Integrating Information Technology into Pedagogy: The Gender Perspective

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Abstract

This study investigated the seeming gender dichotomy in perception among social studies teachers towards the use of technology in instructional practice in the senior high schools of the Cape Coast Metropolis. The theoretical underpinum of the study are essentialism and social construction. A descriptive research design was adopted and questionnaire used to collect data from a purposive sample of 50 social studies teachers who have completed some form of technology integration training. An independent t-test was computed in analyzing the data at an alpha level of 0.05. The findings revealed a higher mean response for females than males in terms of perception on training, competence and importance of technology integration. The difference was however statistically insignificant ($p>0.05$). The result depicted a gradual closure of the gender technology gap. It was therefore recommended that, efforts directed towards bridging the gender technology gap should be vigorously pursued in a continuum.

Keywords: Social Studies teachers, Technology Integration, Perception, Competence, Gender.

Introduction

Information and communication technology (ICT) has become a more ubiquitous element in our society and educational settings are undergoing transformation where educators and students are expected to teach and learn using this new technology irrespective of the subject area [30]. Pelgrum [39] stated that using computers could revolutionize an outmoded educational system, better prepare students for the information age and accelerate national development efforts. Cuban [14] considered computers a vehicle for reforming educational practices, to be used as an instructional tool by teachers at all levels of education. McAllister and Mitchell [31] added that using computers will make the learning process exciting for both students and teachers. In the area of Social Studies, [42] stressed that using computers in social studies teaching makes the learning-teaching process meaningful, integrated and active. This view was supported by [2] who stated that the content of social studies is generally abstract because it is concerned about people, history, culture, flora, landscape, climate; therefore using information technology enables students to understand these facts easier and make them participate in the learning process more actively. Hassell [21] presented several uses for computer in geography: presentation packages, data logging (weather), data handling (databases and spreadsheets to analyze information), simulations and modeling software, mapping and graphic information, GIS (geographic information system), digital images, electronic communications, multimedia authoring machines and

information rich sources (CD-ROM and World Wide Web). Huckel et al [23] believed that the benefit of using computers in teaching social studies, particularly in geography, has been known for a quarter a century. Mason et al [33] argued that using technology in social studies teaching provides unforeseeable facilities and makes effective learning more accessible, compared to traditional classrooms. The social studies teacher is in this wake expected to possess certain competencies and a positive perception in order to effectively use ICT in instruction.

Developing teachers' computer skills requires changing teachers' attitudes towards computers, because their application of computer in their classroom is affected by their attitudes. Albion [3] stressed that teachers' beliefs and attitudes towards computer are among the significant issues to be addressed. Watson [50] asserted that developing teachers' positive attitudes towards computers as an information communication technology is very important to ensure not only computer integration, but also to avoid teacher resistance to use computer in their classrooms. This point of view was supported by the results of some researchers who found that teachers' attitudes towards computers strongly affect their use of computers and their belief in the benefit of their use [27, 10].

Recent studies have shown that the successful application of computer is strongly influenced by teachers' attitudes towards their use, and their belief in the value of their use. Al-Oteawi [5] concluded that teachers who showed the most negative attitudes towards using computers in teaching lack knowledge and skills in their use. Pelton and Pelton [40] also found that teachers' lack of knowledge and experience lead to a lack of confidence to introduce computers in their instruction. Rice et al., [41] opine that teachers must possess positive attitudes toward technology as well as the ability and resources to teach with technology before they can seamlessly integrate technology into the social studies curriculum.

However, a new dimension to attitudes, skills and believes have been their relationship to gender. This is evident by the amount of research carried out in recent years to investigate whether gender differences exist with ICT usage [38, 6]. Some studies show that males hold higher positive attitudes towards the use of computer than females [32 , 19], while other studies showed that females prefer to use computers and have more knowledge about them than males [4]. In contrast, [20] found no difference between males and females. Although existing information is scattered and fragmented, a review of the available existing literature from different parts of the world has revealed that there are clear gender differences in access and use of ICT [36]. The digital divide interpretation is contentious. Some scholars think the digital divide is complex, tricky, widening, dynamic and becoming deeper [17]. Other scholars feel it is narrowing as more divides are created [17]. Yet some writers deny its existence altogether [17] or believe that the digital divide will disappear on its own [16].

