

Original Paper

Does Faculty Perceived ICT Abilities Influence Integration of Information and Communication Technologies in Instruction? A Case of University Early Childhood Education Programmes in Kenya

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Abstract

Information and Communication Technology (ICT) based instruction provide opportunities whereby the teacher is a facilitator and learners are active participants. ICT has tended to make learners effectively connect theory and practice. For ICT to be successfully utilised in instruction teachers need to possess the prerequisite ICT abilities. This study aimed at evaluating integration of ICT in instruction in Early Childhood Education (ECE) programmes in universities in Kenya and how faculty perceived ICT abilities related to ICT integration in instruction. A sample of 88 lecturers purposely drawn from public and private universities that were ECE pioneers and offered ECE programmes formed the study subjects. Questionnaire, observation checklist and document analysis were used to collect data. Both descriptive and inferential statistics were the methods of data analysis employed. Results from data analysed revealed that faculty were integrating basic ICT tools in instruction. It was also revealed that there was no significant difference in ICT integration in instruction by faculty in public and in private universities. The relationship between faculty perceived ICT abilities and ICT integration in instruction was highly significant at alpha value 0.05. It was recommended that there was need for university administration to organize in-service training for faculty to adequately learn how to integrate advanced ICT tools in instruction.

Keywords

ICT, abilities, integration, instruction

1. Introduction

Information and Communication Technology (ICT) is an innovation reported to have continued enhancing human activity in nearly all sectors and particularly in education (Olowe, 2012). A considerable number of countries across the world consider ICT integration in instruction as a firm foundation of education (UNESCO, 2002). This is because ICT integration in instruction has been cited to facilitate achievement of educational objectives (Makewa, Kiboja, Yango, & Ngussa, 2014). Studies have found that when ICT is integrated in instruction, it not only promotes learners to critically think but also supports sharing of resources and collaboration (Onwuagboke, Sigh, & Fork, 2015).

The current generation of children is technologically knowledgeable and interact with technology before attaining school admission (Olowe & Kutelu, 2014). This implies that children of today develop ICT skills at a very tender age and therefore Early Childhood Education (ECE) teachers need to lay strategy on how to maximize on the ICT knowledge these children possess as they gain entry to school. This may be achieved when ECE teacher trainers integrated ICT in instruction and give their teacher trainees the required ICT skills necessary for duplication as they practise during and after training (Makhoha & Mutisya, 2016). Universities are expected to take up the lead in ICT integration in instruction (Haydn & Barton, 2008) since they are the top most training institutions.

The fast development of learning technologies in the 20th century brought rapid change of education delivery. Technology has provided avenues for easy access to comprehensive instructional environments. Research has shown that sectors in charge of education all over the world have heavily invested in ICT with a view to enhance use of ICT in instruction. Despite all these efforts, it is reported that many countries share the challenge of teachers being reluctant to integrate ICT in instruction (Albirini, 2006). Despite many studies done on teacher factors and ICT integration in instruction, there seems little if any information on faculty perceived ICT abilities and ICT integration in instruction particularly in Kenya.

ICT has been credited with a wide range advantages when used. In education, scholars reveal that when ICT is integrated in instruction learners' performances and competencies improve (Yusuf, Kajuru, & Musa, 2014; Qasem & Viswanathappa, 2016). However, studies in Africa indicate that ICT integration in instruction is still in its infancy. In Kenya, Kipsoi, Changach and Sang (2012) report that ICT integration in instruction is minimal and most teachers prefer to use other methods of instruction. Could the reason for most teacher choosing not to integrate ICT in instruction be associated to their university training? In order to answer this question, this study was designed and executed.

In developed countries, reports indicate that ICT integration in instruction is practised. Results for use of ICT in instruction in these countries show improved students' academic performance (Sangani, 2013). In these countries teachers are reported to blend ICT in their teaching-learning process. Although in Africa, reports indicate notable increase in the piling up in educational institutions with digital technology equipment and facilities, research findings indicate underutilised ICT equipment. Moreover, most teachers are reported not to integrate ICT in instruction (Salem & Mohammadzadeh,

2018) and those who integrate it in instruction lack consistency and display dismal performance (Essay, 2013). Most studies done in Africa revealed teachers had high degree of ICT awareness but majority of them exhibited negative attitude towards ICT integration in instruction, and the integration was low (Makhoha & Mutisya, 2016).

