THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

Impact of Lecturers' Perceived Usefulness and Leadership Support on Integration of Information and Communication Technologies in Instruction in Early Childhood Education Programmes in Universities in Kenya

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Abstract:
Research has shown that Information and Communication Technology (ICT) competent educators produce graduates who are ICT competent. Integration of ICT in teaching-learning improves the quality of instruction and achievement of learning outcomes. ICTs are a range of technological tools and resources used to transmit, store, generate, and share information. In developed countries studies have shown that teacher educators have embraced ICT in their work place and daily lives to improve their productivity. The integration of ICT in instruction in Africa is limited despite educational institutions receiving a lot of ICT support from governments. In Kenya, ICT policy underscores ICT integration in instruction at all levels of education. Studies in early years' education have shown limited use of ICT in instruction. The limited use of ICT in early years education could be traced to teacher training institutions. It is from the above background information that this study was designed to establish the extent to which ECE university lecturers integrated ICT in instruction and the factors influencing it. Results revealed that most lecturers' ICT integration in instruction was minimal and at the initial stage because of poor ICT competencies and lack of ICT leadership support.

Keywords: *ICT competencies, leadership support, information and communication technologies, integration in instruction, early childhood education, Universities, Kenya*

1. Introduction

Universities are institutions of higher learning expected to generate competent graduates for implementation of Information and Communication Technologies (ICTs). This expectation is pegged on teacher educators who are assumed to practise the application of ICT as an innovation that has been associated with immense benefits both to the teacher and to the learner (Onwuagboke, Singh & Fook, 2015). According to UNESCO (2012) ICT includes software and hardware tools necessary in generating, storing, transmitting, and sharing information in real time. The internet is critical in the effective performance of most ICTs integrated in instruction (Sharma & Garg, 2016). Studies reveal that teachers need leadership support for better execution of instruction. The support needed includes ICT training, ICT institution policy formulation and adherence to motivation for instructors to use ICT in the teaching learning process, availability and access of ICT resources and provision of ICT technicians to assist during times of challenges (Mutwiri, Kafwa&Mwaka-Kyalo, 2017).

Innovation of ICT has drastically shaped instruction worldwide. This is mostly reported in developed countries which through ICT application in instruction, have continued to improve student performance (Sangani, 2013). In the US, Britain, Canada and Japan among other western countries ICTs are identified to have been commonly applied with success in a variety of areas in improving work performance. However, this situation is found lacking in developing countries particularly in Africa (Ghavifekr, &Rosdy, 2015). In an effort to breach the gap in digital divide, most developing countries are reported to set aside huge budgets for supply and maintenance of ICT resources in different areas including educational institutions. However, reports indicate that these resources may go to waste since most teachers do not integrate ICT in instruction (Salem, &Mohammadzadeh, 2018). Studies done on ICT use in universities in most countries in Africa have reported dismal performance (Makhoha&Mutisya, 2016) and indicate that universities are in their infancy stage in ICT adoption. For example, Boakye and Banini (2008) investigated ICT use in instruction in Benin, Cameroon,

Ghana and Mali. It was found that most teachers had negative attitude towards ICT and did not use ICT in instruction. A study on ICT awareness and use in universities in Nigeria revealed that lecturers were knowledgeable of ICT however their ICT integration in instruction was minimal (Kamba, 2009). In Zimbabwe, reports show that university lecturers shied away from integrating ICT in instruction since they felt incompetent to handle ICT in instruction (Chitiyo & Harmon, 2009). In Uganda it was found that university teacher educators lacked ICT skills necessary to assist them integrate ICT in instruction (Kasse & Balunywa, 2013).

In Kenya, there is need of conducting more studies in universities to investigate ICT integration in instruction (Omwenga, 2003; Keiyoro, 2011; Gikonyo, 2012) since Kipsoi, Changach & Sang (2012) report that majority of the teachers in educational institutions, universities included shy away from integrating ICT in instruction. Most of the studies done in universities in Kenya were on general use of ICT and not specific on particular programme. In addition, these studies showed limited and underutilised use of ICT resources.

