East African Scholars Journal of Education, Humanities and Literature

OPEN ACCESS

Abbreviated Key Title: East African Scholars J Edu Humanit Lit
ISSN: 2617-443X (Print) & ISSN: 2617-7250 (Online)
Published By East African Scholars Publisher, Kenya
Volume-4 | Issue-5 | May- 2021 | DOI: 10.36349/easjehl.2021.v04i05.001

Original Research Article

Virtual or Face-To-Face Approach: Higher Learning Institutions Students Ambivalence towards Environmental Education in the Wake of COVID-19 Pandemic

Damaris Nthenya Salee*

Department of Geography and Environmental Studies, Moi University, Kenya

Article History
Received: 22.03.2021
Accepted: 29.04.2021
Published: 07.05.2021

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Virtual learning in Kenya is still in its infancy and was hardly adopted for undergraduate teaching and learning before the advent of C0VID-19 pandemic. Environmental education (EE) being a required course for all undergraduate teacher trainees, the study therefore sought to investigate the effects of methods of instruction on higher learning institutions students' ambivalence towards environmental education (EE) course in the wake of covid-19. Study population consisted of 478 undergraduate science teacher trainee students from two different cohorts of EE who underwent different modes of instruction in Moi University, Kenya. A sample of 240 (50%) students were randomly selected for the study. The study adopted a descriptive survey, data was collected using online questionnaires and analyzed descriptively, while secondary data on examination performance was analyzed using ANOVA. Results were analyzed to compare the attitudes of the two undergraduate student cohorts who underwent online mode of instruction during the wake of the virulent COVID-19 pandemic with those in the previous year who underwent the conventional lecture hall or face-to-face mode of instruction towards EE course. Results indicated that students' ambivalence towards virtual learning of EE was highly depended on the mode of instruction adopted during their study; however, there was no significant difference in academic performance (95 % (CI); $p > 0.05$) for both cohorts in the considered examinations. The study concludes that although students are very positive towards virtual learning of EE however, they are ambivalent in that learning should be within the university environs and not in their rural homes with their major challenge being low campus internet bandwidth. Further, the mode of instruction is unlikely to affect EE academic performance.

Keywords: environmental education, virtual learning, students' ambivalence, Kenya.

Copyright © 2021 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Environmental education as a vital tool to change the environmental attitude and behavior in a country cannot be disputed. As a member country of the United Nations, Kenya not only introduced EE but also adopted the objectives, goals, aims and guiding principles for the international environmental education programme (IEEP) after the Stockholm conference of 1972 and Tbilisi conference of 1977 [1]. Environmental education as a subject was introduced globally in the higher institutions of learning (universities) in the 1990s. Environmental education course in Kenya has therefore been mainstreamed in the undergraduate teacher trainee curricula in accordance with the objectives as set out in the 1977 Tbilisi inter-governmental conference on environmental education [2]. Teaching of EE in tertiary colleges in Kenya and by extension the study area emphasizes on interdisciplinary approach which encompasses broad perspectives being infused together.

According to Roberts [3], distance education is not a new mode of instruction. It has been in use in the late 1880's, growing rapidly in the 1990's with the breakthrough of the online revolution. Virtual learning in Kenya however, became a point of interest when the government floated the idea to establish the National Open University of Kenya (NOUK) with an aim to raise the annual intake of public universities by 8,000 students which would have created space for more than 40,000 students who qualified for university entry but were locked out due limited intakes [4]. In public universities, virtual learning has been in existence for

***Corresponding Author:** Damaris Nthenya Salee

several years albeit with challenges as per previous studies by Tarus, et al., [5]; Mutisya and Makokha [6] and Tarus [7].

According to The United Nations Educational, Scientific and Cultural Organization [8] report, over 1.37 billion students which accounts for 80% of the global student population were affected by COVID-19 pandemic. In Moi University, virtual learning was still at infantry stage until mid-March 2020 when the Kenyan government Cabinet Secretary for education made an announcement that all learning institutions countrywide including public universities be closed to contain the spread of the COVID-19 pandemic. This directive caught many universities unawares with majority hurriedly opting to train their staff with an aim of implementing virtual learning initiatives for undergraduate students while in their residential mostly rural homes spread across different parts of the country. It was envisaged that by students studying away from the campus, this would ensure learning continued without congesting the universities. The uptake of virtual learning therefore became a reality with the advent of Covid-19 pandemic which led to closure of public universities for many months with the hope that the virus would be contained.

