DOES SOCIAL SUPPORT STRENGTHEN THE LINK BETWEEN EMOTIONAL INTELLIGENCE AND ACCOUNTING STUDENTS' 21ST-CENTURY SKILLS?

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Abstract

This study aims to examine the effect of emotional intelligence on students' 4C (Critical Thinking, Creativity, Collaboration, and Communication) skills, with social support as a moderating variable. Explanative quantitative method was used with 119 vocational students of accounting and office administration as the sample through stratified random sampling technique. The results show that emotional intelligence has a significant effect on creativity, collaboration, and communication, but not on critical thinking. Social support only directly affects collaboration, but does not significantly moderate the relationship between emotional intelligence and the 4C skills. These findings confirm the importance of emotional intelligence in the development of 21st century skills, and show that the role of social support is still limited as a moderator.

Keywords: Emotional Intelligence, 4C Skills, Social Support, Vocational Education, Student Competence

INTRODUCTION

21st-century skills have become one of the goals of education, as individuals who possess these skills will be able to compete globally (Inganah, Darmayanti and Rizki, 2023). One of the challenges of the education system in Indonesia is to adapt to the current education system that integrates 21st-century skills (González-pérez and Ramírez-montoya, 2022; Safitri *et al.*, 2023; Sah *et al.*, 2023). These 21st-century skills have been adopted by the Indonesian government to support the 2013 curriculum for elementary, secondary, and high schools (Anjarwati, Darmayanti and Khoirudin, 2023). These skills are commonly known as the 4Cs, which include Critical Thinking, Creativity, Collaboration, and Communication. Critical Thinking (CT) is the ability to think in various ways and use different perspectives, enabling new and unconventional

thinking in selecting problem-solving alternatives (Gafour and Gafour, 2020). Creativity (CR) is a structured thinking process that involves a combination of different cognitive processes (Dilekçi and Karatay, 2023). Collaboration (CL) is a skill that involves recognizing that others may have different perspectives, necessitating cooperation to exchange insights and expertise (Scoular *et al.*, 2025). Meanwhile, communication (CM) is not merely a skill for exchanging information, but a skill for exchanging information in written, verbal, and non-verbal forms, as well as listening attentively to others to understand the context of the conversation (Stanikzai, 2023). Based on this analysis, the 4C skills are highly necessary to be implemented in schools in Indonesia, including vocational schools, to produce graduates with the skills required by the industry. SMK Muhammadiyah 3 Singosari places greater emphasis on aligning the curriculum with the industrial world, equipping students with the skills required by the business/industrial sector. However, in practice, not all 4C skills are fully implemented in schools. For example, when given the same case study question, students' answers tend to be similar, indicating that they have not yet maximized their critical thinking skills. Another example is students' reluctance to work on group assignments, leading them to become individualistic and unable to maximize their collaboration skills. This study references previous research in the same field, but those references tested variables on students and university students in the health field, whereas this study tests variables on students at a Vocational High School (SMK).

Emotional Intelligence (EI) is the ability of an individual to perceive, express, understand, use, and manage emotions in themselves and others, leading to adaptive behavior (Katodhia and Sinambela, 2020). In other words, EI is the ability to understand and regulate one's emotions. If individuals believe they have the ability to understand and regulate their emotions, they will demonstrate higher emotional intelligence (Kanesan and Fauzan, 2019). EI plays an important role in educational development (Hasan, Tahir and Arisah, 2024). In their original state, students majoring in Business and Management (including accounting and office administration) at SMK Muhammadiyah 3 Singosari tend to have difficulty regulating their emotions. For example, when groups are divided, some students admit that they dislike their group assignments, indicating an inability to regulate their emotions, which makes others

uncomfortable.

