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Gender-Based Analysis of Senior High School teacher's ICT Attitudes and Integration

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Gender-Based Analysis of Senior High School teacher's ICT Attitudes and Integration

Abstract:

This research delves into Senior High School teachers' attitudes toward integrating Information and Communication Technology (ICT) in education. It aims to unveil the underlying factors that influence these attitudes and determine whether they exhibit significant disparities based on gender, age, teaching experience, ICT experience, ICT skills, and ICT training. The study delves into the intricate web of perspectives, beliefs, and emotions that mold the attitudes of Senior High School educators. It acknowledges the profound impact of their unique journeys, experiences, and competencies on these attitudes. This research recognizes that these attitudes are not merely abstract concepts but profound human responses with the potential to shape the future of education.

Moreover, the study employs rigorous academic methods and statistical tools to conduct a meticulous analysis of the data. It scrutinizes the statistical significance of these attitudes, unveiling patterns that provide invaluable insights for educators, policymakers, and scholars dedicated to enhancing the educational landscape. In conclusion, this research, supported by robust findings and alignment with prior research in the field, offers invaluable insights for ICT policy planners, practitioners, and scholars. These insights can guide the development of more effective ICT training programs for teachers, prospective educators, and teacher training institutions.

Keywords: *Senior High School, Information and Communication Technology, Teacher attitudes, Educational technology, Gender disparities*

Introduction

In recent years, Information and Communication Technologies (ICT) proliferation has precipitated profound transformations within education (Pelgrum & Law, 2003; UNESCO, 2011; Voogt & Knezek, 2008). These transformations extend not only to teaching and learning methodologies but also to educational curricula. Developed and developing nations alike have come to recognize ICT as a pivotal instrument for the reconfiguration of education, aiming to enhance instructional quality and to address exigent issues such as educational equity and the cultivation of 21st-century skills (Bingimlas, 2009; Pelgrum, 2001; Weston & Bain, 2010). Effective integration of ICT in education is inherently multifaceted, with teacher-level and school-level factors contributing significantly to its success (Davis, 2018; Ertmer, 2005; Harris, Mishra, & Koehler, 2009).

Extensive literature acknowledges that numerous teacher-level factors wield influence over educators' utilization of ICT in their pedagogical endeavors (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, Sendurur, & Yu, 2012; Harris et al., 2009; Knezek & Christensen, 2016). These encompass demographic

characteristics (Albirini, 2006; Joo, Bong, & Choi, 2000), ICT-related knowledge and competencies (Albirini, 2006; Angeli & Valanides, 2009), motivation (Davis, 2018; Teo, 2009), workload, and time constraints (Ertmer, Ottenbreit-Leftwich, et al., 2012; Joo et al., 2000). Equally vital are school-level conditions, such as technological access (Bingimlas, 2009; Weston & Bain, 2010), technical and administrative support (Ertmer, Ottenbreit-Leftwich et al., 2012; Knezek & Christensen, 2016), and the quality of ICT infrastructure (Davis, 2018; Pelgrum & Law, 2003).

Among the many factors at play, this study emphasizes the influence of teachers' attitudes, ICT skills, and ICT training on the effective assimilation of ICT into modern educational environments (Albirini, 2006; Davis, 2018; Ertmer, 2005). Notably, many nations have recognized the need to provide teachers with ICT training to augment their technical proficiencies and knowledge, which, in turn, may significantly shape their beliefs and attitudes toward ICT in education (Davis, 2018; Teo, 2009).

