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ENHANCING THE 5 Cs THROUGH EIGHT HOLISTIC ACTIVE LEARNING PROCESSES: A STUDY OF ENGLISH PRESERVICE TEACHERS' LEARNING ACHIEVEMENT AND REFLECTIONS IN A 21ST-CENTURY SKILLS FOR LIFE AND CAREER COURSE

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ABSTRACT

This retrospective mixed-methods study examined how eight holistic active learning processes enhanced the 5Cs (Contemplative Thinking, Critical Thinking, Communication, Collaboration, and Creative Thinking) among 29 English preservice teachers. The eight holistic active learning processes-BALANCE, INDARA+C, CLEAR, PEACE, CREATIVE, QUEST, GRACE, and MIRACLE-were implemented in a 21st Century Skills for Life and Career course. Tools for data collection consisted of achievement tests (140 points in total) and 263 weekly reflections over 14 weeks, analyzed using descriptive statistics and thematic coding. The English preservice teachers achieved very good overall performance (84.19%), with collaboration and creative thinking exceeding 90%. The application of skills to daily life increased progressively, from zero to 34 instances, with transformative experiences peaking during the GRACE and MIRACLE sessions. The English preservice teachers preferred interactive activities and requested more practice time. The findings support integrating contemplative education with active learning to develop 21st-century teacher competencies.

Keywords: Contemplative education, Holistic active learning, 21st century skills, Preservice teachers, 5Cs skills

I. INTRODUCTION

The rapid transformation of the 21st century demands a fundamental shift in education-from passive knowledge transmission to the development of essential competencies that enable learners to navigate an unpredictable future. The Organization for Economic Co-operation and Development (OECD, 2019, p. 7) emphasizes that education must help learners develop a "reliable compass" to face complexity and uncertainty. This imperative is particularly critical in teacher education, where future educators must acquire 21st-century skills-specifically, the 5Cs: Creativity and Innovation, Critical Thinking and Problem Solving, Communication, Collaboration, and Contemplative Thinking. These competencies represent core human abilities that distinguish individuals from technological automation and empower educators to design transformative learning experiences (World Economic Forum, 2023, pp. 38-39). Addressing this challenge, the "21st Century Skills for Life and Career" course is designed to cultivate these competencies among preservice teachers through an integrated curriculum that spans cognitive (understanding 21st-century society and the 5Cs), affective (developing teacher identity and professional responsibility), and psychomotor (applying skills in real-world contexts) domains. The course content includes global and Thai perspectives on 21st-century societal changes, essential skills frameworks, and practical applications, while instructors manage pedagogical tensions such as balancing theoretical understanding with experiential learning and integrating contemplative practices into active learning environments.

Recent empirical studies in Thai and regional teacher education consistently demonstrate the effectiveness of integrative approaches in fostering the 5Cs. Contemplative practices-such as mindfulness, deep listening, and visual reflection-have been shown to significantly enhance students' self-awareness, inner calm, and ethical sensitivity (Tanatpornpong & Nakorn, 2024, p. 59; Bodhisatirawaranggoora et al., 2024, p. 97). Critical thinking is promoted through inquiry-based learning, peer questioning, and reflective strategies (Surin & Damrongpanit, 2024, p. 1395; Namsaeng & Ambele, 2024, p. 75). Creative thinking is stimulated through active, digital, and project-based methods (Muñoz-Salinas et al., 2025, p. 2; Li & Tu, 2024, p. 2). Collaboration and communication are strengthened through cooperative lesson planning, peer mentoring, and intercultural training (Maghfiroh et al., 2025, p. 666; Boonmoh & Kulavichian, 2024, p. 124; Marasri, 2025, p. 62). However, significant gaps remain: no existing study has examined the simultaneous development of all five competencies within a single, integrated framework; contemplative education remains underexplored in teacher education research; and there is a lack of systematic models that connect multiple learning processes across extended periods.

