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Rural public junior high school teachers' technology self-efficacy through technology integration confidence scale across profiles

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Abstract

Due to its rapid rise, technology utilization and competence have become a standard for teacher quality in modern education. However, rural teachers face several difficulties adapting to modern technologies, resulting in low technology self-efficacy (TechSE). This study aimed to evaluate rural junior high school teachers' (JHS) TechSE conformant to International Society for Technology in Education (ISTE) standards through a comparative-correlational quantitative research framework. Data were collected using a 2-part survey soliciting their demographic profile and technology confidence via Technology Integration Confidence Scale version 3 (TICS v3). 123 JHS teachers from multiple schools participated in the study. Key findings indicate fair confidence across all subscales despite being from rural areas. Comparative analyses indicate that males had higher overall TechSE but was only statistically significant in the domain Technology Literacy & Digital Citizenship. Postgraduates exhibited higher TechSE scores, although only significant in the domains Technology Usage and Technology Literacy & Digital Citizenship. Further analyses based on teachers' career position and subject taught revealed no significant influence on teachers' TechSE. Correlational analyses on age yielded a significantly weak negative relationship in all domains and teaching experience only in Technology Usage and Technology Literacy and Digital Citizenship, while training experience yielded no influence on teachers' TechSE. These findings suggest that demographic differences are declining and are more nuanced as a recent trend. Meanwhile, teachers are recommended to participate in Continuing Professional Development and targeted interventions such as sex- and age-sensitive technology trainings.

Keywords: Technology self-efficacy; Technology Integration Confidence Scale; Rural public junior high school teachers; Demographic profile

1. Introduction

Educational technology has become ubiquitous due to its practicality and utility. Moreover, teaching competence in the modern schema has evolved to include apt adaptation of emerging technologies and its implications. Pre-service education and institutions have strived to include technologies in their syllabi to allow students to adjust and refine their technological skills before their expected post. The same can be said for in-service teachers and their training regimen as required by the governing bodies for professional development.

This milestone in education has urged different educators to optimize technology usage. Some models and frameworks have already been established to further highlight its significance in educational settings which includes, but is not limited to, TPACK (Mishra & Koehler, 2006), SAMR (Puentadura, 2006), and Carrington's Padagogy Wheel. Despite these advancements, however, it must be noted that advancements in concepts does not necessarily translate to realized improvements.

In understanding technological knowledge competence, technology self-efficacy has gained traction as it often reflects frequency of and competence in actual utilization of different technologies (Thurm & Barzel, 2019). That is, technology self-efficacy, being one's confidence in technology utilization and integration, often positively correlates to their own abilities in applying it, making it an effective bridge between expectation and reality (Sulistiani et al, 2024; Gacayan, 2025). Furthermore, international and national efforts have been and are being carried out to increase its usability and utility through standards. The International Society for Technology in Education is one such organization that aims to proliferate and provide standards for its use.

However, in the midst of the rapid increment in technological prevalence, rural schools receive minimized exposure to technology, worsened by other factors such as difficulty in accessing secure internet and economic disparity (Tagose et al., 2025). This, further exacerbated by digital divide (Kiram & Kiram, 2025), significantly cripples the teachers' ability to integrate technology in their teaching ventures. As Underwood (2022) states, there are disparities in terms of technology self-efficacy between urban and rural teachers, with rural areas perceived as being less efficient, perhaps because of geographical differences.

This phenomenon has been observed globally urging prioritization to improve modern education. Several research include the studies in Africa (Sarfo et al., 2017), Europe (Goodman-Deane et al., 2021; Clipa et al., 2023), Asia (Ghazali et al., 2024) and the United States (Gomez et al., 2021; Underwood, 2022).

Teachers from the Philippines are not exempt from these difficulties. The phenomenon of digital divide is apparent in the Philippines due to lack of electrification and poor internet access in rural areas (Bahinting et al., 2022; Bustillo & Aguilos, 2022). These handicaps in technology usage lessens technology integration and technology self-efficacy of teachers, despite having the desire to adapt fully to modern frameworks of education, especially those in rural areas. This becomes the crux of the issue with which rural school teachers have been perceived to be less efficient with technological utilization and integration.

The confidence to use technology is not only affected by geographic statures, but also by demographic factors. There has been extensive investigation on the plethora of demographic factors that affect technology self-efficacy, albeit inconsistencies in results are often met. Common established factors include sex, age, computer experience (Sarfo et al., 2017), training experience, teaching experiences, education levels (Njiku et al., 2022), gender, career stages, disciplines, teaching stages (Zeng et al., 2022) and program culture for pre-service teachers (Williams et al., 2023). A study by Ding and Hong (2023) further posits that demographic factors—gender, age, and teaching experiences—and emotions are significant predictors of teacher's technology utilization and self-efficacy.

