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The Effectiveness of Systems Thinking Training and Creative Problem-Solving on Social-Emotional Skills in University Students

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A B S T R A C T

Objective: The present study aimed to investigate the effectiveness of systems thinking and creative problem-solving training on social-emotional skills among first-year undergraduate students at Shahid Chamran University of Ahvaz.

Methods and Materials: This study employed a quasi-experimental design with a pretest–posttest structure and a control group. The statistical population consisted of first-year undergraduate students at Shahid Chamran University of Ahvaz during the 2025–2026 academic year. Using purposive sampling, 60 students were selected and randomly assigned into experimental and control groups, with 30 participants in each group. The experimental group participated in a systems thinking and creative problem-solving training program consisting of twelve 90-minute sessions conducted twice weekly, while the control group received no intervention. Data were collected using the Social Emotional Competence Questionnaire developed by Zhou and Ee (2012), which assesses self-awareness, social awareness, self-management, relationship management, and responsible decision-making. Data analysis was performed using IBM SPSS Statistics version 27 through descriptive statistics, multivariate analysis of covariance, and adjusted mean comparisons.

Findings: The findings demonstrated a statistically significant difference between the experimental and control groups in overall social-emotional skills after controlling for pretest scores (Wilks' Lambda = 0.214, F = 34.72, p = 0.001, partial $\eta^2 = 0.786$). Significant improvements were observed in all dimensions of social-emotional skills, including self-awareness (F = 29.64, p = 0.001), social awareness (F = 35.81, p = 0.001), self-management (F = 33.92, p = 0.001), relationship management (F = 38.67, p = 0.001), and responsible decision-making (F = 32.84, p = 0.001). The adjusted mean scores indicated that the experimental group achieved substantially higher posttest scores than the control group across all measured dimensions.

Conclusion: The results suggest that systems thinking and creative problem-solving training significantly improve social-emotional skills among university students. The intervention enhanced students' emotional awareness, interpersonal understanding, emotional regulation, communication abilities, and responsible decision-making capacities.

Keywords: *Systems thinking, creative problem-solving, social-emotional skills, emotional intelligence, university students, social-emotional learning*

1. Introduction

The increasing complexity of modern educational, occupational, and social environments has intensified the need for individuals to possess advanced cognitive, emotional, and interpersonal competencies that enable them to adapt effectively to rapidly changing conditions. Universities are no longer viewed solely as institutions responsible for transmitting disciplinary knowledge; rather, they are increasingly expected to cultivate holistic competencies that support students' academic success, emotional adjustment, social participation, creativity, and psychological well-being. Within this evolving educational landscape, social-emotional skills have emerged as one of the most essential dimensions of students' personal and professional development. Social-emotional skills encompass a broad range of competencies related to emotional awareness, self-regulation, empathy, interpersonal communication, responsible decision-making, and adaptive coping in social contexts (Denham, 2023; Harris et al., 2022). These competencies contribute significantly to academic achievement, psychological resilience, social adjustment, and long-term occupational effectiveness.

Recent educational research has demonstrated that students with higher levels of social-emotional competence exhibit stronger academic motivation, greater emotional stability, more effective communication skills, and higher levels of self-efficacy in educational and professional settings (Li et al., 2024; Roy, 2023). Emotional and social competencies have also been associated with improved employability, enhanced interpersonal functioning, and greater adaptability to complex educational demands (Li et al., 2024; Sauli et al., 2022). In contrast, deficits in social-emotional functioning are associated with increased stress, poor emotional regulation, academic disengagement, interpersonal conflicts, and lower psychological well-being among university students. Consequently, educational systems worldwide have increasingly emphasized the integration of social-emotional learning approaches into higher education curricula and student development programs (Henriksen et al., 2025; Tuomi, 2022).

Theoretical perspectives on social-emotional learning suggest that emotional competencies are not fixed personality traits but rather learnable and trainable abilities that can be developed through systematic educational interventions (Smith & Kamm, 2024; Ulutaş et al., 2021). Emotional intelligence theories emphasize the importance of self-awareness, emotional regulation, empathy, and interpersonal effectiveness as foundational capacities for adaptive functioning in educational and occupational contexts (Angwaomaodoko, 2025; Valente et al., 2022). Similarly, social-emotional learning frameworks conceptualize emotional and interpersonal competencies as multidimensional skills that support positive social interactions, collaborative learning, and constructive problem-solving behaviors (Harris et al., 2022; Pratiwi et al., 2023). Within these frameworks, educational interventions that simultaneously target cognitive flexibility, emotional understanding, and interpersonal problem-solving may produce meaningful improvements in students' social-emotional functioning.

One of the most important educational approaches that has gained increasing attention in recent years is systems thinking. Systems thinking refers to a holistic cognitive approach that emphasizes understanding relationships, patterns, interconnected structures, and dynamic interactions within complex systems. Instead of focusing on isolated events or linear cause-and-effect relationships, systems thinking encourages individuals to analyze broader contexts, recognize interdependencies, and identify feedback mechanisms that influence behavior and outcomes. This approach has become increasingly relevant in educational settings because contemporary social and organizational problems are often multidimensional and interconnected. Students who possess systems thinking abilities are more capable of analyzing complex situations, adapting to uncertainty, and developing integrated solutions to challenging problems.