Nearly all teachers in educational institutions in Kenya are products of universities. Studies on ICT use in most of these educational institutions reveal that teachers do not integrate ICT in instruction as required (Begi, 2007; Kiarie, 2014; Kaindio & Wagithunu, 2014). It is upon this realisation that a study on ICT use in instruction in universities needed to be undertaken to establish factors underlying ICT application in the ECE programmes in universities in Kenya.

2. Problem Statement

The benefits of ICT integration in instruction are many and widespread. However, for these benefits to be realised, teachers need to appreciate the place of ICT in instruction and take a leading role in integrating ICT in instruction. However, in order for teachers to practise integration of ICT in instruction, they need to have trained to do so. Universities are hoped to produce personnel capable of utilising ICT in their daily lives. Interestingly, studies done on ICT application in universities indicate dismal performance. These studies seemed to centre on availability and access of ICT and were not particular to any academic programme. Nevertheless, the impact of lecturer's perceived ICT usefulness and ICT leadership support in integrating ICT in instruction in ECE programmes in universities in Kenya has hardly been analysed. Perceived ICT usefulness and availability of ICT leadership support in integrating ICT in instruction are factors that may influence lecturers to integrate ICT in instruction. If the issue of how lecturers perceive ICT usefulness and consider ICT leadership support are not timely and adequately addressed, both lecturers and students will miss the much benefits associated with ICT integration in instruction.

3. Objectives of the Study

The study sought to achieve the following objectives:

- To explore the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction in ECE programmes.
- To find out the relationship between availability of ICT leadership support and ICT integration in instruction in ECE programmes.

4. Research Methodology

The study employed ex post facto design. A total of 40 universities; 23 public and 17 privates with 142 lecturers and 119 lecturers respectively teaching ECE programmes formed the target population. Out of this target population, 10 public universities and 6 private universities with 50 lecturers and 38 lecturers respectively were sampled for the study. Quantitative research methodology was used to analyse data. Descriptive statistics comprising frequencies, percentages, means and standard deviations were calculated. Inferential statistics calculated as demanded by the null hypotheses were t-test and Pearson Correlation Coefficient. A questionnaire, observation guide and document analysis were methods used for data collection. The questionnaire had three sections. Section A had three items on demographic information. Section B had 10 items soliciting information on perceived ICT usefulness and ICT integration in instruction. Section C had 10 items soliciting information on availability of ICT leadership support and ICT integration in instruction with response type; Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5) adopted. Document analysis was done to identify types of ICT tools available in the universities for instruction, availability of ICT leadership support, and content areas where ICT was applied in instruction. Observation was done as part of data triangulation on ICT tools lecturers used in instruction and extent of the integration. Tables, figures and text were used to present the data.

Pilot study was conducted using two universities; one public with 12 lecturers and the other private with 8 lecturers. The pilot study was done to determine quality of the research instrument in terms of consistency and validity. Correlation coefficient of each research instrument was determined using Cronbach Alpha Technique and each research instrument was found to have correlation coefficient above 0.8.

5. Results and Discussions

The first objective of the study was: To explore the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction in ECE programmes in universities. To achieve this objective, a questionnaire consisting of ten items soliciting information in relation to lecturers' perceived ICT usefulness in instruction was formulated and administered. A scale ranging from 1 representing Strongly Disagree (SD), 2 representing Disagree (D), 3 representing Undecided (U), 4 representing Agree (A) and 5 representing Strongly Agree (SA) was used to assign weights of the responses. Negative perception was categorised to fall between Mean scores of 1 and 3.49 while positive perception was considered to fall between Mean score 3.5 and 5. The results have been presented in Table 1.

Statement	SD		D		U		A		SA	
	F	%	F	%	F	%	F	%	F	%
Improves the quality of instruction	1	1.1	1	1.1	7	8.0	35	39.8	44	50.0
Improves curriculum	0	0.0	3	3.4	8	9.1	32	36.4	45	51.1
Enjoyable and stimulating	0	0.0	1	1.1	8	9.1	33	37.5	46	52.3
It's very involving	6	6.8	8	9.1	6	6.8	24	27.3	44	50.0
Reduces work	3	3.4	12	13.6	15	17.0	32	36.4	26	29.5
Makes work easy	1	1.1	4	4.5	7	8.0	34	38.6	42	47.7
Improves innovativeness	0	0.0	4	4.5	4	4.5	41	46.6	39	44.3
Lowers remedial instruction	1	1.1	7	8.0	19	21.6	28	31.8	33	37.5
Expands learning past school walls	1	1.1	1	1.1	2	2.3	26	29.5	58	65.9
Promotes research in ECE	1	1.1	4	4.5	2	2.3	25	28.4	56	63.6