Evidently, research regarding the topic has been widespread. Meanwhile, considering the state of educational technology in the Philippines, following international standards has not become a priority. Therefore, this study gathered data according to the standards set by the International Society for Technology in Education (ISTE) to diagnose whether rural teachers are at par to said standards.

There remains a significant dearth in research detailing the technology self-efficacy of junior high school teachers, especially in urban areas in the Philippines and in the context of internationalization. Therefore, this study investigates the perceived technology self-efficacy of junior high school teachers from rural schools according to international standards and asserts that their profiles are an integral factor in determining their technology self-efficacy.

1.1. Research Hypotheses

The research sought to determine the teachers' demographic profile, determine their TechSE scores through TICS v3, and determine the differences and relationships between the latter two factors. The specific hypotheses were formulated for the interpretation of results.

H_{01}: There are no significant differences between teachers' TechSE according to their sex, educational attainment, career position, and subject specialization.

H_{02}: There are no significant relationships between teachers' TechSE and their age, teaching experience, and training experience.

2. Methodology

This section of the study encompasses the design, locale, respondents, instruments used, data gathering process, statistical analysis procedures, and ethical considerations of the study.

2.1. Research Design

The study utilized a quantitative survey design employing both correlational and comparative processes. The correlational paradigm evaluates the relationship between teachers' TechSE and age, career seniority, and teaching experience. The comparative paradigm, meanwhile, evaluates whether differences are present in teachers TechSE according to their sex, educational attainment, career position, and subject specialization.

2.2. Study Locale and Respondents

A total of 123 junior high school teachers from six (6) public schools in a selected division from the Philippines agreed to participate in the study, determined via the stratified random sampling technique. Junior high school teachers from rural public high schools were selected as participants due to their extensive experience in the field and valuable insights on the matter. Junior high school teachers from said rural high schools were characterized by being enclosed within the scope of a rural municipality.

However, this also meant the exclusion of elementary school teachers and senior high school teachers due to the possible deviation from subject specializations as one hypothesis assumes. The process included the inclusion of all schools as strata and randomly drawing samples from each stratum using proportionate allocation. The sample size, 123 respondents, was determined through the Slovin's formula, which was then used for calculation of proportionate sample for each school.

2.3. Research Instrument

The survey questionnaire consists of three parts: (1) informed consent forms, (2) demographic profile of teachers and the (3) adapted Technology Integration Confidence Scale version 3 (TICS v3). Permission from each respondent was obtained as evidenced by their approval via signature in the informed consent form which also details the study's salient features.

The demographic profile solicited the teachers' sex, educational attainment, career position, subject specialization, age, teaching experience, and training experience. The TICS v3 was adapted from Gomez (2020) and validated by Gomez et al. (2021). The instrument was further evaluated by three (3) experts in education for face validity and one (1) expert in language for language appropriateness and administrability. A total of five (5) TICS v3 domains were evaluated by the experts: Technology Usage; Technology Application; Technology-infused Learning; Technology Literacy & Digital Citizenship; and Technology-supported Assessment. The content validation index was calculated with all questions being relevant, and revisions were made according to the experts' comments.

The TICS v3 determined teachers' TechSE through a 6-point Likert scale, interpreted as follows: 0 – Not confident at all; 1 – Slightly confident; 2 – Somewhat confident; 3 – Fairly confident; 4 – Quite confident; and 5 – Completely confident. The levels of mean confidence were accordingly interpreted as follows: <3.00 – Somewhat confident; 3.00 – 3.99 – Fairly confidence; and >3.99 – Highly confident.

A reliability analysis (McDonald's omega) on the instrument was run following a pilot test and yielded the following results:

Table 1. Reliability Analysis Results

Construct	***n***	***ω***
Technology Usage	7	0.767
Technology Application	5	0.948
Technology-infused Learning	5	0.925
Technology Literacy and Digital Citizenship	4	0.822
Technology-supported Assessment	4	0.933
Overall Instrument Reliability		**0.970**

2.4. Data Gathering Procedure

Primarily, permissions from relevant administrators were obtained. University administrators approved the conduct of the study after prior approval from the University Research Ethics Committee. The researcher then obtained approval from the relevant Department of Education Division Superintendent and from the selected District In-Charge. Selected schools were then personally visited and permission to conduct study was obtained from the respective school principals.

All respondents were oriented of the specifics of the research before answering. They were also allowed to ask any questions regarding the research. Ample time was given for them to critically analyze each question. The study was conducted in multiple schools in a rural area in the selected division within the months of November and December 2025.

