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Influence of Teachers' Self-Efficacy and Attitude towards the Integration of ICT into Teaching and Learning at the Basic School Level

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ABSTRACT

Background: ICT has become crucial in our everyday life and for that matter teaching and learning. It is, therefore, imperative to examine its involvement in education.

Purpose: The current study sought to explore the influence of teachers' self-efficacy and attitude towards the integration of ICT into teaching and learning at the basic school level.

Method: The study was a descriptive survey with a sample size of 159 teachers representing 270 accessible population which was purposively located. Respondents responded to the questionnaire via an online survey in the quest for data collection. Data to answer research questions and test research hypotheses were analyzed using frequencies, percentages, means, standard deviations, and Pearson Product Moment Correlational Coefficient.

Findings: The study revealed that most teachers have a high level of self-efficacy. The study also found that majority of the teachers have positive attitudes toward the integration of ICT in teaching and learning. However, it was revealed that there is a significant difference between male and female teachers' attitudes towards the integration of ICT in teaching and learning. Finally, there is no significant relationship between self-efficacy and teachers' attitudes toward the integration of ICT in teaching and learning.

Recommendation: Based on the findings, it was, therefore, included in the recommendations that to successfully incorporate ICT into teaching and learning, policymakers must offer the essential teaching and learning tools to teachers.

Keywords: *Self-Efficacy, Attitudes, Integration, ICT, Teachers*

INTRODUCTION

Computer applications, mobile technology, and recording and communication systems are examples of information and communication technologies (ICTs) that have become indispensable and useful in the classroom (Friedman, 2006). The first stage in training is to comprehend how to utilize it, and then put it into practice (Donelly, 2010). This is because integrating ICT into teaching-learning processes promotes powerful teaching-learning environments by improving the teaching and learning process (Buabeng-Andoh, 2012; Aydin, Gurol & Vanderlinde, 2016), improving learner-centered active learning (Fructuoso, 2015 as cited in Islam, 2020), increasing learner achievement (Dibaba & Babu, 2017), and making a difference in education quality (Dibaba & Babu, 2017; UNESCO, 2017). As a result, ICT integration in the teaching-learning process is receiving increased attention in both developed and developing nations (Aydin & Gurol, 2016). Many studies have stressed the study of ICT as a means of incorporating modern technology into the classroom. The findings reveal overwhelmingly positive opinions and widespread agreement that their use will be widely increased among teachers and learners shortly (Karagiorgim & Charalambous, 2006; Foley & Ojeda, 2008). The current study should look at the impact of teachers' self-efficacy and attitudes regarding ICT integration in the classroom.

People's appraisal of their skills to arrange and execute courses of action necessary to achieve specific sorts of performances, according to Bandura (1986: 391) mastery experiences, vicarious experiences, social persuasion, and emotional states are the four primary sources of impact on Self-Efficacy, according to Bandura. The most effective way to develop a sense of self-efficacy is via mastery experiences. These are, in reality, recollections of prior successful experiences that people may recall when confronted with current or future challenges. Negative mastery experiences reduce Self-Efficacy, but positive mastery experiences strengthen it. Vicarious experiences, on the other hand, arise via peer or "model" observation: a process of comparing oneself to others. Seeing these models succeed can boost one's self-efficacy while seeing them fail can decrease one's self-efficacy. If the observer sees himself or herself as similar to the model, the process is accelerated. Positive (verbal) reinforcement is used in social persuasion. It's likely that if people support or motivate you, your Self-Efficacy will rise. Even though social persuasions are less powerful than mastery experiences, they may still have a significant impact on self-belief. According to Bandura, emotional states (psychological elements) are also the final source of Self-Efficacy. Individuals frequently believe that their abilities are (strictly) linked to how they feel in a given moment, with a condition of stress or anxiety indicating failure. The diagrammatic representation of self-efficacy is shown in figure 1.

Figure 1: Nature of Self-Efficacy by Bandura (1977)

The Ghanaian government is now implementing the "One Teacher, One Laptop" program to make ICT integration a vital component of teaching and learning. However, even though there is a strong desire to use ICT in the classroom, little is known about whether ICTs are used as routine tools in the classroom beyond exceptional encounters (Ekizoglu, Tezer & Brozer, 2010). Online teachings have been introduced in schools, according to Morris (2010), although they are not widely used yet.