What makes the seeming gap of importance in social studies is the fact that teachers in social studies are overwhelmingly females [15] and could have a detrimental effect on the effective teaching and learning of the subject. It is in this vein that this paper seeks to bring to bear whether gender differences exist among social studies teachers in the Cape Coast Metropolis in terms of their perceived ICT training, competencies and usage in the teaching and learning process.

Statement of the Problem

Technology can, at least in theory, have a "profound effect" on all subjects, especially social studies, a subject traditionally dominated by transmission-oriented teaching. Technology use can create more student-centered, constructivist approaches to the subject than have characterized the field in the past [18]. Cope and Ward [12] suggested that teachers'

perceptions of learning technologies are likely to be crucial in their successful integration. In other words, measuring an individual's perception is pertinent as it is likely to influence the human behaviour. Hence, female and male teachers' perceptions of issues surrounding ICT has a direct bearing on their usage. What recent studies in ICT integration in social studies have not captured is whether there is a disparity in perception among male and female teachers in social studies in relation to ICT, especially now that this 'effective tool' is seen as not only crucial for the teaching and learning process but also for professional advancement? The main objective of this study is to determine if gender differences exist among social studies teachers in terms of their perceived ICT training, competencies and usage.

Hypotheses of the Study

The study is guided by the following hypotheses:

H_1: There is a statistically significant gender difference among social studies teachers in ICT integration training.
Ho: There is no statistically significant gender difference among social studies teachers in competence derived from ICT integration training.
H_1: There is a statistically significant gender difference among social studies teachers in perception towards ICT usage.

Theoretical Review

Two dominant theoretical viewpoints are currently reflected in the majority of literature about gender and IT: essentialism and social construction [46]. Essentialism is the assertion of fixed, unified and opposed female and male natures [49]. The existence of biological difference between the sexes has led to a tendency to assume that other observed differences between men and women are due to biological determinates as well [36]. When applied to the topic of gender and IT, the essentialist theory presumes the existence of relevant inherent differences between women and men with respect to information technology. It uses the observed differences in the participation of women and men in the IT field as evidence of this view. Thus, the causes of gender underrepresentation in IT are attributed to biology. It turns to observed differences in men's and women's behavior for explanations of what are believed to be inherent, fixed, group-level differences that are based upon bio-psychological characteristics. Essentialism underlies research on gender and IT that views gender as a fixed variable that is manipulated within a positivist epistemology [47].

Atan et al.'s [6] analysis of this perspective points out that focusing on a background literature of psychology, alone, places too much emphasis on individual gender characteristics where a form of essentialism may creep in. Looking only to psychological explanations of observations without giving attention to the influence of context results in a determinist stance with respect to gender. One inference that could be drawn from an essentialist approach to gender and IT research is that women and men should be treated differently. For example, [47] recommended that trainers adopt different approaches toward men and women and that marketers design different marketing campaigns for men and women. Trauth's critique of essentialist approaches to gender and IT research suggested that one logical extrapolation from this line of thinking to IT workforce considerations would be the creation of two different workforces: a "women in IT" workforce and a "men in IT" workforce. Thus, policies for addressing the gender imbalance would focus on differences between women and men and the equality issue would focus on "separate but equal," something that was rejected in the arena of racial equality decades ago [46, 44 & 45].

The other dominant theoretical perspective focuses on the social construction of IT as a male domain. According to this theory, there is a fundamental incompatibility between the social construction of female identity and the social construction of information technology and IT work as a male domain. This explanation for women's relationship to information technology looks to societal rather than biological forces. Thus, the causes of gender underrepresentation can be found in both the IT sector and in the wider society. The literature on gender and technology in general [13, 49] and that of gender and information technology, in particular example [7, 43] looked to social construction theory [8] rather than biological and psychological theories. According to this view, the social shaping of information technology as "men's work", places IT careers outside the domain of women.