Previous research also underscores the pivotal role that teachers' attitudes play in incorporating ICT into their classrooms (Angeli & Valanides, 2009; Teo, 2009). Attitudes are regarded as a guiding force for individual behavior, exemplifying the cohesion and consistency in the cognitive and emotional responses toward a specific object or concept (Ajzen, 1991; Fishbein & Ajzen, 1975). In numerous studies, teachers' attitudes towards ICT in education have been highlighted as a central determinant of their ICT integration behaviors (Angeli & Valanides, 2009; Davis, 2018; Teo, 2009). Despite the recognized importance of attitudes, few comprehensive studies examine Senior High School teachers' attitudes toward ICT use in education (Davis, 2018; Weston & Bain, 2010). Hence, a notable lacuna exists within the scholarly literature, emphasizing the need for more in-depth investigations into teachers' attitudes in this context (Bingimlas, 2009; Pelgrum & Law, 2003). In light of this research gap, the principal objective of this study is to conduct a comprehensive examination of Senior High School teachers' attitudes toward ICT use in education, with particular attention to demographic and experiential variables (Angeli & Valanides, 2009; Knezek & Christensen, 2016). Framed by this overarching aim, the research seeks answers to the following key questions (Ajzen, 1991):

1. What are Senior High School teachers' prevailing attitudes towards using ICT in education?
2. To what extent do these attitudes differ significantly based on teachers' gender, age, teaching experience, ICT experience, ICT skills, and ICT training?

The TPACK Framework

The TPACK framework, introduced by Mishra and Koehler (2006), serves as a guiding model for understanding the complex interplay of technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) in the context of teaching with technology. It emphasizes the need for teachers to understand how these three knowledge domains intersect to create effective ICT integration strategies. The TPACK framework underlines the interdependence of these domains and their influence on teachers' attitudes and behaviors.

Teacher Attitudes and TPACK

Teacher attitudes are a significant factor in technology integration. Positive attitudes are often associated with a greater willingness to embrace technology and develop a robust TPACK. Research has shown that educators with favorable attitudes toward ICT view it as a valuable tool for enhancing pedagogical strategies and student engagement (Harris, Mishra, & Koehler, 2009).

Demographic and Experiential Variables in TPACK

Gender Disparities in Teachers' Attitudes Toward ICT:

Gender disparities in teachers' attitudes toward Information and Communication Technology (ICT) have been the subject of extensive research. A body of literature suggests that male educators tend to display higher levels of confidence and a greater propensity to embrace ICT integration (Albirini, 2006). This gender-related divergence holds significant implications for the development of Technological Pedagogical Content Knowledge (TPACK) and the ultimate outcomes of technology integration in educational settings.

Age as a Determinant:

Age plays a crucial role in shaping teachers' propensity to adopt technology and their attitudes toward ICT. Younger educators, who have grown up in the digital age, often exhibit greater technological adeptness and a more open stance toward innovative pedagogical approaches facilitated by technology. Conversely, older teachers may face challenges when adapting to new technologies (Kotrlik, Redmann, & Douglas, 2014).

The Impact of Teaching Experience:

Teaching experience is often intertwined with age and can significantly influence the development of TPACK. More experienced teachers typically possess well-established teaching methods and a deep reservoir of subject-matter expertise. The TPACK framework offers the opportunity to reimagine and realign their pedagogical approaches with technological advancements (Koehler & Mishra, 2009).

ICT Proficiency and Skills:

Teachers' levels of ICT experience and skills are intimately connected with TPACK development and their attitudes toward technology. Educators with higher proficiency in ICT may be more amenable to innovative pedagogical strategies facilitated by technology. Nevertheless, the TPACK framework serves as a structured means of enhancing the dynamic interplay between technology skills, pedagogical strategies, and content knowledge to create meaningful and effective learning experiences (Niess, 2005).

The Role of ICT Training:

Professional development, including ICT training, significantly enhances teachers' technology skills and confidence, ultimately shaping their attitudes toward technology integration (Graham, Burgoyne, Cantrell, Smith, St. Clair, & Harris, 2009). In an era characterized by rapid technological advancements, the integration of Information and Communication Technologies (ICT) in educational settings has become a critical imperative (Celik & Kahyaoglu, 2007; Prensky, 2006). The promise

Participants

The study encompassed a cohort of 707 Senior High school teachers actively teaching in the Central Region of Ghana during the academic year 2021-2022. The choice of this sample was necessitated by the impracticality of engaging the entire population of high school teachers, which numbered 20,674 in the Central Region (Ministry of Education, Ghana 2021-2022). Employing a pragmatic approach, we administered 455 questionnaires to Senior High School teachers across four districts, namely Cape Coast Metropolitan Assembly, Komenda-Edina-Eguafo-Abirem (KEEA) Municipal Assembly, Mfantseman Municipal Assembly, Assin North Municipal Assembly, and Agona West Municipal Assembly. Our selection of these districts was informed by specific criteria, including the voluntary willingness of teachers to participate, logistical considerations, and the inherent constraints of time and resources.

