DIGITAL METHODS OF INSTRUCTION AND LEARNING IN IKOM EDUCATION ZONE, CROSS RIVER STATE, NIGERIA.

BY

Obogo, Simon Idoko
broidy4u@gmail.com
&
Udoh, Mercy Ndifreke
mercyemma4luv@yahoo.com
Department of Environmental Education
University of Calabar, Calabar
Cross River State, Nigeria

Abstract

The purpose of this study was to investigate digital methods of instruction and learning in Ikom Education Zone of Cross River State, Nigeria. To achieve the purpose of this study two hypotheses were formulated to guide the study in line with the variables of online method of instruction and learning, video-based method of instruction and learning in education. Literature review was carried out accordingly. Ex-post facto design was adopted for the study. A sample of three hundred and thirty-one (331) respondents was used for the study. The sample was selected through stratified random sampling techniques. The questionnaire was the instrument used for data collection. The instrument was validated by experts in Measurement and Evaluation of the Faculty of Education, University of Calabar. The reliability estimate of the instruments was established through Cronbach Alpha reliability method. Simple regression analysis was the statistical technique employed to test the hypotheses under study. Each hypothesis was tested at .05 level of significance. The result of the analysis revealed that, online instruction method and video-based instruction methods significantly influenced learning in education in Ikom Education Zone of Cross River State, Nigeria. Based on the findings of the study it was recommended among others that educational institutions, during planning and implementation of educational program should properly integrate online and video-based methods to enhance learning and strive to ensure development and sustainability of the technology- dependent pedagogical practice.

Keywords: Online Method of Instruction, Video-based Instruction Method, Learning in Education.

Introduction

In today's world, education is facing major challenges: it is expected to provide leaners and teenagers with competencies they will need in the future, to consider informal ways of learning, and to apply digital technologies and modern pedagogical methods to answer these challenges. Educators have always experimented with the art of teaching, which has evolved over centuries

by adopting new approaches, methods, tools, and technologies. We have experienced a rapid growth in science and technology in the last century that resulted in ground-breaking innovations and exciting new technologies. Online instruction methods in education which involves the use of electronic devices like computers, mobiles, Laptops, using the internet has been adjudged by most scholars as a process that promotes accessibility, flexibility and makes teaching and learning of skills and knowledge better while some have opined that it has promoted laziness in research, discouraged hard work and created a less competitive learning environment among students. Video base instruction methods and learning has become a dominant and widely accepted trend used by many. According to Livingstone (2012) the use of camera footage, animation, graphics, texts, and audio which are video-based instruction methods can create multisensory learning experience foster better engagement and retention in learning while Wong and Li (2011) investigated the connection between information and communication technology (ICT) implementation and pedagogical change, the result indicate that organizational interventions and pedagogical interventions interacted with each other in effecting changes in student learning. This article provides a mini review to briefly examine how the use of online and video base instruction methods can influence learning process. The use of these digital method of instructions and learning in Ikom Educational Zone of Cross River State, Nigeria is therefore the crux of this study.

Purpose of the study

This study seeks to:

i. Determine the influence of online method of instruction on learning in education.
ii. Ascertain the influence of video-based methods of instruction on learning in education.

Statement of hypotheses

The following null hypotheses were formulated to guide the study thus:

i. Online method of instruction has no significant influence on learning in education.
ii. There is no significant influence of video-based method of instruction on learning in education.

Literature Review

This section is concerned with the review of literature related to the variables of this study.

Online method of instruction and learning in education

Recent developments have prompted universities around the world to shift towards online education, and evolutions in information and communication technology (ICT) have contributed to the emergence of new and innovative education methods for students (Albastroiu, Felea & Vasiliu, 2014). Kauppi, S., Muukkonen, H., Suorsa, T. and Takala, M., (2020) found out that E-learning provides easier access to learning, promotes flexibility so that students can overcome space and time limitations and offers new potential for the teaching process to be focused on the learners'' needs and possibilities, emphasizing different learning

styles. However, it was estimated that in 2018 only about 15% of the market share belonged to online education, in this context, the 2020 COVID-19 crisis has significantly accelerated the move toward the online environment, on an untested and unprecedented scale" (Burgess & Sievertsen, 2020).