Education not only provides value to students but also trains them to manage their emotions (Arias, Soto-Carballo and Pino-Juste, 2022). Emotions influence how people rationalize, decide, and act. Emotional knowledge is crucial in determining the decisions someone makes (Hasan, Tahir and Arisah, 2024). Previous studies have noted that EI influences CT (Kang, 2015; Hasan, Tahir and Arisah, 2024). Previous research has indicated that EI has a positive influence on CR because individuals with high EI are better able to engage and maintain positive impacts while redirecting negative impacts toward more constructive outcomes (Parke, Seo and Sherf, 2015). The results of this study suggest that individuals with high emotional intelligence tend to be more creative because they are able to maintain positive emotions and redirect negative emotions into productive outcomes. Another study examining the relationship between EI and CL found that EI has a significant correlation with CL (Al-Hamdan *et al.*, 2021). Similar results were also produced by previous research examining the relationship between EI and CM, namely the positive relationship between EI and CM, where EI helps individuals understand and manage their emotions so they can communicate more effectively, empathetically, and professionally (Alipour *et al.*, 2024). Based on the results of previous studies, it can be concluded that EI has an influence on the 4C skills.

Social support (SS) is generally defined as assistance provided by social networks such as family, friends, or community members, in the form of emotional support (such as attention and care), information (such as sharing important information), practical assistance (such as housework), tangible support (such as financial assistance), and psychological support (Bedaso *et al.*, 2021). In the context of this study, SS is defined as emotional support from teachers, families, and the environment to students or fellow students to increase attention and care for students in need. Research by Eskandari & Ghahramanloo (2020) found that high EI is caused by high SS as well. Someone with high emotional understanding can communicate more effectively with others and rely on their support. Conversely, people with poor emotional understanding have weak social adaptation skills, which can have a negative impact on the level of social support they receive (Karademas, 2006).

This study is considered as new study as it examines all four components of the 4C skills simultaneously in relation to emotional intelligence, whereas previous research has generally tested them only partially. It also introduces social support as a moderating variable, providing a fresh perspective on how supportive environments may influence the development of 21st-century skills. Theoretically, the study enriches the Bar-On Emotional-Social Intelligence model by linking it with both cognitive and social aspects of the 4Cs, while practically, it offers valuable insights for educators and policymakers in vocational schools, where preparing students with both emotional and professional competencies is essential for employability. This makes the study important as it not only complements existing literature but also highlights practical strategies for fostering emotionally intelligent, collaborative, and adaptable graduates.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Emotional Intelligence Theory

The emotional intelligence model known as the Bar-On Model of Emotional-Social Intelligence (ESI) defines emotional intelligence as a set of interrelated emotional and social competencies that influence intelligent behavior (Bar-On, 1997). This model is a broader mixed model compared to some other EI theories, encompassing both emotional and social skills. The Bar-On Model is assessed using the Emotional Quotient Inventory (EQ-I), which measures these competencies across five main factors: (1) intrapersonal skills; (2) interpersonal skills; (3) adaptability; (4) stress management; and (5) general mood. The adaptability factor in the Bar-On Mixed Model of Emotional Intelligence has three key skills: problem solving, reality testing, and flexibility. Adaptability is one of the core components determining how well an individual handles change, solves problems, and remains flexible in various situations (Pulakos *et al.*, 2000). The Bar-On mixed model explains that individuals with good emotional intelligence tend to think clearly under pressure (Bar-On, 2006). They solve problems, analyze the factors involved, and design solutions without being overwhelmed by emotions. These skills lead to an individual's ability to think creatively. An individual's ability to think critically under pressure involves creativity. From this theory, the following hypotheses can be formulated.