Table 1: Lecturers' Perceived ICT Usefulness in Instruction

Table 1 shows most lecturers consider ICT useful when integrated in instruction. The number ranges from 66% (the least) to 95% (the most). It is indicative that lecturers perceived ICT to be highly useful especially in expanding learning beyond the classroom (95%), promoting research in ECE (92%) and improving students' creativity and critical thinking (91%). The least number of lecturers (66%) considered ICT to be useful in reducing their work. Interestingly, 77% of the lecturers reported that ICT was very involving. More than half of the lecturers perceived ICT useful when integrated in instruction.

To have more light on how the lecturers perceived ICT usefulness, individual mean scores in the different areas of ICT integration were calculated. Results have been presented in Figure 1.

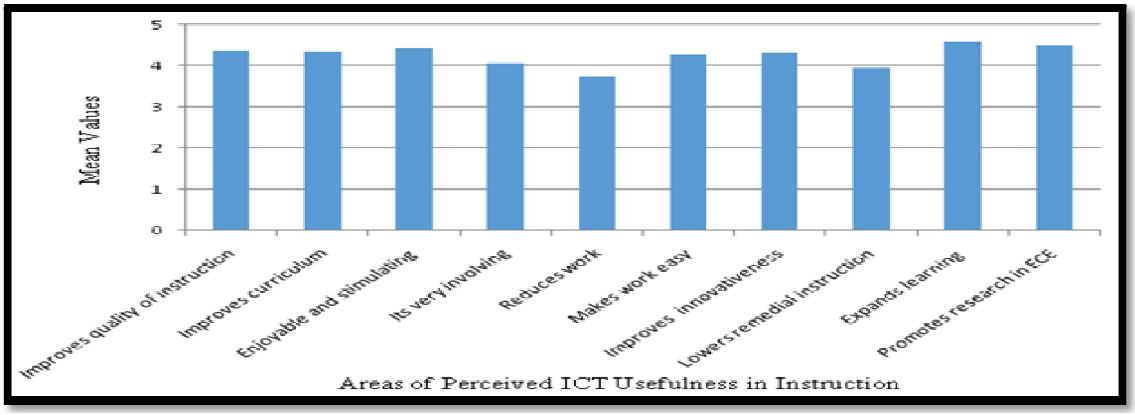

Figure 1: Lecturers' Mean Scores of Perceived ICT Usefulness in Instruction

The results in Figure 1 show that all the mean scores of the questionnaire items were above 3.5 and specifically ranged from M = 3.75 and M = 4.58. Lecturers perceived ICT to be most useful when integrated in instruction in expanding learning (Mean = 4.58) and less useful in reducing their work (Mean = 3.75). This means lecturers had positive perception of ICT usefulness in instruction.

To find out whether statistically there was a significant relationship between lecturers' perceived ICT usefulness and ICT integration in instruction, the following null hypothesis was stated and tested at alpha value 0.05:

- H_{01}: There is no significant relationship between lecturers' perceived ICT usefulness and ICT integration in instruction in ECE programmes in universities at alpha value 0.05.

Pearson Correlation Coefficient was used to determine the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction. The results are shown in Table 2.

		Overall Lecturers' ICT Perceived Usefulness
ICT Integration In Instruction	Pearson Correlation	.176
	Sig. (2-tailed)	.102
	N	88

Table 2: Relationship between Perceived ICT Usefulness and ICT Integration in Instruction
P>0.05

Table 2 shows the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction as indicated by the correlation coefficient was not statistically significant (r = 0.176, p = 0.102). Therefore, the null hypothesis which stated that there was no significant relationship between lecturers' perceived ICT usefulness and ICT integration in instruction in ECE programmesat alpha value 0.05 was accepted. This meant that lecturers considered ICT to be useful but did not integrated ICT in instruction.