A commendable 88.24% response rate was achieved as 707 meticulously completed and returned the questionnaires, substantiating their commitment to this research endeavor. An exploration of the demographic composition of the participant pool reveals a multifaceted assembly. Notably, 57.4% of the participants represented the female teaching cadre, signifying the prominent role of women in the teaching profession. Approximately 60% of the participants were below 40, indicative of a cohort with a significant representation of relatively younger educators. Impressively, 64% of the participants boasted of a teaching experience spanning over a decade, exemplifying their wealth of pedagogical knowledge and expertise. This diverse group demonstrated a strong inclination toward enhancing digital literacy, as 51.5% of respondents reported possessing commendable ICT skills. A notable 62% of participants showcased extensive ICT experience exceeding ten years, underscoring their proficiency in technology integration. Noteworthy is the commitment to professional development, with 63.5% of teachers having

attended 1-3 ICT training sessions, affirming their dedication to continuous improvement.

Data Collection Instruments

In the intricate process of data collection, we anchored our endeavors in the utilization of the Teachers' ICT Attitudes Scale, abbreviated as TICTAS, a meticulously crafted instrument designed by Aydin and Semerci in 2017. This instrument, serving as a comprehensive means of inquiry, is partitioned into two distinct sections, each designed to facilitate a nuanced exploration of educators' attitudes towards the integration of Information and Communication Technology (ICT) in education within the specific context of the Central Region. The initial section encompasses six thoughtfully constructed descriptive questions, delving into pivotal demographic variables that bear significance within the Central Region's educational landscape. These variables encompass gender, age, teaching experience, perceived ICT skills, ICT experience, and participation in ICT training programs. The inclusion of such demographic facets is paramount, furnishing indispensable contextual insights necessary for a comprehensive understanding of the collected data within the distinctive academic milieu of the Central Region.

The second section of TICTAS emerges as an instrumental tool for gauging educators' attitudes towards ICT integration in their pedagogical practices, bearing relevance to the unique educational ecosystem of the Central Region. Comprising sixteen statements, each meticulously calibrated on a five-point Likert scale, this segment provides educators with a spectrum of response options, spanning from "I completely do not agree" to "I completely agree." These thoughtfully crafted statements encapsulate various dimensions of ICT attitudes, ultimately converging into two fundamental constructs: ICT Willingness, comprising eleven items, and ICT Anxiety, consisting of five items. To ascertain the robust psychometric properties of TICTAS within the specific academic context of the Central Region, the Cronbach-Alpha coefficient was assiduously computed, yielding a commendable value of 0.75 for the overall scale. This coefficient stands as a testament to the scale's reliability and internal consistency, affirming its appropriateness for the thorough assessment of educators' ICT attitudes within the Central Region. Such meticulous attention to the psychometric quality of the scale augments the credibility of the gathered data, thereby affirming the suitability of TICTAS for rigorous academic research endeavors within the unique educational landscape of the Central Region.

Subsequent to the data collection phase, a rigorous analytical process unfolded, employing various statistical techniques to unveil the nuanced intricacies of educators' attitudes towards ICT integration in education within the Central

Region. Descriptive statistics, including measures such as means and standard deviations, played a pivotal role in offering a snapshot of the central tendencies and variabilities inherent within the dataset. These statistical summaries were instrumental in encapsulating the prevailing trends and variations in educators' attitudes towards ICT, thereby shedding light on the multifaceted dynamics of their responses within the distinctive academic context of the Central Region.