Subscribing to this view, Bao (2020) noted that social distancing and school closing impacted the educational system around the world, and tremendous effort was put in over a very short period that enhance the nature of teaching and learning processes changes with the use of e-technologies, that most online programs are based on constructivist learning models, which presume that learners are actively involved in the educational process by developing meaningful learning experiences and interacting with teachers and peers to accumulate and create knowledge.

More so, Kearns (2012), Ephraim, Ambe, Udumo, Onnoghen, Egbonyi, Omoogun, ... & Okon (2022) opined that multiple instructional methods need to be used to increase the effectiveness of the online educational process and compensate for the lack of physical presence of both teachers and students in the same space and time. Asynchronous and synchronous communication means can be used in the online environment. Asynchronous communication allows the transmission of messages which can be viewed and responded to at any moment of time, as per the participants' convenience. Such means of interaction comprise emails, chat lists, discussion forum/boards, blogs, announcements, shared documents, virtual board, video tutorials and instant messaging (Craig, Coldwell-Neilson, Goold, and Beekhuyzen, (2012)). Synchronous communication takes place in real time and participants must be logged online at the same time. Such interaction includes text chats, sharing applications, audio-conferences, and videoconference (Huang, et al., 2020). The review of the literature indicates therefore that the type of interaction method is important, but also their variety, the purpose of these methods should encourage dialogue and interaction between teachers and students, as these are associated with better results of the learning process (Bennett, Lockyer & Agostinho, 2018). Students should be motivated to learn, challenged to think, and deploy active learning, offered additional help and provided with varied and meaningful assignments, the interaction between students must be encouraged by proposing collaborative/interactive activities that give them the opportunity to share knowledge and experiences, thus building a sense of community. Another key point in the effectiveness of an online course is that assessments should be consistent with learning activities. The most important learning outcomes that should be tested in online assessments are critical thinking, course knowledge, problem solving, teamwork and communication (OECD, 2013).

A student-centered educational approach is an important factor in the learners' satisfaction and for the successful integration of ICT instruments when using online technologies, teachers may use various approaches to facilitate the technology-mediated education, such as encouraging interaction and collaboration, ensuring that students have a wide pool of activities as well as

setting clear deadlines and benefiting from structured courses and increased instructor presence, which may prove useful when teaching switches back to a face-to face setup (Baran, Correia, & Thompson, 2013).

Video-based instruction method and learning in education

Video-based method of instruction is becoming more prominent in the world of education. Videos in education make it possible to overcome practical real-world constraints and explore the far greater possibilities provided by digital spaces. They promote student-centered learning either within the classroom or at home. Videos can also be integrated in online learning systems (LMS, portal, e-class, etc.) and can be combined with other services. For instance, learners can use in parallel video and an online chat room, forum or even video conferencing to communicate with their instructors. The combination of video with other learning services has great potential to provide to students with an integrated online learning space. The use of video for learning has become widely employed in the past years Giannakos, (2013). Many universities and digital libraries have incorporated video into their instructional materials. Massive Open Online Courses (MOOCs) are becoming an increasingly important part of education. To support video learning, various technological tools have been developed such as Matterhorn and Centra. These tools provide an easy way for a learner who has missed a lecture to catch up, but also enable others, especially slow learners, to review difficult concepts. Many instructors in higher education are implementing video lectures in a variety of ways, such as broadcasting lectures in real time, augmenting recordings of in-class lectures with face-to-face meetings for review purposes, and delivering lecture recordings before class to "flip the classroom" and to provide hands-on activities during class time. Other uses include showing videos that demonstrate course topics and providing supplementary video learning materials for self-study. Although there are many and diverse ways of designing learning videos, there is limited understanding of the efficacy and usefulness of each method (Yousef, Chatti, & Schroeder, (2014a).

