Investigating the Role of Educational Technology in Fostering Social-Emotional Development and Its Correlation with Academic Success in Secondary School in Minna

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Abstract

This study investigates the role of educational technology in fostering social-emotional development and its correlation with academic success in secondary schools in Minna. A mixed-methods design was adopted, with 328 SS II students selected through stratified random sampling and 45 teachers chosen through balloting from three schools. Data were collected using student questionnaires, teacher observation checklists, and academic records, and analysed using descriptive statistics, Pearson's correlation, regression analysis, and thematic analysis. Findings revealed that both students and teachers agreed educational technology positively supports SED, with Grand Means of 3.26 and 3.19, respectively. Correlation analysis showed a moderate, positive, and significant relationship between SED and academic achievement ($r = 0.403$, $p < 0.01$). The study implies that integrating technology-enhanced social-emotional learning can improve students' holistic development and academic outcomes. It is recommended that schools deliberately integrate technology-supported social-emotional learning into daily instructional practices

Keywords: Educational Technology, Social-Emotional Development, Academic Achievement, SEL, Digital Learning Tools

Introduction

Social-emotional development (SED) is increasingly recognised as a cornerstone of effective education, as it equips students with the ability to understand and manage their emotions, develop empathy, and establish positive interpersonal relationships. These competencies are not

only fundamental to personal growth but also influence academic engagement and overall learning outcomes. Developing social-emotional skills in students fosters resilience, motivation, and a sense of belonging within the classroom environment. As Ilxomovna and Gulasal (2026) note, targeted strategies to enhance SED can significantly improve students' adaptability and preparedness for both academic and life challenges.

In recent years, educational technology has transformed traditional classrooms into interactive, digitally enriched learning environments. Teachers increasingly integrate digital tools such as learning platforms, gamified applications, and collaborative software to support both instructional delivery and student engagement (Davis, *et al.,* 2018). These technologies provide opportunities for personalised learning, real-time feedback, and collaborative activities that can enhance students' social and emotional skills. Qi and Derakhshan (2025) highlights that technology-based collaborative learning fosters self-regulation and positive academic emotions, which are crucial for sustaining motivation and improving academic performance.

Despite the widespread adoption of digital tools, there remains limited empirical evidence examining their specific impact on social-emotional development and subsequent academic success. Many schools adopt educational technologies primarily to support content learning, often overlooking their potential to nurture emotional intelligence and interpersonal skills (Nafees *et al.,* 2025; Priadita *et al*., 2026). This gap highlights the need for research investigating how digital tools can holistically support students' social-emotional growth while simultaneously enhancing learning outcomes. Understanding these dynamics is vital for designing effective interventions that balance emotional well-being with academic achievement.

Social-emotional development (SED) encompasses the skills that enable learners to recognise and manage their emotions, build positive relationships, and make responsible decisions. It is increasingly recognised as a fundamental component of holistic education, shaping not only personal well-being but also cognitive engagement and classroom behaviour. Guerrero, Valenciano-Valcárcel, and Rodríguez (2024) emphasise that alternative educational approaches often provide richer contexts for SED by encouraging collaboration, self-reflection, and emotional regulation. Similarly, Rafiyya et al. (2024) highlight that early interventions targeting social-emotional skills in developing countries have a significant impact on learners' adaptability, resilience, and long-term academic engagement. Educational technology has

transformed traditional pedagogical approaches, offering innovative tools that enhance interaction, engagement, and personalised learning. Digital platforms, AI-powered learning systems, and interactive applications are now widely adopted to supplement classroom instruction. Akintayo, Eden, Ayeni, and Onyebuchi (2024) found that systematic integration of technology improves learning outcomes by supporting differentiated instruction and immediate feedback. Meanwhile, Nazaretsky et al. (2025) stress that the effectiveness of AI-powered educational tools depends largely on students' trust and perceived reliability, highlighting the psychological and social dimensions of adopting technology in learning.

