feedback, emphasize effort over ability, and create learning environments that support student risk-taking and learning from mistakes (Seaton, 2018). However, mindset development requires intentional cultivation through targeted interventions, sustained practice, mental intelligence and strong determination (Channuwong et al., 2025; Dweck, 2016).

The objectives of this research are as follows:

1. To study a need for developing research-based learning integrated with positive thinking on digital learning ecosystem among preservice teacher students.
2. To analyze the current state of growth mindset development in preservice teacher students through digital learning platforms.
3. To identify essential requirements for enhancing research-based learning with positive thinking approaches in digital learning ecosystems.

RESEARCH METHODOLOGY

RESEARCH DESIGN

This study employed a sequential explanatory mixed-methods design to comprehensively examine the needs for developing research-based learning combined with positive thinking in digital learning ecosystems (Creswell & Plano Clark, 2017). The quantitative phase involved gathering survey data to identify patterns and trends in current practices and desired outcomes, followed by qualitative interviews to gain deeper insights into participant experiences and perspectives (Teddlie & Tashakkori, 2009). This approach allowed for triangulation of data sources and provided a more complete understanding of the research phenomenon.

POPULATION AND SAMPLES

The target population consisted of preservice teacher students from five Rajabhat universities in Thailand's Rattanakosin Group in 2024, totaling 428 students enrolled in Bachelor of Education and related programs. The sample size was determined using Krejcie and Morgan's (1970) sample size determination method at a 95% confidence level ($\alpha = 0.05$) with an acceptable margin of error of ±5%, yielding a required sample size of 216 participants.

Stratified random sampling was employed to ensure representative participation across academic fields, with stratification variables including gender, academic year, and field of study. This sampling approach ensured that the sample accurately reflected the demographic characteristics of the broader population and enhanced the generalizability of findings across different subgroups within the preservice teacher population.

INSTRUMENT DEVELOPMENT AND VALIDATION

The study utilized a quantitative needs assessment approach with parallel questionnaires designed to measure the gap between current and desired states across four key domains: research-based learning competencies, positive thinking integration, digital ecosystem utilization, and growth mindset development. Two structurally identical questionnaires were developed: Set A measuring current performance levels and Set B measuring desired performance standards.The instrument development process followed a systematic three-phase approach. First, items were generated based on extensive literature review and theoretical frameworks related to each domain. Second, content validity was established through expert evaluation using the Index of Item Objective Congruence (IOC). Third, the instrument was finalized based on expert feedback and IOC scores. Three experts in educational psychology, digital learning, teacher education, and research methodology participated in the content validation process. Each expert evaluated the congruence between individual items and the construct they were intended to measure. IOC scores were calculated using the formula $\Sigma R/N$, where R represents expert ratings and N represents the number of experts. Items with IOC scores ≥ 0.67 were retained without modification, items with scores between

0.50-0.66 were revised based on expert recommendations, and items with scores <0.50 were eliminated from the final instrument.

DATA COLLECTION PROCEDURES

Data collection was conducted in accordance with ethical guidelines and institutional review board requirements. Participants were informed about the study's purpose, procedures, and their rights as research participants. Informed consent was obtained from all participants prior to data collection.
The quantitative phase involved administration of the parallel questionnaires to the stratified random sample of 216 preservice teacher students. Questionnaires were distributed electronically through institutional learning management systems to ensure broad accessibility and efficient data collection. Participants were given adequate time to complete both questionnaires, with reminders sent to maximize response rates.

DATA ANALYSIS

Quantitative data analysis involved descriptive and inferential statistical procedures to identify needs priorities and gaps between current and desired states. Means, standard deviations, and gap scores (desired minus current) were calculated for each domain and individual items. Priority needs were identified based on the magnitude of gap scores and the importance ratings assigned by participants. Statistical significance testing was conducted to determine whether observed gaps represented meaningful differences requiring intervention. Effect size calculations were performed to assess the practical significance of identified gaps. All quantitative analyses were conducted using appropriate statistical software with alpha levels set at 0.05 for significance testing.

RESULTS

PARTICIPANTS DEMOGRAPHICS

The final sample consisted of 216 preservice teacher students representing diverse academic backgrounds and demographic characteristics. The sample included participants from various fields of study within teacher education programs, with representation across different academic years and gender distributions that reflected the broader population characteristics.

