Gender Differences in Pedagogical Interaction of Information Communication Technology Among Science and Mathematics Teachers in Public Secondary Schools in Kieni West Subcounty, Nyeri County, Kenya

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Abstract
The importance of pedagogical integration of ICT in Kenya and globally cannot be overemphasized. It is becoming increasingly apparent that all aspects of people's lives including the way education is taught and delivered are greatly influenced by developments in Information and Communication Technologies (ICTs). This study was carried out to investigate gender differences in pedagogical interaction of Information Communication Technology among science and mathematics teachers in public secondary schools in Kieni West subcounty,Nyeri county,Kenya.The objectives of the study are to (i) establish gender differences in E-learning preparedness in teaching and learning (ii) explore gender differences in attainment of computer skills in teaching and learning and (iii) examine how the proficiency of ICTs influences ICT integration in teaching and learning. Questionnaires were administered to 18 male and 11 female sciences and mathematics teachers. Findings indicated that 81.3% and 30% of the male and female teachers respectively had no usage on power point. Further 72% and 63.6% of the male and female teachers had no access to computers. Gender differences were realized in E-learning preparedness as well as in ICT skills attainment among science and mathematics teachers in public secondary schools in the district. The study recommends that all teachers need to be trained on the basic computer skills.

Keywords: *Pedagogical Integration of ICT, usage on power point, ICT skills attainment, gender differences,*

1.1 Background to the Study
Knowledge is the chief currency for transacting the future and the essence of modern age that propels socio-economic, political, and cultural development of society. An effective system of education is normally tasked to provide knowledge and skills to the learner that which can be used as a key to advance, reproduce and enhance a suitable economy. In essence, knowledge provided

through an education system ought to adequately and efficiently equip the learner and prepare one to realize and effectively utilize the eight goals of education as stipulated in the education policy of a given nation (KIE Syllabus, 2002).The rapid growth in Information Communication and Technologies (ICT) has brought remarkable changes in the education sector in the twenty-first century and affected demands of the modern society. Therefore there is need for all the stakeholders in the field of education to be well equipped with ICT in order to bridge the existing technology gap in teaching and learning processes. To successfully initiate and implement educational technology in the schools depends strongly on the teachers' support and attitudes.Teachers' attitudes toward the use of educational technology can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes.Teo (2008) showed teachers were more positive about their attitude towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer. Teachers' computer experience relates positively to their computer attitudes. According to Peralta & Costa (2007), teachers with more experience with computers have greater confidence in their ability to use them effectively. Jones (2004) reported that teachers competence relate directly to confidence. Teachers' confidence also relate to their perceptions of their ability to use computers in the classroom, particularly in relation to their children's perceived competence.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 (Volman & van Eck, 2001).Studies indicate that male teachers used more ICT in their teaching and learning processes than their female counterparts (Kay, 2006; Wozney et al., 2006). Similarly, Markauskaite (2006),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.

A major challenge identified in many developing countries regarding adoption and use of ICT in schools is that there is no enough staff, and where there are, they are most likely IT professionals without any education experiences, skills, and/or qualifications. To effectively harness ICT for school purposes requires sustained investments in supporting teachers training in order to create new learning environment (Jimoyiannis, & Komis,2007). Teachers play a critical role in implementation and use of ICT as they are at the centre of curriculum implementation and innovation at school level. However, many schools face a challenge of shortages of ICT teachers and other IT professional that support adoption and use of it in classroom. Many schools continue losing well trained ICT teachers to private sector which seems to pay higher salaries (GOK, 2010).To successfully implement ICT in schools depends strongly on teachers' training on the technology. Breisser (2006) 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 (Adams, 2002) that female teachers applied ICT more than the male teachers.Studies have revealed that gender variable was not a predictor of ICT integration into teaching (Norris, Sullivan, Poirot & Soloway, 2003). ICT related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006), influence teachers' attitudes towards computers (Hew and Brush, 2007; Keengwe and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).Sandholtz & Reilly (2004) claim that teachers' technology skills are strong determinant of ICT integration, but they are not conditions for effective use of technology in the classroom. They argue that training programs that

concentrate on ICT pedagogical training instead of technical issues and effective technical support, help teachers apply technologies in teaching and learning.Research studies revealed that quality professional training program helps teachers implement technology and transform teaching practices (Brinkerhoff, 2006; Diehl, 2005). Access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education (Plomp, Anderson, Law, & Quale, 2009). Though infrastructure support is imperative, school technology leadership is a stronger predictor of teachers' use of computer technology in teaching (Anderson & Dexter, 2005). Yee (2000) believe that a leader who implements technology plans and also shares a common vision with the teachers stimulate them to use technology in their lessons.

Yildirim (2007) reported that the major use of technology by teachers was to prepare lesson notes and assessments instead of improving students' performances. The research also revealed that barriers to the use of technology include congested classes,insufficient training, inadequate technical and pedagogical support, rigid school syllabi,inadequate motivation, lack of strong leadership and inadequate cooperation among teachers.Slaouti & Barton (2007) also claimed that lack of access, time pressures, lack of mentors and opportunities for training have effect on teachers' use of ICT in teaching and learning. Chigona & Chigona (2010) found that inadequate training, lack of access to computer laboratories, lack of technical support and inadequate technology resources were factors discouraging teachers from implementing ICT into their teaching. Thuranira and Ndirangu(2014),carried out a study on teachers' preparedness and found that 75.9% of the teachers disagreed that the schools organize regular training on computers while 24.15 % agreed.The findings indicated that 24.1% of the teachers agreed that they had attended forums on e-learning organized for teachers recently while 75.9% had not.Further,.the study found that 32.1% of the teachers disagreed that there are teacher(s) who act as resource persons in e-learning while 67.8% agreed .Regarding confidence in using computers in lessons the response was that 55.1% teachers agreed while 44.8% disagreed, further 46.4% of the teachers used computers regularly. Performance in science and mathematics seem to be lower than in the languages and humanities as well as applied scinces.Integration of ICT in schools acts as a booster in science and mathematics. However, while there are a number of studies On gender differences in teachers' perceptions, skills and practices of ICT in secondary schools in developed countries, there is lack of study on gender differences in pedagogical interaction of information communication technology among science and mathematics teachers in public secondary schools in Kieni-West Subcounty,Nyeri County- Kenya.

1.2 Problem Statement

Kay (2006), 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. If both male and female science and mathematics teachers are well prepared as far as information and communication technology skills are concerned in the teaching and learning process, then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. These would easily result to quality grades in mathematics and sciences in national examinations in the county as well as nationally. While it is shown that teachers' computer experience has a positive impact on the performance of students it is not clear on the gender differences in the teachers' interaction in the information and communication technology. It is for this reason therefore that the researchers were prompted to investigate the pedagogical interaction of Information

Communication Technology among science and mathematics teachers in public secondary schools in Kieni-West Subcounty,Nyeri County- Kenya.

1.3 Purpose of the Study

The purpose of the study was to establish gender differences in pedagogical interaction of Information Communication Technology among science and mathematics teachers in public secondary schools in Kieni West Sub -County,Nyeri County,Kenya.

1.4 Objectives of the Study

The objectives of this study were to:

(i) Establish gender differences in E-learning preparedness in teaching and learning
(ii)Explore gender differences in attainment of computer skills in teaching and learning and
(iii)Examine how the proficiency of ICTs influences ICT integration in teaching and learning.

1.5 Significance of the study

The findings and recommendations of this study are expected to provide measures which should assist teachers to be well equipped with ICT skills and apply them in teaching and learning process at all levels of education. Further,the findings of this study are expected to open areas for further study by other researchers and academicians, hence benefiting the whole community.