This study introduces eight holistic active learning processes (BALANCE, INDARA+C, CLEAR, PEACE, CREATIVE, QUEST, GRACE, and MIRACLE) developed by the researcher as an innovative pedagogical framework designed specifically for the comprehensive development of the 5Cs. The framework is grounded in five key theoretical foundations: Contemplative Education underpins INDARA+C, GRACE, and PEACE by fostering inner awareness and emotional regulation (Zajonc, 2013, p. 83; Barbezat & Bush, 2014, p. 2); Constructivism supports BALANCE, CREATIVE, and QUEST through active knowledge construction (Office of the Education Council, 2020, pp. 18-21; OECD, 2019, pp. 7, 16); Social Learning Theory informs MIRACLE, PEACE, and QUEST through peer interaction and shared learning (Bandura, 1977, pp. 6, 22); Experiential Learning Theory contributes to BALANCE, CLEAR, and CREATIVE by emphasizing direct experience and reflection (Kolb, 1984, p. 41); and Transformative Learning Theory forms the basis of GRACE, CREATIVE, and QUEST through critical reflection and perspective transformation (Mezirow, 1997, p. 5; Jarvis, 2009, p. 25). Each process is intentionally aligned with particular competencies while concurrently supporting the broader dimensions of the 5Cs framework.

These theoretical underpinnings and their integration into each learning process are examined in detail in the literature review section.

The aim of this research is to investigate the effectiveness of eight holistic active learning processes in enhancing 5Cs skills among English preservice teachers, using a mixed-methods approach. Specifically, the study examines preservice teachers' learning achievement after participating in these processes within a 21st-century skills course, analyzes their reflective thinking on 5Cs development through weekly reflections, and explores their suggestions for course improvement. By integrating quantitative achievement data with qualitative reflections over a 16-week period, this study offers comprehensive insights into how contemplative education, when combined with active learning, can equip future teachers with essential competencies required to navigate and shape education in the 21st century.

II. LITERATURE REVIEW

Recent research in teacher education has increasingly focused on developing multiple competencies simultaneously, although comprehensive and integrative frameworks remain limited. Studies on contemplative practices in education demonstrate significant impacts on self-awareness, emotional regulation, and ethical development. Tanatpornpong and Nakorn (2024, p. 59) found that mindfulness-based practices enhanced Thai preservice teachers' self-awareness and stress management, while Bodhisatirawaranggoora et al. (2024, p. 97) showed that visual contemplative practices fostered deeper reflection and aesthetic sensitivity. Critical thinking development has been extensively studied through active learning approaches. A meta-analysis by Surin and Damrongpanit (2024, p. 1395) revealed that peer questioning strategies significantly improved critical thinking, with effect sizes ranging from moderate to large. Research on creative thinking indicates positive outcomes from project-based and digital learning methods (Li & Tu, 2024, p. 2), although Muñoz-Salinas et al. (2025, p. 2) highlight persistent conceptual ambiguities in defining creativity within Southeast Asian educational contexts. Collaborative competencies have been enhanced through structured peer interactions, with Maghfiroh et al. (2025, p. 666) demonstrating how peer mentoring in lesson planning fostered both collaboration and professional identity. Research on communication emphasizes the importance of authentic contexts and intercultural competence (Boonmoh & Kulavichian, 2024, p. 124; Marasri, 2025, p. 62). However, most studies address these competencies in isolation, overlooking the potential synergies of integrated development. Theoretical foundations for holistic learning draw upon multiple paradigms: Contemplative Education emphasizes inner awareness and wisdom (Zajonc, 2013, p. 83; Barbezat & Bush, 2014, p. 2); Constructivism promotes active knowledge construction (OECD, 2019, p. 16); Social Learning Theory highlights collaborative knowledge building (Bandura, 1977, p. 22); Experiential Learning emphasizes reflection-action cycles (Kolb, 1984, p. 41); and Transformative Learning fosters perspective transformation (Mezirow, 1997, p. 5). Together, these theories support integrated approaches that simultaneously engage cognitive, affective, and behavioral dimensions of teacher development.

Building on these theoretical and empirical foundations, this study hypothesizes that eight holistic active learning processes (BALANCE, INDARA+C, CLEAR, PEACE, CREATIVE, QUEST, GRACE, and MIRACLE) can effectively enhance all 5Cs competencies when implemented systematically over an extended period. Each process, while grounded in primary theoretical foundations, incorporates elements from all five theories as complementary frameworks. For instance, BALANCE primarily draws from Experiential Learning and Constructivism but incorporates contemplative elements in Base Exploration, social learning in Networking, and transformative reflection in Evaluation stages. Similarly, INDARA+C, though rooted in Contemplative Education, utilizes constructivist knowledge building, social sharing circles, and experiential application activities. This multi-theoretical integration ensures that each process, regardless of its primary focus, contributes to holistic development across all 5Cs competencies. The study posits that this integrated framework addresses the limitations of single-competency approaches by creating synergistic learning experiences where multiple competencies are developed simultaneously. The 16-week implementation period allows for deep engagement and skill transfer, while the mixed-methods approach captures both quantitative achievement and qualitative transformation. This research thus examines whether holistic active learning processes can prepare preservice teachers with the full spectrum of 21st-century competencies needed for educational leadership in an uncertain future.