STATEMENT OF THE PROBLEM

Educators are continuously looking for innovative ways to reach children who have historically been poor achievers to achieve excellent standards in education. This response comes in the shape of new technology for the bulk of the 20 teachers. Because today's learners are digital natives (Margaran, Littlejohn, & Vojt, 2011), and the majority of these kids are comfortable with technology, employing it makes sense. Technology, on the other hand, is only as good as the people who use it. The curriculum's success is significantly influenced by a teacher's efficient use of technology that has been made accessible to him or her in the classroom. Despite their increased reliance on technology, many teachers still cite a lack of confidence in their ability to integrate it into their curriculum (Bingimlas, 2009). According to previous research, most teachers believe their professional development is fragmented and not directly tied to the difficulties they face in the classroom (Lieberman & Mace, 2010). Zhao and Bryant (2006), for example, determined that while technology integration training can be beneficial, it is only successful at the most basic levels and must be reinforced if greater degrees of technology integration is to be achieved. As a result, schools must develop a strategy that provides teachers with more relevant and meaningful training so that they may increase their self-efficacy when it comes to using technology in their classrooms. Self-efficacy is a sense of one's talents within a certain domain as a general concept. Multiple dimensions of self-efficacy beliefs may have a role in a teacher's thoughts and behaviors when they employ technology in teaching and learning, according to Abbitt (2011). Despite this assumption, little research has looked at the worldwide relationship between the two factors. The current study sought to look at the influence of teachers' self-efficacy and attitude about integrating

ICT into teaching and learning in-depth. The study would specifically answer two research questions (RQ) and test two research hypotheses (RH) and they are as follows:

1. RQ 1: What is the level of self-efficacy of teachers at the basic school level?
2. RQ 2: What are the attitudes of teachers towards the integrating of ICT in teaching and learning at the basic school level?
3. RH 1: There is no significant difference between male and female teachers' attitudes towards the integrating of ICT in teaching and learning at the basic school level.
4. RH 2: There is no significant relationship between teachers' self-efficacy and their attitudes of teachers towards integrating ICT in teaching and learning at the basic school level.

EMPIRICAL REVIEW

In the first study, Goulao (2014) looked at the relationship between self-efficacy and academic achievement in an online setting. The information was gathered from 63 undergraduate learners, both male, and female, in their first year of study, with an average age of 42 years. It was looked into how learners performed in specific academic courses. The data was gathered using a self-efficacy questionnaire with an r =.908 that was adjusted. In this study, descriptive and inferential statistics were employed. The Pearson correlation coefficient was used to evaluate the relationship between self-efficacy and academic accomplishment. Learners had a high level of self-efficacy, with an average of 45, according to the data, and there is a significant relationship between self-efficacy and academic achievement (r=0.286, at the 0.05 level). The first conclusion contradicts the findings of Sawari and Mansor (2013), who argue that self-efficacy is low. The purpose of this study is to evaluate if the study area's learners have low, moderate, or high self-efficacy.

In a study, Eickelmann and Vennemann (2017) investigated if there is a typology of teachers with diverse perspectives regarding the learning potential of ICTs. This subject is investigated using latent class analyses on data from teachers in three European countries: the Czech Republic, Germany, and Norway. Furthermore, the article explores how teachers' computer usage differs depending on the groups to which they may be allocated. In doing so, the study presented here integrates representative data on teacher typologies of attitudes toward and ideas about ICT in teaching and learning with data on computer use in schools, probably for the first time.

Mwila (2018) investigated secondary school teachers' attitudes towards the integration of information and communication technology in the teaching process in Tanzania's Kilimanjaro Region. The study used a cross-sectional survey design. A total of 100 teachers from ten secondary schools were included in the study. The research instruments employed were an interview schedule, questionnaires, and an observation schedule. Descriptive and inferential statistics were used to analyze the data. The survey discovered that both male and female teachers were enthusiastic about incorporating ICT into their classrooms. It was also shown that there is a relationship between a teacher's age group and their views on integrating ICT into the teaching and learning process. The study indicated that ICT integration into the teaching process was mostly determined by teachers' and learners' attitudes toward ICT integration; favorable ICT attitudes are likely to enhance ICT integration in the teaching and learning process. Curriculum planners should include ICT into a curriculum while taking into account economic, cultural, political, social, educational, and catalytic rationales, according to the research. The previous study used a mixed-method approach, but the current study used a strictly quantitative technique.

Hickson (2016) looked at teachers' self-efficacy when it came to integrating technology into the curriculum. The goal of the research was to see if there was a relationship between teachers' self-efficacy in the classroom and their capacity to integrate technology into the classroom. It was decided to conduct a quantitative, correlational analysis. A convenience sample of 64 middle school teachers from a South Georgia school system was used. The Media and Technology Usage Attitude Scale (MTUAS) and the Teachers' Sense of Self-Efficacy Scale was used to survey middle school teachers at one point in time. Once the data was collected, Pearson's Product Moment Correlation Coefficient was used to assess it. There is no statistically significant relationship between teacher self-efficacy and the capacity to incorporate technology into the classroom, according to the study. There was also no relationship between teacher self-efficacy and the use of smartphones, the internet, social media, text messaging, or email. It was advised that a bigger sample size be used in the study.