The study findings support that of Chien, Wu, and Hsu, (2014) in Taiwan which explored teachers' beliefs on use of ICT and their perceived ICT usefulness in instruction. It was reported that although most teachers considered ICT useful in instruction, a significant number of them did not integrate ICT in instruction. Similarly, Wanjala, Aurah, and Koros, (2015) found teachers in secondary schools in Kenya valued ICT as an important component of mathematics instruction. However, most of the teachers did not use ICT in instruction. In addition, Miima, Ondigi, and Mavisi, (2013) found teachers to have high levels of perceived ICT usefulness in instruction but majority did not integrate ICT in instruction.

Results of the current study contradict those of Augustine, Daud and Kamaruddin (2018) who investigate teachers' use of ICT in teaching and learning in Secondary Schools in Nigeria. A sample of 234 teachers was selected from 20 secondary schools. Data was collected using a questionnaire. It was found that teachers' perceived ICT usefulness determined ICT use in instruction and that most teachers integrated ICT in instruction since they perceived ICT to be useful when integrated in instruction.

5.1. Availability of ICT Leadership Support and ICT Integration in Instruction

The second objective of the study was: To find out the relationship between availability of ICT leadership support and ICT integration in instruction in ECE programmes. To achieve this objective statement on different ICT leadership support areas and ICT integration in instruction were determined using a questionnaire consisting of 11 items. Scores of each item ranged from 1 Disagree (SD), 2 representing Disagree (D), 3 representing Undecided (U), 4 representing Agree (A), and 5 representing Strongly Agree (SA). Mean was calculated and grouped in three levels thus Inadequate ICT Leadership support Mean ranged from 1 - 2.99; Moderate ICT Leadership support Mean ranged from 3 - 3.49 while Adequate ICT Leadership support Mean ranged from 3.5 - 5. The results are presented in Table 3.

Statement	SD		D		U		A		SA	
	F	%	F	%	F	%	F	%	F	%
My University has a variety of ICT facilities	8	9.1	23	26.1	17	19.3	33	37.5	7	8.0
My University provides ICT technicians	4	4.5	20	22.7	23	26.1	34	38.6	7	8.0
ICT training is personal responsibility in my University	5	5.7	19	21.6	31	35.2	22	25.0	11	12.5
My University has clear ICT policy	1	1.1	11	12.5	26	29.5	31	35.2	19	21.6
My expertise in ICT is self driven	4	4.5	6	6.8	8	9.1	43	48.9	27	30.7
My department has junk ICT equipment	9	10.2	20	22.7	27	30.7	21	23.9	11	12.5
The lecture halls have few ICT facilities	12	13.6	14	15.9	20	22.7	25	28.4	17	19.3
My department has limited ICT access	10	11.4	19	21.6	18	20.5	31	35.2	10	11.4
My University promotes my ICT knowledge	14	15.9	23	26.1	20	22.7	19	21.6	12	13.6
My department has adequately ICT facilities	10	11.4	24	27.3	25	28.4	21	23.9	8	9.1
My university has clear ICT objectives	2	2.3	10	11.4	20	22.7	31	35.2	25	28.4

Table 3: ICT Leadership Support

Table 3 shows both public and private universities have ICT policies, accounting for 57 % and ICT objectives 64%. Interestingly, majority of the lecturers reported to have attained ICT expertise through self training (80%). This implies that majority of lecturers seek own support in training in ICT usage. Consequently, lecturers get minimal support in ICT development from their university leadership. The finding concur with that of Tibebu, Bandyopadhyay, and Negash, (2009) who found majority of teachers (97%) in Ethiopia trained themselves in ICT integration in instruction.

To provide more light on how the lecturers perceived availability of ICT leadership support in their universities, individual mean scores were calculated for each of the areas of ICT leadership support. Results are presented in Figure 2.