Studies done on ICT integration in instruction in Sub-Saharan Africa indicate acute knowledge of ICT literacy, ICT access is minimal and that ICT in universities are underutilised. Further, most faculty engaged to conduct distant and e-learning had insufficient experiences on ICT use (Kass, 2012). Similar research findings in Zibambwe, Uganda, and Tanzania were that faculty had insufficient knowledge and skills in ICT integration in instruction. They were reported to use ICT mostly for delivery of learning materials and least for instruction (Kasse & Balungwa, 2013; Nkembo, Koloseni, & Shimba, 2011).

The importance of ICT has tended to make many countries in the world develop ICT policy. Dudeney (2010) advises that national ICT policies are crucial for they give direction to educational systems on ICT implementation. The ICT policy in Kenya emphasises on ICT integration in curriculum at all levels of education. To facilitate achievement of this policy, Kenya government over the past few years has increased provision of ICT resources in many institutions of learning including universities (Makhoha & Mutisya, 2016). However, research has shown that equipping institutions of learning with ICT does not translate to ICT integration in instruction (Kinuthia, 2009). Teachers may need to actively engage and innovatively interact with technologies to promote learning. Reports indicate minimal use of technology in universities. Nyerere, Gravenir and Mse (2012) reported underutilization of ICTs in universities in Kenya and most faculty found lacking necessary skills to integrate ICT in instruction. Similar findings are reported in studies done in schools (Sulungai, Toili, & Amadolo, 2012) and preschool institutions (Kaindio & Wagithunu, 2014).

In Kenya, there seems to be a trend of insufficient ICT integration in instruction by teachers in different levels of education including universities. Universities produce most of the professional teachers included. It is from this background that a study to find out ICT integration in instruction in ECE education programmes was formulated.

2. Problem Statement

Innovation of ICT has brought an extensive change in the way education needs to be conducted. The benefits realised when ICT is integrated in instruction are reported to be far reaching to both the teacher and the learner. Despite the many advantages associated with ICT integration in instruction, studies on ICT adoption in instruction in universities report minimal use contrary to expectations.

In an effort to keep the phase of digital development and narrow down digital gap, most countries Kenya included have facilitated educational institutions to acquire and equip themselves with adequate ICT resources. Availability of ICT resources may not translate to ICT integration in instruction. Studies done in universities on ICT adoption seem to have been general, not comparative between public and

private universities and did not correlate faculty perceived ICT abilities and ICT integration in instruction. This study intended to fill in that gap.

3. Objectives of the Study

The study sought to achieve the following objectives:

- (i) To establish the extent to which faculty integrate ICT in instruction in ECE programmes.
- (ii) To find out the relationship between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes.

4. Research Methodology

The researcher used correlational research design. The study was done in universities that offer ECE programmes across Kenya. All the universities were first ranked according to the time ECE programmes were initiated. The first 10 public and 6 private universities to pioneer in ECE programmes were selected for the study. All the faculty teaching ECE programmes in each of the selected universities formed the respondents. Data was collected and analysed using qualitative and quantitative research methodology. A questionnaire was developed, tested and analysed before it was presented to the respondents. Observation checklist, and document analysis were also used to enhance data collection. The questionnaire had three sections. Section A had three items on demographic information. Section B had two subsections; one on basic ICT tools with eight items and the other on Advanced ICT tools with four items. Each of these subsections required response on how the ICTs were used and the extent of use with response type; Never weighted 1, Rarely weighted 2, Sometimes weighted 3, Often weighted 4, and Always weighted 5 adopted. Section C had eleven items soliciting information on faculty perceived ICT abilities and ICT integration in instruction with response type; Strongly Disagree weighted 1, Disagree weighted 2, Undecided weighted 3, Agree weighted 4, and Strongly Agree weighted 5.

Pre-test of the research instruments was done in one public university and one private university. Validity of the research instruments was established by a team of experts from department of Educational Communication and Technology of Kenyatta University while internal consistence of the instruments was determined using Cronbach Alpha technique. The reliability coefficient of each of the instruments was found above 0.80. Data collected was analysed using descriptive statistics; frequencies, percentages, means and standard deviations. The inferential statistics calculated were t-test for independent samples and Pearson's correlation coefficient. Data was presented using tables, graphs and text.

5. Results and Discussions

The following were the results for each research objective and subsequent discussions.

5.1 ICT Integration in Instruction

The first objective of the study was: To establish the extent to which faculty integrate ICT in instruction in ECE programmes.

To achieve this objective the different ways faculty were using ICT in instruction and the ICT used and corresponding category (basic or advanced) were determined using a questionnaire with twelve items. A likert scale was used to measure the extent ICT integration in instruction ranging from N = Never weighted 1, R= Rarely weighted 2, S = Sometimes weighted 3, O = Often weighted 4, and A = Always weighted 5. Means of the responses was calculated to indicate the status of ICT integration in instruction. Means whose score ranged 1-2.99 were termed to indicate Below average ICT integration in instruction. Means whose score ranged 3-3.49 indicated Average ICT integration in instruction while Means whose score ranged 3.5-5 indicated Above average ICT integration in instruction.