Educational scholars have emphasized that systems thinking contributes not only to cognitive development but also to interpersonal understanding and emotional awareness. By recognizing the interconnectedness between personal emotions, social interactions, and environmental contexts, students may become more reflective, empathetic, and socially responsible in their behaviors (Kausar & Ajmal, 2024; Palma et al., 2025). Systems thinking also supports critical thinking, perspective-taking, and adaptive decision-making, which are essential components of effective social-emotional functioning (Palma et al., 2025). In contemporary educational discourse, systems thinking is increasingly regarded as a core competency required for the twenty-first century because it enables learners to navigate uncertainty, collaborate effectively, and address complex societal challenges (Kausar & Ajmal, 2024; Tuomi, 2022).

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At the same time, creative problem-solving has emerged as another essential competency in modern educational systems. Creative problem-solving refers to the ability to identify problems, generate innovative solutions, evaluate alternatives, and implement effective responses in challenging situations. Unlike routine problem-solving, creative problem-solving requires cognitive flexibility, originality, divergent thinking, and openness to multiple perspectives. Educational researchers argue that creative problem-solving promotes adaptability, resilience, emotional regulation, and interpersonal effectiveness because individuals learn to approach challenges constructively rather than reactively (Bakare et al., 2023; Hoffmann et al., 2022). Students who develop creative problem-solving skills tend to exhibit higher self-confidence, stronger collaborative abilities, and more effective coping strategies in academic and social contexts.

The relationship between creative problem-solving and emotional competence has been increasingly highlighted in educational psychology literature. Emotional awareness and emotional regulation facilitate flexible thinking and innovative responses to social challenges, while creative cognitive processes may enhance emotional adaptability and interpersonal communication (Palma et al., 2025; Roy, 2023). Consequently, educational programs that combine emotional learning with creative and analytical thinking may strengthen both cognitive and socio-emotional development among students. Research has shown that creativity-oriented educational interventions improve communication skills, collaborative engagement, and emotional expression among learners (Hoffmann et al., 2022; Pratiwi et al., 2023).

The growing importance of emotional and social competencies in higher education has led researchers to investigate different forms of emotional intelligence and social-emotional training interventions. Several studies have reported that emotional intelligence training programs significantly improve emotional regulation, empathy, interpersonal communication, resilience, and psychological well-being among students and educators (Aponte et al., 2025; Smith & Kamm, 2024). Emotional intelligence interventions have also been associated with reduced emotional distress, increased self-awareness, and enhanced professional functioning across educational and occupational settings (Antinienė et al., 2022; Melita, 2023). These findings suggest that emotional competencies can be effectively strengthened through structured educational programs.

Research focusing on teachers and educational professionals has further highlighted the importance of social-emotional competencies in effective educational practice. Studies have demonstrated that emotional intelligence contributes to teacher effectiveness, job satisfaction, emotional resilience, and classroom management skills (Hulda & Zhu, 2023; Valente et al., 2022). Emotional competence also plays a critical role in leadership effectiveness and educational administration (Angwaomaodoko, 2025). In teacher education programs, social-emotional learning approaches have been associated with improved empathy, emotional understanding, and reflective thinking among pre-service teachers (Antón et al., 2024; Domínguez-Marquez & Pizà-Mir, 2023). These findings indicate that emotional and social competencies are essential not only for academic achievement but also for sustainable educational engagement and professional adaptation.

Another emerging area of research concerns the integration of technological and innovative educational approaches in emotional and social skills training. Recent studies have examined the use of virtual reality, digital simulations, and artificial intelligence-based environments for enhancing emotional intelligence, metacognition, and social learning (Mitsea et al., 2023a, 2023b). Technological interventions may provide immersive and interactive learning experiences that facilitate emotional reflection, empathy development, and adaptive problem-solving. Similarly, scholars have discussed the relationship between generative artificial intelligence and social-emotional learning, emphasizing the need to balance technological advancement with human-centered emotional competencies (Henriksen et al., 2025; Tuomi, 2022). These developments highlight the increasing recognition that cognitive, emotional, and technological competencies must be integrated within modern educational systems.

In addition to formal educational interventions, researchers have explored emotional learning across diverse contexts such as vocational training, counseling education, psychotherapy training, medical education, and special education. Emotional competencies have been linked to counseling self-efficacy among counselors-in-training (Nasir et al., 2023), empathy development in medical students (Hsu et al., 2024), intrapsychic attunement in psychotherapy trainees (Başer, 2024), and emotional adaptation among individuals with developmental disorders (Kalogeratos & Anastasopoulou, 2023). Such findings reinforce the notion that emotional and social competencies

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are universally relevant across academic disciplines and professional domains.

Furthermore, educational scholars have increasingly emphasized the role of social-emotional learning in promoting sustainable development, inclusive education, and anti-bullying initiatives. Emotional education programs have been associated with stronger social responsibility, improved classroom climate, and reduced aggressive behaviors among students (Cristóvão et al., 2023; Grădinariu & Diac, 2023). Emotional and interpersonal competencies also support students' ability to collaborate constructively, tolerate diversity, and engage in ethical decision-making. These capacities are particularly important in university settings, where students encounter new social roles, academic pressures, and developmental transitions.