H1. Emotional Intelligence has a positive influence on Critical Thinking

H2. Emotional Intelligence has a positive influence on Creativity

Interpersonal skills in Bar-On's mixed model refer to the fundamentals of building and maintaining healthy social relationships and interactions (Bar-On, 1997). These skills help individuals understand and respond to the emotions of others and foster positive relationships. This model breaks down interpersonal skills into three key abilities: empathy, social responsibility, and interpersonal relationships. Empathy allows individuals to feel and validate the emotions of others. Social responsibility is about being accountable and caring within a group or community. To build mutually satisfying relationships and maintain good connections with others, an individual requires interpersonal relationships. These three key abilities contribute to an individual's ability to collaborate with others. Empathy occurs when someone feels what another person is feeling, which involves a social process that brings the two individuals together within a group. Social responsibility occurs when an individual is part of a group and has a responsibility within it. Interpersonal relationships occur when there is a connection between one individual and another. In the collaboration process, there will be communication between individuals to strengthen their interpersonal skills, leading to the following hypotheses:

H3. Emotional Intelligence has a positive influence on Collaboration

H4. Emotional Intelligence has a positive influence on Communication

SS refers to emotional support provided by various parties to an individual, including friends, family, colleagues, or teachers (Viratama and Basaria, 2024). This plays a crucial role in reducing stress and anxiety, improving emotional regulation, and enhancing motivation in an individual. In Bar-On's mixed model, SS is one of the interpersonal skill factors, specifically empathy, which involves understanding when others need help and offering emotional support. SS and EI are closely interrelated because both involve understanding and managing emotions within the context of relationships. In the Bar-On mixed model of Emotional-Social Intelligence, social support is not a separate element but rather the output and application of strong interpersonal skills. Thus, it can be concluded that SS not only serves as a means to

reduce psychological pressure but also as a manifestation of EI integrated into interpersonal relationships. When someone possesses good interpersonal skills, such as empathy and understanding of others' emotional needs, social support can be provided more effectively. This aligns with the concept of the Mixed Model of Emotional-Social Intelligence in Bar-On's model, where social support is viewed as tangible evidence of adequate interpersonal competence. Therefore, improving empathy and other interpersonal skills can strengthen the social support provided, thereby positively impacting an individual's emotional well-being. From this analysis, the following hypotheses can be formulated.

H5. Social Support strengthens the influence of Emotional Intelligence on Critical Thinking

H6. Social Support strengthens the influence of Emotional Intelligence on Creativity

H7. Social Support strengthens the influence of Emotional Intelligence on Collaboration

H8. Social Support strengthens the influence of Emotional Intelligence on Communication

RESEARCH METHOD

This study aims to examine the relationship between variables using an explanatory quantitative method. The variables examined are independent variables, namely Emotional Intelligence (X), dependent variables, namely critical thinking (Y1), creativity (Y2), collaboration (Y3), communication (Y4), and moderating variables, namely social support (M). The population in this study consists of 10th and 11th grade students majoring in Business and Management, including accounting and office administration at SMK Muhammadiyah 3 Singosari. This population was selected because 10th and 11th grade students majoring in business management have not yet fully mastered the 4C competencies required in the workplace, so they need to understand the importance of emotional intelligence and social support. Proportionate stratified random sampling was used as the sampling technique for this study, conducted in the following steps: (1) the Slovin formula was used to calculate the sample size, with

a population of 171 students and a significance level of 5%; (2) determining the percentage to be used as the sample size percentage for each class; and (3) the sample was selected randomly. From the calculation using the Slovin formula, the sample size was 119 students and the percentage rate was 70%, distributed across each class. From these results, the data presented in Table 1 was obtained.

The validity and reliability of the research instrument were tested by taking samples from the first 10 respondents in each class and then testing them to determine

Table 1
Distribution of Population and Sample

Class	Population	Percentage	Sample
X AKL	26	70%	18
X MPLB 1	31		22
X MPLB 2	33		23
XI AKL	29		20
XI MPLB 1	26		18
XI MPLB 2	26		18
Total	171		119

Source: Processed data

whether the instrument was valid and reliable. Next, the Moderation Regression Analysis (MRA) technique was applied to analyze the data obtained to test the influence of emotional intelligence on students' 4C skills with social support as a moderating variable.