Furthermore, the reliability and internal consistency of the dataset within the Central Region were subjected to meticulous scrutiny through the calculation of the Cronbach Alpha coefficient. This stringent assessment was indispensable in ensuring the robustness and trustworthiness of the data, thereby fortifying the research outcomes within the specific academic landscape of the Central Region. To further scrutinize the data, univariate statistical tests were deployed, including the independent samples t-test, one-way ANOVA, and the Scheffe test as a post-hoc analysis. These statistical methodologies facilitated the exploration of differences and relationships within the dataset, shedding light on how various demographic and experiential factors influenced educators' attitudes towards ICT integration, specifically tailored to the Central Region context. The Statistical Package for Social Sciences (SPSS) version 21.0 stood as the analytical tool for conducting these various statistical analyses, ensuring the precision and efficiency of the data analysis process within the unique academic context of the Central Region. A standardized scoring approach was adopted when comparing the mean scores within the Likert-type scales, guaranteeing consistency and comparability in the analysis of educators' attitudes towards ICT integration within the Central Region. In the final step, mean scores were judiciously categorized into distinct levels, utilizing an interval of 0.80. This categorization system, customized for the academic context of the Central Region, classified scores into "very low," "low," "modest," "high," and "very high." This strategic classification facilitated the nuanced interpretation of the data, providing clear delineation of prevailing attitudes within the dataset, contextualized within the unique academic milieu of the Central Region.

Results

Descriptive Findings on Teachers' Attitudes towards ICT Use in Education

The findings stemming from the descriptive analysis of teachers' attitudes towards ICT use in education, which are classified into two distinct factors - ICT willingness and ICT anxiety, are succinctly presented in Table 1.

Table 1. Teachers' Attitude towards ICT use in Education

1	increases the quality of teaching and learning process	4.16	1.03
4	is a fruitful means in attaining the educational targets	4.09	1.03
5	offers various teaching and learning opportunities	4.23	1.03
6	makes it easy for me to plan my teaching	4.20	.96
7	increases students' success in my class	4.00	.97
9	makes teaching easier for teachers	3.97	1.02

SD, I believe ICT Use in Education...

11	increases my students' involvement in my class	4.07	.98
12	offers alternative learning opportunities such as e-learning and mobile learning	4.07	.96
13	will be beneficial at each stage of teaching process	3.80	.99
15	plays a critical role in contemporary education	3.03	1.19
16	makes students' learning permanent	3.77	.99
ICT Willingness Overall		3.94	.75
Item	<i>I am afraid that ICT use in education...</i>	<i>M</i>	<i>SD</i>
1	leads to an underestimation of teachers' role	1.95	1.05
2	trivializes teachers	1.85	1.02
3	turns teaching into a monotonous and mechanical process	1.93	1.06
4	will take the place of teachers in the future	1.80	1.06
5	harms teachers' innovativeness	2.23	1.10
6	ICT Anxiety Overall	1.95	.78

As presented in Table 1, the teachers have a highly positive overall attitude (ICT willingness, $M=3.96$, $SD=.75$) toward ICT use in education. However, the results also illustrated that they still feel anxious about ICT. Nevertheless, at a low level (ICT anxiety, $M=1.95$, $SD=.78$). In addition, the results also displayed that teachers believe that ICT use in education offers various teaching and learning opportunities ($M=4.25$) and it also makes it easy for them to plan their teaching ($M=4.22$). On the negative side, teachers are afraid that using ICT in education harms their innovativeness ($M=2.25$).

Comparative findings on teachers' attitude towards ICT use by gender

The results of the comparative analysis of teachers' attitudes toward ICT use in education by their gender are presented in Table 2 below.

Table 2. Teachers' Attitude towards ICT Use by Gender

Factor	Groups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
ICT Willingness	Male	150	3.93	.71	.05	351	-.305	.76
	Female	203	3.96	.79	.06			
ICT Anxiety	Male	150	1.90	.70	.05	351	-1.482	.15
	Female	203	2.02	.86	.07			

With a closer look at Table 2, which presents the mean scores and independent samples t-test results regarding teachers' ICT attitude towards ICT use by gender, there is no significant difference between male and female teachers' ICT willingness [$t(353) = -.307$; $p > .05$], and their ICT anxiety [$t(353) = -1.43$; $p > .05$].

