

Exploring Self-Efficacy and Digital Competence among Junior High School Teachers

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Abstract

The role of digital technology and artificial intelligence is constantly growing and increasingly shapes teaching. This study determined the self-efficacy and digital competence of junior high school teachers in El Salvador City in SY 2026 - 2027. Specifically, it aimed to describe the respondents' characteristics; find out how the respondents assess their self-efficacy; examine the significant influence of the respondents' self-efficacy on their level of digital competence; and test how the respondents' characteristics moderate the relationship between the self-efficacy and digital competence. A descriptive-correlational design, complete enumeration of 163 teachers, and a three-part patterned and modified questionnaire were used in the study. Cronbach's alpha of 0.96-0.98 indicated strong reliability. Frequency, percentage, mean, standard deviation, Spearman correlation, and regression were employed for data analysis.

The findings revealed that most of the respondents were aged 26–35, female, early-career, pursuing master's units, and regionally trained. Respondents demonstrated very high self-efficacy overall, with teaching obtaining the highest mean. Digital competence was also highly competent, with content recording the highest mean. Among the respondent characteristics, only age significantly moderated the relationship between self-efficacy and digital competence, reflecting generational technology rather than credentials or experience.

This study concludes that digital competence in a teaching workforce is fundamentally a matter of teacher's confidence with teaching and content emerging as mutually reinforcing strengths grounded in subject-matter judgment. The study recommends career-appropriate support for underrepresented teacher groups, scenario-based training for problem-solving, hands-on practice with technology, and age-responsive program for teachers.

Keywords: self-efficacy, digital competence

1. Introduction

The rapid development of artificial intelligence and digital technology has transformed education by providing personalized learning, immediate feedback, flexible assessment, improved access to information, and greater student engagement. In the Philippines, educational institutions are encouraged to adapt to these changes through initiatives that provide teachers and learners with access to digital platforms and resources. AI can assist teachers in preparing instructional materials, supporting lessons,

and improving classroom practices, but its use also raises concerns about accuracy, appropriateness, ethics, and responsible implementation. Teachers should remain the primary professionals in the teaching process, using AI and other digital tools to support rather than replace instruction. Recent changes in education policies also reflect the growing need for AI literacy, teacher development, learner preparation, and improved digital infrastructure. In this context, self-efficacy and digital competence have become important competencies because teachers who can effectively use digital technologies tend to have greater confidence in applying them in their teaching. The growing presence of AI further emphasizes the need for teachers to develop both knowledge and practical skills in using AI technologies. Therefore, examining teachers' self-efficacy and digital competence among junior high school teachers in El Salvador City can provide useful evidence for identifying competency gaps and developing appropriate training and professional development programs.

Research Questions

This study aimed to determine the respondents' self-efficacy and digital competence among junior high school teachers in El Salvador City during the School Year 2026 – 2027.

Specifically, this study sought to answer the following questions:

1. How are the respondents distributed in terms of age, sex, years of teaching experience, highest educational attainment, and related training/seminars attended?
2. How do the respondents assess their self-efficacy considering teaching, work-related tasks, and problem-solving?
3. What is the respondents' level of digital competence based on their technological knowledge, pedagogical knowledge, and content knowledge?
4. Is there a significant influence of the respondents' self-efficacy on their level of digital competence?
5. Do the respondents' characteristics moderate the relationship between self-efficacy and digital competence?

Significance

The findings of the study may benefit school administrators, teachers, students, and future researchers by providing useful information on teachers' self-efficacy and digital competence in using artificial intelligence in education. School administrators may use the findings to develop appropriate training programs, provide necessary technologies, and establish policies that support the effective integration of AI in teaching. Teachers may gain a better understanding of their level of self-efficacy and digital competence, helping them identify areas that need improvement in using AI technologies. Students may benefit from improved and more personalized learning experiences as teachers become more capable of integrating AI into classroom instruction. Future researchers may also use the findings as a reference for further studies on educational technology, self-efficacy, digital competence, AI, and other factors that influence the use of technology in teaching.