2.5. Data Analysis

All data obtained were systematically tabulated through Microsoft Excel where basic processes were simultaneously run. Each independent variable was categorized into groups for comparative analysis, namely: sex, educational attainment, career position, and subject specialization. Meanwhile, age, teaching experience, and training experience were run through correlational analysis.

Shapiro-Wilk tests of normality yielded significant deviations from normality. Specifically, the results of the normality tests are as follows: Technology Usage ($W = .970, p = .008$); Technology Application ($W = 0.962, p = .002$); Technology-infused Learning ($W = 0.965; p = .003$); Technology Literacy and Digital Citizenship ($W = 0.931, p < .001$); and Technology-supported Assessment ($W = .949, p < .001$). This prompted the use of nonparametric tools, Mann-Whitney U, Kruskal-Wallis, and Kendall's tau-beta, for analyses. Statistical analyses were run via Microsoft Excel and JAMOVI to ensure result consistency.

2.6. Ethical Considerations

The study was reviewed and approved by the University Research Ethics Committee. Informed consent forms were handed out to each respondent and all respondents were allowed to opt-out of the study at any time regardless of the research phase. Accordingly, the respondents were informed of the benefits, risks, dissemination plan, and confidentiality clause of the paper, promising anonymity in responses. Strict ethical guidelines were followed throughout the conduct of the study.

3. Results and Discussion

This section of the study presents the results, implications, interpretations, and discussions of the analysis of the data obtained from the survey.

3.1. Demographic Profile of Rural Public Junior High School Teachers

Table 2. Demographic profile of rural public junior high school teachers

Variable	***n***	***%***
Sex		
Male	33	27.83
Female	90	73.17
Educational Attainment		
Baccalaureate Degree	81	65.85
Postgraduate Degree	42	34.15
Career Position		
Teacher I	17	13.82
Teacher II	16	13.01
Teacher III	72	58.54
Master Teacher I	14	11.38
Master Teacher II	4	3.25
Subject Specialization		
English	8	6.50
Filipino	17	13.82
Mathematics	26	21.14
Science & Technology	21	17.07
Araling Panlipunan	14	11.38
Technology and Livelihood Education	23	18.70
Music, Arts, Physical Education, and Health	14	11.38
Age		
25-33	45	36.59
34-42	38	30.89
43-51	26	21.14
52 and above	14	11.38
Teaching Experience		
Less than 11 years	61	49.59
11-20 years	48	39.02
21-30 years	11	8.94
More than 30 years	3	2.44
Training Experience		
Less than 8 hours	73	59.35
8-16 hours	10	8.13
17-24 hours	9	7.32
More than 24 hours	40	32.52

Table 2 summarizes the data obtained from the first section of the survey questionnaire. A total of 123 respondents participated in the study, where 33 (27.83%) were male and 90 (73.17%) were female. The teachers' ages ranged from 25 to 61, with an average age of 38 ($SD = 8.8$), predominantly in the younger bracket within 25 to 33 with a number of 45 (36.59%). Similarly, the teachers' career experience ranged from less than a year to 31 years, with an average number of years of teaching of 11.53 ($SD = 6.85$), most, 61 (49.59%), having a teaching experience of less than a year. Lastly, teachers' training exposure and experience ranged from 0 to 360 hours, with an average of 19.34 hours of relevant training ($SD = 43.67$).

3.2. Teachers' Technology Self-Efficacy

Table 3. Rural public junior high school TechSE scores

TICS v3 question focus	***$\overline{x}$***	***SD***	***QD***
Keeping abreast with research for learning outcomes	0.87	3.84	FC
Facilitation and support of learning opportunities	0.86	3.93	FC
Modelling for colleagues the critical exploration of learning resources	1.07	3.58	FC
Collaborative technology use for authentic learning & virtual engagement	1.05	3.59	FC
Co-learning with students in using new resources and in troubleshooting	1.10	3.48	FC
Participation in learning communities for CPD	1.01	3.80	FC
Designing authentic learning tasks & resource use for optimal learning	1.01	3.63	FC
Technology Usage Mean	**1.01**	**3.69**	**FC**
Exploration and application of instruction design principles for creating innovative digital learning environments	0.99	3.60	FC
Technology use for implementing personalized learning experiences for independence and student gain	0.96	3.71	FC
Provision of challenging learning opportunities for critical thinking skills	0.97	3.46	FC
Technology use and student learning strategy management	1.05	3.60	FC
Offering other means via technology for competency display and reflection	1.00	3.68	FC
Technology Application Mean	**0.99**	**3.61**	**FC**
Data-based investigation and adaption of optimal learning strategies	1.07	3.48	FC
Increment in personalization for student needs via technology use	0.92	3.71	FC
Virtual collaboration usage for student learning and student engagement	0.97	3.76	FC
Supporting student-centered pedagogy for project-based learning	1.03	3.64	FC
STEAM support using technology	1.08	3.38	FC
Technology-infused Learning Mean	**1.02**	**3.59**	**FC**
Teaching critical thinking, safety, and responsibility in the cyberspace	0.94	3.89	FC
Promoting curiosity, digital literacy, and media fluency by establishing a learning culture	0.93	3.76	FC
Mentoring students for safe, legal, and ethical use of tools	1.05	3.71	FC
Oversight of personal data and digital identities, alongside privacy protection, via modelling and promoting best practices	1.00	3.83	FC
Technology Literacy and Digital Citizenship Mean	**0.98**	**3.79**	**FC**
Data-driven instruction facilitation based on competency-based assessment	1.00	3.54	FC
Immediate feedback provision for students	1.05	3.82	FC
Peer coordination for creating authentic learning experiences	1.01	3.66	FC
Formative and summative assessments design and implementation	0.92	3.93	FC
Technology-supported Assessment Mean	**1.00**	**3.74**	**FC**