III. RESEARCH METHODOLOGY

This study employed a retrospective embedded mixed-methods design, in which qualitative data from weekly reflections served as the primary source for understanding students' development of 5Cs competencies throughout the 16-week course. Quantitative assessments were strategically embedded at midterm (Week 9) and final (Week 16) to measure learning achievement and triangulate the qualitative findings.

Participants were 29 second-year preservice English teachers enrolled in the required 21st Century Skills for Life and Career course. Data were collected during the second semester of the 2024 academic year at a teacher education institution in southern Thailand. After final grades had been submitted and students informed of their results, the researcher sought consent through the class LINE group application. All participants were informed of the research purpose and were given the option to decline participation by sending a private message. None declined, resulting in full consent. This post-hoc consent procedure ensured that participation was voluntary and uninfluenced by academic evaluation.

Weekly reflection submissions varied between 17 and 26 participants, reflecting the voluntary nature of these assignments during the original course implementation.

Figure 1 presents the conceptual framework, illustrating how theoretical foundations were integrated into the learning processes and linked to measurable outcomes.

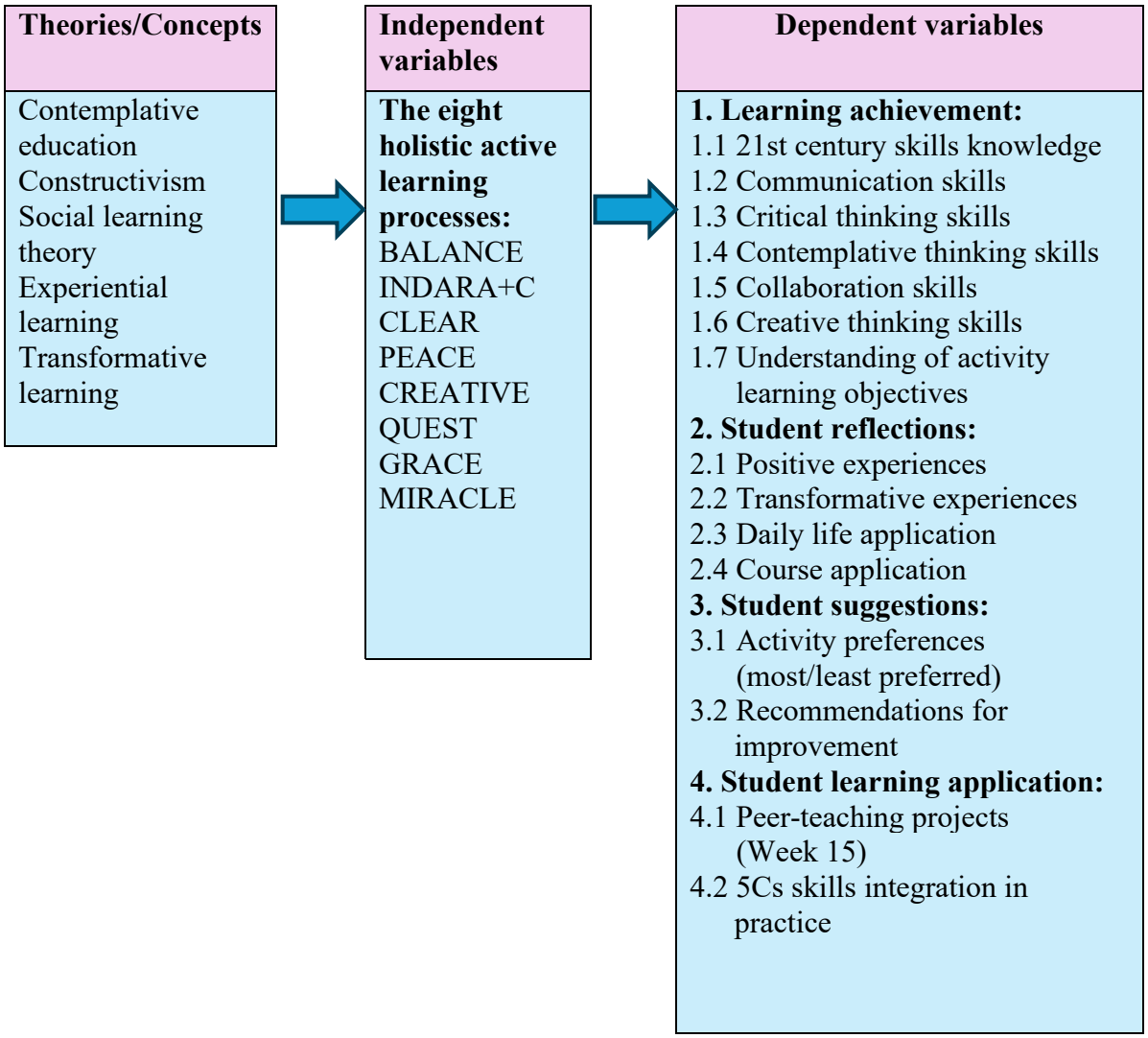

Figure 1: Conceptual framework for enhancing 5Cs skills through eight holistic active learning processes

Eight holistic active learning processes were implemented over 14 instructional weeks, excluding Weeks 1 (orientation), 9 (midterm examination), 15 (peer teaching projects), and 16 (final examination). Each process was designed to develop specific dimensions of the 5Cs competencies-communication, critical thinking, contemplative thinking, collaboration, and creative thinking-through structured pedagogical sequences aligned with relevant theoretical foundations and intended learning outcomes.

BALANCE (Weeks 2–3) focused on building foundational understanding and promoting balance through seven structured steps: Base Exploration (preparing the body and mind), Acquiring Knowledge (connecting new knowledge with prior experiences), Learning by Doing (hands-on activities), Application (solving real-world problems), Networking (peer exchange and discussion), Critical Reflection (thoughtful review), and Evaluation (authentic assessment). Key learning activities included practical and collaborative tasks, such as Brain Gym exercises, comparative analysis of the WEF and P21 frameworks, the Clock Game, News Reporter interviews, community problem-solving through village design using Canva, “Truth or Lie” storytelling, gesture-based games, and role-playing performances.