Comparative findings on teachers' attitude towards ICT use by age

In order to examine whether there is a statistically significant difference between the teachers' attitudes towards ICT use by their age, we employed a One-way ANOVA and Scheffe as a post-hoc. Before ANOVA, Levene's test tested the homogeneity of the variance within the cases. Levene's test results (ICT willingness, $p = .302$; ICT anxiety, $p = .646$) illustrated that the distribution is parametric; thus, the normality assumption is not violated.

Table 3. Teachers' attitude towards ICT use by age

Factor	Groups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>F</i>	<i>p</i>
ICT Willingness	21-30	66	4.02	.82	.10	3-349	.770	.51
	31-40	145	3.97	.69	.05			
	41-50	124	3.87	.76	.07			
	51-60	18	3.95	.80	.18			
ICT Anxiety	21-30	66	1.20	.80	.10	3-349	1.538	.20
	31-40	145	1.86	.78	.07			
	41-50	124	2.00	.73	.07			

	51-60	18	1.95	.89	.21			
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The results from the One-Way ANOVA, presented in Table 3, revealed no statistically significant difference in teachers' ICT use concerning their ages. For both ICT willingness [$F(3, 348) = 0.771$, $p > 0.05$] and ICT anxiety [$F(3, 349) = 1.538$, $p > 0.05$], the p-values exceeded the conventional significance level of 0.05. These results suggest that age does not significantly impact teachers' attitudes towards ICT use in education. In a similar vein, the comparative findings about teachers' attitudes towards ICT use based on their teaching experience are presented in Table 4. Before conducting the ANOVA, using Levene's test, it was essential to assess the homogeneity of variance within the cases. The outcomes of Levene's test for ICT willingness ($p = 0.075$) and ICT anxiety ($p = 0.647$) indicated that the data distribution met the parametric assumption, confirming that the normality assumption was not violated. These rigorous statistical procedures underpin the results' validity and reliability, ensuring that the subsequent interpretations and implications are well-founded and robust.

Table 4. Teachers' Attitude towards ICT Use by Teaching Experience

Factor	Groups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>F</i>	<i>p</i>
ICT Willingness	1-5 years	57	4.00	.79	.11	3-349	1.098	.35
	6-10 years	65	3.84	.81	.10			
	11-15 years	78	4.04	.60	.07			
	16 and above	153	3.91	.77	.06			
ICT Anxiety	1-5 years	57	2.07	.81	.11	3-349	.974	.41
	6-10 years	65	1.92	.84	.10			
	11-15 years	78	1.84	.73	.08			
	16 and above	153	1.97	.76	.06			

The One-Way ANOVA results displayed in Table 4 illustrated that there is no significant difference between teachers' ICT use regarding their teaching experience [ICT willingness, $F(3-349) = 1.098$; $p > .05$; ICT anxiety, $F(3-349) = .974$; $p > .05$].

Comparative findings on teachers' attitude towards ICT use by their ICT experience

The comparative results regarding the difference between the teachers' attitudes towards ICT use and their ICT experience are presented in Table 5 below. Before ANOVA, Levene's test tested the homogeneity of the variance within the cases. Levene's test results (ICT willingness, $p = .600$; ICT anxiety, $p = .038$) illustrated that the distribution is parametric; thus the assumption of normality is not violated.

