



IAE Journal of Research and Development (IJORED)

Vol. 1, Issue 1 August 2025, pp. 156-162,

eISSN: 3088-5515, pISSN: 3088-5523,

Published by IAE.

DOI: <https://doi.org/10.61408/ijored2025v01i01.08>

Application of Design Thinking to Access how ICT Integration in Teaching and Learning Influences CRE Results in Kisumu Central Sub-County

Stephen Otieno Del, Mildred Ayere & Joash Kowino

Maseno University.

Email: otienodel2@gmail.com, ayere mildred@gmail.com & kojoasb@gmail.com.

Abstract

Christian Religious Education (CRE), despite its popularity, has consistently scored below average grades in the KCSE in Kisumu County, CRE having the lowest average among all humanities. Purpose of this study was to explore how Design Thinking process can be used to integrate ICT in CRE in secondary schools in Kisumu Central Sub-County. Study objective was to determine the extent to which ICT integration improves CRE results through design thinking process. This research used design thinking strategies within a descriptive and correlational research designs. Data was collected through FGD guide, questionnaires, and document analysis guide from 21 secondary schools, 1623 students, 68 CRE teachers, 21 directors of study, and 21 principals. A sample of 521 students, 21 CRE teachers, 19 directors of studies, and 19 principals were selected using purposive, saturated, and simple random sampling. Instrument validity was confirmed through expert review and pilot study, and reliability was established using test-retest method at reliability coefficient of .76. Quantitative data analysis involved computing frequencies, means, standard deviation and correlation while qualitative data were analysed using content analysis. The correlation analysis

between ICT uses and CRE results showed a strong positive relationship ($r = .72, p = .032$).

Key words: KA-Knowledge acquisition, KD-knowledge deepening, KC-Knowledge Creation

Introduction

Goldhaber, Khuan and Allysa (2021) explain that the application of technology provides different opportunities to make learning more fun and enjoyable in terms of teaching the same things in different ways thus improving results. Henderson (2020) found out that, the use of ICT in education adds value to teaching and learning, by enhancing the effectiveness of learning there by improving grades. Schools in this sub-county are equipped with ICT resources, they are integrating ICT in CRE and that ICT integration improves CRE grades (MoE, 2021). However, preliminary investigation conducted on CRE KCSE 2016 to 2019 results of this sub-county revealed otherwise. CRE results in all the schools are below average. It is in this light that this research intended to find the cause and solution for this low performance.

Conceptual Framework

This study was based on design thinking theory that states that learners will construct their own individual knowledge from their perceptions of that world. (McLeod, 2019). Mienel, Noweski and Scheer (2012) describe Design Thinking as a team-based learning process that offers teachers support towards practice-oriented and holistic modes of constructivist learning in projects.

Methodology

This research used design thinking strategies within a descriptive design setting and correlation research designs. Descriptive research is defined as

a research method that describes the characteristics of the population or phenomenon studied (McCombes, 2022). In this study, the researcher employed descriptive research method to accurately and systematically describe CRE teachers' ICT competency level in integrating ICT innovative and collaborative tools in CRE lessons. Data was collected from CRE teachers, within the second term using questionnaire and analysed SPSS software version 21.

Results and Discussions

The results are objective based and each section has results presented and discussed independently.

Extent to which Integrating ICT in Teaching and Learning Improves CRE Results

The investigations were mainly based on the documents of the previous and most recent results obtained from the directors of studies' offices in the schools under this study and the results for KCSE 2016-2019 obtained from Kisumu Central sub-county offices. This information was obtained from the directors of studies through document analysis guide and the questionnaire for teachers. The researcher gathered this information and analysed it to arrive at the findings stated in the table below.

Category	Schools																			Average (%)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
KA	3	2	2	2	3	2	3	3	2	2	3	2	2	2	3	3	2	2	2	2.76
KD	3	2	2	2	3	2	2	3	2	2	3	2	2	2	2	2	2	2	2	2.21
KC	3	2	2	2	3	2	2	3	2	2	3	2	2	2	2	2	2	2	2	2.21
Competency levels (per school)	3	2	2	2	3	2	2	3	2	2	3	2	2	2	2	2	2	2	2	2.39
KCSE mean grade 2019	7.8	7.3	7.0	6.9	6.3	2	5.9	5.4	5.3	5.1	4.7	4.3	2	3.7	4.1	3.7	3.3	3.2	2.5	5.1
KCSE mean deviation (2016-2019)	1.7	0.6	1.5	1.2	0.7	2.1	0.0	1.4	1.6	1.9	1.2	0.5	1.9	1.2	2.0	1.1	0.5	0.6	0.5	1.1