Scope and Limitations

This study focused on determining teachers' self-efficacy and digital competence among junior high school teachers in El Salvador City during the School Year 2026 – 2027.

The respondents were one hundred and sixty-three (163) junior high school teachers from the three national high schools namely: El Salvador City National High School, Molugan National High School, and Cogon

National High School. The independent variables were limited only to the respondents' self-efficacy considering technology, pedagogy, and content. The dependent variables were also limited only to the respondents' digital competence based on technology, pedagogy and content. The moderating variables were the respondents' characteristics in terms of age, sex, years of teaching experience, highest educational attainment, and related training/seminars attended.

Despite these limitations, the study offers insightful information about the respondents' digital competence to incorporate AI into their lessons and could be used as a foundation for initiatives and programs that promote successful technology integration in education.

Literature Review

Respondents Characteristics

Briones et al. (2023) found that age, length of service, and academic rank were associated with teachers' self-efficacy and digital competence, while Sangcad and Abarquez (2024) reported that educational attainment and teaching experience were related to self-efficacy and work performance. Similarly, Silao and Luciano (2025) found significant relationships between teachers' age, educational attainment, digital competence, and participation in ICT training. Wong et al. (2025) emphasized that age groups remain relevant in examining teachers' digital readiness, while Cubio (2025) noted that although younger teachers may be more familiar with technology, older teachers can also develop their digital skills through appropriate support and training. Overall, the literature indicates that age, sex, teaching experience, educational attainment, and participation in relevant training may help explain differences in teachers' self-efficacy and digital competence, although their effects may vary depending on the context.

Self-Efficacy

Teacher self-efficacy is an important factor that influences teachers' instructional practices, work performance, and ability to manage challenges in the educational setting. Anoba and Cahapay (2021) found that teachers' technological pedagogical self-efficacy was associated with their intention to continue teaching in remote learning environments, showing the importance of confidence in adapting to changing teaching demands. Briones et al. (2023) emphasized that self-efficacy in work related tasks, such as lesson planning, documentation, and digital responsibilities, is connected to digital competence and work engagement. Similarly, Padohinog et al. (2024) reported that teachers' self-efficacy supports effective teaching practices, learner engagement, and problem solving in classroom situations. Sangcad and Abarquez (2024) highlighted the role of self-efficacy in classroom management, creating a supportive school environment, and improving work performance. Overall, the reviewed literature indicates that teacher self-efficacy is a multifaceted construct that covers teaching, work related tasks, and problem solving, enabling teachers to perform their professional responsibilities, adapt to challenges, and improve their teaching practices.

Digital Competence

Digital competence is an essential component of contemporary teaching because it enables teachers to use technology effectively for instruction, communication, assessment, and development of learning materials. Abella and Dela Rosa (2023) found that teachers' digital competence is influenced by access to ICT facilities, digital skills, and positive attitudes toward technology, while also highlighting the importance of integrating digital tools into teaching rather than using them only for technical purposes.

Valle et al. (2024) emphasized that digital competence is multidimensional and involves technological, pedagogical, and content knowledge, with content knowledge playing an important role in effective technology integration. Lagos and Nabos (2023) reported that teachers commonly use mobile phones, productivity applications, and social networking tools, although the use of more advanced technologies such as learning management systems remains less frequent. Varilla et al. (2024) found that teachers demonstrated strong knowledge in pedagogy and content, while technological knowledge varied according to teachers' digital familiarity and context. Almojano (2025) further noted that limited infrastructure, support, and technological resources can hinder the development of teachers' TPACK. Overall, the literature shows that digital competence involves the interconnected use of technology, pedagogy, and content, and is shaped by teachers' skills, access to resources, training, and school context.