Emotional Intelligence is defined as the ability to perceive, express, understand, and manage emotions (Bru-Luna *et al.*, 2021). EI variables were measured using the Rotterdam Emotional Intelligence Scale (REIS) developed by (Pekaar *et al.*, 2018). This scale consists of 28 items that measure four main dimensions, namely self-focused emotion appraisal, other-focused emotion appraisal, self-focused emotion regulation, and other-focused emotion regulation. Critical Thinking is the ability to apply cognitive skills, such as analyzing, applying, and evaluating when thinking (Alsaleh, 2020). The Critical Thinking variable is measured using the Critical Thinking Disposition Scale (CTDS) developed by Sosu (2013). This scale consists of 11 items divided into two main dimensions, namely critical openness and reflective skepticism. The critical openness subscale reflects openness to new ideas and willingness to re-examine existing beliefs, while reflective skepticism indicates a tendency to rethink past experiences and critically

question evidence. Creativity is the interaction between ability, process, and environment where individuals or groups produce new products that are visible and useful (Patston *et al.*, 2021). The CR variable is measured using the Person–Environment Fit Scale for Creativity (PEFSC) developed by Sen (2012). This scale assesses creativity through the interaction between individual characteristics (person) and environment (environment). The PEFSC consists of 14 items balanced between person and environment aspects.

Collaboration is defined as a social process in which a group is formed to achieve a primary goal (Ulhusna, Putri and Zakirman, 2020). The collaboration variable is measured using the Assessment of Interprofessional Team Collaboration Scale (AITCS) developed by Orchard et al. (2018), designed to assess the effectiveness of interprofessional teamwork, particularly in terms of collaboration among team members. This subscale consists of several statement items that measure individuals' perceptions of teamwork, such as partnership, cooperation, and coordination. Communication is the ability of individuals to cooperate with one another in exchanging information (Safitri & Mujahid, 2024). The CM variable is measured using the Communication Skills Attitude Scale (CSAS) Polish version (CSAS-P) by Rees et al. (2002). This scale consists of two main subscales, namely the Positive Attitude Subscale (PAS-P, 11 items) and the Negative Attitude Subscale (NAS-P, 12 items). Social support is defined as information that makes individuals feel that they are loved, cared for, and valued (Langford *et al.*, 1997). The social support variable was measured using an instrument developed by Shakespeare-Finch & Obst (2011), namely the 2-Way Social Support Scale. This instrument was designed to evaluate individuals' perceptions of the social support they receive and accept from various sources, such as family, friends, and other significant people, including Receiving Emotional Support, Giving Emotional Support, Receiving Instrumental Support, and Giving Instrumental Support.

RESULTS AND DISCUSSION

Results

Research instrument testing was conducted to determine whether the questionnaire instrument was valid and reliable. An instrument is considered valid if the significance

level is <0.05 and $r_{count} > r_{table}$. This instrument test was conducted on 60 students, so the r_{table} value was 0.250. All items in the instrument showed values above r_{table}, indicating that the research instrument was valid.

The research data collected from the questionnaire distribution yielded a total of 119 respondents from a sample spread across 6 classes, as presented in Table 2.

Table 2
Descriptive Statistical Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
EI	119	23	62	46,87	7,775
CT	119	9	37	23,38	5,970
CR	119	13	33	24,55	4,092
CL	119	23	59	42,80	7,424
CM	119	13	36	24,04	4,936
SS	119	11	34	25,44	4,485

Source: Data Processed

Table 3 presents the distribution of data for several variables, starting with the Emotional Intelligence (EI) variable, which was measured using the REIS scale. Students' EI scores ranged from 23 to 62, with an average of 46.87 and a standard deviation of 7.775. The average, which is quite close to the maximum value, indicates that, in general, students' EI levels are relatively high. Meanwhile, the Critical Thinking (CT) variable, measured using the CTDS scale, shows a minimum value of 9 and a maximum of 37, with an average of 23.38 and a standard deviation of 5.970. This average is also relatively high compared to the maximum value, indicating that students' critical thinking skills are quite good. The Creativity (CR) variable, assessed using the PEFSC scale, has a value range between 13 and 33, with an average of 24.55. The average within this range indicates that students' creativity levels tend to be high, especially when compared to the minimum value.