Technology-supported social-emotional learning; beyond academic purposes, technology can play a pivotal role in fostering social-emotional learning (SEL). Digital tools facilitate collaborative tasks, self-paced reflection, and gamified experiences that promote empathy, self-regulation, and relationship skills. Mukhemar, Affouneh, and Burgos (2025) report that technology-enabled SEL provides flexible opportunities for educators to integrate emotional learning into curriculum delivery. Robinson and Van Ryzin (2025) note that technology-supported cooperative learning can enhance positive social and mental health outcomes more effectively than standard curriculum-based SEL programmes, suggesting that digital environments can strengthen both engagement and emotional competence.

Social-emotional development has been consistently linked to academic achievement. Students who demonstrate higher levels of self-awareness, self-regulation, and social competence tend to perform better academically due to increased motivation, persistence, and classroom engagement. Zhao and Sang (2025) conducted a meta-analytic review showing that SEL interventions positively influence grades, test scores, and overall learning outcomes in both elementary and middle school students. Konadu (2025) further emphasises that teachers' own social-emotional skills affect how they implement SEL practices, indirectly influencing students' learning experiences and academic success.

Statement of the Problem

Despite the growing integration of educational technology in classrooms, there is limited empirical evidence on its impact on students' social-emotional development and how this, in turn, influences academic success. While digital tools are widely used for content delivery, their potential to nurture emotional intelligence, self-regulation, and interpersonal skills remains

underexplored. This gap hampers the design of holistic interventions that simultaneously support both students' emotional well-being and academic achievement.

Research Objectives

This study aims to examinethe role of educational technology in fostering social-emotional development and its correlation with academic success in secondary school in Minna. Specifically, the study seeks to:

1. Investigate the role of educational technology in promoting social-emotional development among secondary school students.
2. Assess the teachers' observations on the role of educational technology in promoting SED

Research Questions

The following research questions guided the study;

1. What is the role of educational technology in promoting social-emotional development among secondary school students?
2. What are the teachers' observations on the role of educational technology in promoting SED?

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 alpha level

$H0_1$: There is no significant Relationship between social-emotional development and academic achievement among secondary school students

Methodology

This study adopts a mixed-methods design, combining quantitative and qualitative approaches to explore the role of educational technology in fostering social-emotional development and its correlation with academic success among secondary school students. The correlational aspect allows examination of relationships between technology use, SED, and academic performance. The population of the study comprises all Senior Secondary School chemistry students in Minna Metropolis for the 2023/2024 academic session, totaling 30,000 students (15,500 males and 14,500 females). The target population consists of 1,600 Senior Secondary II (SS II) chemistry

students across all secondary schools, ensuring focus on a specific, academically relevant cohort. A stratified random sampling technique was used to select 328 students proportionally from three schools: Day Secondary School Barikin Sale, Day Secondary School Kwasau, and Day Secondary School Shanu. Male and female students are (164 males, 163 females). Additionally, 45 teachers were selected through balloting, with 15 teachers randomly chosen from each school (Barikin Sale: 8 males, 7 females; Kwasau: 7 males, 8 females; Shanu: 8 males, 7 females). Instrument used for data collection named Educational Technology Social-Emotional Development Questionnaire (ETSEDQ). Datawas analysed using Pearson's correlation, regression analysis, and thematic analysis to identify relationships and emerging patterns.

Results

This section presents the findings of the study, beginning with the demographic characteristics of the respondents. Understanding the composition of the participants provides context for interpreting the subsequent results on educational technology usage, social-emotional development, and academic performance. The study sampled 328 SS II English students from three secondary schools in Minna Metropolis, with proportional representation of male and female students to ensure a balanced perspective.

Table 1: Demographic Information of Respondents of Student

Names of Schools	Male	Female	Total
Day Secondary School Barikin Sale	45	60	106
Day Secondary School Kwasau	55	61	116
Day Secondary School Shanu	64	42	106
Overall total			328

Note: Sample sizes were selected proportionally from each gender group using stratified random sampling.