2.0 METHODOLOGY

2.1 Research Design

The research design adopted in this study was descriptive survey. This method was relevant to the study because it involved frequency of answers to the same questions by different respondents. Both qualitative and quantitative techniques were used.This study sought to establish gender differences in E-learning preparedness in teaching and learning and in the attainment of computer skills in teaching and learning among science and mathematics teachers.The researcher used questionnaires and interviews to collect data. By qualitative techniques, the researcher included open ended items where the respondents were given an opportunity to express their views. Data was categorized; themes established, coded, entered and gender differences in teachers interaction with information and communication technology. By use of this design the researchers intended to report the status of parental involvement in their children's education as it were in the schools studied.The study targeted science and mathematics teachers in public secondary schools Kieni-East Subcounty. Convinience sampling technique was used in this study where the researchers dwelt on science and mathematics teachers who had attended a science and mathematics workshop at the sub county headquarters.

2.2 Research Instruments

The research study used triangulation methodology in data collection. Questionnaires, document analysis and researcher's own observation were used. Questionnaires were administered to 18 male and 11 female sciences and mathematics teachers. Observations were made where information recorded was researcher's own observation, without interviewing the respondents. The information

was related to what was happening during the material day of the study and was not related to the past behaviours or future intentions.

2.3Data Collection Procedure

The study used primary data. Quantitative and qualitative methods were employed in data collection. Quantitative method has the advantage of getting responses of the same questions from a large number of people. Their responses can then be quantified and conclusions drawn from them. Qualitative method enables the researcher to collect data in the actual context in which the actual phenomenon occurs. Questionnaires were issued to the teachers and collected after three days. Upon completing the exercise, the researcher filed the instruments .The researcher then processed the instruments for analysis by eliminating unusable data where the respondents gave the same data to two or more questions and ambiguous answers were interpreted.

2.4 Data Analysis

In this study qualitative data was derived from open-ended questions in the questionnaires and was meant to supplement quantitative data availed by the questionnaire. The researcher perused the collected data and identified information that was related to the research questions and objectives and came up with themes. Different cards were used to record different themes. Related topics to the research questions were categorized and a coding system developed based on collected data. The frequency with which an idea or description appeared was used to interpret the importance. To facilitate quantitative analysis, questionnaires were precoded. A code book was prepared to enable the data to be entered into the computer. For objective items data was first organized in terms of percentages according to the categories on the likert rating scale type responses. The data was tabulated on the basis of how many strongly agreed (5points), agreed (4points), neutral (3points), disagreed (2points) and strongly disagreed (1point) and presented as percentages of the total number of responses. The researcher allocated 1 to no and 2 to yes. Summated scales consisted of a number of statements which expressed either favourable or unfavourable attitude towards the given object to which the respondent was asked to react. The overall scores represented the respondent's position towards an issue. Missing data represented unanswered questions. The researcher used statistical techniques which included frequencies and percentages, cumulative frequency percentage and cumulative frequency, means and standard deviation and modal responses. The findings were graphically represented in pie charts, bar graphs, frequency polygons, cumulative frequency curves, line graphs, area and scatter for ease of interpretation.

2.5 Ethical Considerations

All the participants were briefed on the importance of the research and were requested to participate voluntarily. The researcher assured the study participants confidentiality that all the information given would be treated with strict confidence and only used for the purpose of this study. The participants were reminded not to write their names or the names of their schools on the questionnaires to ensure anonymity. All data was recorded and stored in paper and electronic form. The researcher acknowledged the work of other authors to avoid plagiarism and fraud.

3.0 RESEARCH FINDINGS AND DISCUSSIONS

3.1 Establishing E-Learning Preparedness in Teaching and Learning

3.1.1 Female Responses

The teachers were asked their opinion in parents contributing to the funds for equipping the computer laboratory (Figure 1). The study found that 91% of the female teachers agreed while 9% strongly agreed.

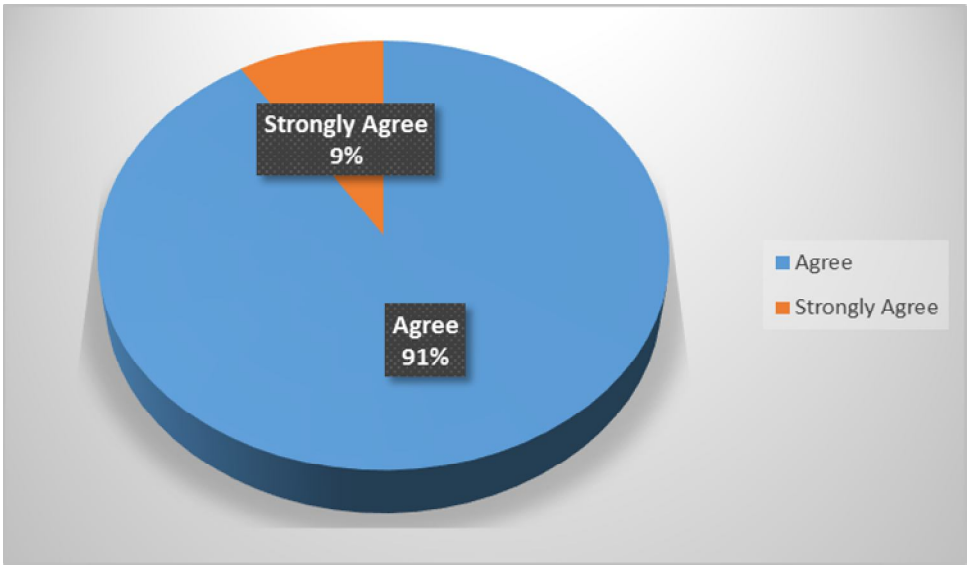

Figure 1: Female respondents on parents' contributions

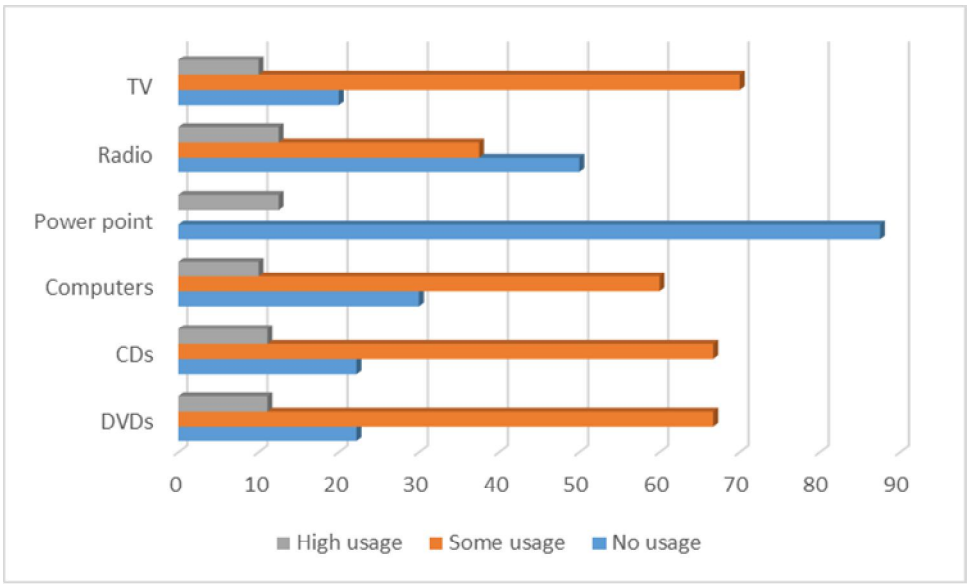

Figure 2: Female respondents' responses on use of ICT tools

The study sought to investigate the usage of digital video disc, compact discs, computers, power points; radio as well as the television as far as the teachers was concerned(Figure 2). Majority (87.5%) of the female teachers had no usage of the power point. There was some usage of the compact disc as well as the digital video disc which stood at 67%.Regarding the computers 30% of the female teachers had no usage, 60% had some usage while 10 % had a high usage. Regarding radio usage the study found that 50%, 37.5% and 12.5% of the female teachers had no usage, some usage and no usage respectively. Majority of the female teachers had some usage of the television while 10% had a high usage. The findings indicated that there was a very small percentage of the female teachers who highly used these devices.The researcher argues that the fact that no usage of the power point was highly rated, then there is a lot that needs to be done as far as workshops to do with ICT integration in schools are concerned.