Faculty were required to indicate ICT tools used in instruction against preferred instructional activity and results presented on Table 1.

Table 1. ICT Tool Used in Instruction by Faculty

Instructional Activity	ICT used	Advanced tool (A) / Basic (B) tool
Giving lectures	PowerPoint	B
Preparing notes	Word	B
Sharing information	Social media	B
Finding resources	Internet	B
Teaching online	Moodle	A
Discussions	Social media	A
Chats	Social media	A
Assignment	Word	B
Conducting tutorials	Power point	B

Table 1 shows that most faculty integrated basic ICT tools in instruction in nearly all instructional activities. Advanced ICT tool were integrated in instruction in teaching online, discussions and in chats in instruction. These results were interpreted to mean that university faculty preferred integrating basic ICT tools in instruction to advanced ICT tools. This may be as a result of faculty low level of competency in using advanced ICT tools in instruction.

After establishing the ICT tools used in instruction, the frequency of use was also established and the results have been presented in Table 2.

Table 2. Faculty ICT Use in Instruction

ICT Used in:	N		R		S		O		A	
	F	%	F	%	F	%	F	%	F	%
Giving lectures	4	4.5	17	19.3	31	35.2	22	25.0	14	15.9
Preparing notes	8	9.09	10	11.4	21	23.9	36	40.9	13	14.7
Sharing information	16	18.2	22	25.0	19	21.6	23	26.1	8	9.1
Finding resources	0	0.0	4	4.5	9	10.2	32	36.4	43	48.9
Teaching online	7	8.0	14	15.9	26	29.5	24	27.3	17	19.3
Discussions	9	10.2	23	26.1	23	26.1	24	27.3	9	10.2
Chats	4	4.5	12	13.6	23	26.1	33	37.5	16	18.2
Assignment	6	6.8	11	12.5	28	31.8	26	29.5	17	19.3
Conducting tutorials	7	7.9	20	22.7	18	20.5	27	30.6	16	18.2

F = Count, % = Per cent

Table 2 shows that the main ways faculty integrated ICT in instruction included: Finding resources (Often and Always: 36.4% + 48.9%) 85.3%, chatting (Often and Always: 37.5% + 18.2%) 55.7% and preparing notes (Often and Always: 40.9% + 14.7%) 55.6%. Faculty were found to least integrate ICT in instruction in sharing information (Often and Always: 26.1% + 9.1%) 35%. The results reveal that majority of faculty used basic ICT tools in instruction majorly to do research and teach. These findings concur with those of Kisirkoi (2015) who conducted a case study to investigate motivation of teachers to integrate ICT in instruction in a boys' secondary school in Kajiado County, Kenya. The respondents were 18 teachers randomly drawn from a population of 30 teachers. Questionnaire was the only method of data collection. It was found majority (77.7%) of teachers used ICT particularly computer which is a basic tool, in instruction to do research, teach, plan and keep record all combined.

When these findings are compared to the channels of diffusion of innovations as advocated by Rogers (1995), it showed that university faculty were in the early stage of technology adoption. In this stage, majority of individuals in an organisation doubt the benefits of an innovation and avoid changing from their long held traditional ways of doing things.

The questionnaire reported that majority of faculty were not using advanced ICT tools. The researcher triangulated data using document analysis and observations made. It was noted that faculty lacked formal training in ICT integration in instruction and had minimal capacity to competently integrate ICT in instruction. These findings support those of Nyerere, Gravenir and Mse, (2012) who found that majority of faculty members (68%) did not incorporate Open and Distant education Learning (ODEL) in their instruction and reported lack of any formal training on content delivery using this method of teaching. The results are similar to those of Makhoha and Mutisya (2016) who reported that majority of teachers in Kenya lacked adequate competency in advanced ICT tools and as a result teachers could not

confidently handle online courses.

Further analysis was done by calculating individual mean scores for the different uses of ICT integration in instruction and the results have been presented in Figure 1.