According to Majumdar (2017), video-based learning (VBL) denotes the knowledge or skills acquired through teaching via video. One of the key features of the video is the use of both auditory and visual cues. Visual aspects provide the primary source of information and audio is used to elaborate on the information. VBL possesses unique features that make it an effective learning method which can enhance and partially replace traditional learning approaches. It is a powerful model used to improve learning outcomes and student satisfaction. It implements components of effective teachers' learning such as theoretical research related to practice problems, the development of collaborative critical discussions, and the public promotion of teaching practice (Vedder-Weiss, Segal, & Lefstein, (2019)).

The proliferation of new VBL models including massive open online courses and flipped learning offers new learning opportunities and challenges as it provides learners with access to high-quality teaching materials anytime and anywhere. In fact, materials with more interactive

elements are more complex than those with less interactive elements and as such require learners to simultaneously carry out more than one activity (Huh et al. 2019). Videos allow teachers to observe students as they solve problems, explain their thinking process, and share their methods of problem-solving, while teachers encourage and extend students' ideas and make explicit connections between different visuals and between concepts and procedures (Santagata & Guarino 2011).

Methodology

The research design adopted for this study is ex-post facto design. Isangedighi (2012) opined that it is the systematic empirical inquiry in which the researcher does not have direct control of independent variables because their manipulations have already occurred. The researcher therefore considered it the best design for this investigation. The study also utilized structured questionnaire, representative sample with the view to generalising the findings to the entire population. The population consists of three thousand, three hundred and five (3,305) students in government secondary schools in Ikom Education Zone of Cross River State. Stratified random sampling technique was used for the study. Based on the six local government areas, 10 % sample of the population was used for the study. These was done using the hat and draw method. The sample of the study comprised of three hundred and thirty-one (331). The instrument for data collection was the questionnaire tagged "Online and Video-Based Method of Instruction and Learning in Education Questionnaire (OVBMILEQ).

The instrument consisted of two sections: A and B. Section A contained information about demographic variables of respondents and section B consisted of 40 statements on digital methods variables on learning in education. The questionnaire is a 4–point modified likert scale type, ranging from Strongly Agree (SA, 4points), Agree (A, 3 points), Disagree D, 2 points) and Strongly Disagree (SD, 1 point) and the reverse for negatively worded items. The questionnaire used for data collection was developed by the researcher presented to two experts in test and measurement in the University of Calabar who edited, offered constructive criticisms and suggestions. To establish the reliability of the instrument, a trial test was carried out. The research instrument was administered to fifty (50) respondents who were not part of the main study. Cronbach alpha was used to determine internal consistency of the instrument. The reliability co-efficient ranged from 0.74 to 0.83. Simple regression analysis was the statistical techniques employed to test the hypotheses under study. Each hypothesis was tested at .05 level of significance.

Results

Ho1:

Online method of instruction does not significantly influence learning in education. The independent variable in this hypothesis is online method of instruction, while the dependent

variable is learning in education. Simple regression analysis was employed to test this hypothesis. The result of the analysis is presented in Table 1.

Table 1: Simple linear regression analysis of the influence of online method of instruction on learning in education in Ikom Education Zone, Cross River State

Model	R	R. square	Adjusted R^2	Std error of the estimate	
1	.706	.498	.494	2.52963	
Model	Sum of square	df	Mean square	F ratio	p-value
Regression	736.083	1	736.083	325.70*	.000(a)
Residual	742.290	329	2.26		
Total	1478.373	330			

* Significant at .05 level.

The simple linear regression analysis of the influence of online method of instruction on the learning in education produced an adjusted R^2 of .494. This indicate that the online method of instruction account for 49.4% of the determinant learning in education in the study area. This finding is a critical indication that online methods are relatively high in the study. The F-value of the Analysis of Variance (ANOVA) obtained from the regression Table was F = 325.70 and the sig. value of .000 (or $p<.05$) at the degree of freedom (df) 1 and 98. The implication of this result is that online method of instruction has a significant influence of learning in education.