However, the rolling out of virtual learning came with its myriad of challenges with the most glaring being unavailability and unaffordability of internet services by students in rural Kenya. After over six months of closure, Kenyan universities had no option but to reopen their doors for their students for blended mode of teaching with instructions that courses that had registered many students who could not fit in the existing lecture halls as per the COVID-19 safety protocol, key among them being social distancing, be taught virtually. The assumption then was that since universities were equipped with internet, the students would access free of charge to enable connectivity. This was meant to ensure the safety of course instructors as well as the students besides other safety measures.

Although the Moi university system of managing instruction abbreviated or popularly known as MUSOMI (customized from Chisimba framework) e-learning platform had been implemented over a decade ago in 2007 [9], it became a household name with both staff and students as trainings commenced in earnest. Earlier findings in a study by Tarus and Gichoya [9], further revealed that for e-learning to be successfully implemented in public universities in Kenya highly dependent on three categories of preconditions namely organizational, technological and pedagogical components.

Aiken [10], defines attitude as a "learned predisposition to respond positively or negatively to a specific object, institution or a person". The mode of content delivery may affect students' attitude towards a certain course or subject. This may be true especially if the method of instruction is changed midway into the course as was the case in this study. As pointed out by Gaskell and Mills [11], e-learners and e-tutors have at times had to contend with negative attitudes from the students and other stakeholders who question about the general quality of virtual learning programmes.

In the study area, EE is a required course unit for all undergraduate teacher trainee students in the first semester of their final year of study. This therefore means that the course unit attracts numerous students which are subsequently split into several groups for ease in teaching with the same learning outcomes. Two consecutive cohorts for the same group which over the years comprised of teacher trainees majoring in science education were the focus of this study. Virtual or online classes were carried during usual hours as per the schedules in the ordinary timetables which meant the students would login into a learning management system (LMS) platform provided by the university though in some cases this was supplemented by other university approved platforms such as Kenya Educational Network (KENET).

This study therefore sought to find out if the mode of instruction influences the academic performance and ambivalence of undergraduate teacher trainee students towards the EE course. The study adopted Spiro's theory of cognitive flexibility [12] which is a learning theory. The theory encourages teachers to adopt and integrate educational technologies in their teaching and learning process. Therefore, the theory was used to guide the instructional design of the virtual learning module of the EE course.

METHODOLOGY

The study adopted a descriptive survey research design. Purposive sampling was used to select the subjects of this study who had undergone the environmental education course unit. Being a comparative study, two different consecutive cohorts for the 2020/2021 (cohort A) and 2019/2020 (cohort B) academic years were thus purposively selected from Bachelor of Education (science) teacher trainees in the School of Education Moi university, Kenya. Both cohorts were taught by the same course instructor and this therefore reduced biasness in the study, the only difference being the mode of instruction with cohort A undergoing virtual mode of instruction though they were within campus environs to enable them access internet services, while the latter were taught using conventional face-to-face mode of instruction in the traditional lecture halls. Besides, there was no curriculum review before or in between the study and therefore both cohorts were subjected to the same course content with similar expected learning outcomes.

Data on academic performance was analyzed for calculation of grades means, one-way ANOVA was done for normalized data and p = 0.05. Preliminary survey indicated that all the students had previous computer use experience while none of them were exposed to online learning management systems prior to this research. These conditions therefore qualified for a comparative study among the study subjects.

The study population comprised of 478 undergraduate students consisting of 238 and 240 students for cohort 2020/2021 (A) and 2019/2020 (B) respectively. Approximately 50% of the students from each of the cohorts were targeted thus 120 students were sampled per cohort totaling to 240 students. Sampling was conveniently done based on a first filled first considered basis whereby the online questionnaire would be deactivated from the system once the desired first 120 responses were received for each cohort.

The research instruments used for data collection in this study were online questionnaires which were prepared using an online survey software and secondary data retrieved on examination performance. Two sets of questionnaires were thus formulated with the first intended to ascertain general students' attitude towards EE and the second purposed to ascertain their attitude towards virtual learning of EE. In order to get a general view of the challenges faced in virtual learning environmental education, similar open-ended questions were included at the end of the questionnaire. The questionnaires were mailed to the respondents to their personal emails and responses were received real time upon being filled to completeness and submitted. The questionnaires were configured in such a way as not to allow double submission of responses from the same subject.

The questionnaires adopted a Likert scale matrix in which respondents were required to state their level of agreement or disagreement with the items. The Likert scale items had options with weights (w) as follows: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) =2 and Strongly Disagree (A) =1. The scales were reversed for negatively stated items. This kind of scale avoided the "undecided" scale and ensured that the respondent's answers had no room to take the middle ground and therefore were encouraged to respond positively or negatively depending on their attitude towards the stated items. According to Esteban, et al., [13], this type of scale investigates whether the individual has a favourable or unfavourable attitude towards the study variable. Further, because of the characteristics of sample and the study items, analysis was done taking into consideration the criterion of internal consistency.