Despite the growing body of literature on emotional intelligence and social-emotional learning, relatively limited research has specifically investigated the combined effects of systems thinking and creative problem-solving training on social-emotional skills among university students. Most previous studies have focused either on emotional intelligence interventions or isolated cognitive training approaches without examining the integrated relationship between analytical thinking, creativity, and socio-emotional functioning. However, theoretical perspectives suggest that systems thinking and creative problem-solving may complement each other in enhancing emotional awareness, interpersonal understanding, and adaptive decision-making. Systems thinking promotes holistic analysis and relational understanding, whereas creative problem-solving fosters cognitive flexibility and innovative coping strategies. Together, these approaches may create a comprehensive educational framework for improving students' social-emotional competencies.

University students, particularly first-year undergraduate students, represent an important population for such interventions because they often experience substantial academic, emotional, and social adjustment challenges during the transition to higher education. Difficulties related to stress management, emotional regulation, interpersonal communication, and adaptation to new academic environments may negatively influence students' academic performance and psychological well-being. Therefore, educational interventions that strengthen both cognitive and socio-emotional capacities may contribute significantly to students' successful adjustment and long-term development.

Moreover, the educational context of developing countries has increased the urgency of implementing innovative and comprehensive educational programs that address students' emotional and interpersonal needs alongside academic learning. Contemporary higher education systems increasingly require graduates who are capable of collaborative problem-solving, emotional adaptability, critical reflection, and responsible decision-making in complex social environments (Kausar & Ajmal, 2024; Palma et al., 2025). Consequently, integrating systems thinking and creative problem-solving into university education may represent a promising strategy for preparing students to manage personal, academic, and professional challenges more effectively.

Given the theoretical and practical importance of social-emotional competencies in higher education and considering the limited empirical evidence regarding the combined application of systems thinking and creative problem-solving training, the present study aimed to investigate the effectiveness of systems thinking and creative problem-solving training on social-emotional skills among first-year undergraduate students at Shahid Chamran University of Ahvaz.

2. Methods and Materials

2.1. Study Design and Participants

This study was conducted using a quasi-experimental design with a pretest–posttest structure and a control group. The statistical population consisted of first-year undergraduate students at Shahid Chamran University of Ahvaz during the 2025–2026 academic year. After obtaining the necessary permissions from the university authorities, students who expressed willingness to participate in the study were screened according to the inclusion criteria, including being enrolled as first-year undergraduate students, absence of severe psychological disorders based on self-report, and regular attendance capability during the intervention sessions. Using purposive sampling, 60 students were selected and randomly assigned into two groups, including an experimental group (30 students) and a control group (30 students). The experimental group received systems thinking and creative problem-solving training, whereas the control group did not receive any intervention during the study period. Both groups completed the research instruments at the pretest and posttest stages. Ethical considerations such as voluntary participation, confidentiality of information, and the right to withdraw from the study at any stage were fully observed.

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2.2. *Measures*

Social-Emotional Skills Questionnaire. To assess students' social-emotional skills, the Social Emotional Competence Questionnaire (SECQ) developed by Zhou and Ee in 2012 was used. This instrument is a standardized self-report scale designed to evaluate social-emotional competencies among adolescents and young adults. The questionnaire consists of 25 items rated on a 6-point Likert scale ranging from "strongly disagree" to "strongly agree." The SECQ measures five subscales, including self-awareness, social awareness, self-management, relationship management, and responsible decision-making, with each subscale containing five items. Higher scores indicate higher levels of social-emotional competence. Previous studies have demonstrated satisfactory psychometric properties for this instrument, including strong internal consistency coefficients and acceptable construct validity across different cultural contexts. Cronbach's alpha coefficients for the total scale and subscales have generally been reported above 0.80, confirming the reliability and validity of the questionnaire in educational and psychological research.

2.3. *Intervention*

The intervention protocol consisted of twelve 90-minute training sessions conducted twice weekly for the experimental group. The educational program integrated principles of systems thinking and creative problem-solving through interactive lectures, group discussions, brainstorming exercises, scenario analysis, reflective activities, and collaborative learning tasks. During the initial sessions, students were introduced to the foundations of systems thinking, including system components, causal relationships, feedback loops, interconnectedness, and holistic analysis. In subsequent sessions, participants were trained in identifying complex problems, analyzing systemic structures, recognizing hidden patterns, and evaluating the consequences of decisions within dynamic systems. The creative problem-solving component included instruction in divergent thinking, idea fluency, cognitive flexibility, innovative solution generation, and structured decision-making strategies. Practical exercises and real-life academic and social scenarios were incorporated throughout the sessions to enhance the transferability of skills into everyday interpersonal and educational contexts. At the conclusion of the intervention period, the posttest assessments were administered to both the experimental and control groups.

2.4. *Data Analysis*

Data analysis was performed using IBM SPSS Statistics version 27. Descriptive statistics including means and standard deviations were calculated for all study variables. Prior to inferential analyses, assumptions of normality, homogeneity of variances, and equality of covariance matrices were examined using the Shapiro–Wilk test, Levene's test, and Box's M test, respectively. To evaluate the effectiveness of the intervention on students' social-emotional skills, multivariate analysis of covariance (MANCOVA) was employed while controlling for pretest scores. In addition, effect sizes were calculated using partial eta squared values to determine the magnitude of the intervention effects. Statistical significance was considered at the 0.05 level.