Furthermore, the Collaboration (CL) variable, measured using the AITCS scale, shows a minimum value of 23 and a maximum of 59, with an average value of 42.80. This indicates that students have fairly strong collaboration skills, as evidenced by the average value being close to the maximum value. For the Communication (CM) variable, measured using the CSAS scale, the minimum value was 13 and the maximum 36, while the average value was 25.13. This indicates that students' communication skills are at a

relatively high level. Finally, the Social Support (SS) variable, measured using the 2-Way Social Support Scale, has a minimum score of 11 and a maximum of 34, with an average of 25.44. This figure indicates that the social support received and provided by students tends to be high, as seen from the closeness of the average to the maximum value.

Hypothesis testing uses Moderated Regression Analysis (MRA). This test can be performed if the data has passed the classical assumption test and there are no problems with the results. The MRA test aims to determine the effect or relationship of independent variables on four dependent variables with one moderating variable. The regression model used is as follows.

$Y1, Y2, Y3, Y4 = \alpha + \beta 1X$ ..... (1)

$Y1, Y2, Y3, Y4 = \alpha + \beta 1X + \beta 2M$ ..... (2)

$Y1, Y2, Y3, Y4 = \alpha + \beta 1X + \beta 2M + \beta 3XM$ ..... (3)

The following is a tabulation of the moderated regression analysis test using these three models.

Table 3
Moderated Regression Analysis

Var	Model 1				Model 2				Model 3			
	Y_1	Y_2	Y_3	Y_4	Y_1	Y_2	Y_3	Y_4	Y_1	Y_2	Y_3	Y_4
EI	0,233	0,000	0,000	0,000	0,492	0,000	0,010	0,086	0,882	0,766	0,879	0,037
SS					0,872	0,162	0,000	0,108	0,753	0,420	0,428	0,041
EI*SS									0,702	0,193	0,480	0,104
R^2	0,012	0,393	0,372	0,136	0,012	0,403	0,475	0,155	0,014	0,412	0,477	0,174

Source: Data Processed

The MRA analysis presented in Table 2 Model 1 explains the effect of EI on students' 4C skills. The results of the analysis show that the EI variable affects CT (0.233), CR (0.000), CL (0.000), and CM (0.000). From these results, the EI variable does not have a significant effect on CT because the significance value is >0.05. However, the EI variable has a significant effect on CR, CL, and CM with significance values <0.05. The higher the level of students' emotional intelligence, the higher their levels of creativity,

collaboration, and communication. The R^2 values in Model 1 are 0.012, 0.393, 0.372, and 0.136, respectively. This means that the EI variable contributes 1.2% to CT, 39.3% to CR, 37.2% to CL, and 13.6% to CM.

Model 2 was analyzed by adding the SS variable to Model 1, showing that SS has significant values for CT (0.872), CR (0.162), CL (0.000), and CM (0.108). Only one value shows a significance level <0.05, which is the effect of SS on CL. Three out of four R2 values in Model 2 are higher than those in Model 1, namely 0.403, 0.475, and 0.155. This means that the SS variable can enhance the contribution of EI to CR, CL, and CM.

Model 3 is the result of MRA testing the moderating effect of SS. Based on the analysis results, SS is unable to moderate the effect of EI on students' 4C skills. The R2 values in Model 3 are higher than those in Model 1, indicating that there is a contribution of EI's effect on students' 4C skills after the moderating variables, respectively 1.4%; 41.2%; 47.7%; and 17.4%.

