

Full Length Research Paper

Technology and gender equity: Rural and urban students' attitudes towards information and communication technology

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This study explored the attitudes of 324 male and female students from two urban and rural Senior High Schools in Ghana towards information and communication technology (ICT). Their average age was 18.3 with SD of 1.4. A six point Likert-type scale questionnaire was constructed to measure the participants' attitudes towards: 1) ICT for accelerated development (ICT4AD) policy in Ghana, 2) learning to acquire ICT skills and 3) using ICT to promote teaching and learning. Descriptive statistics, t-independent test, and univariate analysis were used to analyse the data. The results showed that generally students' attitudes towards technology do not differ in terms of gender. Furthermore, the results indicated that the locality of the male and female students does not influence their attitudes towards technology. However, according to the results students from urban areas have more positive attitudes towards technology than students from rural areas. The results were discussed in line with the literature.

Key words: Gender equity, rural areas, urban areas, information and communication technology, attitudes, technology.

INTRODUCTION

Technological literacy and integration of ICT in education have received great attention worldwide. This is because ability to use ICT to achieve one's goal is critical to economic, social, cultural and educational development. Harvey (1983) envisages that the effectiveness of the use of computers in education may be an important factor in determining which countries will succeed in the future. Following this idea, many governments have carried out policies involving investment in education, investment in infrastructure, creation of favourable institutions, and fostering new institutional innovations to promote ICT literacy programmes and integration of ICT in education (Quibria et al., 2003). In Ghana, many educational practitioners, policy-makers including the government, and other agencies accept that computer technology is the bedrock of quality socio-economic activities and quality education, particularly quality teaching and

learning (President's committee on review of education in Ghana, 2002; ICT4AD, 2003; World Bank, 2007). In this regard, a significant portion of the country's budget is invested in the planning and implementation of ICT policies for quality education and socio-economic development of the nation. Even though ICT awareness and competencies are increasingly important, there are some barriers that can handicap the success of ICT literacy programmes and the integration of ICT in education for the nations' development (Cunningham, 2007). Amongst others, researchers describe women's attitudes towards technology as problematic. Research findings from science, technology, engineering and math (STEM) provide theoretical grounding for the study of gender and ICT. In other words, research findings from STEM perspective identified emotional, cultural, and structural barriers which girls and women face in achieving technological equity. Studies on women's attitudes towards technologies in developed countries indicate that women's negative experiences with technologies have several consequences including limited participation in the information economy as well as limited participation

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in courses related to technology (Cunningham, 2007). In Ghana, generally, both national and education policies pay attention to gender balance. However, specifically, from the perspective of planning and implementation of ICT policies (ICT literacy programmes as well as integration of ICT in education) in Ghana, little or no attention has been paid to research on gender differences with technologies. This state of affair is in line with the assertion of Benzie (1995), confirmed by Albrini (2006) that in developing countries, national programmes have not been so successful to implement ICT into educational systems because they were not supported with educational research.

The present study is aimed at investigating the attitudes of male and female students (from rural and urban areas in Ghana) towards ICT. Furthermore, the study is intended to explore the effect of the geographical location (rural and urban areas) of the male and female students on their attitudes towards technologies. An evidence-based understanding of girls' and boys' (in the rural and urban areas in Ghana) attitudes towards technology will help contribute to successful planning and implementation of gender equity ICT literacy programmes and gender equity policies for integrating ICT into education. In addition, effective and efficient management and administration of ICT; investment in infrastructural support; and in-service training for teachers will also benefit from evidence of girls and boys (from rural and urban areas in Ghana) attitudes towards technology.

Literature on ICT, attitudes and gender

Information and communication technology has become an indispensable tool for democratic society, the information economy, and quality education. And as such it is impossible for any country to participate fully in the globalised economy, the democratic economy and develop the potentials of its citizens without technological literacy. From the economic perspective, the shift from the industrial to the information economy has essentially completely changed the structure of work (Cunningham, 2007). Workers in the present world of work need to have integrated sets of knowledge and skills in the domain and more importantly an adequate knowledge in ICT. According to ITIC (2005), ICT oriented jobs are projected to increase by 34% by 2010. Technological skills and literacy are also important for developmental democracy (Cunningham, 2007; MacPherson, 1977; Sen, 1992). Developmental democracy emphasizes self-development, autonomy, and freedom – the freedom one has to achieve his or her potential; and participate fully in the society and to control his/her own destiny. Similarly, as indicated by Gigler (2004), similar to literacy, newly acquired ICT skills can act as an agent for change for individuals and communities enhancing their abilities to engage with the formal institutions in the economy,