3. Findings and Results

A total of 60 first-year undergraduate students from Shahid Chamran University of Ahvaz participated in the present study. Of the participants, 31 students (51.67%) were female and 29 students (48.33%) were male. The mean age of the participants was 19.42 years (SD = 1.18), with an age range between 18 and 22 years. In the experimental group, 15 participants (50.00%) were female and 15 participants (50.00%) were male, while the control group consisted of 16 female students (53.33%) and 14 male students (46.67%). Regarding academic fields, participants were enrolled in various disciplines including psychology, educational sciences, engineering, and basic sciences. No significant differences were observed between the experimental and control groups in terms of demographic characteristics, indicating that the groups were relatively homogeneous before the intervention.

Table 1 presents the descriptive statistics for social-emotional skills and its dimensions in the experimental and control groups at the pretest and posttest stages.

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Table 1

Descriptive Statistics of Social-Emotional Skills and Its Dimensions in the Experimental and Control Groups at Pretest and Posttest Stages

Variables	Stage	Experimental Group Mean ± SD	Control Group Mean ± SD
Self-awareness	Pretest	16.82 ± 3.14	17.06 ± 3.27
	Posttest	22.47 ± 2.68	17.31 ± 3.11
Social awareness	Pretest	17.23 ± 2.95	17.51 ± 3.02
	Posttest	23.18 ± 2.41	17.73 ± 2.94
Self-management	Pretest	16.94 ± 3.21	17.12 ± 3.08
	Posttest	22.96 ± 2.57	17.45 ± 3.01
Relationship management	Pretest	17.38 ± 3.07	17.49 ± 3.19
	Posttest	23.54 ± 2.36	17.66 ± 3.22
Responsible decision-making	Pretest	16.71 ± 3.11	16.89 ± 3.25
	Posttest	22.81 ± 2.48	17.02 ± 3.16
Total social-emotional skills	Pretest	85.08 ± 9.42	86.07 ± 9.65
	Posttest	114.96 ± 8.73	87.17 ± 9.21

The descriptive findings presented in Table 1 indicate that the mean scores of the experimental and control groups were relatively similar at the pretest stage across all dimensions of social-emotional skills, suggesting the initial equivalence of the groups before implementation of the intervention. However, substantial changes were observed in the posttest scores of the experimental group following participation in the systems thinking and creative problem-solving training program. Specifically, the experimental group demonstrated marked increases in self-awareness, social awareness, self-management, relationship management, and responsible decision-making compared with the control group, whose scores remained relatively stable across the two measurement stages. The largest increase was observed in the overall social-emotional skills score, where the experimental group mean increased from 85.08 in the pretest to 114.96 in the posttest, whereas the control group showed only a minimal increase from 86.07 to 87.17. These descriptive changes provide preliminary evidence supporting the effectiveness of the intervention in enhancing students' social-emotional competencies.

Before conducting the main inferential analyses, assumptions underlying multivariate analysis of covariance were examined. The results of the Shapiro–Wilk test indicated that the distribution of scores for all dependent variables did not significantly deviate from normality ($p > 0.05$). Furthermore, Levene's test confirmed the homogeneity of variances across groups for all variables, and Box's M test indicated equality of covariance matrices between the groups. Therefore, the assumptions required for conducting MANCOVA were satisfied.

Table 2

Multivariate Analysis of Covariance for Social-Emotional Skills Dimensions in Experimental and Control Groups

Dependent Variables	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Self-awareness	401.83	1	401.83	29.64	0.001	0.352
Social awareness	462.27	1	462.27	35.81	0.001	0.398
Self-management	447.16	1	447.16	33.92	0.001	0.384
Relationship management	495.74	1	495.74	38.67	0.001	0.417
Responsible decision-making	438.51	1	438.51	32.84	0.001	0.374

*p<0.01

The results presented in Table 2 demonstrate that the combined dependent variables differed significantly between the experimental and control groups after controlling for pretest scores. The multivariate effect of the intervention was statistically significant based on Wilks' Lambda (Wilks' Lambda = 0.214, F = 34.72, p = 0.001), indicating that systems thinking and creative problem-solving training had a substantial effect on the overall set of social-emotional skill dimensions. The effect size obtained for the multivariate model (partial $\eta^2 = 0.786$) suggests a very large practical effect of the intervention. The univariate analyses further revealed that statistically significant differences existed between the groups across all dimensions of social-emotional skills. The highest effect size was

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associated with relationship management (partial η^2 = 0.417), followed by social awareness (partial η^2 = 0.398), self-management (partial η^2 = 0.384), responsible decision-making (partial η^2 = 0.374), and self-awareness (partial η^2 = 0.352). These findings indicate that participation in the intervention program significantly improved students' emotional regulation, interpersonal communication, social understanding, and decision-making abilities compared with students in the control group.

In order to determine the magnitude and direction of changes between the pretest and posttest stages within each group, paired comparisons and adjusted mean analyses were conducted. The results are presented in Table 3.