Table 2: Demographic Information of Teacher Respondents

Names of Schools	Male	Female	Total
Day Secondary School Barikin Sale	8	7	15
Day Secondary School Kwasau	7	8	15
Day Secondary School Shanu	8	7	15
Overall total	23	22	45

Note: A total of 45 teachers were selected using **balloting**, with 15 teachers randomly chosen from each school.

Research Question One: What is the role of educational technology in promoting social-emotional development among secondary school students?

Table 3: Frequency, Mean, Standard Deviation and Remarks of Students' Responses on the Role of Educational Technology in Promoting SED

S/N	Statement	N	Mean	SD	Remark
1	Using digital learning tools helps me manage my emotions.	328	3.21	0.64	Agree
2	Educational technology allows me to collaborate effectively.	328	3.35	0.57	Agree
3	I feel more confident expressing ideas using digital platforms.	328	3.14	0.61	Agree
4	Digital tools help me stay motivated to complete assignments.	328	3.42	0.52	Agree
5	Using educational technology reduces stress when learning difficult topics.	328	3.05	0.66	Agree
6	I learn to understand other students' perspectives via digital activities.	328	3.27	0.59	Agree
7	Technology-supported activities help me develop self-discipline.	328	3.12	0.60	Agree
8	I feel more connected to teachers and classmates using digital platforms.	328	3.38	0.55	Agree
9	Educational technology improves my problem-solving and decision-making skills.	328	3.20	0.58	Agree
10	I enjoy learning more with interactive/gamified digital tools.	328	3.41	0.53	Agree
	Grand Mean		3.26		Agree

Note: Responses were rated on a 4-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree, with a midpoint of 2.5. Mean = $\geq$2.5 is agree and < 2.5 is disagree.

The results in Table 3 show that students generally agree that educational technology promotes social-emotional development, with individual means ranging from 3.05 to 3.42. The highest agreement was on motivation (3.42) and enjoyment with interactive tools (3.41), while the lowest was stress reduction (3.05). The Grand Mean of 3.26 indicates overall positive perception, implying that technology effectively supports emotional regulation, collaboration, and engagement in learning.

Research Question Two: What is the Teachers' Observations on the Role of Educational Technology in Promoting SED?

Table 4: Mean and Standard Deviation of Teachers' Observations on the Role of Educational Technology in Promoting SED

S/N	Statement	N	Mean	SD	Remark
1	Students show improved emotional regulation during digital learning tasks.	45	3.15	0.55	Agree
2	Students collaborate effectively in group activities using technology.	45	3.25	0.50	Agree
3	Students demonstrate increased confidence when presenting ideas using digital tools.	45	3.10	0.58	Agree
4	Students show motivation and enthusiasm during technology-mediated lessons.	45	3.30	0.48	Agree
5	Students handle challenges or mistakes calmly while using digital platforms.	45	3.05	0.60	Agree
6	Students demonstrate empathy and understanding toward peers in online group activities.	45	3.18	0.53	Agree
7	Students manage their time and complete tasks effectively using digital tools.	45	3.22	0.51	Agree
8	Students participate actively and engage meaningfully during technology-supported lessons.	45	3.27	0.49	Agree
9	Students make thoughtful decisions or solve problems collaboratively in digital environments.	45	3.12	0.56	Agree
10	Students show enjoyment and interest in learning activities that incorporate technology.	45	3.28	0.50	Agree
	Grand Mean		3.19		Agree

Note: Responses were rated on a 4-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree, with a midpoint of 2.5. Mean = $\geq$ 2.5 is agree and < 2.5 is disagree.

Teachers' observations in Table 4 indicate that students generally agree that educational technology promotes social-emotional development, with item means ranging from 3.05 to 3.30.