INDARA+C (Week 4) emphasized internal insight and self-awareness through seven reflective and experiential steps: Insight (self-discovery through the "Mirror of the Heart" activity), Nurturing Knowledge (learning the 5Cs framework), Deep Listening (sharing meaningful life stories with non-judgmental peer listening), Awareness (exploring internal and external dimensions of the self through the "Iceberg Activity"), Reflection (deep contemplation integrated throughout the learning process), Application (understanding and managing emotions through activities such as card stacking and emotion guessing), and Check-Out (structured reflection questions on learning, emotional experience, and areas for improvement).

CLEAR (Weeks 5-6) developed clear communication through five structured steps: Comprehend (analyzing video clips of effective and ineffective communication and sharing personal experiences), Learn (studying communication elements, dimensions, and types through group presentations), Exercise (role-playing communication scenarios and producing communication videos), Apply (implementing communication strategies in group tasks and daily interactions), and Reflect (completing weekly Padlet reflections by responding to five to six guided questions about learning and communication skill development).

PEACE (Week 7) introduced peaceful communication grounded in the principles of Nonviolent Communication through five sequential phases: Preparation (grounding activities to center attention), Engagement (sharing personal communication experiences), Acquisition (learning the core components of Nonviolent Communication), Collaborative Learning (practicing skills in groups), and Expression (sharing reflections and insights). The "Giraffe-Wolf" activity was used to contrast compassionate and aggressive communication styles.

CREATIVE (Week 8) fostered creative problem-solving through an eight-step innovation process: Contemplation (identifying relevant problems), Realization (understanding the root causes), Exploration (researching alternative solutions), Analysis (evaluating options), Transformation & Innovation (developing creative prototypes), Implementation (testing and applying solutions), Verification (gathering feedback from peers), and Evolution/Evaluation (refining approaches based on reflection and results).

QUEST (Week 10) enhanced critical thinking through five progressive steps: Question (formulating meaningful inquiries), Understand (analyzing contextual factors and underlying assumptions), Evaluate (assessing alternative perspectives and potential solutions), Summarize (synthesizing key insights), and Transfer (applying learned concepts to new situations). Key learning activities included analyzing fake news articles and designing decision-making frameworks to support evidence-based reasoning.