Participants

The study involved the one hundred sixty-three (163) junior high school teachers from three National High Schools in the division of El Salvador City, which are Cogon National High School, El Salvador City National High School, and Molugan National High School. Since the respondents are directly involved in classroom instruction and are expected to infuse digital technologies and emerging tools such as artificial intelligence in the teaching-learning process, teaching staff are regarded as the most suitable participants.

The respondents are currently teaching Grades 7 to 10 School Year 2026 – 2027. These teachers belong to any of the following subject areas: English, Mathematics, Science, Araling Panlipunan, Technology and Livelihood Education (TLE), and MAPEH. Having teachers from different subjects will provide a wider scope on the level of digital competence and integration of artificial intelligence in teaching.

Data Collection

The instrument used in gathering the data was a questionnaire composed of three parts. Part 1 dealt with the respondents' characteristics in terms of age, sex, years of teaching, highest educational attainment, and related training/ seminars attended. The variables are research-made.

Part 2 inquired on teachers' self-efficacy considering teaching, work-related tasks, and problem-solving. The variables were patterned and modified based on the study Teachers' Self-Efficacy and Performance by Gamuza et al. (2025) and the study titled Developing a short assessment instrument for Technological Pedagogical Content Knowledge (TPACK.xs) which compared the factor structure of an integrative and a transformative model by Schmid et al. (2020).

Part 3 elicited information on teachers' digital competence based on technological knowledge, pedagogical knowledge, and content knowledge. The variables are patterned and modified based on the studies mentioned above. Each dimension consists of 10 indicators rated using the following scale: 4 – Strongly Agree; 3 – Agree; 2 – Disagree; and 1 – Strongly Disagree.

Data Analysis

The data gathered in this study were analyzed using the following statistical tools:

Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe and summarize the variables in Problems 1, 2, and 3 of the study. Inferential statistics, specifically Spearman's rank-order correlation (r_s) were used to determine the relationship between respondents' self-efficacy and digital competence in Problem 4. Regression analysis was used to test the moderating effect

of the respondents' characteristics on the relationship between self-efficacy and digital competence in Problem 5.

2. Results and Discussions

Problem 1: How are the respondents distributed in terms of age, sex, years of teaching experience, highest educational attainment, and related training/seminars attended?

Table 1

Distribution of Respondents' Characteristics in Terms of Age

Category	Frequency	Percentage
56 years old and above	6	3.68
46 - 55 years old	34	20.86
36 - 45 years old	54	33.13
26 - 35 years old	65	39.88
25 years old and below	4	2.45
Total	163	100.00

Table 1 shows that the largest group of respondents were aged 26 to 35, indicating that the teaching workforce was mainly composed of relatively young teachers who were developing their teaching practices and adapting to different instructional approaches and technologies. Their greater representation may be associated with the continued hiring of teachers and the expansion of educational programs, while their exposure to digital learning during their education may contribute to their familiarity with technology. The findings also suggest that younger teachers may be more open and confident in adopting new technologies, although self-efficacy and confidence may continue to develop through professional experience. In contrast, respondents aged 25 and below comprised the smallest group, indicating that only a few teachers were still in the early stage of adjusting to classroom responsibilities, school procedures, and professional expectations. Overall, the distribution suggests that age may be relevant to teachers' experiences, confidence, and readiness in using digital technologies in their professional practice.

Table 2

Distribution of Respondents' Characteristics in Terms of Sex

Category	Frequency	Percentage
Male	52	31.90
Female	111	68.10
Total	163	100.00

Table 2 shows that female teachers comprised the majority of the respondents, while male teachers represented a smaller proportion of the sample. This distribution reflects the commonly observed predominance of women in the teaching profession, particularly in basic education. Despite the difference in the number of male and female respondents, both groups are represented and have similar opportunities to develop their professional knowledge, self-efficacy, and digital competence. Previous studies also suggest that professional preparation, experience, and engagement in learning may have greater influence on teachers' competence and self-efficacy than sex alone. The findings therefore indicate that the

differences in the number of male and female teachers do not necessarily imply differences in their ability to use technology or perform their teaching responsibilities.