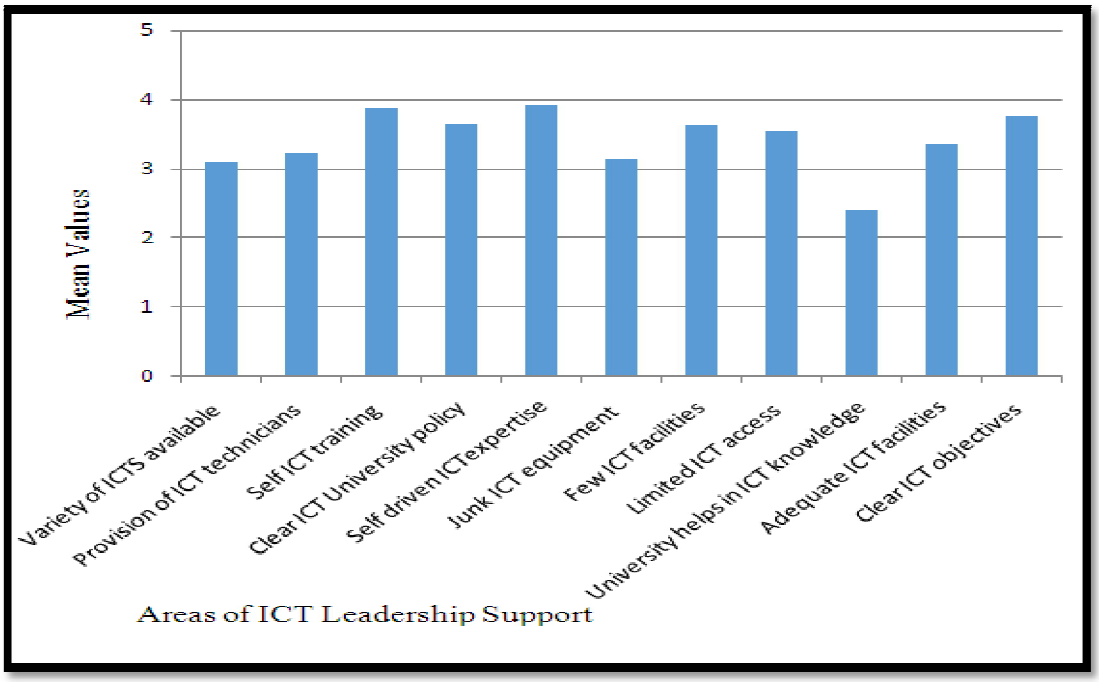

Figure2: Mean Scores of ICT Leadership Support and ICT Integration in Instruction

Figure 2 shows majority of the lecturers were responsible of their ICT expertise and ICT training (mean = 3.92, SD = 1.01 and mean = 3.87, SD = 1.09 respectively). Minimal number of lecturers (Mean = 2.41, SD = 1.29) were of the opinion that they got support from their university leadership in advancing their ICT knowledge and skills. These findings concur with those of Onwuagboke and Ukegbu, (2010) who found general lack of ICT leadership support (mean = 2.7) and shortage of ICT technical personnel in Nigerian colleges of Education.

To further find out whether the relationship between availability of ICT leadership support and ICT integration in instruction was significant, the following null hypothesis was stated and tested at alpha value 0.05.

- H_{02}: There is no significant relationship between availability of ICT leadership support and ICT integration in instruction in ECE programmes in universities at alpha value 0.05.

To test this hypothesis, the data was subjected to correlation analysis. Pearson Correlation Coefficient test was computed and the results have been presented in Table 4.

		Availability of Leadership ICT Support
ICT Integration In Instruction	Pearson Correlation	.308**
	Sig. (2-tailed)	.004
	N	88

Table 4: Relationship between ICT Leadership Support and ICT Integration in Instruction
P < 0.05

Table 4 shows the correlation coefficient between availability of ICT leadership support and integration of ICT in instruction was significant (r = 0.308, p = 0.004) at alpha value 0.05. Therefore, the null hypothesis which stated that there was no significant relationship between ICT leadership support and ICT integration in instruction at alpha value 0.05 was rejected. The positive and significant relationship between ICT leadership support and ICT integration in instruction means that increased availability of ICT leadership support in universities translates to increased lecturers' ICT integration in instruction. Similarly, inadequate ICT leadership support in universities results to poor lecturers' ICT integration in instruction.

The study findings match those of Mwawasi (2014) who did a study on ICT leadership support and ICT use in instruction. It was found that availability of ICT leadership support plays a critical role in determining ICT integration in instruction. The study further revealed that availability of ICT support from institutional leadership translates to teacher motivation in ICT integration in instruction. The current study findings also agree with those reported by Ali, Haolader and Muhammad (2013) on the role of ICT in making teaching-learning effective in higher institutions of learning in Uganda. A sample of 90 teachers and 75 administrators was selected. A questionnaire was used for data collection. Chi-square test and weighted average were the statistical tests used to analyse and interpret the data collected. It was revealed that availability of ICT leadership support was among other factors that influenced use of ICT in instruction.