Figure 3 shows the extent to which the teachers in various departments used the computers and the findings were as follows. Science department indicated that 25% had no usage, 62.5% had some usage while 12.5% had a high usage. In the languages department 66.7% had some usage while 11.1% had a high usage. The art department had 57.1% female teachers having no usage while 28.6% had some usage. The study found that the highest percentage of the female teachers had the highest usage of 25% in the technical department and 50% had some usage. The study found that 57.1% of the teachers in the extracurricular activities had no usage while 28.6% had some usage and a minimal14.3% had the highest usage. According to the findings it is clear that the languages department had the highest usage regarding some usage of the computers. This could be as a result of finding the meaning of difficult terms for the learners.The study notes that the extra curriculum department was highly rated in having no usage.This could be as a result of the common understanding that this area is not academic so minimal use is expected.

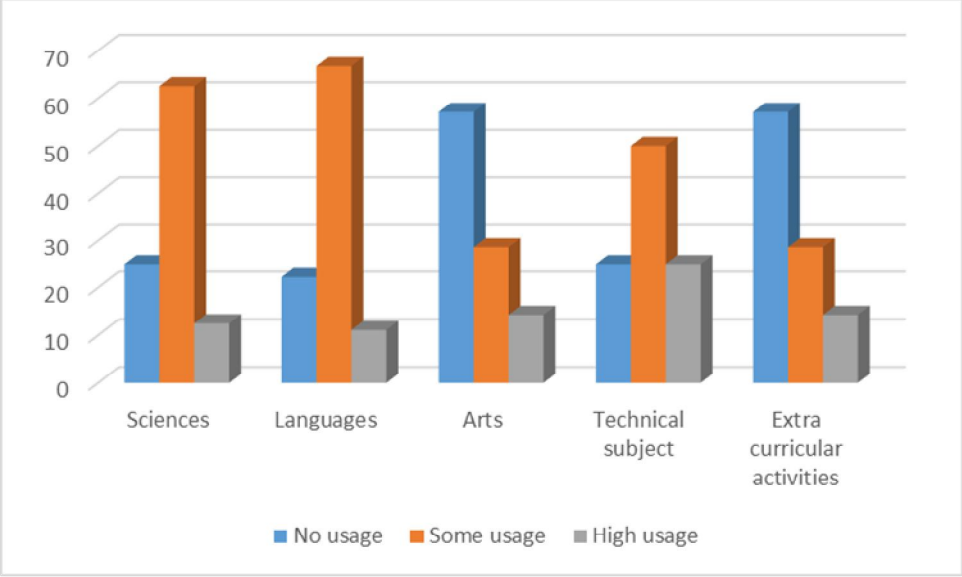

Figure 3: Female respondents' responses on ICT tools use in the departments

3.1.2 Male Respondents Responses The findings indicated that all the male teachers agreed that learning computers contributes to the development of the country and especially vision 2030(Figure 4).

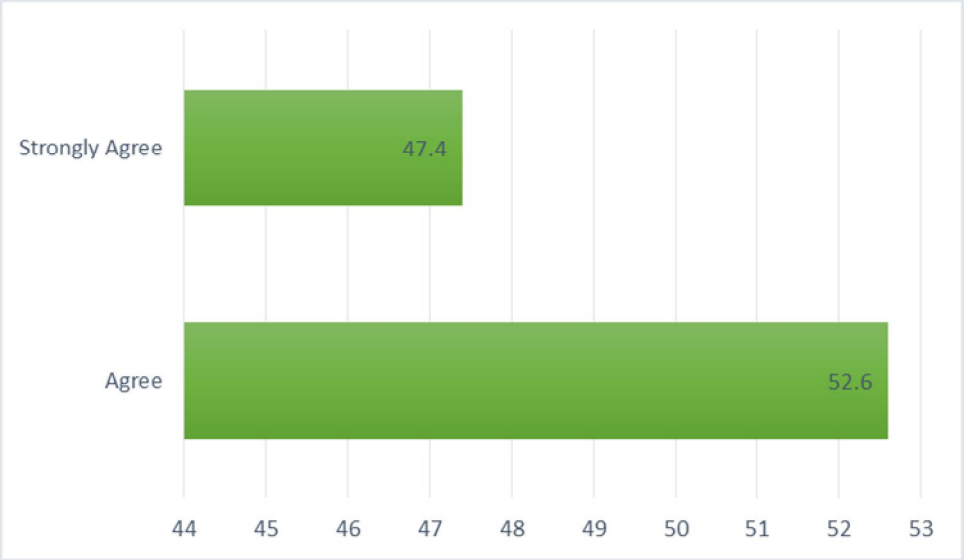

Figure 4:Male respondents response regarding learning computers and vision 2030

Regarding the usage of DVDs, compact discs, computers, PowerPoint, radios as well as the television set the findings were as follows(Figure 5).Majority (57.1%) of the male teachers had some usage on the DVDs while 42.9% had no usage. Regarding the usage of compact disc 26.7% had no usage, 66.7% had some usage while 6.7% had a high usage. As far as computers are concerned 52.9% had some usage while 23.5% had no usage as well as high usage. The study realized that 87.5% had no usage on the radio while 62.5% had no usage on the television set. The study indicated that 81.3% of the male teachers had no usage on the power point and 18.8% had some usage. The findings are similar to those on the female respondents and more so the responses on the usage of the power point. This could be attributed to the fact that the respondents are not knowledgeable enough on the skill required in ICT in the teaching and learning.

Teachers were interviewed regarding application of ICT tools in various departments(Figure 6).Science teachers indicated that 50% had some usage while 37.5% had no usage while in the languages department 44.4% had some usage and 27.8% had no usage. Majority (62.5%) of the male teachers had no usage while 31.3% had some usage on in the technical department.The study indicated that the extracurricular curricular activities had some usage(20%),73.3% had no usage while 6.7% had a very high usage.It is clear that the male teachers in the technical department