Data was from questionnaires was analyzed descriptively. Weighted scores from the Likert scale were first coded for frequency counting. Data on examination performance was analyzed using one-way ANOVA (95 % (CI); p = 0.05), the resultant quantitative data analyzed accordingly with the aid of statistical analysis program SPSS version 24.0.

RESULTS AND DISCUSSION

There is no doubt that virtual learning is transforming undergraduate education in Kenya which could have an impact on the students' attitude towards certain courses resulting to ambivalence.

Students' Attitude towards Environmental Education

Results on weighted scores from Likert questionnaire on general attitude of the students towards EE for both cohorts are as shown in Table 1. The results indicated that both cohort A and cohort B had a very positive aggregate attitude of 72.92% and 78.61% respectively towards the course. The item that stated that: I am alert to environmental issues since learning EE, recorded the highest positive weighted score for both cohort A and cohort B with an individual weight of 84.38% and 90.83% respectively which was followed closely by the item that stated that: I will disseminate EE concepts in my future engagements, again for both Cohort A and cohort B at 82.08% and 90.42 respectively. These findings therefore indicate that undergraduate teacher trainees are not against EE being a component of their undergraduate curriculum.

Table-1: Students' attitude weighted scores towards EE (n=240)

Item	CH	SA	A	D	SD	TL
EE should be scrapped from Teacher Education curriculum	A	8	32	90	264	**356**
	B	10	36	96	240	**382**
EE should be incorporated in other teaching subjects instead	A	24	32	108	176	**340**
	B	20	24	120	192	**356**
EE should be an elective course in the curricula	A	32	60	72	136	**300**
	B	26	32	96	184	**338**
I am alert to environmental issues since learning EE	A	280	96	22	7	**405**
	B	336	90	8	2	**436**
I will disseminate EE concepts in my future engagements	A	268	84	34	8	**394**
	B	320	96	16	2	**434**
I can pursue a higher degree in EE if fully sponsored	A	80	72	106	21	**279**
	B	92	105	86	19	**302**
Total	A					**2,100**
	B					**2,264**

CH-cohort, SA-strongly agree, A-agree, D-disagree, SD-strongly disagree. TL- total on the other hand, the item with the least positive score against it was the one that stated that: I can pursue a higher degree in EE if sponsored at 58.13% and 62.92% for both cohort A and cohort B respectively. It should be noted that EE is included as a management course in the teacher education curriculum, students may opt to pursue higher degrees in their specialized teaching subjects and therefore this could have had an impact on weighted attitude score. Also noted was that in all cases, cohort B weighted scores were higher than those for cohort A. This could partly be attributed to the fact that cohort B had completed the entire course using the conventional way and were already practicing teachers unlike cohort A who were still in campus with a full semester to complete their studies.

Students' Ambivalence towards Virtual Teaching and Learning of Environmental Education

The study also sought to study students' ambivalence towards virtual teaching and learning of EE. According to Gaskell and Mills [11], feedback on attitude among e-students has been used as a performance measure of online teaching and learning process. As shown in Table 2, the weighted scores had clear variations between those for cohort A and B. The overall student's aggregate attitude towards virtual learning indicated that cohort A had very strong positive attitude at 84.85% when compared to cohort B who had a slightly aggregate negative attitude at 46.91%. The difference in students' attitudes based on the mode of instruction was also exemplified by Getuno et al., [14] in his study on Kenyan polytechnics. However, notable also was that the aggregate score for cohort B was highly impacted positively by only one item which was stated as: If I were an EE instructor, I would embrace online teaching. This statement had an individual positive attitude weighted score of 75.21%, implying that though the cohort B students were very negative on being taught online, however, they were ambivalent in that they would not mind embracing online teaching skills.