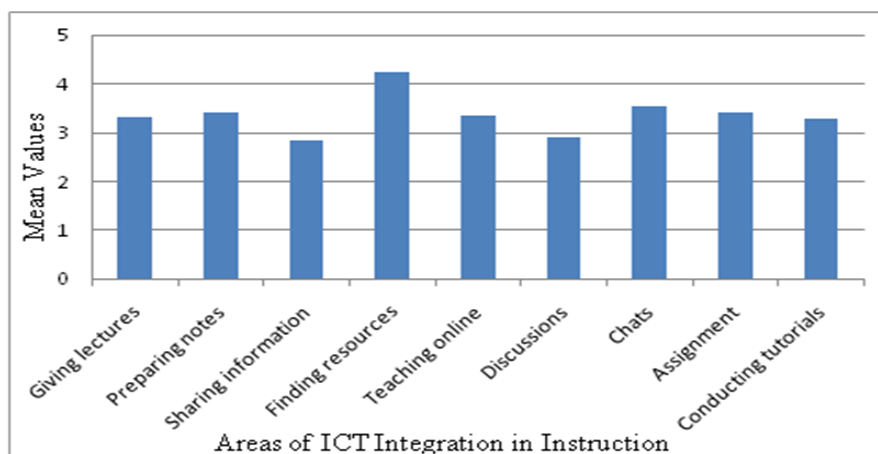


Figure 1. Faculty Mean Scores of ICT Integration in Instruction

Figure 1 shows that faculty in public and private universities often integrated ICT in instruction notably in finding resources (Mean = 4.14), chats (Mean = 4.30) preparing notes (Mean = 3.48) and in discussions (Mean = 3.41). On further scrutiny, it was revealed that on average, faculty integrated ICT in instruction in giving lectures, preparing notes, teaching online, assignments, and conducting tutorials. Generally, the results indicate that most faculty integrated ICT in instruction when finding resources while the least number of faculty integrated ICT in instruction when sharing information. These findings support those of Buabeng-Andoh (2012) who found that majority of teachers in Ghana were fairly good in using basic ICT tools (Mean = 3.02, SD = 0.99). In support of the study results, Jegede (2006) and Bee, Lau and Hua (2008) who found that teachers integrate basic ICT tools in instruction. To understand the extent to which faculty integrated ICT in instruction, overall mean scores in ICT integration were calculated and the results have been presented in Table 3.

Table 3. Overall Mean Scores in ICT Integration by Type of University

	Type of university	N	Mean	Std. Deviation
Average ICT integration	Public	50	3.4542	.65326
	Private	38	3.3824	.76889

Table 3 shows the overall mean score in ICT integration for faculty in public universities was 3.45, while that of faculty in private universities was 3.38. The results imply that faculty in both public and private universities sometimes integrated ICT in instruction and the difference in ICT integration

between them was minimal. Faculty in both public and private universities integrated ICT in instruction in nearly the same level.

The findings are consistent to those of Dawam, Rafidah, Ahmad, Kamaruzaman, Taniza, Jamel and Suhardi (2009) who did a study on the use of ICT instruction in public and private institutions of higher learning in Malaysia. It was found that there was no difference in faculty ICT integration in instruction and the faculty were in the initial stage of technology adoption.

Further analysis was done to find out whether there was a difference in ICT integration in instruction in ECE programmes between public and private university faculty. Hence the following null hypothesis was stated and tested at alpha value 0.05.

H_{01} : *There is no significant difference in ICT integration in instruction in ECE programmes between faculty in public and universities.*

The independent sample t-test was used to test the hypothesis and the results have been presented in Table 4.

Table 4. Independent Samples Test for Equality of Means

		t-test for Equality of Means					95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Average ICT integration	Equal variances assumed	.39	86	.69	.07	.18	-.29	.43
	Equal variances not assumed	.36	21.86	.72	.07	.20	-.35	.49

Results in Table 4 show that mean difference in faculty ICT integration in instruction in ECE programmes in public and private universities was .07 with a p-value of 0.69. The results imply that the difference between the two means was not significant and thus the null hypothesis was accepted. This meant that faculty ICT integration in instruction in ECE programmes in public and private universities was at the same level.

The findings of this study were in line with those of Kasse and Balunywa (2013) who found that no major differences exist in ICT integration in instruction in universities. These studies found ICT integration in instruction in both public and private universities to be average and the same level. Similarly, the current results indicate that ICT integration in instruction in ECE programmes in universities is not dependent on the university status - public or private. Faculty in public and private universities integrate ICT in instruction in ECE programmes in similar ways.

These findings concur with those of Ajegbalen (2016) who did a study on the use of ICT to enhance university education in Nigeria. It was found that most university faculty, on average integrated ICT in

instruction. Similarly, Makewa et al. (2014) investigated ICT integration in Higher Education in University of Arusha. It was also found that faculty regularly integrated basic ICT tools in instruction, results similar to the findings of this study. Results of the current study support DOI theory by Rogers (1962). Rogers established that members of a society adopt innovation at different times.