Table 3
Distribution of Respondents' Characteristics
in Terms of Teaching Experience

Category	Frequency	Percentage
21 years and above	15	9.20
16 - 20 years	13	7.98
11 – 15 years	37	22.70
6 – 10 years	46	28.22
5 years and below	52	31.90
Total	163	100.00

Table 3 shows that respondents with 5 years and below of teaching experience comprised the largest group, indicating that a considerable portion of the teaching workforce was still in the early stage of their professional careers. These teachers may still be developing their classroom skills, professional judgment, self-efficacy, and digital competence through actual teaching experience and professional development opportunities. In contrast, teachers with 16 to 20 years of experience represented the smallest group, although they may possess substantial knowledge and experience in classroom practices and the use of educational technologies. The findings suggest that teaching experience provides opportunities for teachers to strengthen their confidence and skills, while differences in the distribution of respondents across experience levels may reflect changes in staffing, transfers, promotions, retirement, and other workforce conditions.

Table 4
Distribution of the Respondents' Characteristics
in Terms of Highest Educational Attainment

Category	Frequency	Percentage
Doctorate Degree	8	4.91
with Doctorate Degree units	14	8.59
Master's Degree	33	20.25
with Master's Degree units	78	47.85
Bachelor's Degree	30	18.40
Total	163	100.00

Table 4 shows that teachers with units earned toward a master's degree comprised the largest group of respondents, indicating that many teachers are actively pursuing graduate studies as part of their professional growth and efforts to improve their teaching skills and competencies. Their continued education may also help them strengthen their knowledge of teaching strategies and technology, although completing advanced degrees can be challenging due to workload and other professional responsibilities. In contrast, teachers with doctorate degrees comprised the smallest group, suggesting that only a few respondents had reached the highest level of formal academic qualification. However, formal educational

attainment does not necessarily determine a teacher's competence, as professional skills may also develop through teaching experience, continuous learning, collaboration, adaptability, and actual classroom practice. Overall, the findings indicate that teachers value professional development while recognizing that competence can be developed through both formal education and practical experience.

Table 5
Distribution of Respondents' Characteristics
in Terms of Related Training/Seminars Attended

Category	Frequency	Percentage
International	10	6.13
National	37	22.70
Regional	74	45.40
Division	34	20.86
School	8	4.91
Total	163	100.00

Table 5 shows that regional level training was the most commonly attended form of professional development among the respondents, indicating that teachers had considerable exposure to training programs conducted through wider educational networks. Such training may help teachers enhance their professional knowledge, instructional practices, confidence, and ability to integrate educational technologies into teaching. In contrast, school level training was the least attended, suggesting that teachers relied more on division, regional, and national training opportunities to develop their competencies. The limited participation in school-based training may indicate a need for more localized and practical professional development activities that directly address teachers' specific needs, particularly in using digital technologies and artificial intelligence in instruction. Overall, the findings emphasize the importance of continuous professional development and accessible, relevant, and hands on training opportunities for strengthening teachers' self-efficacy and digital competence.

Problem 2: How do the respondents assess their self-efficacy considering teaching, work-related tasks, and problem-solving?

Table 6
Summary Distribution of Respondents' Assessment of Self-Efficacy

Variable	Mean	SD	Interpretation
Teaching	3.75	0.29	Very High
Work-Related Tasks	3.68	0.35	Very High
Problem-Solving	3.67	0.34	Very High
Overall	3.70	0.29	Very High

Table 6 shows that the respondents had a very high level of self-efficacy, with an overall mean of 3.70, indicating strong confidence in their abilities across teaching, work related tasks, and problem solving. Among the three areas, teaching obtained the highest mean of 3.75, suggesting that respondents were most confident in delivering lessons, presenting content, using examples, and performing other regular teaching

responsibilities. This may be attributed to their consistent exposure to classroom instruction, supervision, evaluation, teacher education, and professional development activities. Problem solving obtained the lowest mean of 3.67, although it still fell under the very high level, suggesting that respondents were slightly less confident when dealing with unfamiliar, unexpected, or challenging classroom situations that require immediate decisions and flexible responses. Overall, the findings indicate that teachers possess strong self-efficacy across different professional tasks, while problem solving may require greater opportunities for practical, scenario based, and experience focused training.