Discussion

Based on the results of the analysis in this study, the effect of EI on students' CT showed insignificant results. This means that although EI theoretically has the potential to improve students' critical thinking skills through emotional management in dealing with pressure, clear thinking, and self-reflection, empirically, this has not been optimally realized in students at SMK Muhammadiyah 3 Singosari. Some possible causes of this weak influence include the low practical application of emotional management in critical learning situations or the lack of deep reflection and skeptical thinking habits in an academic context. This finding differs from previous research findings stating that individuals who can effectively understand and regulate their emotions tend to be more capable of critical thinking because they can handle emotional pressure calmly, think clearly, and evaluate and reflect objectively (Kang, 2015; Hasan, Tahir and Arisah, 2024). This discrepancy can be explained from several perspectives. First, the educational background and environment of vocational high school students differ from the populations studied in previous research, which primarily focused on university students or learners in general academic and health fields. Vocational students may have a more practical and procedural orientation in their learning, so aspects of emotional management

have not been explicitly linked to critical thinking processes in the school environment. Second, while EI theoretically involves skills such as stress regulation, flexibility, and problem-solving (Bar-On, 1997), the practical application of these skills in a learning context may not be fully developed without supportive pedagogical strategies. At SMK Muhammadiyah 3 Singosari, as mentioned in the background, students tend to provide uniform answers when given case study questions. This indicates that although students have relatively high levels of EI, they are not yet accustomed to using these skills for critical thinking and generating unique or different solutions.

Based on the results of Table 3, it can be concluded that EI has a significant positive influence on student creativity. This finding reinforces the theory that individuals with high emotional intelligence are better able to maintain positive emotional stability, manage negative emotions productively, and have high thinking flexibility, all of which are important components in the creative thinking process. Theoretically, this relationship is also supported by Bar-On's mixed model approach, which places adaptability as one of the key dimensions of EI. Adaptability encompasses problem-solving ability, reality testing, and flexibility, all of which are closely related to creative activities. In other words, students with high EI are better able to face challenges, adapt to dynamic learning environments, and generate original and useful new ideas, thus supporting H2. The findings of this study align with previous research by Parke et al. (2015), which noted that the higher an individual's EI, the higher the level of creativity exhibited by students. Additionally, this study reinforces the approach of Bar-On's mixed model of Emotional-Social Intelligence, which positions adaptability as a key component of EI. Thus, the empirical results of this study demonstrate that the dimensions of EI in Bar-On's mixed model indeed play a significant role in supporting student creativity, particularly in vocational education settings such as vocational high schools (SMK).

Based on the research findings presented, it was found that EI has a positive and significant influence on the CL skills of students at SMK Muhammadiyah 3 Singosari. This indicates that the higher the level of EI students possess, the better their ability to collaborate with their social environment, thereby validating H3. This finding is consistent with the theoretical framework and literature review referencing the Bar-On mixed model, where interpersonal skills such as empathy, social responsibility, and interpersonal

relationships are important aspects of EI that are highly relevant to collaboration (Bar-On, 1997). The ability to understand one's own emotions and those of others facilitates the social processes that are central to effective teamwork. These results are also in line with previous research findings by Al-Hamdan et al. (2021), who found a significant correlation between EI and CL. Students' ability to form and maintain cooperative relationships within learning groups is crucial, as the industrial world demands high teamwork skills. This study confirms that students with good EI are more capable of managing group dynamics, addressing differing perspectives, and creating an inclusive and collaborative learning environment.

Based on the research results presented in the document, the influence of EI on students' communication skills shows a significant relationship. These results indicate that the higher students' ability to recognize, understand, and manage their own and others' emotions, the better their communication skills are, both verbally, in writing, and nonverbally, so that H4 can be accepted. This finding is consistent with previous research by Alipour et al. (2024), which found that EI helps individuals understand and manage their emotions so they can communicate more effectively, empathetically, and professionally. Effective communication skills are a key factor in social interactions in the workplace. Additionally, good communication skills are closely related to interpersonal skills in Bar-On's EI model, which includes empathy, social responsibility, and interpersonal relationships. These three aspects enable students not only to express their opinions but also to actively listen and respond appropriately in social contexts, as explained by Stanikzai (2023) that 21st-century communication encompasses empathetic and contextual two-way communication aspects.