5.2 Perceived ICT Abilities and ICT Integration in Instruction

The second objective of the study was: To find out the relationship between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes in universities.

To realise the objective, the different ways faculty perceived their ICT abilities in ICT integration in instruction in ECE programmes in universities were determined using a questionnaire of nine items. A Likert scale was used to measure the extent to which faculty perceived ICT abilities in ICT integration in instruction ranging from; SD = Strongly Disagree “1”, D = Disagree “2”, U = Undecided “3”, A = Agree “4”, and SA = Strongly Agree “5”. Response Means were calculated to inform on adequacy of ICT perception. Mean scores that ranged 1-3.49 indicated inadequate perception on faculty ICT abilities while Mean scores that ranged 3.5-5 indicated adequate perception on faculty ICT abilities. The results are presented in Table 5.

Table 5. Perceived ICT Abilities to Integrate ICT in Instruction

Perceived ICT abilities in integrating:	SD		D		U		A		SA	
	F	%	F	%	F	%	F	%	F	%
Word processor (e.g., Microsoft word)	0	0	8	9.1	14	15.9	38	43.2	28	31.8
Spreadsheet (e.g., Microsoft excel)	5	5.7	20	22.7	22	25	25	28.4	16	18.2
Presentation (e.g., Microsoft powerpoint)	4	4.5	11	12.5	29	33.0	29	33.0	15	17.0
Database (Microsoft Access)	11	12.5	14	15.9	22	25	31	35.2	10	11.4
Blogs	39	44.3	38	43.2	4	4.5	4	4.5	3	3.4
Search engines (e.g., Internet/ WWW)	3	3.4	4	4.5	5	5.7	37	42.0	39	44.3
Communication (e.g., Email)	2	2.3	11	12.5	9	10.2	39	44.3	27	30.7
Teleconferencing	31	35.2	39	44.3	13	14.8	3	3.4	2	2.3
Learning Management Systems (e.g., moodle)	12	13.6	11	12.5	12	13.6	28	31.8	25	28.4

F = Frequency, % = per cent

Table 5 shows that generally faculty perceived themselves to have sufficient abilities to integrate ICT in instruction using different ICT tools. Majority of the faculty (Often + Always: 42.0 + 44.3%) 86.3% distinguished themselves to have prerequisite ICT abilities to integrate search engines in instruction and (Often + Always: 43.2% + 31.8%) 75% in word processor while minority of the faculty reported to have perceived ICT abilities to integrate ICT in instruction in blogs (4.5% + 3.4%) 7.9% and in teleconferencing (Often + Always: 3.4% + 2.3%) 5.7%. These findings are consistent with those of

Onyia and Onyia (2011) who investigated faculty perception on technology integration in Nigeria university system: Implication for faculty quality curriculum design. A mixed method research design was used. Data was collected using a questionnaire from 60 respondents. It was found that majority (66%) of the faculty had positive ICT abilities with basic ICT tools application in instruction. It has been reported that the success of integration of ICT in instruction largely depends on the teacher educators' perceived ICT abilities. When teacher educators have inner confession to effectively handle a wide range of ICTs in instruction, they are likely to demonstrate ICT competencies (Tondeur, Velcke, & VanBraark, 2008).

To understand the level of faculty perceived ICT abilities, mean scores in the different tools were generated and the results have been presented in Figure 2.

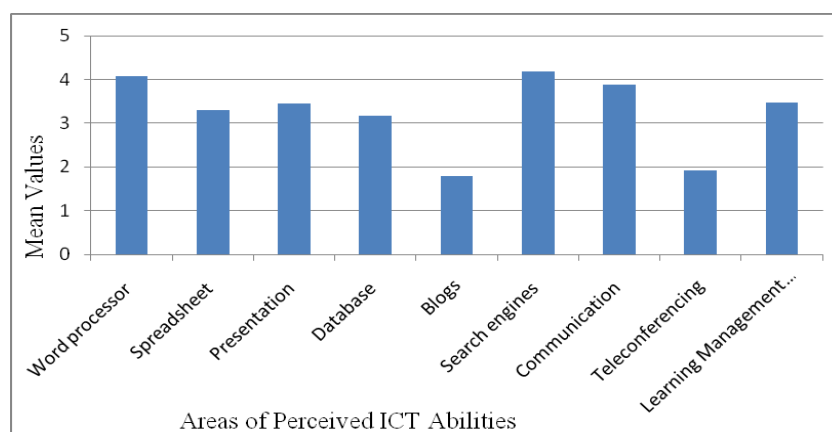


Figure 2. Faculty Mean Scores of Perceived ICT Abilities to Integrate ICT in Instruction

Figure 2 shows that mean on faculty perceived ICT abilities ranged from 1.93-4.19. The results imply that in a Likert scale of 1-5 most of the faculty perceived ICT abilities was below mean 3.5. This implies that faculty had inadequate perceived ICT abilities. This means that most faculty felt uncomfortable to use ICT in instruction. The results may be interpreted to mean that most faculty in ECE programmes lack the necessary knowledge and skills to confidently integrate ICT in instruction hence develop a negative feeling towards ICT use in the classroom.