political, social and cultural spheres of life (p. 31). Moreover, there is abundant evidence in the literature that ICT is a critical key to quality education for all. In education, ICT has become a subject of study in its own right; it is also having a remarkable impact across all curriculum areas. Therefore continued development of policies and pedagogical models for effective integration of ICT into education has become the agenda for both developed and developing countries. In education, ICT is used for multiple purposes (Olakulehin, 2006). According to Heinich et al. (1996) and Smaldino et al. (2008), in education ICT can be used: 1) to aid management and administrative activities, 2) as an object of instruction, and 3) for learning and instructional purposes.

Using ICT as an object of instruction consists of learning to acquire ICT knowledge and skills to cope with the challenges of the knowledge economy and democratic society. Using ICT for learning and instructional purposes focuses on the use of ICT to acquire an integrated set of knowledge and skills in the subject areas in order to perform effectively in the world of work. Kozma (1991, 1994) indicates that taking into consideration the processing capabilities of ICT tools, it must be argued that: 1) ICT may enable learners to elaborate their mental models and correct their misconceptions with the use of a macro world; 2) ICT can enable learners to connect their symbolic learning in school to real world situations, and 3) ICT can also enable learners share ideas across different cultures. Bransford et al. (1999) claim that a number of features of ICT tools are consistent with principles of the science of learning and hold promise for improving teaching and learning. It is argued that ICT serves as a valuable tool for the development of individuals as well as countries across the world. As indicated by Lima and Brown (2007) on global citizenship, "the world we live in is constantly changing and generating new challenges for its inhabitants. ICT presents opportunities for all to be more informed, engaged, and able to communicate within an interconnected world, but new skills must be mastered by the individuals to be empowered and included in this knowledge society where access and use of information are the most valuable asset" (p.141).

Attitudes are one of the most studied aspects of social functioning. An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations to which it is related (Allport, 1954). In the literature, three accepted concepts generated from the term attitude are: cognitive (a person's knowledge about an attitudinal object), affective (a person's feelings about an attitudinal object), and behavioral (a person's action towards the attitudinal object in a certain way). According to Fisbien and Ajzen (1975), attitude is an important concept that is often used to understand and predict people's reaction to an object (such as ICT) or change and how behavior can be

influenced. Several types of scales have been developed to measure attitudes. One of the most recognized scales for measuring attitudes is the Likert-type scale. The scale demands that individuals make a decision on their level of agreement.

Women's and girls' negative attitudes towards ICT can deter them from achieving quality education through ICT; and consequently prevent them from functioning well in the knowledge economy and democratic society. As pointed out by Cunningham (2007), females' negative experiences with technology have several social, cultural and economic consequences. This includes limited employment opportunities, limited participation in the information economy, as well as limited participation in ICT oriented classroom/training activities.

It is argued that the negative attitudes of females towards ICT are incompatible with global citizenship. For this reason the rather low number of females in ICT fields attracts a lot of attention worldwide in the present era. This is reflected in the statement to the World Summit on the Information Society, Geneva, 10 December, 2003 by United Nations Secretary General, Kofi Annan that:

“The so-called digital divide is actually several gaps in one. There is a technological divide – great gaps in infrastructure. There is a content divide. There is a gender divide, with women and girls enjoying less access to information technology than men and boys. This can be true of rich and poor countries alike.”

The organisation for economic development and co-operation (OECD) (2007) presented an overview of the differences between men and women in ICT-related employment, ICT education and training, and ICT access and use among 31 OECD countries. The results indicate that the gender gap with regard to ICT continues. There are significant differences between women and men in ICT-related employment, with women having low shares of employment in ICT specialist occupations (for example, software engineers, IT specialist). Among the most intensive users of ICTs, women are most heavily represented in office and secretarial occupations rather than professional ones. In addition, according to the results the differences are also a reflection of educational patterns, with women tending not to go into ICT education to the level same as men. Moreover, as indicated by the results, in terms of ICT access across the whole population, differences are significantly lower. But women tend to have lower access to ICTs (PCs and the internet) overall and these gaps are heightened amongst older age groups. In regard to the actual use of ICT, the OECD findings demonstrate that women and men tend to use their access differently. It can be argued that the OECD (2007) findings provide comprehensive evidence that generally, women in 31 OECD have negative attitudes towards ICT related employment and ICT oriented education and training as compared to men.