Empirical Review

Gender differences and the use of ICT have been reported in several studies. However, studies concerning teachers' gender and ICT use have cited female teachers' low levels of computer use due to their limited technology access, skill, and interest [48]. Research studies revealed that male teachers used more ICT in their teaching and learning processes than their female counterparts [26, 49]. Similarly, [34] investigated gender differences in self reported ICT experience and ICT literacy among first year graduate trainee teachers. The study revealed significant differences between males and females in technical ICT capabilities, and situational and longitudinal sustainability. Males' scores were higher. Jamieson-Proctor, Burnett, Finger and Watson [25] conducted a study on teachers' integration of ICT in schools in Queensland State. Results from 929 teachers indicated that female teachers were integrating technology into their teaching less than the male teachers. But the situation was different in mid-western US basic schools where [9] found that females' self-perceptions about technology competence improved while males' self-perceptions about technological dominance remained unchanged in a lego-logo project. The study was in agreement with [1] that female teachers applied ICT more than the male teachers. This study confirms report by [51] that gender gap has reduced over the past years, presently, a greater number of females than males have used internet and web 2.0 technologies.

However, some studies revealed that gender variable was not a predictor of ICT integration into teaching [37]. In a research conducted by [26], he found that male teachers had relatively higher levels of computer attitude and ability before computer implementation, but there was no difference between males and females regarding computer attitude and ability after the implementation of the technology. He claimed that quality preparation on technology can help lessen gender inequalities. Kirkpatrick and Cuban [29], however, noted that the gender gap is narrowed when both genders are exposed to the same amounts and types of learning experiences on computers. Atan et al. [6] further added that the absence of gender disparity is obvious when females and males are in a learning environment that requires the constant use of specific computer software to support their learning activities. However, activities such as handling computer hardware and performing computer maintenance are still seen as masculine in nature. King et al. [28] added that measurable gender differences exist when females construe computers as "masculine".

Chen and Tsai [11] also reported that males exhibited more favourable attitudes toward Web-based learning than females. Their results suggested that males perceived the proliferation and development of the Internet to result in a better tool in reducing the digital divide and establishing a society of equity and justice. Jackson et al. [24], however, found that while females used e-mails more than males, the latter used the Web more. Houtz and Gupta's [22] study found significant gender difference in the way females and males rated themselves in their ability to master technology skills. Even though both genders were positive about their technological ability, males rated themselves higher than females. Females view technology

as less of a threat when they perceive computers as a method of communication and not as a computational tool [28].

Methodology

The descriptive design was used to conduct the study and data was collected from a purposive sample of 50 social studies teachers from all senior high schools of the Cape Coast metropolis. A two page questionnaire was designed to collect data from respondents. This contained a five point Likert scale constructed for questions having exhaustive responses. Here, the items were presented as a declarative statement, followed by response options that indicate varying degrees of agreement with or endorsement of the statement. The responses were ranked as Strongly Agree (5), Agree (4), Not Sure (3), Disagree (2) and Stronlgy Disagree (1). The questionnaire was divided into two parts. The first part sought to elicit demographic information about participants and the second part required information on technology integration courses, competence and technology usage in social studies. A reliability estimate of the instrument gave a significant Cronbach alpha average value of 0.85. Completed questionnaires were retrieved and items were scored and coded and independent t-test analyses done using the Predictive Analysis Software (PASW) version 18.

Data Analysis

To elucidate whether there were differences in the perception of ICT integration courses offered in terms of gender, the t-test comparative analysis was conducted. The results are shown in Table 1.

Table 1: Comparative Analysis of Gender in Terms of ICT Integration Courses Offered

GENDER	N	Mean	Mean Difference	Std. Deviation	df	t	Sig. (2-tailed)
Male	25	3.68	-.36	.80	48	-1.72	.093
Female	25	4.04	-.36	.68			

Significant at p< 0.05(2-tailed)

Table 1 indicates that females recorded (M= 4.04, SD = 0.68) and males (M= 3.68, SD= 0.80). This implies that females had a higher mean response than males in terms of how they perceived ICT integration courses they have offered. However, the difference was not significant (t (50) =-1.72, p=0.93). Thus the first hypothesis was rejected. This shows that female teachers' perceptions were similar to those of the males regarding the ICT integration training received in teaching social studies within the 0.05 confidence level. This result could be justified by the fact that both genders had been exposed to very similar technology integration courses.

The comparative analysis was also conducted on male and female social studies teachers in terms of perception of competence obtained from technology integration training. The result is shown in Table 2.