Similarly, Emmanuel, Chiaka and Edna (2014) conducted a study on ICT Integration in the Curriculum of Federal Unity Schools in Nigeria. It was found that ICT leadership support had significant influence on ICT utilization. This implies that availability of ICT leadership support plays important role in all educational institutions in influencing teachers' and students' ICT integration in instruction. However, Ang'ondi (2013) points out that despite the positive and significant relationship between availability of ICT leadership support and ICT integration in instruction, challenges such as

inadequate functional ICT equipment and related facilities, and teachers' lack of relevant knowledge and skills on how to integrate ICT in instruction seem to challenge such a relationship.

According to Mwawasi (2014) ICT leadership support include timely communication of the institution vision on ICT, objectives focusing ICT, lecturers' in-service refresher training on ICT, motivation of lecturers to use ICT in instruction, among other support services. When lecturers are supported with equipped ICT lecture rooms and current ICT facilities, allowed to attend ICT refresher courses and seminars, lecturers are likely to integrate ICT in instruction. This is because the results of this study confirm existence of a positive and significant relationship between availability of ICT leadership support and ICT integration in instruction.

Lecturers who are continually exposed to ICT practices are likely to develop interest in ICT integration in instruction. Kpolovie, Iderima and Ololube, (2014) suggest that fear of failure in integrating ICT in instruction discourages lecturers from using ICT applications in instruction. This fear is harboured by lecturers when they fail to frequently interact with ICT infrastructure. High level ICT leadership support committed in areas of ICT training, provision of modern ICT infrastructure and generally personnel support are critical components of successful ICT integration in instruction at all educational levels (Mac Callum, Jeffrey, &Kinshuk, 2014).

6. Conclusions

In the first objective the researcher was to explore the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction in ECE programmes. Results showed that majority of lecturers' perceived ICT usefulness was positive and the relationship between lecturers' perceived ICT usefulness and ICT integration in instruction was not significant. Thus, lecturers' perceived ICT usefulness did not positively influence lecturers to integrate ICT in instruction.

Lastly, the study was to find out the relationship between availability of ICT leadership support and ICT integration in instruction in ECE programmes. Results showed that majority of the lecturers in both public and private universities had inadequate available ICT leadership support. The relationship between availability of ICT leadership support and ICT integration in instruction was highly significant. Therefore, availability of ICT leadership support practices in universities influenced lecturers' integration of ICT in instruction.

7. Recommendations

In order to improve ICT integration in instruction, the following recommendations were made for the key stakeholders who include: Lecturers of ECE programmes, management of universities, and Ministry of Education, Science and Technology.

7.1. Lecturers of ECE programmes

It is recommended that lecturers to frequently attend ICT trainings to learn how to use ICT in instruction. When this is implemented in universities, it is hoped that lecturers may improve their competences on ICT integration in instruction since majority of lecturers perceived ICT useful and did not integrate it in instruction. The relationship between lecturers' perceived ICT usefulness and ICT integration in instruction was also not significant and therefore had negative impact on ICT integration.

7.2. Management of Universities

- University management need to appreciate and carter for the factors that influence ICT integration in instruction. There is need for the university management to clearly understand the role played by lecturers' perceived ICT usefulness and availability of ICT leadership support in ICT integration in instruction so as to seek strategies to strengthen lecturers for better use of ICT in instruction.
- University management need to motivate lecturers to integrate ICT integration in instruction. Lecturers' ICT integration in instruction in both public and private universities was minimal. The relationship between lecturers' perceived ICT usefulness and ICT integration in instruction was also not significant.
- University management needs to provide lecturers easy access to ICT that can be used for both preparation and instructional use.
- University management needs to provide more time for teaching so as or lecturers to adequately plan on how to integrate ICT in instruction.
- University management needs to provide technical support for ICT integration in instruction. Majority of the lecturers in both public and private universities had reported that ICT leadership support was inadequate.

7.3. Ministry of Education Science and Technology

Provide adequate funds to universities to enable them to organize adequate in-service training for lecturers 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 as outlined in the National ICT policy framework.

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