The highest agreement was on students' motivation (3.30) and enjoyment (3.28), while the lowest was handling challenges calmly (3.05). The Grand Mean of 3.19 reflects an overall positive impact, suggesting that technology effectively supports emotional regulation, collaboration, confidence, and engagement in learning.

Hypothesis One: There is no significant relationship between social-emotional development and academic achievement among secondary school students.

Table 5: Pearson Correlation Analysis of the Relationship between Social-Emotional Development and Academic Achievement among Secondary School Students

	Correlation	SED_Total	Academic Achievement Score
Social-Emotional Development (SED)_Total	Pearson Correlation	1	.403**
	Sig. (2-tailed)		.000
	N	328	328
Academic Achievement Score	Pearson Correlation	.403**	1
	Sig. (2-tailed)	.000	
	N	328	328

The correlation analysis reveals a moderate, positive, and statistically significant relationship between students' social-emotional development and academic achievement. The Pearson correlation coefficient of r = 0.403 indicates that as students' social-emotional development increases, their academic achievement also tends to improve. The significance value (p = .000, 2-tailed) shows that this relationship is statistically significant at the 0.05 level, meaning the likelihood that the observed association occurred by chance is extremely low. The consistent sample size of 328 students across both variables strengthens the reliability of the result. Overall, the finding demonstrates that social-emotional development is meaningfully associated with students' academic performance.

The implication of this finding is that fostering students' social-emotional development such as emotional regulation, collaboration, self-discipline, and confidence can contribute positively to academic success. It suggests that educational interventions, particularly those supported by technology, should not focus solely on cognitive outcomes but also intentionally integrate social-

emotional learning components to enhance overall student achievement and holistic development.

Discussion of Findings

The results reveal that students perceive educational technology as enhancing social-emotional development, particularly in motivation, engagement, and enjoyment, with slightly lower impact on stress reduction. This aligns with Priadita *et al* (2026) who found that digital tools can strengthen emotional regulation and collaboration in learners. Similarly, Qi and Derakhshan (2025) highlighted that technology-based collaborative learning improves social regulation and academic emotions. The findings suggest that technology effectively supports emotional growth alongside cognitive learning. However, the modest variation between stress management and motivation indicates uneven benefits, suggesting that not all digital tools equally foster every SED dimension. Unlike some studies (Ilxomovna & Gulasal, 2026), the study did not measure long-term retention, a limitation worth noting.

Teachers' observations corroborate students' perceptions, confirming that technology promotes confidence, collaboration, and emotional regulation. These findings are in agreement with Mukhemar, Affouneh, and Burgos (2025), who reported positive outcomes of technology-enabled SEL interventions. The moderate positive correlation between SED and academic achievement ($r = 0.403$, $p < 0.05$) indicates that students with stronger social-emotional skills perform better academically, consistent with Zhao and Sang (2025). This implies that integrating SEL-focused educational technology can enhance both well-being and learning outcomes. Schools should deliberately design interventions that promote emotional regulation, collaboration, and self-discipline while monitoring tools' effectiveness to maximize academic and socio-emotional benefits.

Conclusion

This study has shown that educational technology plays a significant role in fostering social-emotional development among secondary school students. Both students and teachers perceived digital tools as enhancing motivation, engagement, collaboration, and emotional regulation. The moderate positive correlation between social-emotional development and academic achievement further highlights that students with stronger social-emotional skills tend to perform better academically. Therefore, integrating technology-supported social-emotional learning into

instructional practices can enhance holistic student development, promoting both emotional well-being and improved learning outcomes.

Recommendations

1. Schools should integrate technology-supported social-emotional learning activities to enhance students' emotional regulation and collaboration.
2. Teachers should design interactive digital lessons that promote motivation, engagement, and self-discipline among learners.
3. Educational policymakers should provide resources and training for implementing technology-enhanced social-emotional learning in classrooms.
4. Curriculum developers should include structured digital tools targeting social-emotional development alongside traditional academic content.
5. Regular assessment of students' social-emotional growth should be conducted to link emotional skills with academic achievement.

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