Table-2: Students' attitude weighted scores towards virtual teaching and learning of EE (n=240)

Item	CH	SA	A	D	SD	TL
It is impossible to teach EE virtually	A	4	14	63	352	**433**
	B	69	38	69	36	**212**
EE virtual learners require prior advanced training in IT	A	8	30	63	304	**405**
	B	67	78	27	20	**192**
Split EE learners into small groups to enable physical learning	A	9	26	45	332	**412**
	B	77	50	39	20	**186**
EE virtual learning is more convenient than physical learning	A	172	60	72	10	**314**
	B	32	75	54	33	**194**
EE physical learning enhances student performance in exams	A	3	10	63	364	**440**
	B	79	66	39	20	**204**
EE virtual learning should continue with/out Covid-19 pandemic	A	292	90	30	2	**414**
	B	56	54	58	59	**227**
If I were an EE instructor, I would embrace online teaching	A	356	57	16	4	**433**
	B	144	177	30	10	**361**
Total	A					**2,851**
	B					**1,576**

CH-cohort, SA-strongly agree, A-agree, D-disagree, SD-strongly disagree. TL-total. The statement: EE physical learning enhances student performance in exams, had the highest negative score for cohort A at 91.67% with majority (75.83%) strongly disagreeing with this statement indicating that the mode of instruction did not in any way impact on their personal attitude towards their anticipated academic performance. It is imperative to note that cohort A transited from the conventional to online learning after three years of face-to-face learning and therefore their attitude promotes virtual learning. These findings further agree with those in a study by Fojtík [15], who concluded first year online students have worse academic grades outcomes than full-time face-to-face students with the differences diminishing in the subsequent years of study where results for both are comparable, the current study subjects being final year students. Overall, unlike cohort B, cohort a students were very positive on virtual learning of EE and were willing to adopt it post COVID-19 era as supported by a recent study by Ismaili [16].

On the other hand, the statement: EE virtual learning is more convenient than physical learning, had the least positive weighted attitude score of 65.42% for cohort A. These findings however negate those of a study by Smedley [17], who reported that virtual

learning is not only flexible but also convenient to the learner and further confirms ambivalence of the study subjects towards online teaching. The statement: Split EE learners into small groups to enable physical learning, scored the least at 38.75% with respect to Cohort B. Overall, there was a clear-cut variation in the attitude weighted scores between both cohorts. This could be attributed to the fact that although cohort A had been exposed to both conventional face-to-face and online modes of instruction while cohort B was only exposed to the conventional methods hence, the latter could have been facing resistance to change. Resistance to adoption of virtual learning by learning has also been reported in a study by Dovbenko et al., [18].

Mode of Instruction Influence on Performance of Environmental Education

Results on one-way ANOVA for comparison of academic performance in both cohorts are as shown in Table 3. Comparisons were made between the grades for continuous assessment test (CAT) which accounts for 30% of the total mark, the end of semester examination accounting for 70% as well as the aggregate mark. The results indicate that there was no significant difference ($p>0.05$) in all the considered cases. These results were inconsistent with those reported by Ishmirekha [19], who reported that students who learn face-to-face perform poorly than those that learn online. It should however be noted that the cohorts attempted different examinations.

Table-3: Comparison of examination grades between the cohorts

Exam mean grades	Cohort A	Cohort B	p
Sit-in CAT	21. 26±4.87	20.54± 3.58	0.06
End of semester	40.12±6.76	40.56±8.32	0.06
Total marks (%)	62.36±8.24	60.24±7.78	0.08

General challenges facing the virtual learning of EE

Virtual learning being in the infancy stages of adoption especially at undergraduate level in the study area. Before delving into the challenges that (may) face virtual mode of instruction in the institution under consideration, the students were asked on where they preferred to undertake their studies, whether on-campus (within university environs) or off-campus (home environment). The findings indicated that 99.17% of the students across both cohorts preferred on-campus learning.

Further, when asked to indicate their major challenge to virtual learning, the study indicated that most (84.14%) students reported low bandwidth and inaccessibility to internet within campus as the major challenge facing online learning. This agrees with earlier findings by Isaacs and Hollow in the e-Learning Africa [20] Report, which ranked limited bandwidth as the highest challenge faced by Kenyan universities in the provision and implementation of virtual learning amongst other challenges such as lack of appropriate training in ICT and poverty.

The findings further indicated that a paltry 8.44% and 7.42% had challenges with lack of an appropriate learning gadget and unaffordability of internet credit respectively. These findings therefore indicate learners' ambivalence in that although virtual is mostly adopted for off-campus learning, they however prefer on-campus virtual learning mode of instruction.

CONCLUSION

The study concludes that, the mode of instruction whether virtual or physical does neither have an influence on students' attitude towards learning EE course nor their academic performance. However, the students' attitude towards the mode of teaching may vary depending on the mode of instruction already exposed to the students in that those taught conventionally prefer face-to-face while those taught virtually prefer the virtual mode of instruction. Irrespective of the mode of instruction, the student' ambivalence was clear since they all preferred residing within the university environs while learning EE virtually with their main challenge being low bandwidth. It should however, be noted that the findings reported in this study cannot be generalized for similar studies since the challenges for instance, may be unique to the study area. Further, since different courses have different content, the study therefore recommends the need to carry out another study on other courses and areas of specialization.