Note. Qualitative description (QD) of means: <3.00 – Somewhat confident (SC); 3.00 – 3.99 – Fairly confident (FC); and >3.99 – Highly confident (HC).

Table 3 reveals the teachers' mean confidence scores in different questions and constructs regarding technology self-efficacy. Teachers reportedly scored "fairly confident" in all domains and questions of the survey. This indicates a satisfactory acceptance and adaptation of teachers to technology in accordance with the International Standards of Technology in Education as subsumed in the Gomez' (2020) TICS v3.

Despite the numerous limitations in technology integration in the rural municipality, teachers' general technology self-efficacy remains relatively high, staying above the median score across all constructs and subscales. These findings align with other studies that find high technology self-efficacy even among rural and remote areas (Cahapay & Anoba, 2021; Aldave & Obiso, 2025).

They were most confident in the domain Technology Literacy & Digital Citizenship ($\bar{x}_G = 3.79, SD = 0.98$) which focuses on modeling proper technology etiquette for overall usage while aptly navigating the technology to one's advantage. This implies that teachers feel particularly competent in promoting proper traversal of technological features while simultaneously simulating safety practices for students. This is followed by Technology-supported Assessment ($\bar{x}_G = 3.74, SD = 1.00$), the subscale focused on teachers' capability in employing assessment strategies and appropriate feedback for student growth. The latter signifies an essential emphasis of teachers' disposition regarding assessment design and implementation with technology, which is also often emphasized on in-service trainings and their introduction of technological tools on the matter.

On a different note, they were specifically most confident in the utilization of technology for promoting and facilitating various learning opportunities ($\bar{x} = 3.93, SD = 0.86$), a necessary skill each teacher must be equipped with.

On the other hand, they were least confident in Technology-infused Learning ($\bar{x}_G = 3.59, SD = 1.02$), the domain centered on integrating technology for implementing student-centered instructional practices regularly. This is followed by Technology Application ($\bar{x}_G = 3.61, SD = 0.99$), the subscale that highlights technological integration for instructional purposes while supporting students' technology application in the aim of authentic learning outcomes.

They were particularly least confident in STEAM support using technology for leveraging discourse and critical thinking ($\bar{x} = 3.38, SD = 1.08$). This finding may be due to the perceived nicheness of and stigmas and limited knowledge on the area STEAM (Science, Technology, Engineering, Arts, and Mathematics). thereby diminishing other specializations' perception of it (Burrell, 2018; Huang et al., 2021).

3.3. Teachers' TechSE Across Profiles

Table 4. Sex and teachers' TechSE

Mann-Whitney U test						
Domain	**Group**	***n***	$\bar{R}$	***U***	***p***	***Interpretation***
Technology Usage	F	90	59.16	1229	.143	Non-significant
	M	33	69.76			
Technology Application	F	90	59.00	1215	.122	Non-significant
	M	33	70.18			
Technology-infused Learning	F	90	58.61	1179.5	.080	Non-significant
	M	33	71.26			
Technology Literacy and Digital Citizenship	F	90	57.96	1121.5	.036*	Significant
	M	33	73.02			
Technology-supported Assessment	F	90	58.82	1198.5	.100	Non-significant
	M	33	70.68			

*Legend: $\bar{X}$ – average; $\bar{R}$ – average rank; U – test statistic; *p<0.05.*

Predominantly, no significant differences were observed in four (4) out of five (5) domains: Technology Usage ($U = 1229, p = .143$), Technology Application ($U = 1215, p = .122$), Technology-infused Learning ($U = 1179.5, p = .080$), and Technology-supported Assessment ($U = 1198.5, p = .100$). In accordance with these findings, Cantores Soqueña (2021), Goodman-Deane et al. (2021), Zeng et al. (2022), Clipa et al. (2023), Quiño and Potane (2023), and Jere and Tsoka (2024) found no significant difference in ICT integration and self-efficacy between the two sexes. Omar and Ismail (2021) and Šabić et al. (2021) further noted that although males had higher technology self-efficacy scores, they were minor, with the latter further stating that they had a greater moderating effect in older ages.