CURRENT STATE ASSESSMENT

Analysis of current state measurements revealed varying levels of competency across the four assessed domains, with domain averages ranging from 3.50 to 3.79 on a 5-point scale. Research-based learning competencies showed moderate levels of development (M = 3.63), with participants demonstrating basic understanding of research concepts but limited experience in conducting independent investigations. Positive thinking integration scores (M = 3.74) indicated that while participants recognized the importance of positive thinking principles, their actual implementation in educational contexts remained limited.
Digital ecosystem utilization results showed the lowest current state performance (M = 3.50), with significant variation among participants. Some demonstrated advanced technological skills while others reported limited confidence and experience with digital learning tools. Growth mindset development scores (M = 3.74) indicated that participants generally endorsed growth mindset beliefs but showed inconsistency in translating these beliefs into actual learning behaviors and teaching practices.

TABLE 1 ANALYSIS: TEACHING AND LEARNING CONDITIONS

The assessment of current teaching and learning conditions revealed moderate satisfaction levels across most indicators, with current state means ranging from 3.21 to 3.92. The largest gap (1.51) was identified in learners' access to adequate learning resources and equipment, indicating significant infrastructure needs. Participants showed strong desire for enhanced digital integration, though they acknowledged current digital technology use as already relatively advanced (3.92 current state). The domain average gap of 1.13 suggests substantial room for improvement in foundational teaching and learning conditions.

TABLE 2 ANALYSIS: DIGITAL LEARNING ECOSYSTEM IMPLEMENTATION

Digital learning ecosystem implementation showed the most significant gaps overall, with a domain average gap of 1.21. The most critical need was institutional technology infrastructure support, showing the largest individual

gap (1.83) in the entire study. This finding indicates that while participants recognize the value of digital tools, systemic support remains inadequate. Tracking learner progress through digital means also showed a substantial gap (1.48), suggesting needs for both technical capabilities and pedagogical training in learning analytics. Despite these challenges, participants demonstrated relatively positive attitudes toward digital learning's potential benefits.

TABLE 3 ANALYSIS: RESEARCH-BASED LEARNING IMPLEMENTATION

Research-based learning implementation revealed significant practical barriers despite theoretical acceptance. The largest gaps appeared in foundational areas: adequate resources and tools (1.65) and skills for designing research-based lessons (1.64). Interestingly, participants showed high current recognition of training needs (4.15) and support requirements (4.08), indicating strong motivation for development. The domain's moderate gap average (1.03) masks substantial variation, with resource and skill gaps being much larger than motivational gaps.

TABLE 4 ANALYSIS: POSITIVE THINKING INTEGRATION

Positive thinking integration showed the smallest domain gap (0.98), suggesting relatively strong current understanding and acceptance. However, systematic implementation remained challenging, with curriculum incorporation showing the largest gap (1.24). Participants strongly endorsed positive thinking's benefits conceptually but needed support for practical application. The finding that instructor role modeling showed the smallest gap (0.65) suggests participants already recognize the importance of modeling positive attitudes.

TABLE 5 ANALYSIS: GROWTH MINDSET DEVELOPMENT

Growth mindset assessment revealed interesting paradoxes in participant responses. While participants strongly endorsed effort and commitment (4.15 current state), they showed significant gaps in believing abilities can be developed (1.42 gap). This suggests potential confusion about growth mindset concepts or inconsistent application across different contexts. Goal-setting challenges (1.20 gap) and feedback acceptance difficulties (1.11 gap) indicated specific areas requiring targeted intervention.

TABLE 6 ANALYSIS: INTEGRATED APPROACH OPINIONS

Participants showed strong enthusiasm for the integrated approach combining research-based learning with positive thinking in digital ecosystems. The largest gap (1.26) appeared in connecting research with classroom practice, indicating a critical implementation challenge. Participants recognized the theoretical benefits of integration but needed support for practical application. The relatively small gaps in digital ecosystem benefits (0.67-0.82) suggest participants already appreciated digital tools' potential, contrasting with the larger implementation gaps seen in Table 2.