GRACE (Weeks 11-12) cultivated self-compassion and meaningful interpersonal connection through five reflective and experiential phases: Ground Yourself (using the L-O-V-E framework: Loving Practice, ORS Process [Observe–Reflect–Share], Vision, Engagement, and Essential Learning); Ritualize and Relate (creating safe and trusting spaces for authentic sharing); Act with Compassionate Awareness (engaging in empathetic actions); Create Meaningfully (expressing insight through mandala creation); and Express and Reflect (sharing personal insights and synthesizing learning experiences).

MIRACLE (Weeks 13–14) built collaboration skills through seven interconnected phases: Motivation (inspiring teamwork and collective purpose), Inspiration (sharing success stories to foster shared vision), Royal Speeches (grounding collaborative values in ethical and cultural principles), Active Lecture (engaging students through interactive input), Collaboration (participating in team-based learning activities), Learning Reflection (processing group experiences and insights), and Experiential Insight (gaining personal realizations through shared learning).

Student-led projects applying the CREATIVE framework (Week 15) featured student-designed innovative teaching projects that addressed real-life challenges faced by their classmates using the CREATIVE framework. The process followed eight integrated steps: Contemplation (reflecting on authentic peer challenges), Realization (identifying and understanding the root causes), Exploration (researching potential solutions and pedagogical approaches), Analysis (evaluating instructional strategies), Transformation & Innovation (designing targeted learning activities), Implementation (conducting peer teaching sessions), Verification (gathering peer feedback), and Evolution/Evaluation (reflecting on the teaching experience and participant responses). This culminating activity enabled students to meaningfully apply the 5Cs competencies in authentic, student-centered teaching contexts.

Quantitative data were collected through seven post-test topics (20 points each; 140 points in total) using proctored Google Forms administered in classroom settings during the midterm and final examinations. Each assessment consisted of multiple-choice questions with four answer options per item. The midterm examination assessed students' understanding of 21st-century skills, creative thinking (Guilford's divergent thinking and Torrance's components), and communication skills (active listening, nonviolent communication, and cross-cultural competence). The final examination evaluated collaboration skills (team effectiveness, trust-building, and conflict management), understanding of learning objectives, critical thinking (10 items, 2 points each), and contemplative thinking (mindful awareness, self-empathy, and reflective practices). Descriptive statistics, including means, standard deviations, and percentages, were calculated using Microsoft Excel to analyze students' achievement levels across the targeted competencies.

Qualitative data consisted of 263 weekly reflections collected via Padlet during Weeks 2-8 and 10-14. For Weeks 2-5, students responded to five reflection prompts: (1) Which 21st-century skills (5Cs) did you develop through today's activities, and how? (2) How did you feel about today's learning process? (3) Which activity did you enjoy most, and why? (4) Which activity did you enjoy least, and why? (5) What skills do you need to improve, and how will you develop them? From Week 6 onward, a sixth question was added: "How can you apply today's learning to your daily life or other contexts?"- aimed at capturing skill transfer and real-world application.

Qualitative analysis employed manual coding based on a four-dimension analytical framework: positive experiences, transformative experiences, daily life application, and course application. The coding framework was validated by three education experts, each holding a doctoral degree and possessing extensive experience in teacher education. The researcher conducted all initial coding, while one expert reviewed the coding of Week 3 reflections to ensure interpretive consistency. Ongoing consultations with the expert panel throughout the analysis process contributed to the overall reliability of the coding procedure.

Data integration occurred during the interpretation phase, where quantitative achievement scores were compared with qualitative themes to identify convergent patterns and relationships. For example, high achievement in collaboration (91.21%) was interpreted alongside reflection data indicating frequent mentions of teamwork and peer support during the MIRACLE sessions. This embedded design enabled ongoing monitoring of skill development while providing objective measures to corroborate qualitative insights.

Trustworthiness was enhanced through multiple strategies: data triangulation, audit trail maintenance, member checking of interpretive summaries with selected participants, and reflexive journaling by the researcher throughout the analysis process.