Table 5. Teachers' Attitude towards ICT Use by ICT Experience

Factor	Groups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>F</i>	<i>P</i>	Scheffe
ICT Willingness	1-5 years	11	3.56	.68	.20	3-349	1.132	.34	
	6-10 years	87	3.91	.70	.08				
	11-15 years	128	3.97	.71	.06				
	16 and more	127	3.94	.82	.07				
ICT Anxiety	1-5 years	11	2.69	1.10	.33	3-349	3.962	.00	1 > 2, 3, 4
	6-10 years	87	1.98	.66	.07				2 < 1
	11-15 years	128	1.86	.71	.06				3 < 1
	16 and more	127	1.95	.86	.08				4 < 1

Teachers' Attitude towards ICT Use by ICT Experience

According to the comparative results given in Table 5, there is no significant difference between teachers' ICT willingness [$F(3-348) = 1.131$; $p > .05$;] and their ICT experience. Nevertheless, the results also indicated that there is a significant difference between teachers' ICT anxiety [$F(3-348) = 3.961$; $p < .05$] and their ICT experience. For a deeper exploration of the significant mean scores across the categories of ICT experience, Scheffe was conducted as a post-hoc test. Scheffe results illustrated that the teachers with 1 through 5 year ICT experience feel significantly more anxious about use of ICT in teaching and learning ($M = 2.68$, $SD = 1.10$) compared with the teachers of other ICT experience categories [6-10 years, ($M = 1.97$, $SD = .65$); 11-15 years, ($M = 1.85$, $SD = .70$); 16 years and more, ($M = 1.94$, $SD = .85$)].

Comparative findings on teachers' attitude towards ICT use by their ICT skills

The ANOVA results regarding the difference among the teachers' attitudes towards ICT use by their ICT skills are given in Table 6 below. Before the analysis, Levene's test tested the homogeneity of the variance within the cases. Levene's test results (ICT willingness, $p = .051$; ICT anxiety, $p = .428$) illustrated that the distribution is parametric. Thus the assumption of normality is not violated.

Table 6. Teachers' Attitude towards ICT Use by Perceived ICT Skills

Factor	Groups	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>F</i>	<i>P</i>	Scheffe
ICT Willingness	Low	27	3.75	.56	.11	3-349	1.975	.12	
	Medium	144	3.87	.66	.06				
	High	131	4.01	.77	.07				
	Excellent	51	4.07	.95	.13				
ICT Anxiety	Low	27	2.33	.74	.14	3-349	3.028	.03	1 > 3
	Medium	144	1.99	.72	.06				
	High	131	1.88	.80	.07				
	<u>Excellent</u>	51	1.82	.84	.12				

Teachers' Attitude Towards ICT Use by Perceived ICT Skills

As shown in Table 6, the comparative results reveal that there is no statistically significant difference in teachers' ICT willingness based on their perceived ICT skills [$F(3-349) = 1.975$, $p > 0.05$]. However, concerning their ICT anxiety, a notable discrepancy emerges [$F(3-349) = 3.028$, $p < 0.05$] based on their perceived ICT skills. To delve deeper into this significant divergence in mean scores across the various levels of perceived ICT skills, post-hoc tests, including Scheffe and Dunnet C, were conducted.

The Dunnet C post-hoc results elucidate that teachers with low-level ICT skills exhibit significantly higher anxiety levels regarding the educational use of ICT ($M = 2.33$, $SD = 0.74$) compared to those with high-level ICT skills ($M = 1.88$, $SD = 0.80$). This distinction highlights the importance of ICT skills and their influence on teachers' confidence and comfort in utilizing technology for educational purposes. These findings have critical implications for developing targeted ICT training programs and support mechanisms to enhance teachers' ICT competencies, especially for those with lower perceived ICT skills.

Comparative findings on teachers' attitude towards ICT use by their ICT training

Factor	Groups	n	M	SD	SE	df	F	p	Scheffe
ICT Willingness	None	50	3.88	.73	.10	3-349	1.355	.26	
	1-3	224	3.92	.71	.05				
	4-6	54	4.12	.65	.09				
	7 and more	25	3.86	1.20	.24				
ICT Anxiety	None	50	2.18	.88	.12	3-349	4.447	.00	1 > 3
	1-3	224	1.98	.76	.05				
	4-6	54	1.67	.64	.09				3 < 1
	7 and more	25	1.79	.83	.17				

The study's outcomes concerning teachers' attitudes toward using Information and Communication Technology (ICT) in education are thought-provoking. They are presented in Table 7. Before commencing the analysis, an essential check for the homogeneity of variance within the data was conducted using Levene's test. The results of Levene's test demonstrated that the dataset adheres to parametric distribution, thus preserving the normality assumption.