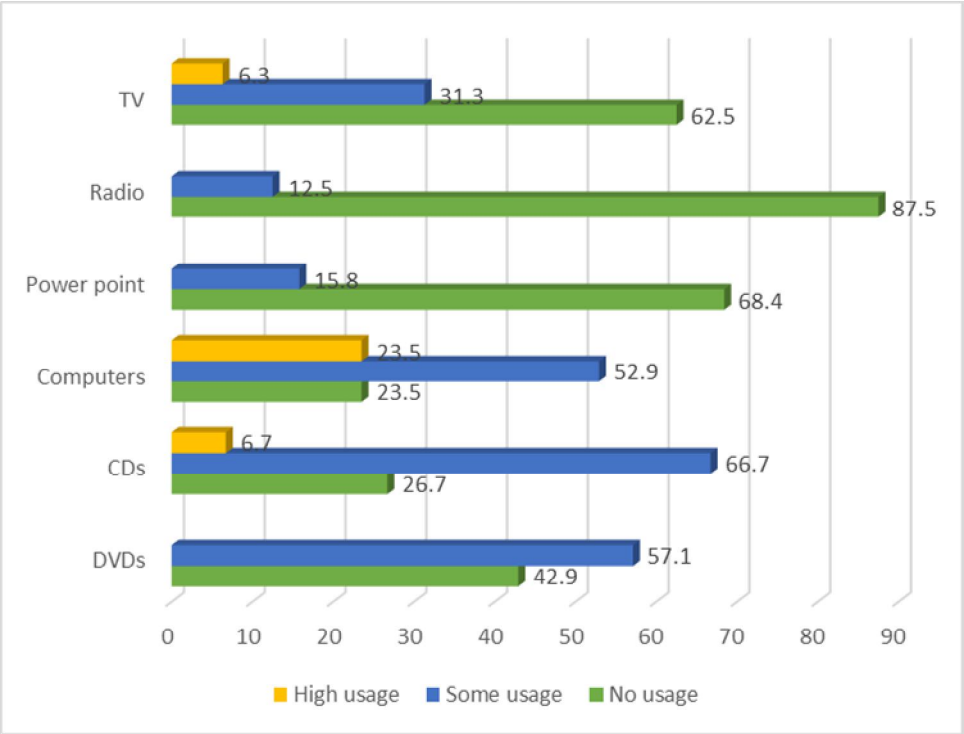

Figure 5: Responses of male respondents on use of ICT tools

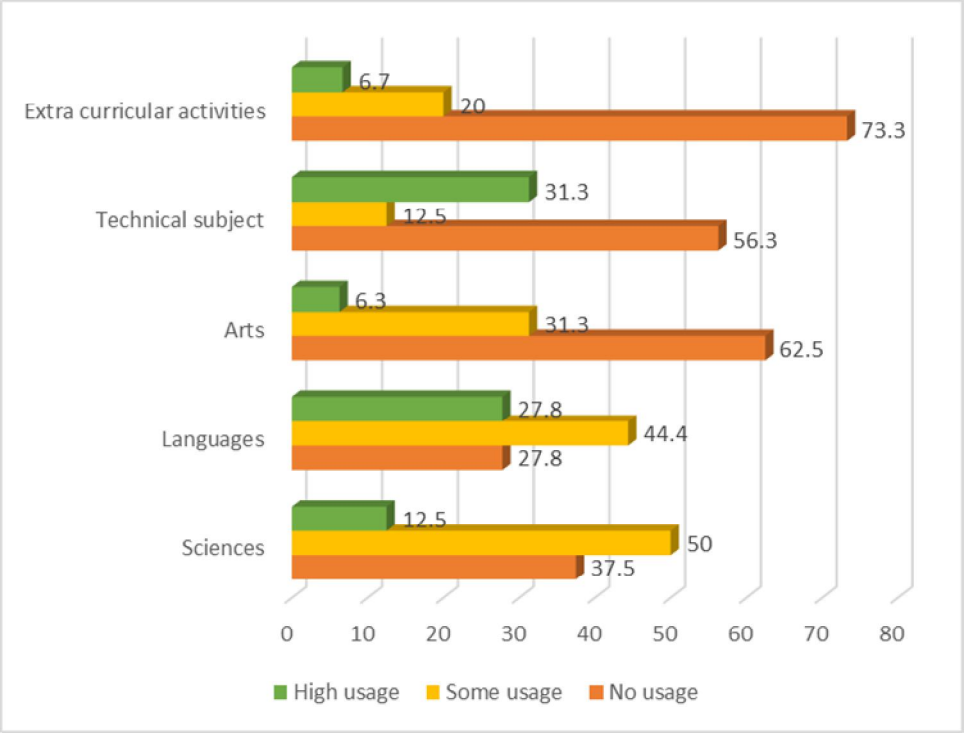

Figure 6: Responses of male respondents on ICT use in departments

3.2 Gender Differences in Attainment of Computer Skills

3.2.1Female Responses

The study further established how freely the teachers could open and shut the computer.Majority (80%) of the female teachers strongly agreed while 20% agreed (Figure 7).

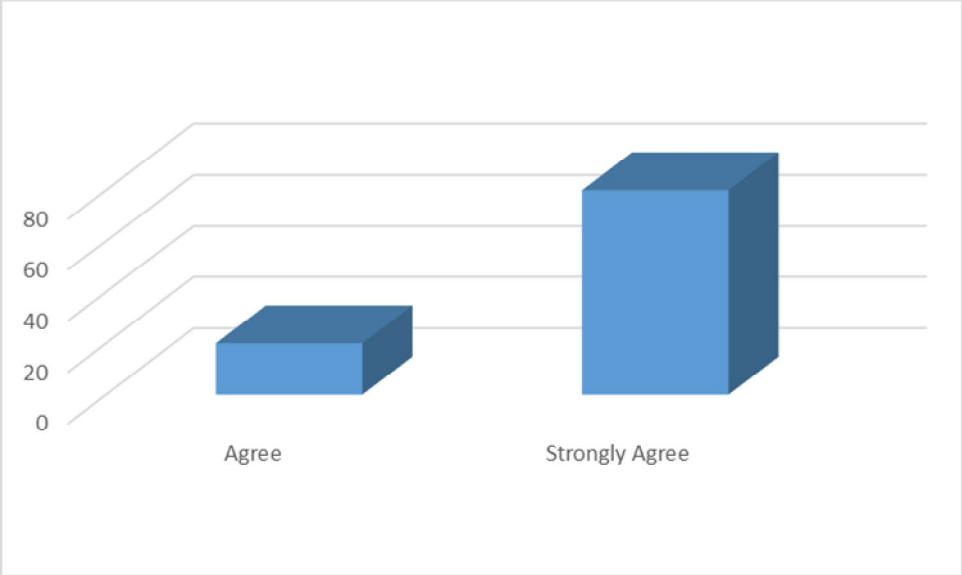

Figure 7: Female respondents' responses on opening and shutting down the computer

Regarding printing and scanning a document from the computer, the findings indicated that 40% disagreed while 30% agreed (Figure 8).

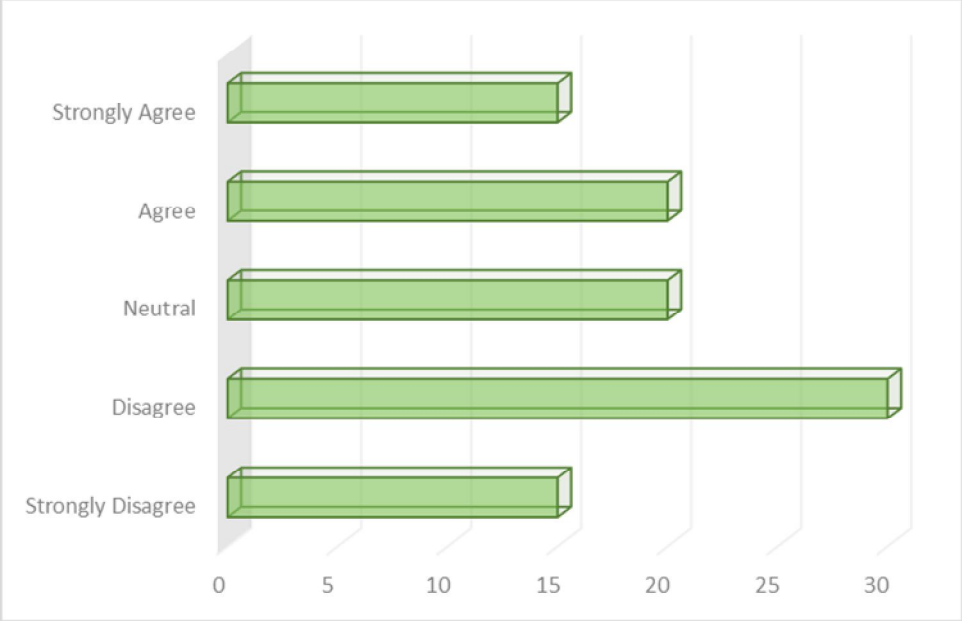

Figure 8:Female respondents responses on scanning and printing documents

The study realized that 36 % of the female teachers had no Personal computers while 46% had a few (Figure 9).