Model 2, which tests the simultaneous influence of EI and SS on CT, shows that EI has a positive influence on CT with a significance value of 0.492. However, this value is still above the significance threshold of 0.05, so the relationship is not yet statistically significant. On the other hand, SS has a significance value of 0.872, indicating that SS does not have a significant direct influence on CT. Similarly, the R^2 value in Model 2 is 0.012, showing a stagnant value compared to Model 1 (0.012), which does not indicate that the presence of SS slightly expands EI's contribution to CT, but rather the opposite.

Model 3 shows that the interaction is not significant with a significance value of 0.702. This means that SS does not significantly moderate the relationship between EI and CT, so H5 is not accepted. However, there is a slight increase in the R^2 value from 0.012 to 0.014, indicating that although the interaction is not significant, the combination of EI and SS has a slight increase in contribution to predicting students' CT ability. Therefore, even though SS is available, it is possible that the quality or students' perception of such support is not yet optimal, so its role as a moderator in strengthening the relationship between EI and CT is not yet effective.

The results of the analysis in Model 2 show that EI has a significant positive influence on students' creativity. This finding supports the statement by Parke et al. (2015) that individuals with high EI levels are able to maintain positive emotional impacts and redirect negative impacts into something productive, which ultimately fosters creativity. Creativity, as explained by Dilekçi & Karatay (2023), is the result of a structured thinking process involving different cognitive combinations, and this ability is greatly influenced by good emotional regulation, as explained in Bar-On's EI model. Therefore, the higher the EI possessed by students, the greater their potential to generate original and relevant creative ideas in response to the situations they face. The SS variable does not have a significant direct effect on students' creativity. This indicates that although SS is considered important in supporting students' emotional and psychological development (Karademas, 2006; Eskandari and Ghahramanloo, 2020), social support from the surrounding environment, such as teachers or peers, is not strong enough to directly enhance students' creativity if it is not accompanied by adequate emotional intelligence. Analysis of Model 3 shows that SS does not significantly moderate the influence of EI on students' creativity. In other words, the presence of social support neither strengthens nor weakens the influence of EI on creativity, so H6 is not accepted. Although the moderation variable is not statistically significant, the R^2 value in this model increases from 0.393 (Model 1) to 0.412 (Model 3), indicating that including SS as a moderator still contributes a small amount to the increase in creativity variation explained by the model. These results can be explained through Bar-On's approach in Emotional-Social Intelligence (ESI), which positions SS as a manifestation of interpersonal skills, not as an entirely independent external factor. Effective social support tends to arise from individuals who

already possess high EI skills, so the effect of SS may not appear directly in moderation but rather as part of the EI competency ecosystem itself. This finding complements previous research, which has tended to focus solely on the direct relationship between EI and creativity, without considering SS as an interaction variable or moderator.

EI has a significant positive effect on students' collaboration skills in model 2. This shows that the addition of the Social Support (SS) variable can strengthen the contribution of EI to CL, even though SS itself only has a significant direct effect on CL, without moderating the effect of EI on CL in model 3. This means that although SS does not statistically moderate, its presence still adds to the variation explained in the model (R^2 increases to 0.477). This finding reinforces the results of Al-Hamdan et al. (2021), who stated that emotional intelligence has a significant correlation with collaboration skills. Students who can recognize and manage their emotions tend to be more capable of working together, empathizing with fellow team members, and demonstrating social responsibility in the collaborative process. This highlights the importance of EI in shaping collaborative attitudes among vocational high school students. Additionally, social support from teachers and peers serves as a factor that enhances comfort and safety in interactions, ultimately strengthening collaboration. However, the results of Model 3 show that the interaction between EI and SS is not statistically significant, so H7 is not accepted. Nevertheless, practically speaking, SS still adds value to the model, as evidenced by the increase in R^2 from 0.475 (Model 2) to 0.477. This aligns with Eskandari & Ghahramanloo (2020), who state that individuals with high EI are more capable of building social relationships and receiving support from their environment. Therefore, social support may not directly moderate, but it still plays a supporting role in optimizing collaboration.