Limitations and ethical considerations: Due to its retrospective design, this study could not establish causal relationships, as no control group or pre-test data were available. The dual role of the instructor-researcher posed a risk of bias, which was addressed through reflexive journaling and peer consultation. Although inter-rater reliability testing was not conducted for qualitative coding due to resource limitations, ongoing expert consultation helped ensure interpretive consistency. The small, homogenous sample-29 English preservice teachers from a single institution-limits the generalizability of the findings. Voluntary participation in weekly reflections may have introduced response bias, as more engaged students were likely to contribute. Moreover, the use of multiple-choice assessments may have inadequately captured the depth of 21st-century competencies, especially in critical and contemplative thinking. The 16-week course duration also prevented the assessment of long-term skill retention. While formal ethical approval was not required due to the study's retrospective nature, all ethical protocols were upheld, including informed consent, voluntary participation, and anonymization of data.

IV. RESULTS

Analysis of data from 29 preservice English teachers revealed the following findings:

Table 1: Post-test achievement scores (n=29)

Assessment components	Mean/20	SD	%	Level
5Cs skills				
Communication	15.34	2.26	76.72	Good
Critical thinking	14.90	1.94	74.48	Good
Contemplative thinking	17.93	1.68	89.66	Very good
Collaboration	18.24	0.86	91.21	Excellent
Creative thinking	18.10	1.67	90.52	Excellent
Foundation knowledge				
21st Century skills knowledge	16.28	2.78	81.38	Very good
Understanding of activity objectives	17.07	1.70	85.34	Very good
Total (140 points)	**117.86**	**-**	**84.19**	**Very good**

Note: Achievement levels: Excellent = 90-100% (18-20 points), Very good = 80-89% (16-17.9 points), Good = 70-79% (14-15.9 points), Fair = 60-69% (12-13.9 points), Needs Improvement = Below 60% (<12 points).

Students achieved very good overall performance ($\bar{X}$ = 117.86, 84.19%), with collaboration (91.21%) and creative thinking (90.52%) reaching excellent levels. The highest variance was observed in foundational knowledge of 21st-century skills (SD = 2.78), indicating greater individual differences in theoretical understanding. One student who demonstrated outstanding collaboration reflected: "*I finally understand that real teamwork isn't just dividing tasks, but truly listening and building on each other's ideas"* (Student 15, Week 13).

Table 2: Number of students who submitted reflections each week

Week	W2	W3	W4	W5	W6	W7	W8	W10	W11	W12	W13	W14	Total
Number of students	26	26	20	24	22	25	18	24	20	21	20	17	263

Note. Variations in weekly submissions reflect the voluntary nature of the reflection activity and contextual learning conditions. For instance, Week 8 immediately preceded the midterm examination period, and Week 14 marked the final teaching session led by the researcher before the exams. A few students were absent due to illness or personal commitments, while others attended class but chose not to submit reflections.

Table 3: Reflection analysis by learning process

Categories	BAL (W2-3)	IND+C (W4)	CLE (W5-6)	PEA (W7)	CRE (W8)	QUE (W10)	GRA (W11-12)	MIR (W13-14)	Total
Positive experience	70	20	40	22	18	19	38	37	264
Transformative experience	12	19	26	12	10	17	31	31	158
Daily life application	0	8	27	17	13	23	34	32	154
Course application	68	20	10	8	17	5	41	17	186

Note: BAL=BALANCE, IND+C=INDARA+C, CLE=CLEAR, PEA=PEACE, CRE=CREATIVE, QUE=QUEST, GRA=GRACE, MIR=MIRACLE. Numbers represent frequency of coded reflection instances in each category.

Daily life application increased from zero during BALANCE to 34 during GRACE. Transformative experiences peaked during GRACE and MIRACLE sessions (n=31 each). Examples of transformative experiences during GRACE sessions included: *"The mandala activity made me realize I've been too hard on myself. I learned self-compassion isn't weakness"* (Student 8, Week 11). Another student reflected: *"Sharing in the circle without judgment changed how I see my classmates—we all struggle with similar fears"* (Student 23, Week 12).

Table 4: Activity preferences summary

Process	Most preferred	Least preferred	Main suggestion
BALANCE	Clock game, Role play	Theory comparison	More activity time
INDARA+C	Iceberg activity	Card stacking	Reduce lecture time
CLEAR	Videos, Kahoot	Presentations	More practice time
PEACE	Empathy cards	Making slides	Reduce presentation frequency
CREATIVE	Banana menu	Fishbone diagram	More completion time
QUEST	Human knot	Cause-effect diagram	Better time management
GRACE	ORS, Mandala	Few/None	Consider environment
MIRACLE	Village protection	Royal speeches searching	Provide royal speech examples directly

Students consistently expressed a preference for interactive activities, frequently describing them as "fun and engaging" (mentioned 45 times), involving "learning by doing" (38 times), and allowing them to "work with friends" (32 times). In contrast, theory-based activities were less preferred, often perceived as involving "too much information" (28 times) or being "difficult to understand" (22 times). One student reflected: *"The Clock Game was amazing because we moved, laughed, and learned time management without realizing it"* (Student 4, Week 2). Conversely, another remarked: *"Comparing theories felt like reading a textbook-too abstract without real examples"* (Student 19, Week 3).