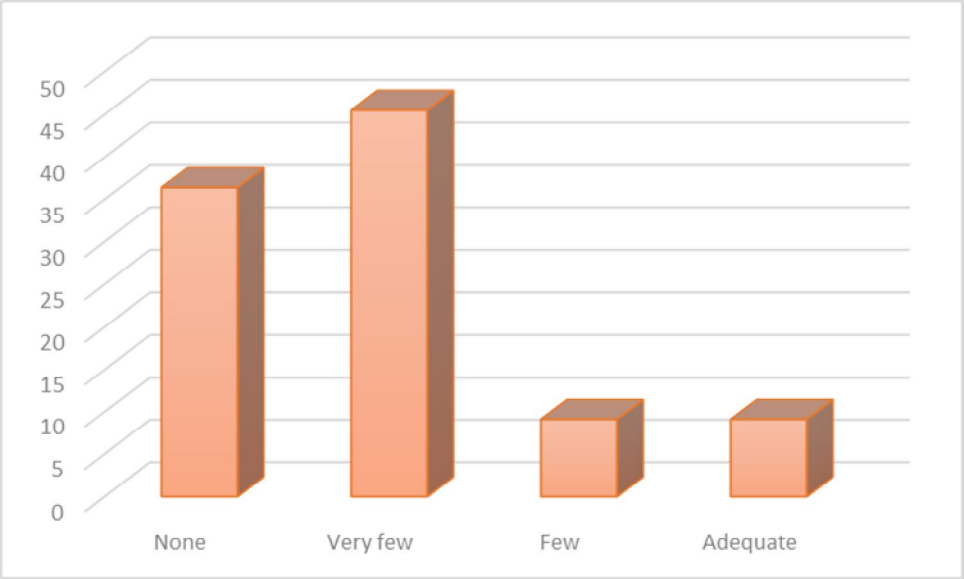

Figure 9: Female respondents' responses on personal computers

3.2.2 Male Respondent Responses

The study findings further indicated that 90% of the male teachers agreed that they could freely open and shut the computers while 5% could not. The researchers asked the teachers if they could create a document and save in the computer (Figure 10). The responses were that 84% agreed and 11% disagreed. Majority (84%) of the teachers knew how to use the computer keyboard while 11% did not know. The teachers were asked if they could print or scan a document from the computer and the response was that 64% agreed while 11% disagreed. Given these responses the researcher argues that the teachers have the basic skills and what they require is more time in the practice of the skills learned in any given workshop.

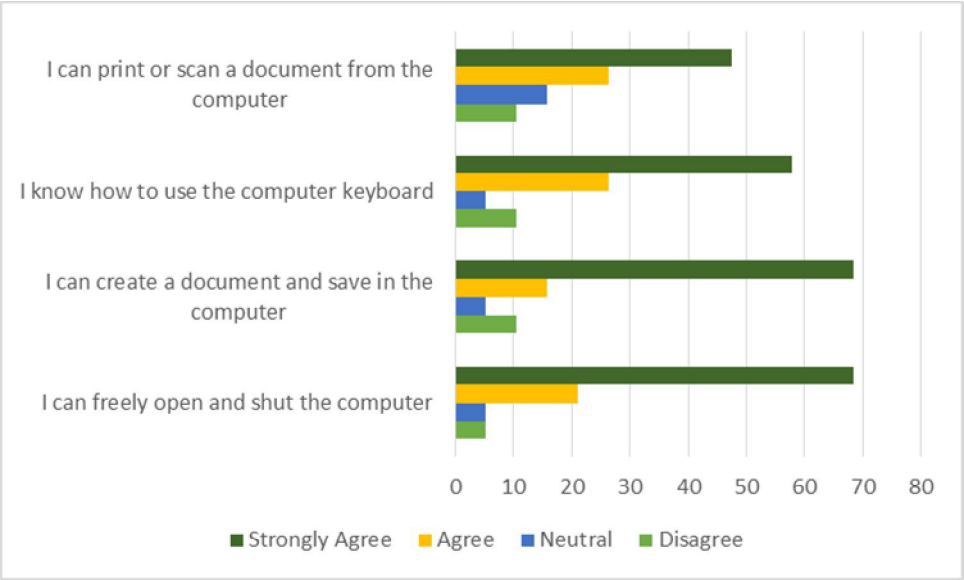

Figure 10: Male respondents' responses on attainment of computer skills

According to the findings 26% of the male teachers had no personal computers while a few had (47%).

3.3 Influence of ICT Proficiency in the Integration of ICT in Teaching And Learning

3.3.1Female Respondents Responses

Regarding examination past papers, 55% had no usage, 18% had some usage while 27% had a high usage (Figure 11).

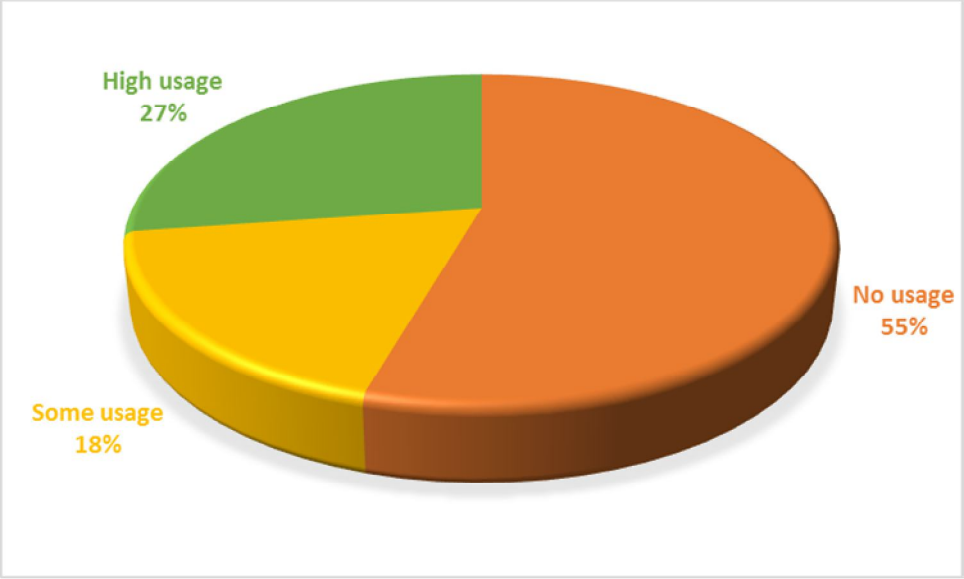

Figure 11: Female respondents' usage of ICT in examination papers

Figure 12 shows that majority of the female teachers (36%) had knowledge on word processing while 18% no ability. Further 9% had excellent word processing while 55.6% had little ability on the spread sheets. Regarding power point presentation 50% had no ability while 30% had little ability. The researchers realized that 20% could email while 30 % could handle internet browsing though 30% had little ability to email and 30% had no ability to browse the internet.

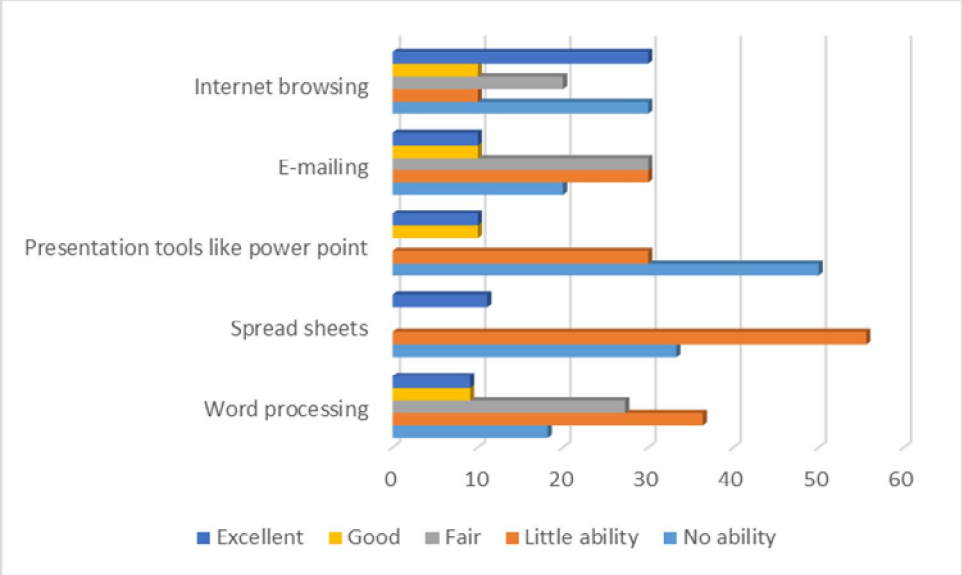

Figure 12: Female respondents' responses on application of ICT skills

The teachers were asked to indicate their attendance to forums on e-learning .The response were that 82% disagreed while 18% agreed (Figure 13).