Similarly, Gbemu, Sarfo, Adentwi, and Aklassu-Ganan (2020) looked at how teacher educators' Self-Efficacy Beliefs (SEB) affected their actual usage of ICTs in instructing prospective teachers in Ghana's Ashanti Region. The opinions of 115 teacher educators were randomly chosen on a closed-ended Likert-type scale questionnaire using a mixed-methods descriptive survey methodology. Following that, a convenience sample of 13 teacher educators was monitored for their actual usage of ICTs in their classrooms. After that, the data were analyzed using frequency counts, percentages, and mean and correlational statistics. The findings revealed that teacher educators were unsure about their abilities to use ICTs in their classrooms, in addition to not employing such tools in their classrooms. Furthermore, it can be deduced from the studies that the teacher educators' lack of confidence in their abilities to utilize ICTs to educate resulted in their failure to employ these tools in their classrooms. Colleges of Education should engage with the government and T-TEL to empower teacher educators through pedagogical training to improve their ICT self-efficacy beliefs and actual use. The empirical data offered is sufficient to support the current study's discussion.

MATERIALS AND METHODS

The study was a descriptive survey to characterize and publicize the current phenomena in connection to the specified goals and objectives. According to Krejcie and Morgan's (1970) sample size determination table, 159 teachers representing 270 accessible populations were purposively located to respond to the questionnaire via an online survey. The questionnaire was derived from Schwarzer and Jerusalem’s (1995) general Self-Efficacy Scale, which has 10 questions with r=.76 to.90, and teachers' Attitudes about the Use of Information Communication Technologies, which has 15 items and has r=.818. With 1-Strongly Disagree (SD), 2-Disagree (D), 3-Agree (A), and 4-Strongly Agree (SA) were the responses on a four-point Likert scale. RQ 1 data were analyzed using frequencies and percentages, whereas RQ 2 data were analyzed using means and standard deviations. Furthermore, data for RH 1 were analyzed using means and standard deviations, whereas data for RH 2 were analyzed using Pearson Product Moment Correlational Coefficient.

RESULTS

RQ 1: What is the level of self-efficacy of teachers at the basic school level?

Table 1: ***Level of Self-Efficacy of Teachers***

Level	Number of Teachers	Percentage (%)
Low	1	0.6
Moderate	26	16.4
High	132	83.0
Total	**159**	**100**

In Table 1, it can be seen that the majority of the teachers (n = 132, 83.0%) were identified to have high self-efficacy. This was followed by (n = 26, 16.4%) of teachers were having moderate self-efficacy with only one teacher having low self-efficacy. Every teacher has a level of self-efficacy.

RQ 2: What are the attitudes of teachers towards the integrating of ICT in teaching and learning at the basic school level?

Table 2: ***Attitude of Teachers towards the Integration of ICT in Teaching and Learning***

Statement	**N**	**Mean**	**SD**
The ICT helps teachers to teach concepts and skills in more effective ways.	159	3.65	0.564
I feel comfortable with the idea of using ICT as an instructional tool in teaching.	159	3.60	0.627
The use of ICT helps learners understand concepts more effectively.	159	3.58	0.599
The use of the Internet in teaching and learning is most advantageous.	159	3.57	0.707
Teaching with the use of ICT is more useful than traditional ways of teaching.	159	3.56	0.662
The LCD Projector is a valuable instructional tool for teaching.	159	3.55	0.752
The ICT helps learners learn because it allows them to express their thinking in better and different ways.	159	3.48	0.645
The ICT will change the way learners learn in my classes.	159	3.43	0.830
The use of the Smart Phone as an instructional or learning tool excites me.	159	3.40	0.819
The ICT will change the way I teach.	159	3.33	0.966
The idea of using YouTube videos in teaching and learning makes me confident.	159	3.25	0.746
The use of ICT will help the teachers teach writing skills better.	159	2.68	1.033
If something goes wrong with the ICT gadget, I will not know how to fix it.	159	2.35	1.001
The ICT is not conducive to learner learning because it is not easy to use.	159	1.86	0.958
The use of ICT in teaching and learning scares me.	159	1.36	0.697
Mean of Means/SD of SDs	**159**	**3.11**	**0.774**

From table 2, the majority of the teachers agreed with the statement "The ICT helps teachers to teach concepts and skills in more effective ways" (Mean = 3.65, SD = 0.564). Following this is the majority of teachers agreeing with the statement "I feel comfortable with the idea of using ICT as an instructional tool in teaching" with (Mean = 3.60, SD = 0.627) while most teachers with (Mean = 3.58, SD = 0.599) agreed to the statement "The use of ICT helps learners understand concepts more effectively". However, the majority of the teachers disagreed with the statement "The use of ICT in teaching and learning scares me" (Mean = 1.36, SD = 0.697). It can, therefore, be inferred from the analysis that the majority of the teachers have positive attitudes toward the integration of ICT in teaching and learning (Mean of means = 3.11, SD of SDs = 0.774).