The findings of the current study support those reported by El-Deghaidy and Nouby (2008), and Al Bataineh (2014). These researchers found that teacher educators had inadequate ICT abilities necessary to integrate ICT in instruction. These findings are also in agreement with those of Makaura (2014) who investigated students' perceptions on use of ICT in a higher education teaching learning context. Among other findings, students reported that on average, faculty integrated ICT in instruction though they lacked the enthusiasm to do so. This may be attributed to the faculty low perceived ICT abilities thus sometimes feeling uncomfortable to integrate ICT in instruction. Other findings in support of the current study are those of Dawam et al. (2009). The study was based on faculty perception on integration of ICT in the teaching learning process. It was reported that faculty perceived ICT abilities

to integrate ICT in instruction were inadequate and that contributed to part of the barriers to technology implementation in higher institutions of learning in Malaysia.

In contrast to the current study are findings by Bee, Lau and Hua (2008) who explored the extent for ICT adoption among faculty in institutions of higher learning in Malaysia. It was found that faculty had high levels of perception on their ICT competencies in ICT integration in instruction and did integrate ICT in instruction. Moreover, Harris (2002) found those teachers who perceived their ICT abilities to integrate ICT in instruction as adequate were confident and willing to explore new pedagogical methods by use of ICT. Gulbahar and Guven (2008) report that the way teachers are taught during training determines whether they will experiment with emerging ICT related teaching approaches. It therefore implies that teacher educators who integrate ICT in instruction are likely to positively influence their trainees in using ICT in instruction.

In order to determine whether the relationship between faculty perceived ICT abilities and ICT integration in instruction was significant, the following hypothesis was stated and tested at alpha value 0.05:

H₀₂: There is no significant relationship between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes.

Pearson correlation was used to compute the correlation coefficient and level of significance. The results are presented in Table 6.

Table 6. Correlation between Faculty Perceived ICT Abilities and ICT Integration in Instruction

	Test	Faculty Perceived ICT Abilities
ICT Integration In Instruction	Pearson Correlation (r)	.486**
	Sig. (2-tailed)	.000
	N	88

P<0.05

Table 6 shows that correlation coefficient between overall faculty perceived ICT abilities and ICT integration in instruction was significant ($r = 0.486$, $p = 0.000$). This implies that a significant relationship existed between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes. Therefore the null hypothesis which was stated that there was no significant relationship between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes was rejected. These results imply that most faculty perceived themselves to have ICT abilities and that positive perception on their ICT abilities was critical in influencing them to integrate ICT in instruction.

This study findings confirms that of Buabeng-Andoh (2012) who found a substantial positive relationship between teachers' perceived ICT competencies and ICT integration in instruction ($r = 0.68$,

$p < 0.01$). The study results are consistent to those of Sorgo, Verckonik and Kocijanic (2010) whose data analysis revealed positive correlation between teachers' perceived ICT competencies and ICT integration in instruction ($r = .49, p < 0.05$).

The result of this study supports that of Olojede (2016) whose study was about faculty perception and attitudes in integrating ICT in instruction in Nigeria. A randomly selected sample of 120 faculty s was used. A questionnaire was employed to collect data. The study results had Pearson's Correlation Coefficient of 0.037 which was significant at alpha value 0.05. This implied that faculty were positive in their ICT abilities and integrated ICT in instruction. Similarly, Makewa et al. (2014) study results found that there was a positive and significant relationship between faculty perceived ICT abilities and ICT integration in instruction.

6. Conclusions

The first objective was to establish the extent to which faculty integrated ICTs in instruction in ECE programmes. Results had revealed that the faculty integration of ICT in instruction in both public and private universities was low and on almost the same level. It was therefore concluded that most faculty ICT integration in instruction was minimum, integrated basic ICT tools and faculty ICT knowledge was in the initial stage.

In the second objective the researcher was to find out the relationship between faculty perceived ICT abilities and ICT integration in instruction in ECE programmes in universities. Results showed that majority of the faculty perceived ICT abilities was negative. Results further revealed that the relationship between faculty perceived ICT abilities and ICT integration in instruction was highly significant. Consequently, it was concluded that faculty perceived ICT abilities positively influenced faculty ICT integration in instruction.