Problem 3: What is the respondents' level of digital competence based on their technological knowledge, pedagogical knowledge, and content knowledge?

Table 7

Summary Distribution of Respondents' Level of Digital Competence

Variable	Mean	SD	Interpretation
Technology	3.61	0.38	Highly Competent
Pedagogy	3.62	0.40	Highly Competent
Content	3.63	0.39	Highly Competent
Overall	3.62	0.37	Highly Competent

Table 7 shows that the respondents had a high level of digital competence, with an overall mean of 3.62, indicating that they were highly competent in content, pedagogy, and technology. The close scores across the three dimensions suggest that the respondents had a balanced level of competence in integrating digital tools with their teaching practices and subject matter. Content obtained the highest mean of 3.63, indicating that teachers were most confident in selecting and using digital tools that were appropriate to the subjects and topics they teach. Technology obtained the lowest mean of 3.61, although it was still interpreted as highly competent, suggesting that teachers were generally capable of using digital technologies but may need additional opportunities to develop advanced technical skills and gain more hands-on experience. Overall, the findings indicate that the respondents possessed strong and relatively balanced digital competence, while continued training and institutional support may further strengthen their ability to use technology effectively in teaching.

Problem 4: Is there a significant influence of the respondents' self-efficacy on their level of digital competence?

Table 8

Result of the Significant Influence of Self-Efficacy on Digital Competence

Self-Efficacy		Digital Competence			Overall
		Technology	Pedagogy	Content	
Teaching	r_s -value	0.44	0.45	0.45	0.47
	p-value	<0.01	<0.01	<0.01	<0.01
	Interpretation	S	S	S	S
Work-	r_s -value	0.53	0.58	0.55	0.60

Related Tasks	p-value	<0.01	<0.01	<0.01	<0.01
	Interpretation	S	S	S	S
Problem-Solving	r _s -value	0.65	0.67	0.67	0.72
	p-value	<0.01	<0.01	<0.01	<0.01
	Interpretation	S	S	S	S

Table 8 shows that self-efficacy had a positive and statistically significant relationship with digital competence across all three areas of self-efficacy and all three dimensions of digital competence, leading to the rejection of the null hypothesis. This indicates that teachers with higher confidence in teaching, work related tasks, and problem solving also tend to demonstrate higher competence in technology, pedagogy, and content. Among the relationships, teaching self-efficacy showed the weakest association with technology, suggesting that confidence in delivering lessons does not automatically translate into confidence in using specific digital tools. In contrast, work related task self-efficacy showed stronger relationships with digital competence because many administrative and professional responsibilities involve digital applications. Problem solving self-efficacy demonstrated the strongest relationships, particularly with pedagogical and content competence, indicating that teachers who are confident in handling unexpected challenges are also more capable of adapting digital tools, adjusting teaching strategies, and evaluating digital resources according to learners' needs. Overall, the findings suggest that self-efficacy, particularly confidence in problem solving and managing work related tasks, is closely associated with teachers' ability to use digital technologies effectively in teaching and other professional responsibilities.

Problem 5: Do the respondents' characteristics moderate the relationship between self-efficacy and digital competence?