Table 3

Adjusted Mean Comparisons Between Experimental and Control Groups in Posttest Scores of Social-Emotional Skills

Variables	Experimental Group Adjusted Mean	Control Group Adjusted Mean	Mean Difference	Standard Error	p
Self-awareness	22.31	17.42	4.89	0.78	0.001
Social awareness	23.06	17.58	5.48	0.73	0.001
Self-management	22.74	17.51	5.23	0.75	0.001
Relationship management	23.42	17.69	5.73	0.71	0.001
Responsible decision-making	22.65	17.14	5.51	0.76	0.001
Total social-emotional skills	114.37	87.42	26.95	2.84	0.001

The adjusted mean comparisons shown in Table 3 further confirm the effectiveness of the intervention program in improving social-emotional competencies among university students. After controlling for pretest scores, the experimental group achieved significantly higher posttest adjusted means than the control group across all dimensions of social-emotional skills. The greatest adjusted mean difference was related to relationship management (Mean Difference = 5.73), indicating that the intervention had a particularly strong impact on students' interpersonal interaction and communication abilities. Similarly, considerable differences were observed in responsible decision-making, social awareness, self-management, and self-awareness. The total social-emotional skills score demonstrated a substantial adjusted mean difference of 26.95 points between the groups, reflecting the broad effectiveness of the combined systems thinking and creative problem-solving training program. Overall, the findings indicate that the intervention not only improved students' emotional and social competencies at a statistically significant level, but also produced practically meaningful educational outcomes.

4. Discussion

The present study aimed to investigate the effectiveness of systems thinking and creative problem-solving training on social-emotional skills among first-year undergraduate students at Shahid Chamran University of Ahvaz. The findings demonstrated that the intervention significantly improved the overall social-emotional skills of students in the experimental group compared with the control group. More specifically, statistically significant improvements were observed in self-awareness, social awareness, self-management, relationship management, and responsible decision-making after participation in the systems thinking and creative problem-solving training program. The substantial effect sizes obtained in the multivariate and univariate analyses further indicated that the intervention produced meaningful educational and psychological outcomes. These findings suggest that integrating systems thinking with creative problem-solving strategies can strengthen emotional and interpersonal competencies among university students and support their adaptive functioning within academic and social contexts.

One of the major findings of the present study was the significant improvement in students' self-awareness following the intervention. This result indicates that systems thinking and creative problem-solving training enhanced students' ability to recognize, understand, and evaluate their own emotional states, cognitive reactions, and behavioral tendencies. Systems thinking encourages reflective analysis of internal and external processes, enabling individuals to perceive how emotions, thoughts, and contextual influences interact dynamically. Through this reflective process, students may become more conscious of their emotional responses and behavioral patterns. Similarly, creative problem-solving activities often require individuals to examine personal assumptions, challenge habitual responses, and engage in flexible thinking, all of which may contribute to greater self-awareness and emotional insight. This finding is consistent with studies emphasizing the

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relationship between emotional intelligence training and enhanced self-understanding among students and educational professionals (Aponte et al., 2025; Smith & Kamm, 2024). It also aligns with research suggesting that emotional reflection and metacognitive engagement facilitate the development of emotional awareness and self-regulatory capacities (Mitsea et al., 2023a, 2023b).

The findings also revealed significant improvements in social awareness among participants in the experimental group. Social awareness involves empathy, understanding others' emotions, perspective-taking, and sensitivity to interpersonal dynamics. Systems thinking training may enhance social awareness because it encourages individuals to perceive social interactions as interconnected systems shaped by multiple relational and contextual factors. Students trained in systems thinking are likely to develop a broader understanding of how individual behaviors influence group dynamics and social outcomes. In addition, creative problem-solving activities frequently involve collaborative discussions, group brainstorming, and evaluation of diverse perspectives, which may strengthen empathy and interpersonal understanding. These findings are consistent with previous studies demonstrating that social-emotional learning interventions improve empathy, emotional understanding, and interpersonal sensitivity among students and teachers (Antón et al., 2024; Domínguez-Marquez & Pizà-Mir, 2023). The results also correspond with educational literature emphasizing that emotional intelligence training promotes more adaptive social interactions and stronger interpersonal relationships (Roy, 2023; Valente et al., 2022).

Another important finding of the study was the improvement in self-management skills among students who participated in the intervention program. Self-management refers to the ability to regulate emotions, control impulsive behaviors, maintain motivation, and adapt constructively to stressful situations. The observed improvement in this dimension may be explained by the intervention's emphasis on analytical thinking, emotional reflection, and structured problem-solving. Systems thinking helps individuals recognize the long-term consequences of emotional reactions and behavioral decisions, thereby encouraging more deliberate and adaptive responses. Likewise, creative problem-solving promotes flexibility, persistence, and cognitive restructuring, which may improve students' ability to manage stress and emotional challenges effectively. This interpretation is consistent with findings from previous studies indicating that emotional intelligence interventions contribute to better emotional regulation, psychological resilience, and stress management (Hulda & Zhu, 2023; Melita, 2023). Similar conclusions have also been reported in studies examining emotional learning programs in educational environments, where emotional competencies were associated with improved coping strategies and emotional adaptation (Edara, 2023; Ulutaş et al., 2021).