7. Recommendations

To improve the integration of ICT in instruction, the following recommendations were made to key stakeholders. The key stakeholders included: Faculty of ECE programmes, management of universities, and Ministry of Education, Science and Technology.

7.1 Faculty of ECE Programmes

- (i) Attend in-service training on how to integrate advanced ICT tools in instruction. This is because most faculty were using basic ICT tools in instruction.
- (ii) Integrate more ICT in instruction. This is because faculty ICT integration in instruction was minimal and at the initial stage.
- (iii) Frequently attend ICT trainings to learn how to use ICT in instruction. When this is implemented in universities, it is hoped that faculty may improve their competences on ICT integration in instruction. This is because majority of faculty perceived ICT abilities were negative.

7.2 Management of Universities

- (i) Organize in-service training for faculty to learn how to integrate advanced ICT tools in instruction. This is because most faculty were using basic ICT tools in instruction. Faculty ICT integration in instruction was also minimal and their perceived ICT abilities were negative.
- (ii) Motivate faculty to integrate ICT integration in instruction. The faculty ICT integration in instruction in both public and private universities was minimal.
- (iii) Provide faculty easy access to ICT that can be used for both preparation and instructional use.
- (iv) Provide more time for teaching to allow faculty enough time to plan on how to integrate ICT in instruction.

7.3 Ministry of Education Science and Technology

- (i) Provide adequate funds to universities to enable them to organize adequate in-service training for faculty to learn how to integrate advanced ICT tools in instruction. The funds would also be used to provide more ICT resources for ICT integration in instruction.

References

- Ajebalen, A. J. (2016). The Use of ICT to enhance University Education in Nigeria. *International Journal of Education, Learning and Development*, 4(5), 1-11.
- Al Bataineh, M. T. (2014). The relationship between social studies teachers' attitudes towards technology and their perceptions of competency needed for implementing technology in their classrooms in Jordan. *World Journal on Educational Technology*, 6(2), 226-237.
- Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 47(4), 373-398. <https://doi.org/10.1016/j.compedu.2004.10.013>
- Bee, T., Lau, C., & Hua, S. (2008). Exploring the Extent of ICT Adoption among Secondary School Teachers in Malaysia. *International Journal of Computing and ICT research*, 2(2), 19-36.
- Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education & Development using Information & COMMUNICATION Technology*, 8(1).
- Dawam, M., Rafidah, S., Ahmad, K. A., Kamaruzaman, J., Taniza, T., Jamel, E. S., & Suhardi, M. (2009). *The Use of ICT in Public and Private Institutions of Higher Learning, Malaysia*. Computer and Information Science.
- Dudeney, G. (2010). *The Internet and the language classroom* (Vol. X). Cambridge: Cambridge University Press.
- El-Deghaidy, H., & Nouby, A. (2008). Effectiveness of a blended e-learning cooperative approach in an Egyptian teacher education programme. *Computers & Education*, 51, 988-1006. <https://doi.org/10.1016/j.compedu.2007.10.001>
- Gulbahar, Y., & Guven, I. (2008). A survey on ICT usage and the perceptions of social studies teachers