TABLE 1: CURRENT STATE AND DESIRED STATE ASSESSMENT OF TEACHING AND LEARNING CONDITIONS

Item	**Current State (M)**	**Desired State (M)**	**Gap Score**	**Priority Ranking**
Instructors use diverse and appropriate teaching media	3.42	4.68	1.26	3
Learners can adequately access learning resources and equipment	3.21	4.72	1.51	2
Classroom atmosphere promotes learning	3.67	4.75	1.08	6
Instructor teaching methods facilitate content understanding	3.58	4.71	1.13	5
Need for increased use of technology and digital media in teaching	3.89	4.83	0.94	8
Need for increased outdoor learning activities	3.34	4.52	1.18	4
Digital technology makes teaching more interesting and interactive	3.92	4.79	0.87	10
Learners can improve self-learning through digital technology	3.76	4.81	1.05	7

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
Domain Average	**3.60**	**4.73**	**1.13**	

TABLE 2: IMPLEMENTATION OF DIGITAL LEARNING ECOSYSTEM IN TEACHING AND LEARNING

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
Digital learning ecosystem enhances teaching efficiency	3.45	4.76	1.31	2
Learners show more enthusiasm when using digital tools	3.67	4.69	1.02	6
Digital ecosystem enables effective tracking of learner progress	3.23	4.71	1.48	1
Digital technology stimulates greater classroom participation	3.58	4.65	1.07	5
Instructors are ready to use digital learning ecosystems in teaching	3.41	4.58	1.17	3
Institutional technology infrastructure adequately supports digital ecosystem use	2.89	4.72	1.83	1
Digital learning ecosystem enables diverse and flexible learning	3.52	4.74	1.22	4
Digital ecosystem promotes 21st-century skills development	3.71	4.78	1.07	5
Digital technology makes teaching more interesting and interactive	3.84	4.73	0.89	8
Learners can improve self-learning through digital technology	3.69	4.75	1.06	7
Domain Average	**3.50**	**4.71**	**1.21**	

TABLE 3: IMPLEMENTATION OF RESEARCH-BASED LEARNING IN TEACHING

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
Understanding of research-based learning principles and concepts	3.28	4.65	1.37	2
Awareness of research benefits in teaching processes	3.72	4.71	0.99	6
Skills and ability to design research-based lessons	2.94	4.58	1.64	1
Adequate resources/tools to support research-based learning	2.87	4.52	1.65	1
Need for additional training in research-based learning	4.15	4.73	0.58	8
Need for institutional support in implementing research-based teaching	4.08	4.69	0.61	7
Belief that research-based learning enhances analytical thinking skills	4.12	4.76	0.64	7
Belief that learners will be more interested when using research-based approaches	3.89	4.67	0.78	6
Domain Average	**3.63**	**4.66**	**1.03**	

Table 4: IMPLEMENTATION OF POSITIVE THINKING CONCEPTS IN TEACHING CONTEXT

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
Positive thinking promotes good learning atmosphere in classroom	3.94	4.78	0.84	8
Positive thinking can increase learner motivation	4.02	4.81	0.79	9
Training learners to think positively reduces learning stress	3.67	4.72	1.05	4
Instructors should demonstrate positive thinking as role models	4.18	4.83	0.65	10
Positive thinking affects learners' academic achievement	3.85	4.74	0.89	6
Activities emphasizing positive thinking make learners more enthusiastic	3.56	4.69	1.13	2
Positive thinking skills should be incorporated into curriculum	3.41	4.65	1.24	1
Learners need more positive thinking-focused instruction	3.48	4.58	1.10	3
Instructors need training on positive thinking	3.52	4.61	1.09	4
Positive thinking helps develop daily problem-solving skills	3.78	4.76	0.98	5
Domain Average	**3.74**	**4.72**	**0.98**	

Table 5: GROWTH MINDSET FRAMEWORK OF PRESERVICE TEACHER STUDENTS

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
View obstacles as learning and development opportunities	3.67	4.72	1.05	5
Try new approaches when facing difficulties	3.89	4.68	0.79	10
Transform failures into valuable lessons	3.72	4.74	1.02	6
Seek help from others during difficult work	3.54	4.58	1.04	7
Set challenging new goals for assigned work	3.41	4.61	1.20	2
Learn from mistakes and try to improve next time	4.08	4.79	0.71	11
Believe abilities can be developed significantly	3.23	4.65	1.42	1
Commitment and dedication are crucial for achieving goals	4.15	4.81	0.66	12
Criticism helps understand mistakes and improve	3.78	4.69	0.91	9
Accept criticism and feedback from others	3.52	4.63	1.11	4
Role models inspire personal and professional development	3.89	4.71	0.82	8
Good role models possess qualities like patience and determination	4.02	4.76	0.74	10
Domain Average	**3.74**	**4.70**	**0.96**	