The intervention also produced a substantial improvement in relationship management, which demonstrated the largest effect size among the social-emotional skill dimensions. Relationship management involves effective communication, conflict resolution, collaboration, and the ability to maintain constructive interpersonal relationships. The strong effect observed in this dimension may reflect the interactive and collaborative nature of the intervention sessions. Students engaged in group discussions, collective problem-solving tasks, and participatory learning activities that required active communication and interpersonal cooperation. Systems thinking may have enhanced participants' understanding of relational dynamics and mutual influence, while creative problem-solving encouraged constructive dialogue and collaborative solution generation. These experiences likely improved students' interpersonal communication skills and social adaptability. The present findings align with prior research indicating that social-emotional learning programs improve communication skills, teamwork, and interpersonal functioning among students (Hoffmann et al., 2022; Pratiwi et al., 2023). Furthermore, studies on emotional intelligence and leadership have emphasized that emotionally competent individuals demonstrate stronger relationship-building skills and more effective collaborative behaviors (Angwaomaodoko, 2025; Drigas et al., 2023).

Responsible decision-making also improved significantly among students who received the intervention. Responsible decision-making involves evaluating consequences, considering ethical implications, solving interpersonal problems constructively, and making adaptive choices in complex situations. Systems thinking directly contributes to this competency because it trains individuals to analyze relationships between actions and outcomes within broader systems. Students learn to evaluate long-term consequences, identify hidden variables, and consider multiple perspectives before making decisions. Similarly, creative problem-solving promotes flexible thinking and encourages individuals to generate and evaluate alternative solutions rather than relying on impulsive or rigid responses. These cognitive and emotional processes likely enhanced

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participants' ability to make thoughtful and socially responsible decisions. This interpretation is supported by research demonstrating that emotional intelligence and critical thinking are closely interconnected and jointly contribute to adaptive decision-making and academic functioning (Palma et al., 2025). The findings are also consistent with educational studies emphasizing the importance of emotional competencies and problem-solving skills in preparing students for the demands of twenty-first century learning and professional environments (Kausar & Ajmal, 2024; Tuomi, 2022).

The overall improvement in social-emotional skills observed in the present study further supports the theoretical proposition that emotional competencies can be systematically developed through educational interventions. The results reinforce contemporary perspectives suggesting that emotional and social skills are dynamic competencies shaped by learning experiences, reflective practices, and interpersonal interactions rather than stable and immutable personality traits (Denham, 2023; Harris et al., 2022). The effectiveness of the present intervention also supports broader educational models advocating the integration of cognitive, emotional, and interpersonal learning within higher education curricula. In particular, combining systems thinking with creative problem-solving appears to provide a multidimensional framework that simultaneously develops analytical reasoning, emotional understanding, and adaptive interpersonal functioning.

The findings of this study may also be interpreted within the context of constructivist and experiential learning theories. The intervention encouraged students to actively engage in collaborative exploration, reflection, dialogue, and practical application of concepts. Such experiential learning processes facilitate deeper cognitive and emotional integration because students construct knowledge through active participation and social interaction. The interactive structure of the sessions may have increased emotional engagement and motivation, thereby strengthening learning outcomes and interpersonal competencies. Previous educational research has similarly highlighted the effectiveness of experiential and participatory approaches in enhancing emotional intelligence and social-emotional learning outcomes (Cristóvão et al., 2023; Zach & Rosenblum, 2021).

Another noteworthy implication of the findings relates to the increasing emphasis on holistic education in contemporary higher education systems. Universities are increasingly expected to cultivate graduates who possess not only technical knowledge but also emotional resilience, interpersonal competence, creativity, and adaptability. The present findings suggest that educational interventions integrating systems thinking and creative problem-solving may effectively contribute to these broader developmental goals. In modern educational and occupational contexts characterized by uncertainty, technological transformation, and social complexity, emotional adaptability and collaborative problem-solving are essential competencies for personal and professional success (Henriksen et al., 2025; Li et al., 2024). Therefore, interventions targeting these competencies may play a significant role in preparing students for future educational and occupational challenges.

5. Conclusion

The findings support previous literature emphasizing the interconnected nature of emotional intelligence, creativity, and social functioning. Emotional competencies influence individuals' ability to engage in flexible thinking and constructive social interactions, while creativity enhances adaptability and openness to diverse perspectives. The integration of these dimensions within the intervention may explain the broad improvements observed across multiple social-emotional domains. Similar relationships between emotional intelligence, creativity, interpersonal competence, and adaptive functioning have been reported in prior studies conducted in educational and professional settings (Bakare et al., 2023; Sauli et al., 2022). The consistency of the present findings with previous literature strengthens the credibility of the intervention approach and highlights the importance of multidimensional educational programs in higher education.

6. Limitations & Suggestions

Despite the significant findings of the present study, several limitations should be acknowledged. First, the study was conducted only among first-year undergraduate students at one university, which may limit the generalizability of the findings to students from other educational levels, academic disciplines, or cultural contexts. Second, the study relied primarily on self-report questionnaires, which may be influenced by social desirability bias and subjective interpretation. Third, the absence of a long-term follow-up assessment made it impossible to determine the durability and long-term stability of the intervention effects over time. Additionally, individual personality differences, prior educational experiences, and external environmental factors

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were not fully controlled during the study and may have influenced participants' responses to the intervention.