Similarly, in a research study conducted by Yuhkymenko and Brown (2009) in Ukraine, the results indicate that boys had significant greater access to a computer at home than girls; and boys often have more access to internet than girls do. This finding is more in line with the findings of OECD (2007). However, research study conducted by Cavas et al. (2009) indicates that the attitudes of females and males science teachers in Turkey do not differ in terms of gender.

Even though this finding generates a lot of debate but it seems to be in line with the view of Cooper (2006) that the gender gap in the use of and knowledge about ICT has diminished. But having diminished does not mean that the gap is closed. Researchers (Hafkin and Taggard, 2001) have proposed several reasons for the negative attitude towards ICT among women. It is important to take note that biological explanations to females' negative attitudes towards technology fields have generated a lot of complex debate (Swidey, 2005). However, research conducted by STEM reveals that the negative attitudes of females towards ICT fields can be explained, theoretically, in line with emotional, cultural, and structural barriers (Cunningham, 2007). In terms of cultural barrier, many research findings (Butler, 2003; AAUW, 2000) provide evidence that the culture of technology classes is unfriendly to girls. According to the results of a study conducted by Isomuru (2004) and Margolis and Fisher (2002), girls report that computer culture is masculine. These perceptions and conceptions of girls that the culture of computer is more friendly for boys and unfriendly for them might explain why females have unrealistic attitudes towards the computer. In addition, from the perspective of structural barrier, there is evidence (Young, 2000) that teachers treat boys and girls differently in the classroom; and more specifically teachers encourage girls to remain where they are. For instance, in her research study, Young indicates that girls have lower confidence with their computer skills than boys. Meanwhile girls perceived their teachers as encouraging but boys did not perceive their teachers as encouraging. This suggests that girls like teachers may be because teachers understand their level of confidence. For example, towards ICT and not challenging them to do more to that. Young (2000) argues that this raises a question such as whether or not teachers are “killing with kindness” and not challenging girls to learn beyond their own. Moreover, according to Hafkin and Taggard (2001), a series of factors including the geographical location of technological facilities constrain womens' access to ICT. In developing countries, most of the technological facilities are concentrated in the urban areas. There is lack of adequate infrastructure such as telephone facilities, satellite facilities, electricity, and more especially communication centers in the rural areas. This therefore indicates that males and females attitudes towards ICT would depend on the geographical location (rural or urban). In

developing countries, such as Ghana, attempts have been made by the government to develop a comprehensive policy to promote global citizenship as well as successful integration of ICT into education.

In 2004, the Parliament passed into law Ghana's ICT for accelerated development (ICT4AD) policy. The policy indicates the vision of Ghana in relation to ICT in the knowledge and technological age. It addresses the exploitation and deployment of ICT to promote the economy – financial system, agriculture, civic, culture, import, export, democracy, legal, education, and others – of Ghana. This policy is at various stages of implementation. For instance, in 2009, ICT courses were introduced in all basic and second cycle schools in rural and urban areas of Ghana. This initiative by the government, as stipulated in ICT4AD policy, is to ensure that students have ICT skills before coming out of each level of education. Furthermore, computer laboratories are built in most of the schools. The intention is to equip these laboratories with adequate ICT tools to facilitate teaching and learning as well as the acquisition of ICT skills. However, there is no evidence based information about women/girls' and men/boys' attitudes towards ICT (gender and ICT) in Ghana. According to Hafkin and Taggart (2001), it is extremely difficult to get data on gender and technologies in developing countries. The International Telecommunication (2009) gathers data on the internet and computer use by countries but the data are not sex-disaggregated. But as discussed earlier, an evidence-based knowledge about gender and attitudes towards ICT use in Ghana would help to promote: government ICT4AD policy, the policy on successful integration of ICT into education, and global citizenship. Furthermore empirically based knowledge about gender and attitudes towards ICT use in Ghana will help contribute to knowledge and understanding of information and communication technology and gender equity in developing countries in the literature. This study is designed to explore the attitudes of male and female Senior High School (SHS) students (from rural and urban areas in Ghana) towards 1) ICT4AD policy in Ghana, 2) learning to acquire ICT skills, and 3) using ICT to facilitate teaching and learning. Furthermore, the study is intended to explore the effect of the geographical location (rural and urban areas) of male and female students on their attitudes towards technologies.