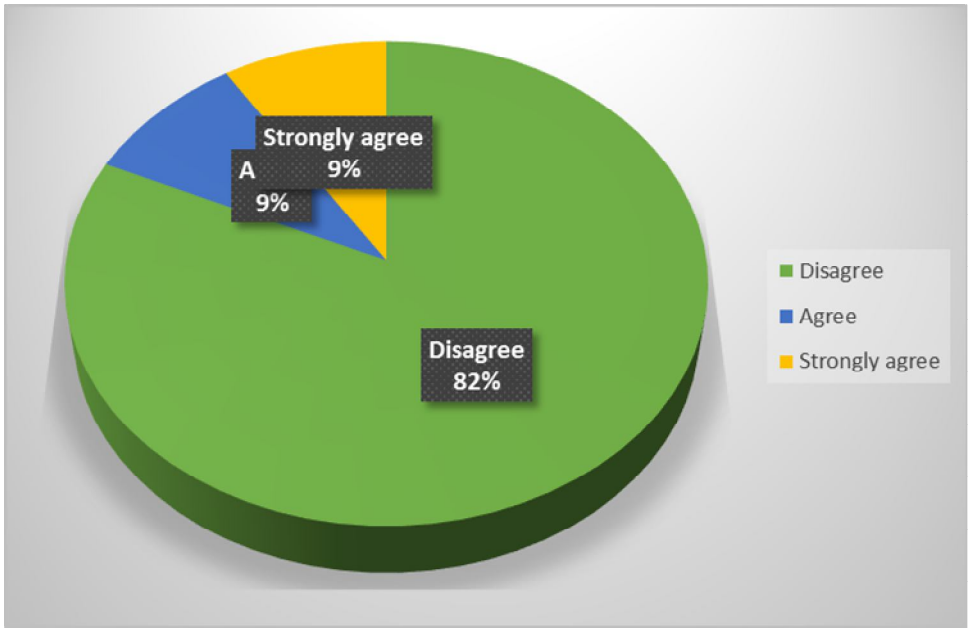

Figure 13: Female respondents' responses on attending E-learning forums

The study was set to investigate on how regularly the teachers used the computers to gather information for lessons. The responses were that 73% disagreed while 27% agreed (Figure 14).

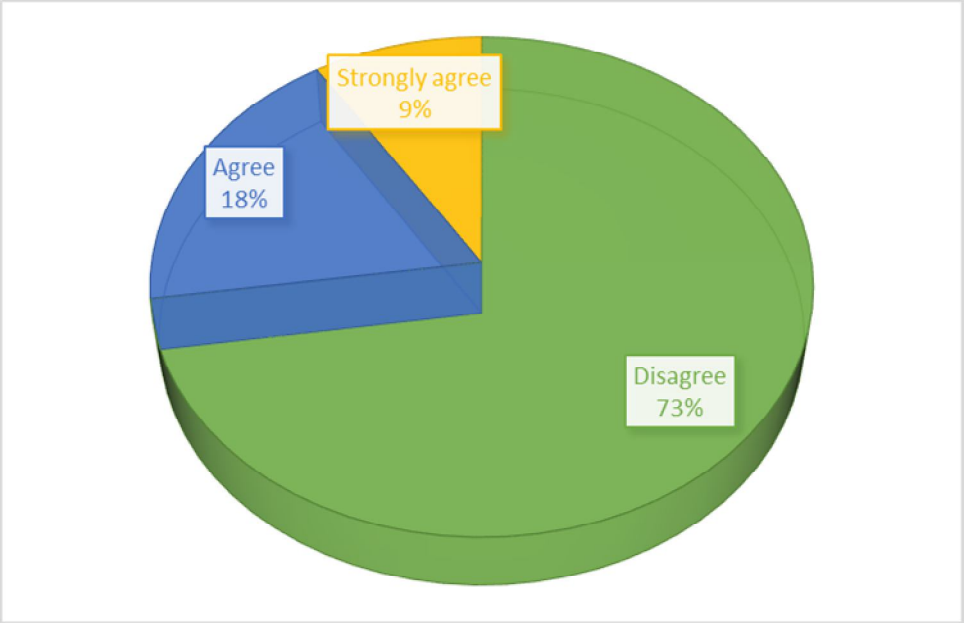

Figure14: Female respondents' responses on using computer to gather information

Figure 15 indicates that majority (55%) of the female teachers disagreed that they use computers regularly for correspondence through e-mail while 18% strongly agreed.

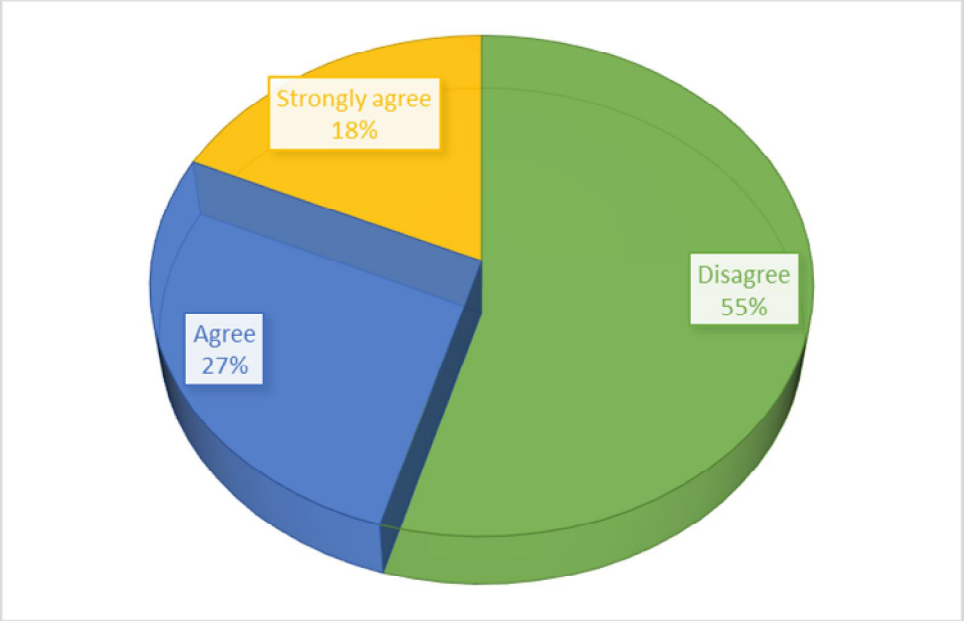

Figure15: Female respondents' responses regarding correspondence through E-mail

Figure 16 indicates findings of the study which showed that 55% of the teachers did not use computers in maintaining student's performance records while 18% used.

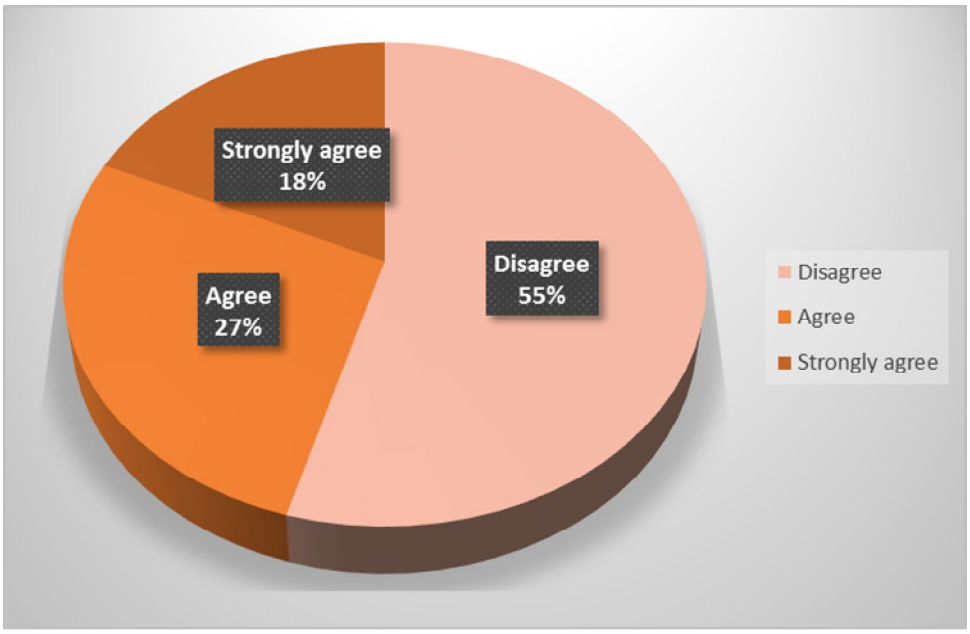

Figure 16: Female respondents' responses on maintaining students' performance

As regards the use of computers only when required to do so (Figure 17), 60% disagreed while 40% agreed.