This finding could indicate sparser sex differences as of recent developments due to only one domain bearing significance, concurrent with the conclusion of Kahraman & Yilmaz (2018) who noted the significant decline in gender differences. This could also implicate the enhanced access of technology to non-gender specific audiences, given the prevalently declining gender prejudice and norms. On the other hand, it is only statistically significant in one (1) of five (5) domains: Technology Literacy & Digital Citizenship ($U = 1121.5, p = .036$), with males ($\bar{R} = 73.02, n = 33$), having higher scores than females ($\bar{R} = 57.96, n = 33$).

Furthermore, it is important to note that males reported higher scores than females in all subscales. This partially corroborates a multitude of studies that conclude that males have higher technology self-efficacy than females. Kwon et al. (2019), Woods et al. (2021), and Shertzer (2023) also noted that sex is a statistically significant predictor of technology self-efficacy, remarking that different nuances underlying sex-based differences be explored.

In line with this, Huffman et al. (2013) found that technology self-efficacy is influenced by sex, noting that males reported higher scores, perhaps due to stereotypes. They posited that it goes beyond such constructs and may also be influenced by gender roles. Several other research also find males having greater technology self-efficacy than their female counterparts (Buabeng-Andoh, 2019; Şimşek & Sarsar, 2019; Cahapay & Anoba, 2021; Sarikaya, 2022), in the mathematics specialization (Njiku et al., 2022), and in basic and advanced operational processes, although no differences were identified in computer utilization for instruction (Scherer & Siddiq, 2015).

An important facet to take note of, however, is the unsurprising male-to-female ratio being 33:90, especially given that teaching is a female-dominated field. This may have limited the statistical power in determining subtler differences in their scores, making it a significant feature to consider.

On the contrary, Bala (2024) observed significantly higher computer self-efficacy scores among females in the intermediate, advanced, and overall levels of competency compared to males. Furthermore, ICT literacy and self-efficacy differences were recorded by Mahawan (2025) where females had higher scores in both domains. Awofala et al. (2020) also noted that female pre-service STEM teachers reported statistically significantly higher computer self-efficacy scores than males.

Table 5. Educational attainment and teachers' TechSE

Domain	**Group**	***n***	**$\bar{R}$**	***U***	***p***	***Interpretation***
Technology Usage	Baccalaureate	81	60.02	1540.5	.391	Non-significant
	Postgraduate	42	65.82			
Technology Application	Baccalaureate	81	59.21	1475	.226	Non-significant
	Postgraduate	42	67.38			
Technology-infused Learning	Baccalaureate	81	58.05	1381	.087	Non-significant
	Postgraduate	42	69.62			
Technology Literacy and Digital Citizenship	Baccalaureate	81	60.51	1580	.514	Non-significant
	Postgraduate	42	64.88			
Technology-supported Assessment	Baccalaureate	81	56.27	1237	.013*	Significant
	Postgraduate	42	73.05			

*Legend: $\bar{X}$ – average; $\bar{R}$ – average rank; U – test statistic; *p<0.05.*

The Mann-Whitney U test, as reflected in Table 5, reveals that postgraduates have a generally higher

TechSE than baccalaureate graduates, although only significant in the subscale Technology-supported Assessment ($U = 1237, p = .013$).

This may be explained by the training in teacher education institutes which promise the refinement of teachers' assessment construction and adaptation to current trends, as is reflected in PPST Domain 5 (Assessment and Reporting), encouraged in Professional Development frameworks, and as a highlighted goal of teacher education institutes by authors (Rural, 2021; Kissi et al., 2023; Tandas, 2025).

These findings are partially supported by others who concluded that recorded TechSE was higher among postgraduates than baccalaureate graduates in the English specialization (Şen and Yildiz Durak, 2022) and in the special education specialization (Vosough Matin, 2023). Conversely, other authors have noted the opposite, with undergraduates having higher technology self-efficacy compared to those with at least graduate units (Cahapay & Anoba, 2021).