METHODOLOGY

Participants

The target population for the present study is males (boys) and females (girls) in rural and urban SHSs in Ghana. Since the population consists of similar entities and taking into consideration other constraints (such as financial), to answer the research questions, 324 students from two urban and two rural SHSs in the Ashanti Region of Ghana were randomly selected. The school registers were used as the sample frame. The units in the sample

frame were numbered. And the numbers were used randomly (the technique for the selection provided equal chances for any number to be chosen) to select the sample. The sample finally consisted of 159 males (98 from urban and 61 from rural schools) and 165 females (86 from urban and 79 from rural schools). Their average age was 18.3 with the standard deviation of 1.4.

Materials

The basic material for the study was a questionnaire. A six points Likert-type scale questionnaire, ranging from strongly agree (6) to strongly disagree (1), was constructed to measure the participants' attitudes towards: 1) ICT4AD policy in Ghana, 2) learning to acquire ICT skills (LiAICT) and 3) using ICT to promote teaching and learning (ICT4TL).

The questionnaire consisted of the introduction, Part I and II. The introduction briefly contained the importance of the study and the fact that participants' responses would be treated as confidential. Part I included participants' profile: age, sex, and name and geographical location of school. Part II consisted of three parts of Likert-type scales as already mentioned. The first part which consisted of 13 items was constructed based on the 13 main objectives of the ICT4AD policy in Ghana. Each of the objectives was used to construct a statement. The students were asked to rate the statement in terms of the extent to which they agree (Table 1). The second and third parts of the scale, each consisted of 6 items or statements, were constructed based on the potential roles of ICT in education (Heinich et al., 1996; Smaldino et al., 2008). The students were asked to rate each statement in terms of the extent to which they agreed (refer to table 1 for details of the scales). The questionnaire was pilot tested. The Cronbach alphas were: 0.77 for ICT4AD scale, 0.72 for learning to acquire ICT skills, and 0.72 for using ICT to promote teaching and learning. The Cronbach alpha for the entire three scales (the global scale) was 0.81.

Procedure

The questionnaire was administered to the students in their normal classrooms. Through the help of the various headmasters and headmistresses of the schools, the researchers met the selected subjects and the rationale for the study was made known to them. In addition, the participants were instructed to work independently and they were supervised by the researchers. They were allowed to use 25 min to answer the questions. All the questionnaires were collected back from the students at the end of the stipulated time. This procedure yielded a 100% return rate.

Data analysis

The responded questionnaires were scrutinized to identify mistakes. In order to facilitate scoring and analyses, the data were coded according to the following rules: Strongly disagree – 1; disagree – 2; somewhat disagree – 3; somewhat agree – 4; agree – 5; strongly agree – 6. All the responses were inputted into the computer for computer analyses (SPSS – 16). Descriptive statistics, student t test, and multivariate analyses were used to analyse the data.

RESULTS

The study aims at investigating the attitudes of male and female students in urban and rural schools in Ghana

Table 1. Description of the 3 scales.

A	ICT4AD scale
	In Ghana computer/internet is better means for:
1	Speeding up human resource development.
2	Achieving quality education.
3	Facilitating government administration and service delivery.
4	Developing export oriented products and services industry.
5	Modernizing agriculture and developing business industry.
6	Developing a globally competitive value-added services sector.
7	Promoting national health.
8	Rapid development of physical infrastructure.
9	Developing scientific and industrial research capacity.
10	Providing legal, regulatory, and institutional frameworks.
11	Facilitating national security and law and order.
12	Promoting foreign and local direct investment drive.
13	Facilitating the development of the private sector.
	B LtAICT scale
	In Ghana it is very necessary for every student to:
1	Learn about a computer/internet.
2	Learn to use a computer/internet.
3	Learn social issues related to the use of computer/internet.
4	Use computer/internet for typing text and drawing objects.
5	Use computer/internet to communicate with others around the world.
6	Use computer/internet to solve complex mathematics problems.
	C ICT4TL scale
	In Ghana, computers/ICT should be used to:
1	To help students learn specific skills, knowledge and attitudes.
2	To help students communicate their ideas.
3	To engage students with real world problems.
4	To help students to think logically and systematically.
5	To help students acquire good problem solving skills.
6	To help students explore new ideas in the real world.

towards ICT. The following results were found in line with the research questions.