RH 1: There is no significant difference between male and female teachers' attitudes towards the integrating of ICT in teaching and learning at the basic school level.

Table 3: Independent Samples Test on Attitude of Teachers towards the Integration of ICT in Teaching and Learning

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig	T	Df	Sig. (2-tailed)
ATTITUDE	Equal variances assumed	2.664	.105	2.115	157	.036
	Equal variances not assumed			2.114	132.671	.036

In table 3, Levene's test for equality of variances on attitudes of teachers towards the integration of ICT in teaching and learning and gender shows that equality variance of homogeneity assumption was met with F = 2.664, sig=.105 greater than ρ=.05. With that Table 3 further indicates that t (157) = 2.115, sig=.036 less than ρ=.05. This establishes that there is a significant difference between male and female teachers' attitudes towards the integration of ICT in teaching and learning. The group statistics on the independent sample t-test are presented in Table 4.

Table 4: *Group Statistics on Attitudes of Teachers towards the Integration of ICT in Teaching and Learning*

	GENDER	N	Mean	Std. Deviation
ATTITUDE	Male	96	3.11	.380
	Female	63	2.98	.381

Table 4 indicates that there is significant difference between male with (n = 96, Mean = 3.11, SD = .380) and female with (n = 63, Mean = 2.98, SD = .381) teachers' attitudes toward the integration of ICT in teaching and learning. This means that males have more positive attitudes toward the integration of ICT in teaching and learning than their female counterparts although they both have positive attitudes toward the integration of ICT.

RH 2: There is no significant relationship between teachers' self-efficacy and their attitudes toward the integrating of ICT in teaching and learning at the basic school level.

Table 5: ***Teachers' Self-Efficacy and their Attitude of Teachers towards the Integrating of ICT in Teaching and Learning***

		SELF-EFFICACY	ATTITUDE
SELF-EFFICACY	Pearson Correlation	1	.147
	Sig. (2-tailed)		.065
	N	159	159

In Table 5, it can be observed that sig = .065 greater than ρ = .05. This indicates that there is no significant relationship between self-efficacy and teachers' attitudes toward the integration of ICT in teaching and learning. Although, r = .147 which means a positive low relationship, it is not statistically significant.

DISCUSSION

First, the study revealed that most teachers have a high level of self-efficacy. Basic school teachers have the zeal to take up tasks and do them properly. The finding agrees with Goulao (2014) who found that respondents have a high level of self-efficacy. The study also found that majority of the teachers have positive attitudes toward the integration of ICT in teaching and learning. The finding confirms Eickelmann and Vennemann's (2017) finding that teacher typologies of attitudes towards and beliefs about ICT in teaching and learning with data on computer use in schools. Likewise, it agrees with Mwila (2018) that both male and female teachers had positive attitudes towards the integration of ICT in their teaching process. However, it was revealed that there is a significant difference between male and female teachers' attitudes towards the integration of ICT in teaching and learning which contradicts Mwila's (2018) finding stated earlier.

Finally, there is no significant relationship between self-efficacy and teachers' attitudes toward the integration of ICT in teaching and learning. The finding agrees with Hickson (2016) who asserted that no statistically significant relationship between teacher self-efficacy and the ability to integrate technology within the classroom. However, it contradicts the finding from Gbemu, Sarfo, Adentwi, and Aklassu-Ganan' (2020) study that revealed the lack of belief in their ability to use ICTs to teach translated into the teacher educators not using these tools in their teaching.

CONCLUSION

It can be concluded from the discussion that basic school teachers would exert energy in their activities because of the high level of self-efficacy. More so, they are likely to integrate ICT in teaching and learning when given the resources, skills, and knowledge of its use. Considering this conclusion, male teachers are more likely to do that compare to female teachers. Finally, it can be concluded that teachers' positive attitudes towards the integration of ICT in teaching and learning are not influenced by their high level of self-efficacy.

RECOMMENDATIONS

Based on the conclusions, we, therefore, recommend that to successfully incorporate ICT into teaching and learning, policymakers must offer the essential teaching and learning tools to

teachers. Also, stakeholders, working via the Ministry of Education, must provide periodic ICT workshops for in-service teachers to keep them up to speed on current ICT technologies in teaching and learning. Cooperating institutions, such as telecommunications institutions, must channel their support to community schools to assist teachers in the field of ICT and its application. They should ensure the building of adequately resourced ICT laboratories, particularly in distant locations, to ensure uniformity in the study and use of ICT. Finally, preservice teacher education's ICT curriculum has to be revised to place a greater focus on skill development.

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