Despite the discernible differences, they are predominantly non-significant: Technology Usage ($U = 1540.5, p = .391$), Technology Application ($U = 1475, p = .226$), Technology-infused Learning ($U = 1381, p = .087$), and Technology Literacy and Digital Citizenship ($U = 1580, p = .514$). Non-significance in these domains hint at broad, non-degree-specific interventions for the teachers' advantage and perusal. By allowing teachers to access different technology interventions, resources, and tools, rural public high school teachers would gain holistic improvements in their disposition and competence, regardless of academic attainment.

These results align with past research that state that there are no significant differences in teachers' TechSE with regards to their educational attainment (Cantores Soqueña, 2021), albeit higher scores were recorded among postgraduate degree holders (Jere and Tsoka (2024).

Table 6. Career position and teachers' TechSE

Kruskal-Wallis Test				
Construct	χ^2	***df***	***p***	***Interpretation***
Technology Usage	6.291	4	.178	Non-significant
Technology Application	4.773	4	.311	Non-significant
Technology-infused Learning	8.196	4	.085	Non-significant
Technology Literacy and Digital Citizenship	6.603	4	.158	Non-significant
Technology-supported Assessment	6.102	4	.192	Non-significant

The findings indicate non-significant results across all domains: Technology Usage ($\chi^2 = 6.291, df = 4, p = 0.178$), Technology Application ($\chi^2 = 4.773, df = 4, p = 0.311$), Technology-infused Learning ($\chi^2 = 8.196, df = 4, p = 0.085$), Technology Literacy and Digital Citizenship ($\chi^2 = 6.603, df = 4, p = 0.158$), and Technology-supported Assessment ($\chi^2 = 6.102, df = 4, p = 0.192$).

This implies that career position is not indicative of teachers' TechSE. Interestingly, this also signifies that teachers' confidence in technology integration is not dependent on career tiers as reflected by their career progression. These results further stipulate the need for interventions for teachers not centered on roles, allowing for more holistic technology resources and tools to be used rather than those that satisfy only a specific niche. Meanwhile, uniformity in scores may also have been affected by age and experience mediation, similarity in intervention access, and standardization of technology in teacher-assessment tools, as criteria according to career position does not strictly change.

These findings are corroborated by Cahapay and Anoba (2021) who found no significant difference in teachers' TPK self-efficacy in accordance with their teaching position. Similarly, Zeng et al. (2022), in their meta-analysis, have reported non-significant moderating effect of teaching stages in teachers' technology self-efficacy and TPCK.

Table 7. Subject specialization and teachers' TechSE

Kruskal-Wallis Test				
Construct	χ^2	***df***	***p***	***Interpretation***
Technology Usage	4.856	6	.562	Non-significant
Technology Application	2.255	6	.895	Non-significant
Technology-infused Learning	9.063	6	.170	Non-significant
Technology Literacy and Digital Citizenship	10.495	6	.105	Non-significant
Technology-supported Assessment	4.854	6	.563	Non-significant

Legend: χ^2- chi-square; df - degrees of freedom

Table 7 reveals that there are no significant differences in teachers' technology integration self-efficacy across all domains in accordance with the subject they teach: Technology Usage ($\chi^2 = 4.856, df = 6, p = 0.562$), Technology Application ($\chi^2 = 2.255, df = 6, p = 0.895$), Technology-infused Learning ($\chi^2 = 9.063, df = 6, p = 0.170$), Technology Literacy and Digital Citizenship ($\chi^2 = 10.495, df = 6, p = 0.105$), and Technology-supported Assessment ($\chi^2 = 4.854, df = 6, p = 0.563$).

This implies that teachers' subject specialization does not affect their TechSE. That is, TechSE is not specific to the subject of study. Furthermore, this also suggests that technology gaps based on discipline are negligible, given the uniformity of scores across subject specializations. This consistency across subjects may be explained by the broadness of technology-related tools being utilized (most commonly "Kahoot!" and Google Classroom) and absence of niche in interventions and in-service trainings. These results indicate the need for continuing non-subject-specific interventions for teachers, similar to the findings on career position and TechSE.

This result concurs with Woods et al. (2021) who reported no significant predictive ability between secondary teachers' subject taught and their TechSE scores, noting that this change may have been affected by time. These observations are consistent with Zeng et al. (2023), who remarked no significant moderating effect of discipline between TechSE and TPCK, though cautiousness regarding this conclusion was recommended.

On the other hand, this contradicts Şimşek and Sarsar's (2019) findings where the TechSE of pre-service teachers in Mathematics and Turkish language fields were significantly lower than that of other subjects.