Ho2:
Video-based method of instruction does not significantly influence Learning in education. The independent variable in this hypothesis is Video-based method of instruction, while the dependent variable is learning in education. Simple regression analysis was employed to test this hypothesis. The result of the analysis is presented in Table 2.

Table 2: Simple linear regression analysis of the influence of video-based method of instruction on learning in education in Ikom Education Zone, Cross River State

Model	R	R. Square	Adjusted R^2	Std error of the estimate	
1	.346	.120	.112	3.34984	
Model	Sum of square	df	Mean square	F ratio	p-value
Regression	176.689	1	176.689	44.62*	.000
Residual	1301.684	329	3.96		
Total	1478.373	330			

* Significant at .05 level.

The simple linear regression analysis of the influence of video-based method of instruction on the learning in education produced an adjusted R^2 of .112. This indicated that the Video-based methods accounted for 11.2% of the determinant learning in education in the study area. This finding is a critical indication that Video-based practice is relatively high in the study. The F-value of the Analysis of Variance (ANOVA) obtained from the regression table was F = 44.62 and the sig. value of .000 (or $p<.05$) at the degree of freedom (df) 1 and 98. The implication of this result is that Video-based method of instruction has a significant influence on learning in education.

Discussion of findings

The result of the first hypothesis revealed that online instruction methods significantly influence learning in education in Ikom Education Zone, Cross River State. This finding could be as a result of high awareness and reliable access to internet facilities with increased use of mobile internet phones within the urban areas.

The finding is in line with the view of Kearns (2012) who opined that those multiple instructional methods need to be used to increase the effectiveness of the online educational process and compensate for the lack of physical presence of both teachers and students in the same space and time. Asynchronous and synchronous communication means can be used in the online environment. Asynchronous communication allows the transmission of messages which can be viewed and responded to at any moment of time, as per the participant's convenience. Such means of interaction comprise emails, chat lists, discussion forum/boards, blogs, announcements, shared documents, virtual board, video tutorials and instant messaging.

The findings of this also supported that of Kauppi, et al., 2020). E-instruction methods provides easier access to learning, promotes flexibility so that students can overcome space and time limitations and offers new potential for the teaching process to be focused on the learners' needs and possibilities, emphasizing different learning styles.

The result of the second hypothesis revealed that video-based methods of instruction significantly influenced learning in education in Ikom Education Zone, Cross River State. The finding could be attributed to free access to video learning site that are also made user-friendly through social media platforms and video recording devices contained in mobile phones and better internet services to students within the area.

The finding is in line with the view of Majumdar (2017) who observed that Video-based Instructions (VBI) denotes the knowledge or skills acquired through teaching via video. One of the key features of the video is the use of both auditory and visual cues. Visual aspects provide the primary source of information and audio is used to elaborate on the information. VBI possesses unique features that make it an effective learning method which can enhance and partially replace traditional learning approaches. It is a powerful model used to improve

learning outcomes and student satisfaction. It implements components of effective teachers' learning such as theoretical research related to practice problems, the development of collaborative, critical discussions, and the public promotion of teaching practice.

The findings of this study also supported that of Huh et al. (2019) who found out that the proliferation of new VBI models including massive open online courses and flipped learning offers new learning opportunities and challenges as it provides learners with access to high-quality teaching materials anytime and anywhere. In fact, materials with more interactive elements are more complex than those with less interactive elements and as such require learners to simultaneously carry out more than one activity.

Conclusion

Based on the results of the study, it was concluded that Online and Video-based methods of instruction significantly influence learning in education.

Recommendations

Based on the findings of the study it was recommended that; Students should be motivated to learn, challenged to think, and deploy active learning, offered additional help and provided with varied and meaningful assignments, the interaction between students must be encouraged by proposing collaborative/interactive activities that give them the opportunity to share knowledge and experiences, thus building a sense of community. Educational institutions should be integrated into planning and implementation of online methods of instruction and video-based instruction methods to enhance development and sustainability of the technology-dependent pedagogical practice.