Table 5: Week 15 Student projects and 5Cs skills integration

Team (n)	Theme	Sample activities	5Cs skills focus	Key outcome
1 (10)	Love	Blossom & Brush, Mug & Hug	Collaboration, Creative thinking	"Applied collaboration in daily life"
2 (10)	Emotions	EMUTION*, Deep Talk	Communication, Critical thinking	"Learned to deal with emotions"
3 (9)	Health	Brain Gym, You are what you eat	Contemplative thinking, Critical thinking	"Reviewed eating habits through contemplation"

Note: *EMUTION is a student-created fortune-telling activity combining emotional themes with spiritual symbols.

Table 5 presents student-designed projects conducted in Week 15, which served as the culminating activity for integrating the 5Cs skills through team-based learning. Each team selected a meaningful theme (e.g., love, emotions, health) and created interactive activities to apply their knowledge in authentic, practical contexts.

Team 1 focused on emotional bonding and creativity through art-based activities; Team 2 designed tools for emotional expression and peer dialogue; and Team 3 explored health awareness through mindful reflection and critical analysis. These projects reflect students' ability to co-create engaging learning experiences while demonstrating mastery in selected 5Cs skills.

The students' reflections revealed a strong sense of ownership and relevance. For example, one student remarked, "After the Brain Gym, I realized I've never paid attention to what I eat or how it affects my energy" (Student 12, Week 15), while another shared, "Deep Talk helped me open up emotionally, something I've always avoided" (Student 17, Week 15). Such insights underscore the transformative and practical value of student-led learning.

Skills development pattern

The frequency of 5Cs skills mentioned in student reflections across the eight learning processes is illustrated in Figure 2**.**

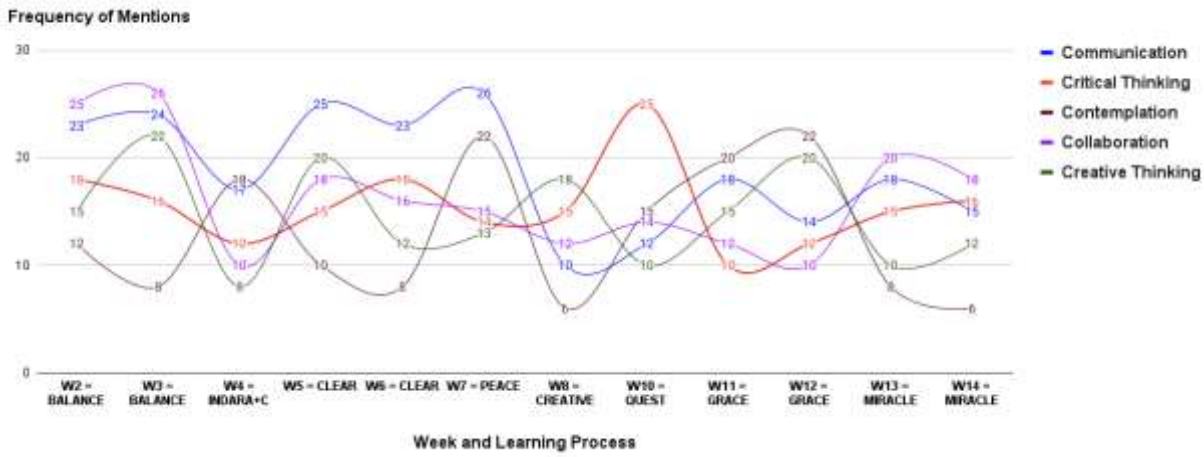

Figure 2: Development of 5Cs skills across 12 weeks by learning process

Communication and collaboration exhibited consistently high frequencies across all learning processes. Contemplative thinking notably increased during the INDARA+C (Week 4) and GRACE (Weeks 11-12) sessions. Creative thinking peaked during the CREATIVE process (Week 8), while critical thinking reached its highest frequency during QUEST (Week 10).