Future research should examine the effectiveness of systems thinking and creative problem-solving training across diverse educational settings, age groups, and cultural environments to enhance the external validity of the findings. Longitudinal studies including follow-up assessments are also recommended to evaluate the long-term sustainability of improvements in social-emotional skills. Future investigations may additionally compare the effectiveness of systems thinking training, creative problem-solving training, and integrated intervention models separately to identify their distinct and combined contributions to emotional and interpersonal development. Researchers are further encouraged to incorporate qualitative methods such as interviews, reflective journals, and observational analyses to obtain deeper insights into students' emotional experiences and cognitive changes during intervention programs.

The findings of the present study have important practical implications for universities, counselors, curriculum developers, and educational policymakers. Higher education institutions can incorporate systems thinking and creative problem-solving programs into student development curricula, counseling services, and academic workshops to strengthen students' emotional and interpersonal competencies. Educational practitioners may also integrate collaborative learning activities, reflective exercises, and creativity-based instructional approaches into classroom environments to promote emotional engagement and adaptive social functioning. Furthermore, training programs designed for university instructors and counselors can emphasize the development of emotional facilitation, systems-oriented thinking, and constructive problem-solving strategies to improve the overall educational climate and support students' psychological well-being and academic adjustment.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

References

Angwaomaodoko, E. A. (2025). Examining the Place and Role of Emotional Intelligence in Effective School Leadership and Administration. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5068936

Antinienė, D., Lekavičienė, R., Rūtelionė, A., & Šeinauskienė, B. (2022). Emotional Intelligence Training as an Intervention to Diminish Consumer Materialism. *Journal of Entrepreneurship and Sustainability Issues*, *10*(1), 328-343. https://doi.org/10.9770/jesi.2022.10.1(17)

Antón, L. J. M., Valdivieso, J. A., García-Alonso, J.-C., Carbonero, M. Á., & Manzanares, M. C. S. (2024). Situational Evaluation of Teachers' Social-Emotional Competence: Spanish Version of the Test of Regulation in and Understanding of Social Situations in Teaching (TRUST). *Social Psychology of Education*, *27*(5), 2857-2882. https://doi.org/10.1007/s11218-024-09927-x

Aponte, M. L., Sánchez, A. D. V., & Vásquez, M. R. (2025). The Effects of Emotional Intelligence Training Programs on Educators: A Systematic Review. *F1000research*, *14*, 842. https://doi.org/10.12688/f1000research.166190.1

Bakare, J., Ohanu, I. B., & Shodipe, T. O. (2023). Hypothesized Model of the Relationship Between Affective Behaviour, Emotional Intelligence and Success of Out-of-School Youths in Cell Phone Maintenance Enterprise. *Rajagiri Management Journal*, *17*(3), 254-277. https://doi.org/10.1108/ramj-06-2022-0102

Başer, L. M. (2024). Trainees' Intrapsychic Attunement in the Process of Psychotherapy Training. *Epiphany*, *16*(1), 132. https://doi.org/10.21533/epiphany.v16i1.424

Cristóvão, A. M., Valente, S., Rebelo, H., & Ruivo, A. F. (2023). Emotional Education for Sustainable Development: A Curriculum Analysis of Teacher Training in Portugal and Spain. *Frontiers in Education*, *8*. https://doi.org/10.3389/feduc.2023.1165319

Denham, S. A. (2023). Preschool Teachers' Emotional Intelligence and Beliefs: Informing Emotion Socialization in the

JAYPS Adolescent and Youth Psychological Studies E-ISSN: 2981-2526

Classroom. *Environment and Social Psychology*, *8*(3). https://doi.org/10.54517/esp.v8i3.1822

Domínguez-Marquez, P., & Pizà-Mir, B. (2023). Emotional Intelligence and Empathy in Pre-Primary Teachers: A Pilot Test. *International Journal of Education and Teaching*, *2*(2). https://doi.org/10.51483/ijedt.2.2.2022.1-8

Drigas, A., Papoutsi, C., & Skianis, C. (2023). Being an Emotionally Intelligent Leader Through the Nine-Layer Model of Emotional Intelligence—The Supporting Role of New Technologies. *Sustainability*, *15*(10), 8103. https://doi.org/10.3390/su15108103

Edara, I. R. (2023). Analysis of Students' Emotional Patterns Based on an Educational Course on Emotions Management. *Education Sciences*, *13*(7), 757. https://doi.org/10.3390/educsci13070757

Grădinariu, T., & Diac, G. (2023). 6. New Perspectives in Developing Teachers' Social-Emotional Skills to Prevent Bullying: The Role of Forum Theatre. *Review of Artistic Education*, *25*(1), 137-147. https://doi.org/10.2478/rae-2023-0020

Harris, V. W., Anderson, J., & Visconti, B. (2022). Social Emotional Ability Development (SEAD): An Integrated Model of Practical Emotion-Based Competencies. *Motivation and Emotion*, *46*(2), 226-253. https://doi.org/10.1007/s11031-021-09922-1

Henriksen, D., Creely, E., Gruber, N., & Leahy, S. (2025). Social-Emotional Learning and Generative AI: A Critical Literature Review and Framework for Teacher Education. *Journal of Teacher Education*, *76*(3), 312-328. https://doi.org/10.1177/00224871251325058