Table 1. Teachers' ICT competencies and KCSE mean grade 2019

None Starter	New (Novice)	Applying (Intermediate)	Integrating (Advanced)	Transforming (Expert)
1	2	3	4	5
(%)	(%)	(%)	(%)	(%)

Source: UNESCO

Table 1 presents information from the directors of studies obtained through document analysis guide and the questionnaire for teachers. It presents a comparison for all the three domains for ICT integration; KA, KC and KD. It goes further to display the overall mean competency for all the three domains against the last KCSE used in this study (2019) and the overall mean deviations for CRE results. The average teachers ICT skill level are to be a determinant in KCSE performance in CRE. For instance, school A are averagely at advanced level (3) in all the 3 UNESCO competency levels, the same school had the highest KCSE mean (7.8) in CRE implying ICT competency levels of CRE greatly influence results. This information was used to find the relationship between integration of ICT in CRE and the CRE result. ICT use and CRE results showed a strong positive relationship ($r = .72$, $p = .032$).

CRE teachers confirmed that little effort they put in integrating ICT in teaching resulted in improved CRE KCSE results over the years. Level of ICT integration competency of CRE teachers play a key role on the improvement of CRE results. This research revealed that, for CRE results to improve greatly CRE teachers need to possess ICT integration competencies in KA, KD and KC recommended by the UNESCO ICT competency level (2018) on which this research was based. The study compared the KCSE results between 2016 and 2019 and computed mean deviation for the four years and realized an overall mean deviation of 1.1 confirming that ICT integration in CRE over the years improved CRE

results. The researcher gathered this information and analysed it to arrive at the findings stated in the table below.

Table 2: Correlation analysis for KA, KD and KC and KCSE mean grades

Category	Correlations	Sig.
KA	0.7614*	0.32**
KD	0.7434*	0.35**
KC	0.7434*	0.35**

Source: Research data when conducted?

Discussions

Albugami and Ahmed (2015) say design thinking and ICT innovative and collaborative resources enable students to create knowledge on their own and significantly enhances CRE learning outcomes. CRE teachers and students were asked, “Does use of ICT in CRE lessons improve students’ confidence, participation and eventually CRE RESULTS?” 98% replied yes. Pruthviraj et al. (2023) found out that students' experiential and joy of learning approach to the use of design thinking approach with ICT tools has benefited to enhance their confidence, understanding level, interest in learning, and participation when it was used for teaching and learning and that the results improved greatly. ICT integration positively influences student outcomes. Specifically, the overall mean deviations for the years analysed indicate an improvement mean= 1.1 and SD = 1 confirming the effectiveness of ICT resources in enhancing CRE results. These findings are supported by research from McKnight et al. (2016).

Conclusions and recommendations

Conclusion

Despite the means for KA, KD and KC scores across having an overall mean score of 2.39, the KCSE results keep improving yearly. This is a

clear indication that if teachers could possess more knowledge in ICT integration in teaching and learning CRE in classroom, performance can improve greatly.

Recommendation

It therefore calls for teachers to use these advanced resources for KD and KC that go beyond integrating basic ICT skill (KA) as recommended by the UNESCO ICT competency level for teachers (2018) that this research focuses on.

References

- Albugami, S., & Ahmed, V. (2015). Success factors for ICT implementation in Saudi secondary schools: From the perspective of ICT directors, head teachers, teachers and students. *International Journal of education and development using ICT*, 11(1).
- Goldhaber, A. B., Khuan, H., & Allysa, R. (2021). Impact of ICT Integration on Quality of Education among Secondary Schools in USA. *Journal of Education*, 4(6), 53–61. Retrieved from <https://stratfordjournals.org/journals/index.php/journal-of-education/article/view/945>
- Henderson, D. (2020). Benefits of ICT in Education.
- McCombes, S (2019). *Descriptive Research | Definition, Types, Methods & Examples*.
- McLeod, S. (2019). Constructivism as a theory for teaching and learning. *Simply psychology*, 17.
- Mienel, Noweski and Scheer (2012). Design Thinking is a team-based learning process that offers teachers support towards practice-oriented and holistic modes of constructivist learning in projects.
- Ministry of education, Kenya. (2021). *Policy on information and communication technology in education and training*.
- Pruthviraj C. (2024). *Design Thinking with ICT Tools: An Approach to Enhance Engagement in Design Problem and Practical Exposure*.