Table 2: Comparative Analysis of Gender in Terms of Competence Derived from ICT Integration Courses

GENDER	N	Mean	Mean Difference	Std. Deviation	df	t	Sig. (2-tailed)
Male	25	3.60	-.16	1.00	48	-.57	.568
Female	25	3.76	-.16	.97			

Significant at p< 0.05(2-tailed)

Table 2 depicts that there was no significant difference between the means of female and male teachers with regards to the competence derived from ICT integration training. Hence the null hypothesis was not rejected. This is represented by (t (50) =-.57, p=0.568). Thus the large value of p>0.05 indicates the insignificance of the variation in mean figures for both males and female teachers in terms of their perception towards competence in ICT.

In determining the difference in perception of ICT usage by both male and female social studies teachers, another t-test was conducted and the result is shown in Table 3.

Table 3: Comparative Analysis of Gender in terms of Perception on ICT Usage in Social Studies

GENDER	N	Mean	Mean Difference	Std. Deviation	df	t	Sig. (2-tailed)
Male	25	3.92	-.08	.76	48	-.419	-.677
Female	25	4.00	-.08	.58			

Significant at p< 0.05(2-tailed)

The findings for the third hypothesis as depicted in Table 3 indicates that there is no significant difference in male and female social studies teachers in relation to their responses to their perception of ICT usage in Social Studies. (t (50) =-.4.19, p=-0.677). Thus the hypothesis was rejected that there was a statistically significant difference between the means of female and male teachers in terms of perception on ICT usage in Social Studies. This shows that female teachers' perceptions were similar to those of the males regarding their perception towards ICT usage in teaching social studies within the 0.05 confidence level.

Discussion of Results

The results obtained for the first hypothesis indicated that there is no statistically significant difference in perception of social studies teachers towards training obtained in technology integration. The novelty however of this finding was the fact that the mean values obtained for females were higher than that of males. This finding corresponds with what [29] work which noted that, the gender gap is narrowed when both genders are exposed to the same amounts and types of learning experiences on computers. Atan et al. [6] further added that the absence of gender disparity is obvious when females and males are in a learning environment that requires the constant use of specific computer software to support their learning activities. In this case all the graduate teachers of social studies were exposed to the same learning environment during their integration training.

The results for the second hypothesis was not different from the first. This is because there was no statistically significant difference in perception of ICT competence among male and female social studies teachers. The key finding here with regards to the mean response indicated females having a higher response rate than males. A result that is contrary to what

[22] study found that there was significant gender difference in the way females and males rated themselves in their ability to master technology skills. According to him, even though both genders were positive about their technological ability, males rated themselves higher than females. The reverse was however noted in the case of the social studies teachers in this study.

Findings in relation to the third hypothesis revealed that females continued to obtain higher mean values than males in their perception response towards the usage of ICT in the social studies classroom. This findings collaborates [9] study which revealed that females' self-perceptions about technology competence and usage improved while males' self-perceptions about technological dominance remained unchanged in a lego-logo project. This study confirms report by [51] that gender gap has reduced over the past years. King et al. [28] also believed that females view technology as less of a threat when they perceive computers as a method of communication and not as a computational tool. They purport that measurable gender differences exist when females construe computers as "masculine".

Conclusion

The perception of technology being the haven for males is gradually fading away, and female social studies teachers are now understanding and perceiving technology to be an effective tool in the classroom. This is underscored by their high rating of perceived training, competence and usage of technology in the social studies curriculum. The advantage has however been the exposure to same technology integration training together with their male counterparts, and this has bridged the wide gap that existed between males and females in terms technology integration with only the former hitherto having the advantage and positive orientation. The findings prove that females are now at par if not having a far more positive perception than their male counterparts.

Recommendations

The major recommendation of the present findings is that integration training in social studies if not offered in a different milieu between males and females and in varied environments, females will have a positive approach to training and even tend to grasp competence better than males. The essentialism philosophical recommendation by Venkatesh and Morris (2000) that trainers should adopt different approaches toward men and women in relation to ICT should be reconsidered, which is underpinned by the effect of exposing both sexes to the similar if not the same environment and approach to training.

We further recommend that, the social construction theory and perception of technology use being a male domain should be seen as an issue of antiquity. Technology should be perceived as an essential tool of the social studies teacher without an emphasis on gender.

In the wake of the above it behoves on government, ministry of education and other stakeholders to embark on integration training, perception and usage campaign in a holistic manner. Finally, the efforts at bridging the gender technology gap should be vigorously pursued in a continuum to cover all disciplines.

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