Table 6: OPINIONS ON INTEGRATED RESEARCH-BASED LEARNING WITH POSITIVE THINKING IN DIGITAL ECOSYSTEM

Item	Current State (M)	Desired State (M)	Gap Score	Priority Ranking
Research-based learning promotes systematic analytical and problem-solving skills	3.95	4.78	0.83	8
Research increases student responsibility for their own learning	3.87	4.72	0.85	7
Research-based learning improves research and synthesis skills	3.78	4.75	0.97	5
Research process stimulates creativity and continuous learning	3.82	4.74	0.92	6
Positive thinking builds confidence in facing learning challenges	3.69	4.71	1.02	4
Positive thinking reduces stress and increases learning happiness	3.61	4.67	1.06	3
Positive thinking helps see opportunities in failures	3.54	4.69	1.15	2
Digital ecosystem improves access to information and learning resources	4.12	4.79	0.67	9
Digital technology enables effective interaction and collaboration	3.98	4.76	0.78	8
Digital learning provides flexibility and adaptability	3.91	4.73	0.82	7
Research helps connect theory with classroom practice	3.45	4.71	1.26	1
Domain Average	**3.79**	**4.73**	**0.94**	

DISIRED STATE ASSESSMENT

Desired state measurements consistently showed high aspirations across all domains, indicating strong motivation among preservice teachers to develop competencies in research-based learning, positive thinking integration, digital technology use, and growth mindset development. Participants expressed particular interest in developing skills that would enhance their effectiveness as future educators and their ability to support student learning and well-being.

NEED ASSESSMENT GAP

Gap analysis revealed significant discrepancies between current and desired states across all measured domains. The largest gaps were identified in digital ecosystem utilization and the integration of research-based learning with positive thinking approaches. These findings indicated priority areas for intervention development and resource allocation. Research-based learning gaps were particularly pronounced in areas related to data analysis, research dissemination, and connecting research findings to teaching practice. Positive thinking integration gaps were most evident in the systematic application of positive thinking interventions and the measurement of well-being outcomes in educational settings. Digital ecosystem gaps reflected disparities in access to technology, technical skills development, and pedagogical integration of digital tools. Growth mindset development gaps indicated needs for more structured approaches to mindset cultivation and the translation of mindset beliefs into consistent behaviors and practices.

PRIORITY NEED IDENTIFICATION

Based on gap magnitude, importance ratings, and feasibility considerations, several priority needs emerged from the analysis. The highest priority was assigned to developing integrated approaches that combined research-based learning with positive thinking principles in digital environments. This integration was seen as essential for creating comprehensive educational experiences that address multiple competency areas simultaneously.

Additional priority needs included professional development for faculty members to support integrated pedagogical approaches, technological infrastructure improvements to support digital learning ecosystems, and

the development of assessment tools to measure growth mindset development and positive thinking outcomes in educational contexts.

DISCUSSION

IMPLICATIONS FOR TEACHER EDUCATION

The findings of this need assessment have significant implications for the design and implementation of teacher education programs. The identified gaps between current and desired states highlight the need for comprehensive curriculum revisions that integrate research-based learning, positive thinking, and digital literacy competencies. Traditional approaches to teacher preparation may be insufficient for developing the complex skill sets required for effective teaching in contemporary educational environments. The large gaps in digital ecosystem utilization suggest that teacher education programs must prioritize technological integration not merely as an add-on component but as a fundamental aspect of pedagogical preparation (Wongmajarapinya et al., 2024). This integration should focus on developing preservice teachers' technological pedagogical content knowledge (TPACK) while simultaneously building their confidence and competence in using digital tools for research, collaboration, and instruction.