REFERENCES

1. UNESCO. (1980). Environmental education in the light of the Tbilisi Conference. Paris: Unesco
2. Republic of Kenya. (2010). Secondary Annual Reports Volume 10, November 2008. Nairobi. KIE.
3. Roberts, J.J. (2019). Online learning as a form of distance education: Linking formation learning in theology to the theories of distance education. Theological Studies, 75(1) 58-69
4. Nganga, G. (2010). Kenya: State to launch e-learning university. University world news. Available at: http://www.universityworldnews.com/article (accessed 11 December 2020).
5. Tarus, J.K., & Gichoya, D. (2015). E-Learning in Kenyan Universities: Preconditions for Successful Implementation. The Electronic Journal of Information Systems in Developing Countries, 66(4); 1-14.

6. Mutisya, D.N., & Makokha, G.L. (2016). Challenges affecting adoption of e-learning in public universities in Kenya. E-Learning and Digital Media, 13(3–4) 140–157.
7. Tarus, J. (2011). Adoption of e-learning to support teaching and learning in Moi University. Master of Philosophy (Information Technology) thesis, Moi University.
8. UNESCO. (2020). "1.37 Billion students now home as COVID-19 school closures expand, ministers scale up multimedia approaches to ensure learning continuity – UNESCO IITE", available at https://iite.unesco.org/news/1-37-billion-students-now-home-as-covid-19-school-closures-expand/
9. Tarus, J.K., Gichoya, D., & Muumbo, A. (2015). Challenges of Implementing E-Learning in Kenya: A Case of Kenyan Public Universities. International Review of Research in Open and Distributed Learning, 16(1) 120-141
10. Aiken, R. L. (2000). Psychological Testing and Assessment, (10th ed.). Boston: Allyn and Bacon.
11. Gaskell, A., & Mills, R. (2014). The quality and reputation of open, distance and e-learning: what are the challenges? The Journal of Open, Distance and E-learning (e-journal), 29(3), 190-205.
12. Spiro, R. J., Feltovich, P. J., Jacobson, M. L., & Coulson, R. L. (1999). Cognitive Flexibility, Constructivism, and Hypertext: Random Access Instruction for Advanced Knowledge Acquisition in ill-structured Domains http://www.ilt.columbia.edu/ilt/papers/Spiro.html. Accessed on 1st March 2021
13. Esteban, M.I., Luis, V.A.M., & Francisco, M.C. (2017). Attitudes of University Students towards the Environment: Environmental Education and Innovation. Revista de Humanidades, 31; 17-38.
14. Getuno, D.M., Kiboss, J.K., Changeiywo, J.M., & Ogola, L.B. (2015). Effects of an E-Learning Module on Students' Attitudes in Electronics Class. Journal of Education and Practice, 6(36) 80-86.
15. Fojtik, R. (2018). Problems of Distance Education. International Journal of Information and Communication Technologies in Education, 7, 14-23.
16. Ismaili, Y. (2021). Evaluation of students' attitude toward distance learning during the pandemic (Covid-19): a case study of ELTE university. On the Horizon https://doi.org/10.1108/OTH-09-2020-0032
17. Smedley, J.K. (2010). Modelling the impact of knowledge management using technology. OR Insight, 23, 233–250.
18. Dovbenko, S., Naida, R.G., Beschastnyy, V.M., Bezverkhnia, H.V., & Tsybulska, V.V. (2020). Problem of Resistance to the Introduction of Distance Learning Models of Training in the Vocational Training of Educators. International Journal of Learning, Teaching and Educational Research, 19(2), 1-12. https://doi.org/10.26803/ijlter.19.2.1 accessed on April 4th, 2021
19. Konwar, I. H. (2017). A study on attitude of college students towards e-learning with special Reference to North Lakhimpur of Lakhimpur District, Assam. International Journal of Information, 4(1), 1-9.
20. Isaacs, S., Hollow, D. (2012). The e-learning Africa 2012 report, ICWE, Germany. http://www.elearning-africa.com/pdf/report/ela_report_2012.pdf accessed March 15, 2021.

Cite This Article: Damaris Nthenya Salee (2021). Virtual or Face-To-Face Approach: Higher Learning Institutions Students Ambivalence towards Environmental Education in the Wake of COVID-19 Pandemic. *East African Scholars J Edu Humanit Lit*, 4(5), 209-214.