The comparisons provided in Table 7 unveil that when it comes to the number of ICT training sessions they have participated in, there is no statistically significant variance in teachers' ICT willingness [$F(3-349) = 1.355$; $p > .05$]. Nevertheless, a noteworthy distinction emerges concerning their ICT anxiety [$F(3-349) = 4.447$; $p < .05$] relative to their ICT training experience. To gain a deeper insight into which mean scores significantly differ across the spectrum of teachers' ICT training, we administered a post-hoc Scheffe test. The Scheffe results pinpoint that teachers who have not previously undergone ICT training display significantly higher levels of anxiety when contemplating the integration of ICT into their teaching and learning practices compared to those who have participated in 4 to 6 ICT training sessions [no-ICT training ($M = 2.18$, $SD = .88$); 4-6 ICT training, ($M = 1.67$, $SD = .64$)].

Discussion

This academic study delves into a thorough exploration of teachers' attitudes toward the integration of Information and Communication Technology (ICT) in education, with a specific focus on the central region. The research meticulously examines potential variations influenced by factors such as gender, age, teaching experience, ICT proficiency, ICT training, and ICT experience. The successful assimilation of ICT in education is acknowledged as a multifaceted endeavor, dependent on an interplay of factors at the teacher, school, and national levels. Notably, teachers emerge as pivotal contributors to the effective implementation of ICT in classroom settings, emphasizing the significance of enhancing their ICT skills and attitudes for a meaningful infusion of technology in educational environments.

However, it is crucial to approach the study's findings with a nuanced understanding of certain inherent limitations. The research recognizes that teachers' attitudes toward ICT represent only one facet of the complex web of influences governing their actual utilization of ICT in pedagogy. Furthermore, the study's generalizability is acknowledged to be constrained by its specific focus on high school teachers in the central region, limiting the extent to which the findings can be extrapolated to educators at different educational levels or in diverse geographical locations. Additionally, the effects of the variables under consideration may fluctuate contingent upon additional factors, such as the ICT infrastructure of schools and the administrative stance towards ICT adoption. The predominantly quantitative nature of the study prompts a call for future research combining qualitative and quantitative methodologies to comprehensively scrutinize the factors influencing teachers' ICT attitudes.

Despite these reservations, the study's findings stand out for their robustness and promise to contribute substantially to the academic literature. The research highlights the generally positive attitude exhibited by teachers in the central region towards the utilization of ICT in education, aligning with prior studies. However, the nuanced exploration also reveals persistent concerns and anxieties among teachers regarding the integration of ICT, emphasizing the complexity of their relationship with technology. Moreover, the study challenges certain conventional assumptions by suggesting that older teachers in the central region may display a greater readiness to embrace ICT in education, attributing this disposition to their extensive teaching experience, adept classroom management skills, and familiarity with technology use. This finding contradicts the common notion that younger teachers are inherently more inclined to adopt ICT in their teaching practices.

The research further dissects the impact of variables such as teaching experience, ICT experience, perceived ICT skills, and ICT training on teachers' attitudes and anxieties. The nuanced analysis unveils intriguing patterns, such as the absence of a significant difference in teachers' ICT willingness based on their ICT experience but a significant discrepancy in teachers' ICT anxiety

according to their ICT experience. Similarly, the study explores the role of perceived ICT skills and ICT training, uncovering noteworthy distinctions in teachers' attitudes and anxieties based on these factors.

In conclusion, while acknowledging the study's limitations, these findings offer valuable insights for policymakers, practitioners, and scholars in the field of ICT in education. The nuanced understanding of teachers' attitudes and anxieties in the central region can inform the development of targeted interventions, including ICT training programs, aimed at enhancing teachers' readiness and confidence in integrating technology into their teaching practices.

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