Attitudes of students towards ICTF4D policy

Table 2 shows the statistical scores of the students' attitudes towards ICT4ID policy in Ghana. The *t* independent test analyses indicated that there is no significant difference between attitudes of males and females from rural and urban areas in Ghana towards ICD4AD policy. This means that attitudes of males and females (from urban and rural areas) towards ICT4AD policy are similar. However, the *t* independent test revealed statistical significant difference between students in urban schools and students in rural schools on their attitudes towards ICT4AD policy in Ghana ($t(317) = 0.29$, $p = 0.001$). Indicating that students from urban areas have more positive attitudes ($M = 4.6$) towards ICT4AD policy

than students in rural areas ($M = 4.2$).

Attitudes of students towards learning to use ICT

Table 3 depicts the statistical scores of the students' attitudes towards learning to use ICT. *t* independent test analyses indicated that there is no statistically significant difference between attitudes of males from rural and urban areas in Ghana towards learning to use ICT. This means that attitudes of males and females (from urban and rural areas) towards learning to use ICT are similar.

Attitudes of students toward the use of ICT for teaching and learning

Table 4 shows the statistical scores of the students' attitudes towards the use of ICT for teaching and

Table 2. Statistical scores on students attitudes towards ICT4AD policy.

Attitude	N	Mean	Standard Deviation	t	p
Gender (overall)					
Male	159	4.46	0.43		
Female	169	4.40	0.50		
Total	324	4.43	0.8	0.59	0.55
Location					
Urban	179	4.6	0.73		
Rural	139	4.2	0.72		
Total	318	4.4	0.75	0.29	0.001
Gender (urban)					
Male	98	4.5	0.78		
Female	81	4.7	0.71		
Total	179	4.6	0.74	1.68	0.093
Gender (rural)					
Male	61	4.3	0.77		
Female	78	4.1	0.72		
Total	139	4.2	0.75	1.42	0.151

Table 3. Statistical scores on attitudes of students towards learning to use ICT.

Attitude	N	Mean	Standard deviation	t	p
Gender overall					
Male	157	5.17	1.02		
Female	156	5.22	1.27		
Total	313	5.19	0.02	0.53	0.59
Location					
Urban	177	5.28	1.17		
Rural	136	5.09	0.50		
Total	313	5.23	0.71	0.67	0.50
Gender (urban)					
Male	97	5.22	0.82		
Female	80	5.33	0.85		
Total	177	5.27	1.17	0.62	0.53
Gender (rural)					
Male	60	5.07	0.83		
Female	76	5.11	0.77		
Total	136	5.09	0.80	0.26	0.79

learning. The *t* independent test analysis indicated that there is no statistically significant difference between attitudes of males and females from urban areas in Ghana towards the use of ICT for teaching and learning. This means that attitudes of males and females from urban areas towards the use of ICT to promote learning are similar. However, the *t* independent test revealed statistically significant difference between attitudes of males and female students in rural areas towards the use of ICT for teaching and learning ($t(135) = 1.98; p = 0.48$).

Indicating that male students from rural areas have more positive attitudes ($M = 4.89$) towards the use of ICT for teaching and learning than female students in rural areas ($M = 4.77$).

Students' attitudes towards ICT in general

Table 5 presents the mean scores on students (from rural and urban areas) attitudes towards ICT in general

Table 4. Statistical scores of students' attitudes towards the use of ICT for teaching and learning.

Attitude	n	Mean	Standard deviation	t	p
Gender (overall)					
Male	157	4.95	0.821		
Female	156	4.91	0.853		
Total	313	4.93	0.837	0.34	0.74
Location					
Urban	177	5.00	0.831		
Rural	136	4.82	0.833		
Total	313	4.91	0.85	1.46	0.225
Gender (urban)					
Male	97	4.98	0.82		
Female	80	5.03	0.85		
Total	177	5.00	0.83	1.92	0.55
Gender (rural)					
Male	60	4.89	0.82		
Female	76	4.77	0.84		
Total	136	4.82	0.83	1.98	0.48

Table 5. Mean score of students' attitude towards ICT in general.