Table 9

Moderating Effect of Respondents' Characteristics on the Relationship Between Self-Efficacy and Digital Competence

Respondents'		Self - Efficacy				Digital Competence			
Character-istics		Teach- ing	Work -Re- lated	Prob- lem Solv- ing	Over all	Technol- ogy	Peda- gogy	Con- tent	Over all
Age	Chi-Square	10.731	8.709	8.212	10.807	14.853	10.555	13.695	15.714
	P-value	0.030	0.069	0.084	0.029	0.005	0.032	0.008	0.003
	Interpre-tation	S	NS	NS	S	S	S	S	S
Sex	Z-value	-0.841	-	-0.719	-	-0.484	-0.315	-0.354	-
			1.400		1.022				0.308
	P-value	0.401	0.161	0.472	0.307	0.628	0.753	0.723	0.758
	Interpre-tation	NS	NS	NS	NS	NS	NS	NS	NS
Teaching Experience	Chi-Square	2.441	2.661	5.658	2.851	8.252	4.758	7.524	7.976
	P-value	0.655	0.616	0.226	0.583	0.083	0.313	0.111	0.092
	Interpre-tation	NS	NS	NS	NS	NS	NS	NS	NS
Highest Ed- ucational Attainment	Chi-Square	3.440	4.343	5.961	4.520	3.466	4.012	4.170	3.395
	P-value	0.487	0.362	0.202	0.340	0.483	0.404	0.383	0.494
	Interpre-tation	NS	NS	NS	NS	NS	NS	NS	NS
Training/ Seminars Attended	Chi-Square	1.715	6.867	5.711	4.600	3.496	6.592	8.555	7.118
	P-value	0.788	0.143	0.222	0.331	0.478	0.159	0.073	0.130
	Interpre-tation	NS	NS	NS	NS	NS	NS	NS	NS

Table 9 shows that age was the only respondent characteristic that significantly moderated the relationship between self-efficacy and digital competence, while sex, teaching experience, highest educational attainment, and training or seminars attended did not show significant moderating effects. This indicates that differences in age may influence how self-efficacy is associated with teachers' digital competence, with younger teachers potentially having greater exposure to digital technologies during their education and early professional experiences. The findings suggest that generational exposure to technology, opportunities for technology use, and experiences within the professional environment may contribute to differences in teachers' confidence and digital skills. Overall, the results indicate that age plays a significant role in the relationship between self-efficacy and digital competence, whereas the other respondent characteristics examined in the study do not significantly alter this relationship.

3. Conclusion and Recommendations

Conclusion

The study concludes that teachers' confidence in performing their professional responsibilities plays an important role in their ability to engage with and apply digital tools in education. The findings emphasize that being digitally competent involves both technical skills and the need for teachers' self-efficacy. Teachers with a high level of self-confidence can use digital tools correctly.

Moreover, the findings suggest that the improvement of teachers' competencies should be seen as a process requiring sustained support rather than solely depending on the individual characteristics of a teacher. Schools can facilitate this process through various practical activities and collaborations. Thus, this paper elaborates on the necessity of cultivating teachers' self-efficacy along with their digital competence skills.

Recommendations

Based on the findings of the study, the following recommendations are offered:

1. School administrators should provide sustained professional development opportunities that allow teachers in higher age groups to share practical strategies and problem-solving experiences, while younger teachers may benefit from coaching, mentoring, and guided opportunities to handle increasingly complex responsibilities. Teachers of all ages should also be encouraged to learn from one another and adapt to emerging technologies and teaching approaches.
2. Teachers are encouraged to strengthen their professional capabilities through continuous learning, practical experience, and reflective practice to build confidence in handling problem-solving situations. These opportunities may further support their professional growth and ability to respond effectively to classroom challenges.
3. Teachers may enhance their digital competence by participating in practical courses and constant learning associated with technology. Regular practice and collaboration with colleagues may further support the effective integration of technology into meaningful experiences.
4. School administrations can integrate self-efficacy growth into the structure of digital competence training programs. It is important to provide teachers with the possibility to use device, receive feedback and cooperate to boost their self-efficacy. Such initiatives can help teachers adapt to changing instructional demands and improve their use of digital tools in the classroom.
5. School administrators should implement age-responsive professional development that strengthens the link between teachers' self-efficacy and digital competence. Provide differentiated coaching, mentoring, and hands-on digital training that address the varying needs of teachers across age groups, while encouraging continuous learning and adaptation to emerging technologies.

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