Table 8. Age and teachers' TechSE

Kendall's tau-b				
	Variables	***τb***	***p***	***Interpretation***
Age	Technology Usage	-0.233	.000**	Significant
	Technology Application	-0.202	.002**	Significant
	Technology-infused Learning	-0.167	.009**	Significant
	Technology Literacy and Digital Citizenship	-0.287	.000**	Significant
	Technology-supported Assessment	-0.148	.022*	Significant

**p<0.5. **p<0.01.*

Table 8 reveal the results of the correlational analysis between age and the domains of technology self-efficacy. It illustrates that there are statistically significant weak negative correlations across all domains of the technology self-efficacy scale: Technology Usage ($\tau b = -0.233, p = 0.000$), Technology Application ($\tau b = -0.202, p = 0.002$), Technology-infused Learning ($\tau b = -0.167, p = 0.009$), Technology Literacy and Digital Citizenship ($\tau b = -0.287, p = 0.000$), and Technology-supported Assessment ($\tau b = -0.148, p = 0.022$).

This signifies that age is significantly related to teachers' technology self-efficacy. That is, the negative correlation indicates that as age increases, teachers' technology self-efficacy declines. This may be due to the recession in usage, dependence, and access of technological tools with the increment in age. Decrement in these factors have also been noted by other studies (Goodman-Deane et al., 2021; Rosales-Márquez et al., 2025; Şen and Yildiz Durak, 2022). Other factors such as lessened frequency of use, motivation deficit, and digital disengagement could have contributed to this waning. Hence, it is vital that teachers receive age-sensitive guidance during technology-related in-service trainings and interventions to enhance not only their competence on the matter but also their disposition regarding it.

This supports several other studies with the same findings. Shertzer (2023) also found that age was a significant predictor of technology self-efficacy. Šabić et al. (2021) found that younger teachers had higher ICT self-efficacy than older teachers, further positing that gender-age effect exists, more apparent among older ages. Others have also highlighted significant differences according to age and teachers' TPK self-efficacy (Cahapay & Anoba, 2021; Sarikaya, 2022).

On the other hand, Quiño and Potane (2023) noted age differences among pre-service teachers, where those within 24 to 34 had higher digital self-efficacy than those younger (18-24) and older (35-44). These results significantly diverge from the data of Omar & Ismail (2023) who found no significant differences in teacher's technology self-efficacy according to their age, noting smaller scores in younger teachers. This non-significance aligns with Cantores Soqueña (2021), Jacinto and Samonte (2021), and Gacayan (2025) who found no significant differences between age groups in Iloilo and Ifugao, Philippines, respectively. Moreover, Pozas et al. (2024) determined non-significant associations between teachers' age and their ICT self-efficacy.

Table 9. Teaching experience and teachers' TechSE

Kendall's tau-b				
	Variables	***τb***	***p***	***Interpretation***
Teaching Experience	Technology Usage	-0.158	.013*	Significant
	Technology Application	-0.118	.066	Non-significant
	Technology-infused Learning	-0.104	.103	Non-significant
	Technology Literacy and Digital Citizenship	-0.186	.004**	Significant
	Technology-supported Assessment	-0.063	.332	Non-significant

**p<0.5. **p<0.01.*

Table 9 reveals the results of the correlational analysis between career experience and the domains of TechSE. Two (2) of five (5) domains yielded statistically significant weak negative correlations in Technology Usage ($\tau b = -0.158, p = 0.013$) and Technology Literacy and Digital Citizenship ($\tau b = -0.202, p = 0.002$), indicating a negative correlation where scores decrease as career experience increases in these specific domains.

Vosough Matin (2023) found significantly higher TechSE scores among special education teachers with less professional seniority (10 years or less) than those among those with 16 years or more career experience. Similarly, Cahapay and Anoba (2021) and Orakova et al. (2024) found higher scores among teachers with at most 9 years compared to those above 10 years of teaching experience.

The remaining three (3) of five (5) domains yielded non-significant negative correlation coefficients: Technology Application ($\tau b = -0.118, p = 0.066$), Technology-infused Learning ($\tau b = -0.104, p = 0.103$), and Technology-supported Assessment ($\tau b = -0.0063, p = 0.332$). Despite its non-significance, it is worth highlighting that negligible negative correlation pervades across all domains. Common notions regarding this decline are the recency of exposure to ICT-related tasks as manifested in recent teacher education curriculum and age mediation.

This supports prior research by Shertzer (2023) who stated that the variable is not a significant predictor of TechSE and Şen and Yildiz Durak (2022) who found that teachers with 6-10 years of teaching experience had higher technology self-efficacy as opposed to those who have already served for 26 years, albeit non-significant. Aldave and Obiso (2025) also determined menial difference in teacher's acceptance and application rates according to teaching experience. Concurrently, other authors have also noted this non-significance of difference (Bakar et al., 2020; Cantores Soqueña, 2021; Gacayan, 2025).