V. CONCLUSION AND DISCUSSION

This study examined the enhancement of 5Cs skills through eight holistic active learning processes among 29 preservice English teachers. Students demonstrated very good overall performance (84.19%), with collaboration (91.21%) and creative thinking (90.52%) reaching excellent levels, while communication (76.72%) and critical thinking (74.48%) remained at good levels. Analysis of 263 weekly reflections revealed progressive skill development, with daily life application rising from zero during BALANCE to 34 instances during GRACE sessions. Transformative experiences peaked during GRACE and MIRACLE sessions (n = 31 each), despite lower submission rates in Weeks 8 and 14. Students consistently preferred interactive activities over theoretical components, frequently requesting more hands-on practice time. The Week 15 peer-teaching projects showcased successful integration of all 5Cs, as teams creatively addressed real-life problems related to love, emotions, and health. These findings confirm the effectiveness of the eight holistic processes in cultivating integrated 21st-century competencies among preservice teachers.

The differentiated achievement levels reflect complex interactions between pedagogical approaches, skill characteristics, and cultural contexts. Collaboration and creative thinking excelled because these skills were embedded in every process from Week 2-14, aligned with Thai collectivist culture valuing group harmony, and utilized enjoyable experiential activities that students described as “fun and engaging” (45 mentions). These findings support constructivist (Kolb, 1984, p. 41) and social learning theories (Bandura, 1977, p. 22) emphasizing experiential and collaborative learning. Conversely, communication and critical thinking faced barriers as students found theoretical content “too much information” and expressed cultural discomfort with questioning peers-essential for critical thinking but conflicting with Thai values of maintaining

social harmony. This aligns with transformative learning challenges in collectivist contexts (Mezirow, 1997, p. 5). The lower submissions in Weeks 8 and 14, coinciding with complex analytical tasks and semester-end fatigue, paradoxically produced the highest transformative experiences, suggesting depth matters more than participation rates. Figure 2 reveals non-linear skill development patterns, with contemplative thinking peaking during INDARA+C and GRACE sessions incorporating mindfulness practices (Barbezat & Bush, 2014, p. 2; Zajonc, 2013, p. 83). Unlike previous research examining individual competencies separately (Surin & Damrongpanit, 2024, p. 108; Li & Tu, 2024, p. 119), this integrated approach demonstrates synergistic effects while highlighting cultural considerations essential for 21st-century teacher education (OECD, 2019, p. 7; World Economic Forum, 2023, p. 6). Future research should employ parallel group designs comparing variations of the eight processes, avoiding ethical concerns of non-intervention control groups while examining optimal combinations for diverse cultural contexts.

SUGGESTION

This retrospective classroom research revealed the potential effectiveness of eight holistic active learning processes in developing 5Cs skills among preservice English teachers, offering valuable insights for educational reform. Based on these promising results, several recommendations emerge for practice and future research. For immediate classroom implementation, educators should prioritize interactive, hands-on activities that engage students across multiple learning dimensions. The finding that students consistently preferred experiential activities while requesting "more practice time" suggests restructuring courses to minimize lecture-heavy sessions. Each learning process should incorporate collaborative elements, as these naturally foster creative thinking while aligning with collectivist cultural values. For culturally challenging competencies like critical thinking, educators should employ progressive scaffolding-beginning with neutral topics before advancing to peer evaluation-creating psychologically safe spaces where students can develop analytical skills without violating cultural norms of harmony. Future research should focus on transforming these eight processes into a validated pedagogical model through systematic Research and Development (R&D). The immediate next phase should employ prospective designs with parallel groups where two student cohorts experience different combinations or sequences of the processes, addressing ethical concerns of non-intervention control groups while enabling comparative effectiveness studies. This R&D approach allows the instructor-researcher to compare outcomes between variations, identifying optimal configurations. The development process should include creating standardized assessment rubrics that capture integrated competency development, refining instructional sequences based on comparative data, and establishing clear implementation guidelines derived from both groups' experiences. The R&D cycle should prioritize refining successful processes (GRACE and MIRACLE) while strengthening challenging areas like critical thinking development. Immediate tasks include creating comprehensive lesson plans, detailed facilitator guides, and formative assessment tools to track skill progression. The validated model should feature flexible modules integrable into existing courses without curriculum overhaul. Documentation must capture both successes and challenges, forming a living repository that can guide teacher education programs across Southeast Asia in developing culturally responsive frameworks for 21st-century competencies.

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