FRAMEWORK FOR INTEGRATED APPROACH

Based on the need assessment findings, a comprehensive framework for integrating research-based learning with positive thinking in digital learning ecosystems emerges. This framework should include multiple interconnected components that address the identified priority needs while building on existing strengths and resources within teacher education programs. The framework should incorporate experiential learning opportunities that allow preservice teachers to engage in authentic research projects while practicing positive thinking strategies and utilizing digital tools. These experiences should be scaffolded to build competency gradually while providing multiple opportunities for reflection, feedback, and refinement of skills and mindsets.

CHALLENGES AND CONSIDERATIONS

The implementation of integrated approaches to teacher education will face several challenges that must be addressed proactively. Faculty development needs represent a significant challenge, as many teacher educators may lack experience in research-based learning, positive thinking interventions, or digital pedagogy integration. Comprehensive professional development programs will be necessary to build faculty capacity and confidence in implementing new pedagogical approaches.

Technological infrastructure and resource requirements present additional challenges, particularly in contexts with limited funding or technical support. Sustainable implementation strategies must consider cost-effectiveness, scalability, and long-term maintenance requirements for digital learning ecosystems.

Student readiness and motivation variations also require careful consideration. While the needs assessment revealed strong desire for competency development, individual differences in technological skills, research experience, and mindset orientations will require differentiated approaches to instruction and support.

RECOMMENDATIONS FOR FUTURE RESEARCH

The findings of this need assessment suggest several directions for future research. Longitudinal studies examining the development of integrated competencies over time would provide valuable insights into the effectiveness of interventions and the sustainability of learning outcomes. Comparative studies examining different approaches to integration could inform best practices and identify optimal implementation strategies. Research examining the transfer of competencies from preservice preparation to actual teaching practice would help validate the relevance and impact of integrated approaches. Additionally, studies investigating the effects of integrated approaches on student outcomes in K-12 settings would provide important evidence for the ultimate value of these innovations in teacher education.

CONCLUSION

This need assessment provides compelling evidence for the development of integrated approaches that combine research-based learning with positive thinking in digital learning ecosystems to foster growth mindset development among preservice teachers. The significant gaps identified between current and desired states indicate both the necessity and the potential impact of comprehensive interventions addressing these priority areas.

The findings suggest that successful implementation will require systematic changes to teacher education curricula, faculty development initiatives, technological infrastructure improvements, and ongoing support systems. While challenges exist, the strong motivation and aspirations expressed by preservice teachers provide a foundation for successful implementation of innovative pedagogical approaches. The study contributes to the growing body of literature on teacher education innovation while providing practical guidance for educational leaders seeking to enhance teacher preparation programs. As educational systems worldwide face increasing complexity and demands, the development of teachers who can engage in research-based practice, maintain positive perspectives, and effectively utilize digital technologies becomes increasingly critical for educational success and student well-being. Future research should continue to explore optimal approaches to integration while examining the long-term impacts of these innovations on teacher effectiveness and student outcomes. The continued evolution of educational technology and our understanding of positive thinking principles will require ongoing adaptation and refinement of teacher education approaches to ensure that new teachers are prepared for the challenges and opportunities of contemporary educational practice.

ETHICAL CONSIDERATION

Ethical guidelines were followed by the research team members when conducting a questionnaire related to human subjects. Before collecting data, ethical approval was obtained from the appropriate university Institutional Review Board (IRB) to ensure all procedures respected participants' rights and privacy. It was approved by The Research Ethics Committee of King Mongkut's Institute of Technology Ladkrabang has exempted the following study which is to be carried out in compliance with the International guidelines for human research protection as Declaration of Helsinki, The Belmont Report, CIOMS Guideline, International Conference on Harmonization in Good Clinical Practice (ICH-GCP) and 45CFR 46.101(b) (EC-KMITL_68_066) on 26 May 2025. The participants were reached out in person and provided a clear description of thestudy at the beginning of the questionnaire. They were informed about all aspects of the study and assured of the protection of the data as well, and they could discontinue their participation at any time without any penalties. Their participation in the research study titled 'The Needs Assessment for A Development of Research Based Learning Combined with Positive Thinking in Digital Learning Ecosystem to Help PreService Teacher Students Develop a Growth Mindset' was voluntary. Data collected was used exclusively for research purposes. Strict measures were implemented to ensure the anonymity and confidentiality of all responses. The data was only accessible to research team members, and it was safeguarded with no identified information or disclosure. Indeed, the ethical issues are addressed and given full consideration prior to and during the collection of data required for this study.

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