Table 10. Training experience and teachers' TechSE

	Kendall's tau-b			
	Variables	***τb***	***p***	***Interpretation***
Training Experience	Technology Usage	0.074	0.283	Non-significant
	Technology Application	0.038	0.590	Non-significant
	Technology-infused Learning	0.056	0.423	Non-significant
	Technology Literacy and Digital Citizenship	0.057	0.419	Non-significant
	Technology-supported Assessment	0.022	0.750	Non-significant

Surprisingly, the results of the correlational analysis, as discerned in Table 10, between training exposure and TechSE yielded non-significant across all domains: Technology Usage ($\tau b = 0.074, p = 0.283$), Technology Application ($\tau b = 0.038, p = 0.590$), Technology-infused Learning ($\tau b = 0.056, p = 0.423$), Technology Literacy and Digital Citizenship ($\tau b = 0.057, p = 0.419$), and Technology-supported Assessment ($\tau b = 0.022, p = 0.750$). This suggests that higher training exposure does not equate to higher TechSE.

The results obtained reveal a stark contrast with past research that highlight the impact of trainings on teachers' TechSE. It is important to stress, however, that majority of the respondents had no recollection of any recent relevant trainings, perhaps implying a scarcity of accessible technology-related trainings, or just an overall lack thereof in rural areas. This highlights a very significant caveat not often discussed in national realities, reflecting the need for such inclusive and readily available in-service trainings. Meanwhile, Cantores Soqueña (2021) remarked non-significant differences in teachers' computer self-efficacy based on their attended relevant trainings.

Hartell et al. (2014) found that there is a significant difference in teachers' perception of their ability to utilize technology in teaching and assessment according to their training experience. That is, those with training experience exhibited greater self-efficacy in the use of technology and pedagogy (Vosough Matin, 2023). Gomez et al. (2021) highlighted continuing professional development programs such as relevant trainings for the improvement of teachers' technological-pedagogical competence. This may also strengthen positive attitude aside from the intended skills learnt (Clipa et al., 2023). Şimşek and Sarsar (2019) further highlights that teacher who participate in-service trainings or other relevant trainings are more inclined to use technology in education.

Summary and Conclusions

The current study adds to the continuously growing knowledge on classroom technology integration confidence and self-efficacy. As exhibited in the study, rural junior high school teachers generally possess moderate confidence in technology integration, implying relatively high technology self-efficacy despite originating from rural areas.

Comparative analysis by biological sex revealed significant differences in only one domain (Technology Literacy & Digital Citizenship), implying a decline in sex-based disparity in technology utilization and confidence following recent studies. Similarly, educational attainment yielded significant differences in only one domain (Technology-supported Assessment). Notably, postgraduates generally had higher TechSE scores across domains. Caveats, however, include pervasively higher TechSE scores among males across domains, approximately 1:3 male-to-female ratio, and exclusion of postgraduate units the teachers have earned, warranting cautious interpretation of detected differences.

TechSE differences according to career positions and subjects taught, however, yielded non-significant results, signifying that career positions and subject specializations do not influence teachers' TechSE. Key caveats within these variables include the disproportionality of groups which, again, may have obscured the detection of differences. The findings indicate that interventions warrant prioritization on general instances of TechSE improvement over hierarchical and subject-specific interventions. Meanwhile, this could also indicate a gradual decrement in differences according to demographic factors given several contrasts to past findings.

Age exhibited a statistically significant, weak negative relationship with teachers' TechSE, implying diminished self-efficacy among older teachers. This trend remains true across all domains and is pervasively remarked by other authors, noting age-linked decrement of technology utilization and dependence as a contributing factor.

Career experience exhibited a generally negative relationship with teachers' TechSE, significant only in the domains Technology Usage and Technology Literacy & Digital Citizenship, implying declining self-efficacy as experience increases in these specific domains. Unexpectedly, training experience showed no significant relationship with teachers' TechSE; however, conclusions on this association warrant caution due to data skewness from respondents' disclosure of no recent technology-focused trainings.

The study found mixed findings regarding the influence of different demographic profiles towards teachers' TechSE, thus warranting further studies on the matter. The findings indicate that sex, age, and teaching experience subtly shape teachers' TechSE in select domains, highlighting the need for interventions and professional development programs, such as in-service trainings and seminars, that keep these factors in mind, especially for Philippine rural contexts. Accessibility and availability of said interventions should be given attention. Furthermore, given decline in differences according to several demographic factors, prejudice should be lessened, and more holistic programs be implemented. Future studies should include other demographic and non-demographic, intrinsic and extrinsic, and attitudinal and behavioral factors that could influence teachers' TechSE for a holistic overview of its different contributing factors.

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