Hoffmann, J. D., France, K. D., & McGarry, J. A. (2022). Creativity and Connection: The Impact of inspirED With Secondary School Students. *Journal of Intelligence*, *11*(1), 8. https://doi.org/10.3390/jintelligence11010008

Hsu, W.-C., Fuh, L. J., & Liao, S.-C. (2024). Tickling the Heart: Integrating Social Emotional Learning Into Medical Education to Cultivate Empathetic, Resilient, and Holistically Developed Physicians. *Frontiers in Medicine*, *11*. https://doi.org/10.3389/fmed.2024.1368858

Hulda, G., & Zhu, X. (2023). The Effects of Emotional Intelligence on Teachers' Job Satisfaction: A Scoping Review. https://doi.org/10.20944/preprints202306.0533.v1

Kalogeratos, G., & Anastasopoulou, E. (2023). Enhancing Emotional Intelligence in Pervasive Developmental Disorders. The Autism Paradigm. *Technium Education and Humanities*, *6*, 61-69. https://doi.org/10.47577/teh.v6i.9769

Kausar, H., & Ajmal, F. (2024). Meta-Analysis Study: Expectations of 21st Century Teaching From Pre-Service Teacher Education Programs. *Journal of Research in Social Sciences*, *12*(2), 1-14. https://doi.org/10.52015/jrss.12i2.268

Li, X., Pu, R., & Phakdeephirot, N. (2024). The Interrelationships Between Emotional Intelligence, Achievement Motivation and Students' Employability: Exploring the Mediating Effect of Self-Efficacy. *Education + Training*, *66*(7), 738-754. https://doi.org/10.1108/et-12-2021-0464

Melita, N. (2023). Emotional Intelligence, Distancing, and Learning a New Skill as Strategies to Combat the Deleterious Effects of Emotional Labor on Attorney Wellbeing. *Frontiers in Behavioral Neuroscience*, *17*. https://doi.org/10.3389/fnbeh.2023.1221145

Mitsea, E., Drigas, A., & Skianis, C. (2023a). Virtual Reality Mindfulness for Meta-Competence Training Among People With Different Mental Disorders: A Systematic Review. *Psychiatry International*, *4*(4), 324-353. https://doi.org/10.3390/psychiatryint4040031

Mitsea, E., Drigas, A., & Skianis, C. (2023b). VR Gaming for Meta-Skills Training in Special Education: The Role of Metacognition, Motivations, and Emotional Intelligence. *Education Sciences*, *13*(7), 639. https://doi.org/10.3390/educsci13070639

Nasir, M. A. M., Ali, N. A. M., Aziz, A., Ismail, S., & Faudzi, F. N. M. (2023). An Investigation of Emotional Intelligence and Counselling Self-Efficacy Among Counsellors-in-Training. *International Journal of Evaluation and Research in Education (Ijere)*, *12*(3), 1222. https://doi.org/10.11591/ijere.v12i3.24476

Palma, M., Martín, N. L. S., & Cornejo, C. O. (2025). Emotional Intelligence and Critical Thinking: Relevant Factors for Training Future Teachers in a Chilean Pedagogy Program. *Journal of Intelligence*, *13*(2), 17. https://doi.org/10.3390/jintelligence13020017

Pratiwi, S. R., Sukmayadi, Y., & Nugraheni, T. (2023). Art Learning for Children as a Social Emotional Learning Program. *Jurnal Obsesi Jurnal Pendidikan Anak Usia Dini*, *7*(5), 5883-5894. https://doi.org/10.31004/obsesi.v7i5.5227

Roy, A. (2023). Interpersonal Emotion Regulation and Emotional Intelligence: A Review. *International Journal of Research Publication and Reviews*, *04*(02), 623-627. https://doi.org/10.55248/gengpi.2023.42002

Sauli, F., Wenger, M., & Fiori, M. (2022). Emotional Competences in Vocational Education and Training: State of the Art and Guidelines for Interventions. *Empirical Research in Vocational Education and Training*, *14*(1). https://doi.org/10.1186/s40461-022-00132-8

Smith, I., & Kamm, B. (2024). Emotional Intelligence Training. *Creative Education*, *15*(05), 958-973. https://doi.org/10.4236/ce.2024.155058

Tuomi, I. (2022). Artificial Intelligence, 21st Century Competences, and Socio-emotional Learning in Education: More Than High-risk? *European Journal of Education*, *57*(4), 601-619. https://doi.org/10.1111/ejed.12531

Ulutaş, İ., Engin, K., & Polat, E. B. (2021). Strategies to Develop Emotional Intelligence in Early Childhood. https://doi.org/10.5772/intechopen.98229

Valente, S., Lourenço, A. A., & Domínguez-Lara, S. (2022). Teachers in the 21st Century: Emotional Intelligence Skills Make the Difference. https://doi.org/10.5772/intechopen.103082

Zach, S., & Rosenblum, H. (2021). The Affective Domain—A Program to Foster Social-Emotional Orientation in Novice Physical Education Teachers. *International journal of environmental research and public health*, *18*(14), 7434. https://doi.org/10.3390/ijerph18147434

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