In Model 2, EI and SS were simultaneously included to examine their direct effects on communication skills. The results indicate that EI has a significant positive effect on student communication, although it is at the threshold of significance, while SS has not yet shown a significant direct effect on the communication variable. However, the increase in the coefficient of determination (R^2) from 0.136 in Model 1 to 0.155 in Model 2 indicates that the addition of the SS variable strengthens the predictive model, even though the direct effect of SS is not yet statistically significant. Model 3 shows that SS is not yet

strong enough to statistically moderate the relationship between EI and communication skills. Nevertheless, the R^2 value indicates that the presence of social support still contributes to strengthening the relationship between emotional intelligence and students' communication skills, even though its moderating effect is not yet statistically significant. This aligns with the findings of Alipour et al. (2024), who state that EI helps individuals manage their emotions, ultimately supporting more empathetic and effective communication. Social support, on the other hand, although not directly moderating, remains important as a supportive environment that allows students to express and practice their communication skills with more confidence. As explained by Stanikzai (2023), communication is not only the exchange of information but also includes listening skills, empathy, and strong non-verbal abilities. EI plays a significant role in this regard by training students to be more aware of their own and others' emotions and to communicate appropriately. Meanwhile, the presence of social support from teachers and peers, although insufficient to significantly strengthen the influence of EI, remains important as part of a healthy and supportive school climate. Thus, these results reinforce the evidence that EI is an important predictor in the development of communication skills among vocational high school students. While SS has not significantly moderated this relationship, so H8 is not accepted. This opens up opportunities to enhance social support-based intervention strategies to optimize their role in strengthening communication skills through improved EI.

CONCLUSIONS AND SUGGESTIONS

Conclusions

This study aims to determine the effect of EI on 4C skills (Critical Thinking, Creativity, Collaboration, and Communication) and to examine the role of SS in strengthening these relationships. The analysis results indicate that EI significantly influences Creativity, Collaboration, and Communication, but not Critical Thinking. This suggests that students' emotional intelligence plays a crucial role in fostering collaborative, creative, and communicative abilities, but it is not yet sufficiently strong in enhancing their critical thinking skills. SS directly influences Collaboration significantly but does not statistically moderate the relationship between EI and the four

4C skills. However, the increase in the coefficient of determination (R^2) in some models indicates that SS still contributes additional value, even if not statistically significant. These findings reinforce the theory that EI plays an important role in shaping students' social and personal skills. The stronger influence of EI on interactive and expressive skills indicates that the ability to manage emotions and understand others is key to building creativity, communication, and effective collaboration. These results also open opportunities for the development of more detailed theoretical models to explain the factors influencing critical thinking, as the EI variable has not been able to significantly explain the variability in such abilities. Practically, these findings provide an important foundation for teachers, school counselors, and education administrators to design learning programs and activities that promote the development of students' EI. On the other hand, schools also need to create a socially supportive environment, as while SS does not act as a moderator, its presence still has a positive influence on student interactions.

Limitations and Suggestions

This study has limitations in terms of population scope, as it only involves vocational high school students majoring in Business and Management at one school, so the findings cannot be generalized to all vocational high school students or other secondary school levels. Theoretically, the results imply that emotional intelligence plays a stronger role in shaping creativity, collaboration, and communication than in critical thinking, suggesting that future models of emotional-social intelligence need to account for contextual and educational differences in skill development. Practically, the findings highlight the importance for educators and policymakers to design interventions that strengthen students' emotional intelligence alongside the 4C skills, while also creating structured and consistent forms of social support within schools. Further research is recommended to broaden the scope by involving participants from diverse majors, school types, and regions, in order to obtain a more comprehensive and generalizable understanding of the relationship between emotional intelligence, social support, and 21st-century skills.

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