Location of institution	sex	Mean	Std. deviation	N
Urban	Male	14.7536	2.44439	97
	Female	15.0741	1.75490	80
	Total	14.8985	2.16034	177
Rural	Male	14.3178	2.12870	60
	Female	13.9471	1.85012	76
	Total	14.1107	1.97892	136
Total	Male	14.5871	2.33150	157
	Female	14.5251	1.88288	156
	Total	14.5562	2.11664	313

(ICT4AD, LtAICT, and ICT4TL). Univariate analysis on the mean scores revealed statistically significant main effect for attitudes of students from urban and rural areas towards ICT in general $F(1,313) = 10.691$. $p < .001$. "eta square" = 0.033; indicating that students from urban areas have more positive attitudes ($M = 14.90$) towards ICT in general than students from rural areas ($M = 14.11$). However, univariate analysis revealed no statistically significant difference between males and females (from rural and urban areas) attitudes towards ICT in general (ICT4AD, LtAICT, and ICT4TL), indicating that generally there are attitude similarities among male and female students from rural and urban areas towards ICT. In addition, there was an interaction effect between attitudes of male and female students in urban areas and attitudes of male and female students in rural areas

towards ICT (Figure 1) but the relationship is not statistically significant, "eta square" = 0.007 (which is very low). Furthermore, t independent test showed no statistically significant difference between the attitudes of male and female students from urban areas towards ICT in general, indicating that attitudes of male and female students in urban areas are alike. Similarly, t independent test revealed no statically significant difference between the attitudes of male and female students in rural areas towards ICT in general.

DISCUSSION AND CONCLUSION

This study was designed to investigate the attitudes of male and female SHS students (from rural and urban

Estimated marginal means of ICT attitude

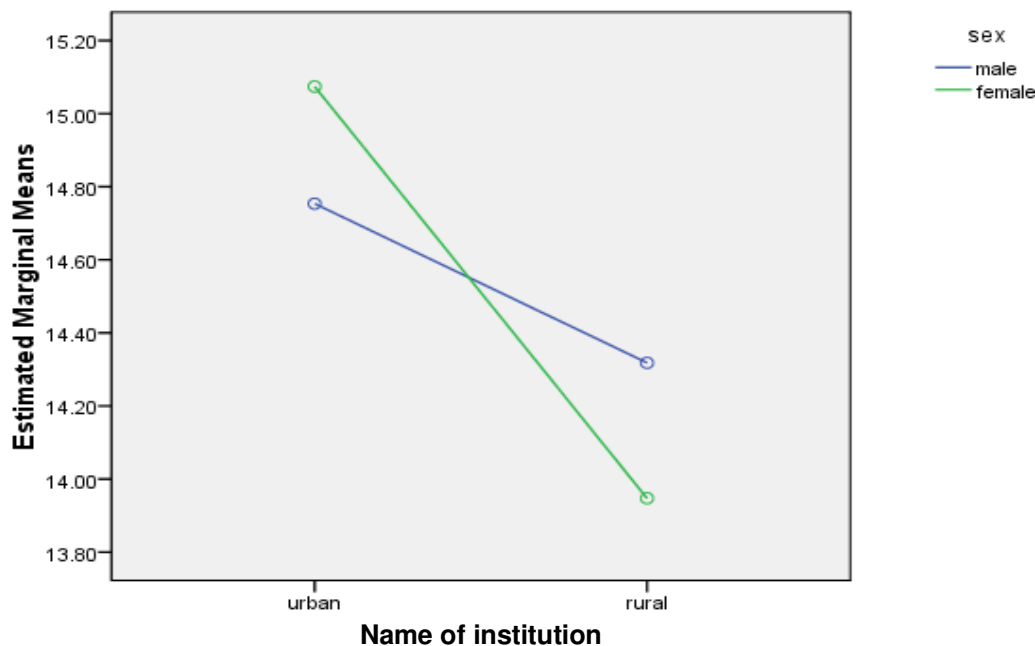


Figure 1. Interaction effects of gender attitude and geographical location.

areas) towards the use of technologies in Ghana. Furthermore, the study was set out to explore the interaction effect of geographical location of male and female students on their attitudes toward ICT. A six point likert –type scale was used to collect the data. The result of the study shows that generally there is no significant difference between the attitudes of males and female SHS students (from rural and urban areas in Ghana) towards ICT (ICT4AD, LtAICT and ICT4TL). This result could be interpreted to mean that in Ghana girls and boys in rural and urban areas have similar attitudes towards technologies. This finding contradicts the findings of Shade (2002), OECD (2007), Yuhkymenko and Brown (2009), and the report of Kofi Annan (2003) that woman/girls have negative experiences in the use of ICT. However, this finding is in consonance with Cavas (2009) that there is no significant difference in attitudes of male and female science teachers towards ICT use. It is important to consider that the sample of some of the research findings (OECD, 2007; Shade, 2002) mostly focus on women; and the sample of the present study focuses on girls. In the OECD findings, it was reported that the gender divide in attitude towards ICT is heightened among the old people and less significant among the youth. This report from the OECD findings and the present findings seem to support Cooper (2006) and it could be interpreted that the gender (girls and boys) gap in attitudes towards the use of ICT among the youth, to some great extent, is not like “the past”. The following reasons might explain the disappearance of