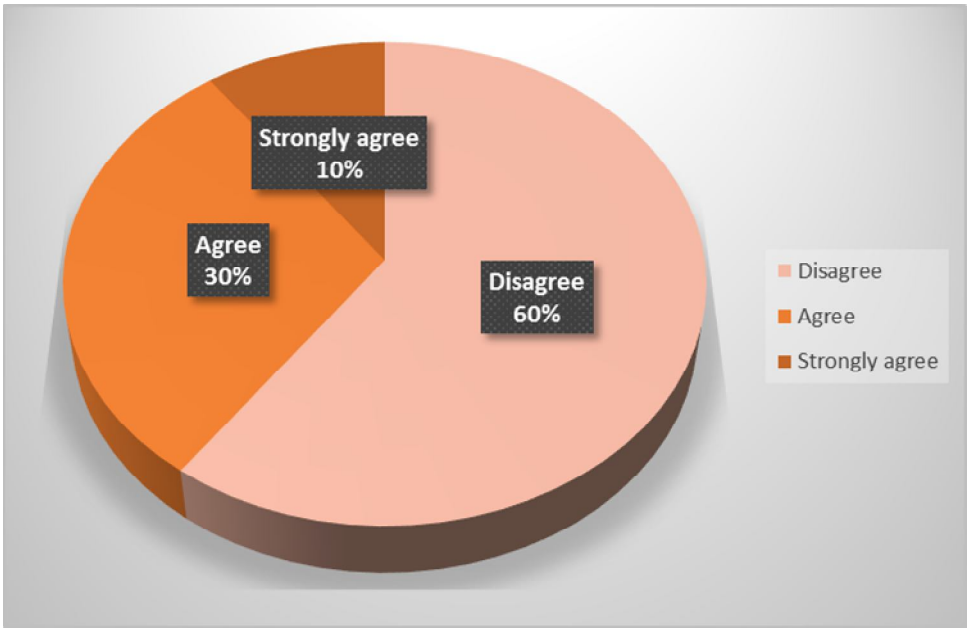

Figure 17: Female respondents' responses on computer use

3.3.2 Male Respondents

The study noted that 11% did not use the computers for past examination papers but 61% had some usage and 28 had the highest usage. The use of computers for examinations positively impacts on the learner who finally attains better results due to exposure.The study further sought the level of computer training the teachers had achieved. The study showed that 53% had basic skills 35% had a certificate and 12% had a diploma(Figure 18).

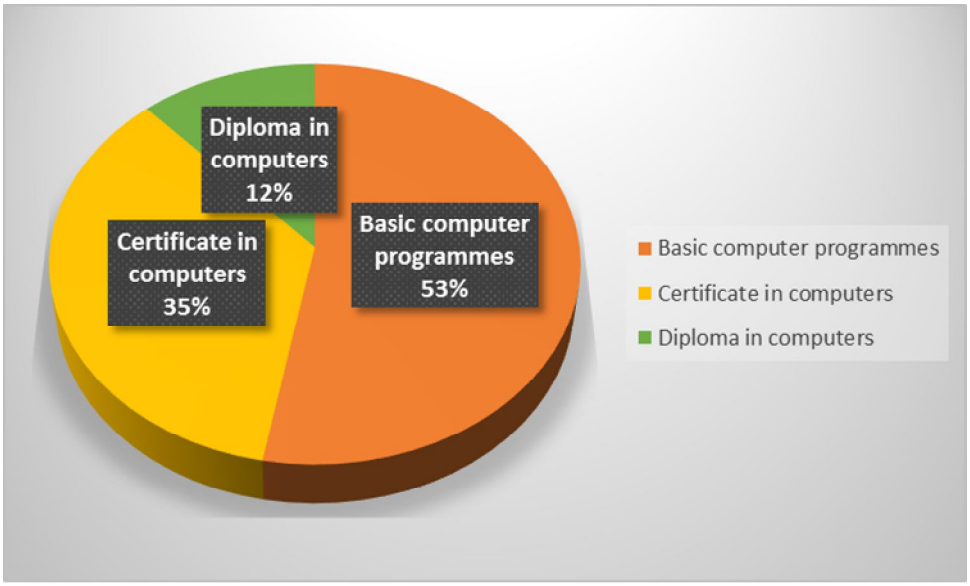

Figure 18:Male respondents responses on computer training

Regarding the ability of the male respondents in word processing,spread sheets,power point presentation,e-mailing as well as internet browsing was as indicated below(Figure 19).The teachers were excellent in word processing and internet browsing.Majority 70% had the ability of word processing and 11% had no ability.The study further investigated the knowledge of the male teachers on the spread sheets.It was noted that 18% of the male teachers had no ability while 41% had the ability.Presentation tools like power point regarding the male teachers indicated that 39% had the ability while 22% had no ability.The results indicated that 56% of the male teachers had the ability in E-mailing while 6% had did not have.Regarding internet browsing the findings were that 61% were good at it while 6% were not.

Figure 20 indicates the level of confidence in using a computer in a lesson the response was that 66% agreed while 33% disagreed.Majority of the male teachers (65%) agreed that they regularly use computers in gathering information for lessons while 35% did not.Teachers were asked to indicate how regularly they used computers for correspondence through e-mail. The findings were that 71% agreed while 39% disagreed.The researcher wanted to know if the teachers used the computers in maintaining student performance records. Results indicated that 47% used while 53% did not use.It was interesting to note that 61% of the male teachers disagreed that they use the computers only when required to do so while 39% agreed.