References

Albastroiu, I., Felea M. and Vasiliu, C., (2014) Geographic Information System - modern teaching method in business administration. *Amfiteatru Economic, 16(37), pp.770-783.*

Bao, W., (2020) COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, *2(2), pp.113-115.*

Baran, E., Correia, A.P. and Thompson, A.D., (2013) Tracing successful online teaching in higher education: voices of exemplary online teachers. Teachers College Record, *115(3), pp.1-41.*

Bennett, S., Lockyer, L. and Agostinho, S., (2018) Towards sustainable technology enhanced innovation in higher education: Advancing learning design by understanding and supporting teacher design practice. *British Journal of Educational Technology, 49(6), pp.1014–1026.*

Burgess, S. and Sievertsen, H., (2020) Schools, skills, and learning: The impact of COVID19 on education. [online] VOXEU.

Craig, A., Coldwell-Neilson, J., Goold, A. and Beekhuyzen, J., (2012) A review of e-learning technologies. Opportunities for Teaching and Learning. In: CSEDU 2012, Proceedings of the 4th International Conference on Computer Supported Education. Porto, Portugal, 2012: INSTICC.

Ephraim, I. E., Ambe, B. A., Udumo, B. O., Onnoghen, N. U., Egbonyi, E. E., Omoogun, R. M., ... & Okon, H. P. (2022). A survey of virtual instructional competence among tourism teachers in secondary schools, Calabar South local Government Area, Nigeria. *Education and Information Technologies*, *27*(8), 11307-11323.

EU. (2010). 2010 joint progress report of the council and the commission on the implementation of the 'education and training 2010 work programme'. *Official Journal of the European Union, C, 117*

Giannakos, M.N. (2013) "Exploring the video-based learning research: A review of the literature". British *Journal of Educational Technology, 44(6), pp. 191–195.*

Huang, R.H., Liu, D.J., Tlili, A., Yang, J.F., Wang, H.H., et al., (2020) Handbook on facilitating flexible learning during educational disruption: The Chinese experience in maintaining undisrupted learning in COVID-19 Outbreak. Beijing: Smart Learning Institute of Beijing Normal University.

Huh, D., Kim, J. H., & Jo, I. H. (2019). A novel method to monitoring changes in cognitive load in video-based learning. *Journal of Computer Assisted Learning, 35(6), 721–730*.

Isangedighi, A. J (2012). Essentials of research and statistics in education and social sciences. Calabar: Eti-Nwa Associates

Kauppi, S., Muukkonen, H., Suorsa, T. and Takala, M., (2020) I still miss human contact, but this is more flexible — Paradoxes in virtual learning interaction and multidisciplinary collaboration. British *Journal of Educational Technology, 0(0), pp.1-16.*

Kearns, L.R., (2012) Student assessment in online learning: Challenges and effective practice. MERLOT *Journal of Online Learning and Teaching, 8(3), pp.198-208.*

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education, 38(1), 9–24*

Majumdar, A. (2017). Getting started with Video-Based Learning. https ://elear ningi ndust ry.com/video -based -learn ing-getti ng-start ed.

OECD, 2013. Assessment of higher education learning outcomes. AHELO Feasibility Study Report. [pdf] Washington:

Santagata, R., & Guarino, J. (2011). Using video to teach future teachers to learn from teaching. *ZDM Mathematics Education, 43, 133–145.*

Vedder-Weiss, D., Segal, A., & Lefstein, A. (2019). Teacher face-work in discussions of video-recorded classroom practice: Constraining or catalyzing opportunities to learn? *Journal of Teacher Education.*

Wong, E. M. L., & Li, S. C. (2011). Framing ICT implementation in the context of educational change: a structural equation modelling analysis. *Australasian Journal of Educational Technology, 27(2), 361–379*

Yousef, A. M. F., Chatti, M. A., & Schroeder, U. (2014a). The state of video-based learning: A review and future perspectives. *International Journal on Advances in Life Sciences, 6(3–4), 122-135.*