gender (girls and boys) gap in attitudes towards the use of ICT (in Ghana). First, the youth (including boys and girls) in the present technological era (or digital world – including Ghana), are considered as digital natives (Prensky, 2001; Sarfo and Ansong-Gyimah, 2010). Irrespective of physical or emotional factors, the digital natives have become attached to the emerging ICT tools. This is in line with the old theory of Zajonc (1968) that the more a person is exposed to an object or a person, the more he or she responds positively to that object or person. Hence, the girls’ realistic attitudes as boys towards ICT.

Secondly, recently both governmental and non-governmental organizations have become more gender sensitive than in the past. In Ghana for instance, recently the government has established Women’s Ministry. Among other things the ministry is responsible for empowering women and girls and building their self-confidence in STEM fields. In addition, several NGOs in Ghana have been using the available FM stations, TV stations, and newspapers as good platforms to promote programmes intended to empower girls and increase their self esteem, for example, towards the use of ICT. On the other hand, the fact that the findings of this study and Cooper (2006) contradict the findings of Yuhkymenko and Brown (2009) suggests that generally attitudes of males and females towards ICT use is inconsistent. However, according to the result of the study, students (both girls and boys) in urban areas have more positive attitudes towards ICT use than students

(both girls and boys) in rural areas. These attitudes dissimilarities among students in urban areas and rural areas are in line with the proposition of Hafkin and Taggard (2001). The following reason may explain the differences in attitudes of students from rural and urban areas towards ICT. In developing countries, the ICT facilities (such as internet, communication center, connectivity, electricity, telephone) are more available in the urban areas than rural areas. Therefore the students in the urban areas might have more access to ICT facilities than the students in the rural areas. And as already stated the more a person is exposed to an object (such as ICT tools) or a person, the more he or she responds positively to that object or person (Zajonc, 1968). Furthermore, the results of the study in totality shows that the geographical location (rural or urban areas) of students does influence or affect the gender divide in attitudes towards ICT use but the effect is not significant. In addition, more specifically the study provides empirical evidence that female students and male students in the urban areas have similar attitudes towards ICT; and attitudes of female students and male students in the rural areas towards ICT are comparable.

If attitudes actually predict people's behavior as proposed by Fisbien and Ajzen (1975), then the study provides evidence that gender divide among the youth in the urban and rural areas does not constitute much of a problem for the 1) ICT4AD policy in Ghana, 2) learning to acquire ICT skills, and 3) using ICT for teaching and learning or integration of ICT into teaching and learning to promote quality education in Ghana. In the present study, the participants were randomly selected from only one region out of the ten regions in Ghana. In addition, the participants, as their average age indicates, are mostly girl and boy literates. It is also important to note that the present study didn't investigate the actual use of ICT tools among girls and boys in the rural and urban areas. Moreover, there are little or no research findings on males (boys) and females' (girls) attitudes towards ICT use in Ghana. Based on the aforementioned limitations or weaknesses of the present study, it is suggested that a similar research study should be replicated in the remaining nine regions to validate and generalise or challenge the findings. The suggested research study should categorise the participants in terms of: 1) young, 2) old, and 3) level of education; and investigate the actual use of ICT tools among girls and boys in rural and urban areas. It is hoped that this would give researchers and policy makers a comprehensive knowledge based about gender and ICT use (in Ghana). In conclusion, it is argued that the present study was systematically conducted. Therefore, the study provides evidence that attitudes dissimilarities among girls and boys towards the use of ICT, to some extent, can be reduced or even eliminated in both urban and rural areas (in developing countries) if ICT facilities are available in both areas. In general, the results of the present study together with cooper (2006) provide very positive findings and help to

think more positively.

The present study shows that differences in attitudes towards ICT use among girls and boys or males and females (in Ghana) can be overcome. However, considering the findings of research studies in other countries and the finding of the present study, it is suggested that generally gender and attitudes towards ICT use is a very complicated issues and therefore calls for more research studies.

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