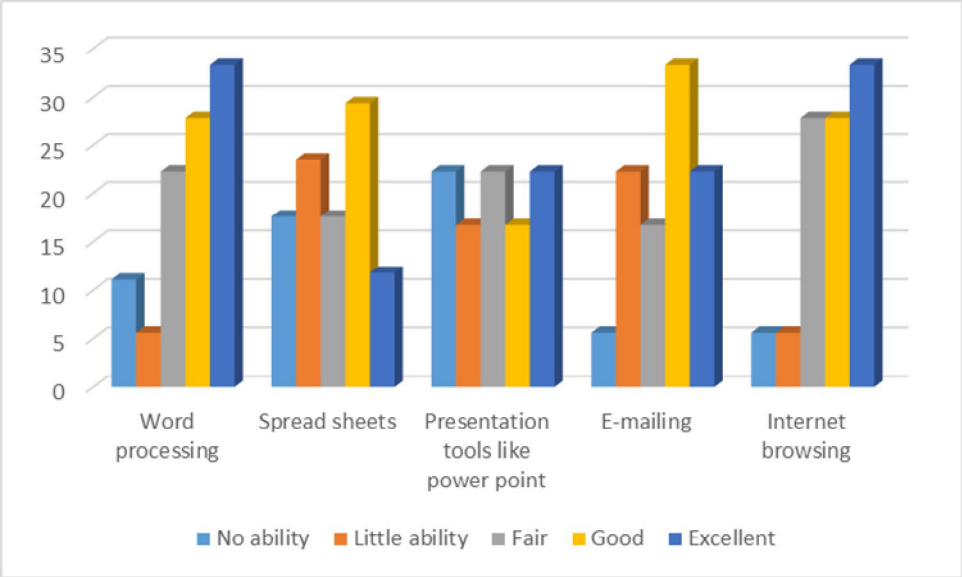

Figure 19: Male respondents' responses regarding application of ICT skills

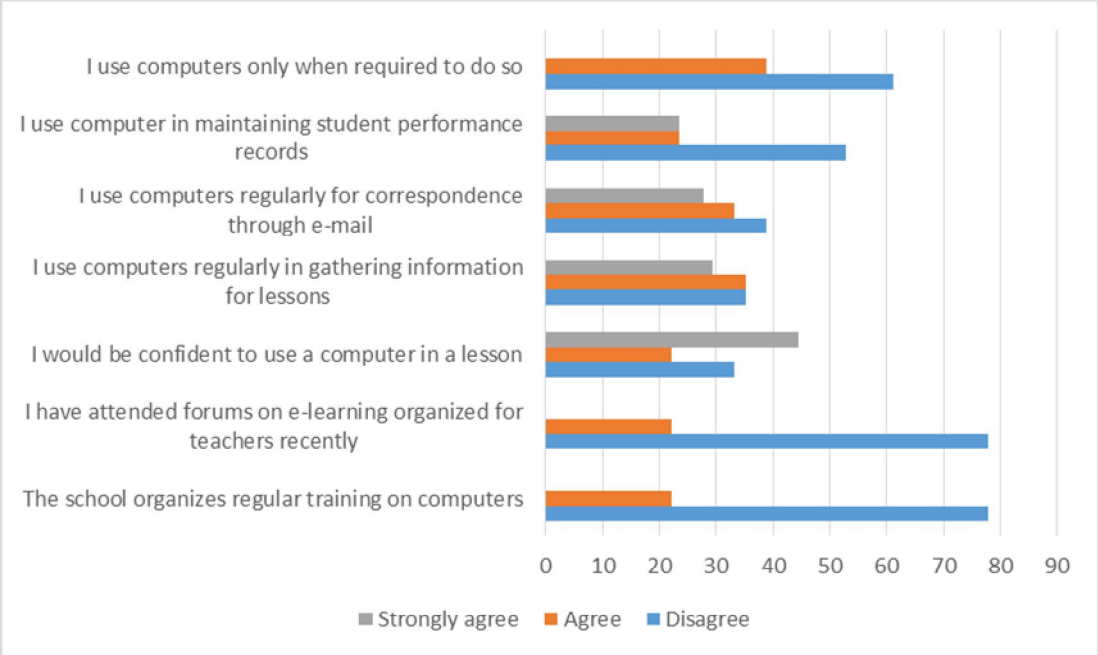

Figure 20:Male respondents ability in application of computer knowledge

4.0 Conclusion

The researcher concludes that teachers have adequate skills in ICT which they can comfortably utilize in the teaching and learning process. It is clear that teachers are good at opening and shutting down the computers and creating documents. It is disturbing to note that there is almost no use of the power point which is very common in today's presentations. Attending E-learning forums as

well as gathering teaching and learning materials as well as past papers is wanting. The study concludes that if all the teachers are well trained on ICT and monitoring and evaluation well conducted in schools the the students will be in a better position in their academic performance This would on the other hand motivate the teachers who would be better placed regarding computer skills than the learners of today.

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REFERENCES

Adams, N.B. (2002). *Educational computing concerns of postsecondary faculty*. *Research on Technology in Education*, vol. 34, no. 3, pp. 285-303.

Anderson, R. E. & Dexter, S. (2005). *School technology leadership: An empirical investigation of prevalence and effect*. Educational Administration Quarterly, vol. 41, no. 1, pp. 49-82.

Bauer, J., & Kenton, J. (2005). *Toward technology integration in the schools: Why it isn't happening.* Journal of Technology and Teacher Education, vol. 13, no. 4,pp. 519–546.

Breisser, S. R. (2006). *An examination of gender differences in elementary constructionist classrooms using Lego/Logo instruction*. Computers in the Schools, vol. 22, pp.7-19.

Brinkerhoff, J. (2006).*Effects of a long-duration, professional development academy on technology skills, computer self-efficacy and technology integration beliefs and practices.*Journal of Research on Technology in Education, vol. 39, no. 1, pp. 22-43

Chigona, A., & Chigona, W.(2010).*An investigation of factors affecting the use of ICT for teaching in the Western Cape schools.* 18th European Conference on Information Systems.

GOK, (2010) *National ICT Policy, Ministry of Information and Communication,* government printers, Nairobi, Kenya

GOK, (2010) *ICT Capacities and Capabilities in Secondary Schools in Kenya* 2009/2010, NCST No: 046, Nairobi,Kenya

Hew, K. F., & Brush, T. (2007). *Integrating technology into K-12 teaching and learning: current knowledge gaps and recommendations for future research.* Educational Technology Research and Development, vol. 55, pp. 223-253.

Jamieson-Proctor, R. M.,Burnett, P. C., Finger, G., & Watson, G. (2006).*ICT integration and teachers' confidence in using ICT for teaching and learning in Queensland state schools*.Australasian Journal of Educational Technology, vol, 22, no. 4, pp. 511-530

Jones, C.A. (2001) *Teach Support: Preparing teachers to use technology. Principal Leadership*,vol. 1, no. 9, pp. 35-39.

Kay, R. (2006). *Addressing gender differences in computer ability, attitudes and use:* The laptop effect. Journal of Educational Computing Research, vol. 34, no. 2, pp. 187-211.

Keengwe, J., & Onchwari, G. (2008). *Computer technology integration and student learning:Barriers and promise,* Journal of Science Education and Technology, vol. 17, pp. 560–565.

Markauskaite, L. (2006). *Gender issues in preservice teachers' training: ICT literacy and online learning.* Australasian Journal of Educational Technology, vol. 22, no. 1, pp. 1-20.

Norris, C., T., Sullivan, J., Poirot., & Soloway, E. (2003). *No access, no use, no impact: Snapshot surveys of educational technology in K-12,* Journal of Research on Technology in Education, vol. 36 , no. 1, pp. 15-27

Peralta, H., Costa, F.A. (2007). *Teachers' competence and confidence regarding the use of ICT*. *Educational Sciences Journal*, vol. 3, pp. 75-84

Plair, S. (2008). Revamping professional development for technology integration *Factors influencing teachers' adoption and integration of ICT and fluency*. *The clearing house*, vol. 82, no .2, pp. 70-74

Plomp, T., Anderson, R. E., Law, N., & Quale, A. (Eds.). (2009). *Cross-national information and communication technology: policies and practices in education*. Charlotte, N.C.: Information Age Publishing.

Samarawickrema, G. & Stacey, E. (2007). *Web-based learning and teaching: A case study in higher education Distance Education*, vol. 28, no. 3, pp. 313-333.

Teo, T.(2008). *Pre-service teachers' attitudes towards computer use*: ASingapore survey.*Australasian Journal of Educational Technology*,vol. 24, no.4, pp. 413-424.

Thuranira,S. and Ndirangu,L.(2014). *Teachers' Preparedness in the Integration of Information Communication Technology in Public Secondary Schools.* International Journal of Innovation and Scientific Research Vol. 12, no. 1, pp. 107-114.

Volman M. and van Eck, E. (2001). *Gender equity and information technology in education: The second decade.* Review of Educational Research, vol. 71, no. 4, pp. 613-634.

Wozney, L., Venkatesh, V., & Abrami, P.C. (2006). *Implementing computer technologies:Teachers' perceptions and practices.* Journal of Technology and teacher education, vol. 14,no.1, pp. 173-207.

Yee, D. L. (2000). *Images of school principals' information and communication technology leadership. Technology, Pedagogy and Education*, vol. 9, no. 3.

Yildirim, S. (2007). "*Current Utilization of ICT in Turkish Basic Education Schools*: A Review of Teacher's ICT Use and Barriers to Integration". International Journal of Instructional Media,vol. 34, no.2, pp. 171-86.