- in Turkey. *Educational Technology & Society*, 11(3), 37-51.
- Harris, S. (2002). Innovative pedagogical practices using ICT in schools in England. *Journal of Computer Assisted Learning*, 18, 449-458. <https://doi.org/10.1046/j.0266-4909.2002.00256.x>
- Haydn, T., & Barton, R. (2008): First do no harm: Factors influencing teachers' ability and willingness to use ICT in their subject teaching. *Computer & Education*, 51(1), 439-447. <https://doi.org/10.1016/j.compedu.2007.06.001>
- Jegade, P. O. (2006). *A study of predicting factors of teacher educators towards ICT in south western, Nigeria* (Unpublished PhD Thesis). Obafemi Awolowo University, Ile-Ife, Nigeria.
- Kaindio, P. M., & Wagithunu, M. N. (2014). Integrating Information Communication Technology Skills in Preschool Education in Kenya. *Mediterranean Journal of Social Sciences*. <https://doi.org/10.5901/mjss.2014.v5n5p89>
- Kass, A. (2012). *Do not be afraid of fear/sense of personal and professional capability in teaching*. Tel Aviv: MOFET Institute [In Hebrew].
- Kasse, J. P., & Balunywa, W. (2013, February). *An assessment of e-learning utilization by a section of Ugandan universities: Challenges, success factors and way forward*. Paper presented at the International conference on ICT for Africa 2013, Harare, Zimbabwe.
- Kinuthia, W. (2009). Educational Development in Kenya and the Role of Information and Communication Technology. *International Journal of Education and Development using ICT*, 5(2).
- Kipsoi, E. J, Changach J. K., & Sang, H. C. (2012). Challenges facing adoption of ICT in educational management in schools in Kenya. *Journal of Sociological Research*, 3(1). <https://doi.org/10.5296/jsr.v3i1.1882>
- Kisirkoi, F. K. (2015). Integration of ICT in Education in a Secondary School in Kenya: A Case Study. *Literacy Information and Computer Education Journal (LICEJ)*, 6(2). <https://doi.org/10.20533/licej.2040.2589.2015.0253>
- Makaura, A. H. (2014). *Students' Perceptions of the Use of ICT in a Higher Education Teaching and Learning Context: The Case of a South African University Central University of Technology, Department of Postgraduate Studies: Education*.
- Makewa, L. N., Kuboja, J. M., Yango, M., & Ngussa, B. M. (2014). ICT-Integration in Higher Education and Student Behavioral Change: Observations at University of Arusha, Tanzania. *American Journal of Educational Research*, 2(11A), 30-38. <https://doi.org/10.12691/education-2-11A-5>
- Makhoha, G. L., & Mutisya, D. N. (2016). Status of E-Learning in Public Universities in Kenya. *The International Review of Research in Open and Distributed Learning*, 17(3). <https://doi.org/10.19173/irrodl.v17i3.2235>
- Nkembo, K. S., Koloseni, D., & Shimba, F. (2011). *ICT and the Education Sector in Tanzania: Effectiveness of Introducing and Applying ICT in Higher Learning Institutions in Tanzania: The*

- Case of Ardhi University*. Lambert Academic Publishing.
- Nyerere, J. K. A., Gravenir, F. Q., & Mse, G. S. (2012). Delivery of open, distance and e-learning in Kenya. *International Review of Research in Open and Distributed Learning*, 13(3), 185-205. <https://doi.org/10.19173/irrodl.v13i3.1120>
- Olojede, J. C. (2016). *Perception and Attitudinal Behavior of Lecturers' in the Use of Information and Communication Technology Tools in Teaching/Learning in Michael Okpara University of Agriculture Umudike, Department of Rural Sociology and Extension Abia State, Nigeria*.
- Olowe P. K. (2012). *Information and Communication Technologies (ICTs) in Nigerian Early Childhood Education* (Alebure, V. I., Opoola, B. T., & Adejumobi, A. A., Eds.).
- Olowe, P. K., & Kutelu, B. O. (2014). Perceived Importance of ICT in Preparing Early Childhood Education Teachers for The New Generation Children. *International Journal of Evaluation and Research in Education (IJERE)*, 3(2), 119-124. <https://doi.org/10.11591/ijere.v3i2.5405>
- Onwuagboke, B. B. C., Singh, T. K. R., & Fork, F. S. (2015). Need For ICT Integration For Effective Instructional Delivery In Nigerian Colleges Of Education. *Journal of Education And Practice*, 6(3), 51-56.
- Onyia, .C. R., & Onyia, M. (2011). Faculty perception for technology integration in Nigeria university system: Implication for faculty quality curriculum design. *International Journal of Business and Social Science*, 2(12).
- Rogers, E. M. (1995). *Diffusion of Innovations*. New York: Free Press.
- Salem, N., & Mohammadzadeh, B. (2018). A Study on the Integration of ICT by EFL Teachers in Libya. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(7), 2787-2280. <https://doi.org/10.29333/ejmste/90594>
- Sangani, K. (2013). BYOD to the classroom [bring your own device]. *Engineering & Technology*, 8(3), 42-45. <https://doi.org/10.1049/et.2013.0304>
- Sorgo, A., Verckovnik, T., & Kocijancic, S. (2010). Information and communication technologies (ICT) in biology teaching in Slovenian secondary schools. *Eurasia Journal of Mathematics, Science and Technology Education*, 6, 37-46. <https://doi.org/10.12973/ejmste/75225>
- Sulungai, M. W., Toili, W. W., & Amadalo, M. M. (2012). Teachers' related factors influencing the integration of information technology in the teaching of mathematics in secondary schools in Kenya. *African Journal of Education and Technology*, 2(1), 1-14.
- Tondeur, J., Valcke, M., & van Braak, J. (2008). A multidimensional approach to determinants of computer use in primary education: Teacher and school characteristics. *Journal of Computer Assisted Learning*, 24, 494-506. <https://doi.org/10.1111/j.1365-2729.2008.00285.x>
- UNESCO. (2002). *Information and communication technology in education*. A curriculum for schools and programme of teacher development.