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University Students' and Lecturers' Attitude towards Online Pedagogical Infrastructure in the Post-Covid 19 Pandemic Period

The Case of Masinde Muliro University of Science and Technology, Kenya

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Abstract:- Covid 19 pandemic became a game changer in the implementation of online learning in all higher learning institutions across the globe. Two years since the pandemic, educational systems are still dealing with its effect. This study therefore focused on the attitude of lecturers and students in the post-covid 19 pandemic to illustrate their feelings on the status of online learning systems and infrastructures. The study was conducted at Masinde Muliro University of Science and Technology which was in the verge of implementing online learning when the pandemic stroke. The university had accessible population of 7400. A sample of 603 students and lecturers was obtained using stratified random sampling. Questionnaires and interviews were used to collect data from the respondents. The study adopted a descriptive research design in which qualitative and quantitative data was collected and analyzed. ANOVA and Correlational Regression was used to analyze the data. The findings showed that lecturers attitude affect the use of online infrastructure. However, a positive attitude was registered amongst the respondents in the post covid-19 pandemic study compared to the previous studies conducted before the covid-19. This study recommends that lecturers and student still need more training and motivation for complete adoption of the online learning infrastructures.

Keywords:- Post Covid-19 Pandemic, Online Learning, Attitude, e-Learning.

I. INTRODUCTION

Introduction of learning technologies have seen the enhancement of online learning in higher learning institutions. Despite the innovations of these technologies, covid-19 pandemic caught most institutions unawares and therefore led to the derailed learning during the pandemic since most governments had to close learning institutions to pave the way for management of the pandemic. This drove most institutions into the adoption of online learning systems which they were not prepared to use at the time. Successful outcomes were noted in some private and public

universities however majority of the institutions scrambled with the implementation processes (Daniel, 2021).

It was noted that online classes, television broadcasts, radio and modular approaches were some of the different distance learning strategies that were adopted by learning institutions.

As stipulated by Rimba, Izlan, & Sakka (2020), the attitude of both the lecturers and the students affects the effectiveness of online learning. Based on the post covid-19 pandemic survey on the problems learners experienced during the pandemic, they found out that 74.2% perceived that e-learning is less effective and ineffective compared to traditional classroom learning while 64.3% felt dissatisfied with how online learning was conducted during the covid-19 pandemic. However, they also cited that power fluctuations, unreliable internet, inadequate training contributed to the negative attitude registered by 62.3% of the faculty members.

Research by Winahyu (2020) on the problems of distance learning suggests that many of the lecturers ignored the idea of online learning before Covid-19 pandemic, this affected their attitude towards it and most faculty members refused to adopt it. Only 8% had positive attitude and confidence in using online learning and 9.6% had used the e-learning platform prior to Covid-19. Insufficient knowledge of technology, age, and inadequate training were cited as some of the factors that seemed to be contributing to poor attitude of the faculty members and students in Indonesia. This study used a survey approach and recommended that the same approach could be used in studying other aspects of online learning.

Faculty members' attitude towards new learning technologies greatly impacts their acceptance of the same technologies (Hart and Laher, 2015). In a study conducted at the university of Witwatersrand in South Africa, the attitude of faculty members was generally positive regarding acceptance of online learning technology and that their perceptions enhanced the successful implementation.

Cultural attitude towards e-learning can promote or hinder how an institution implements in e-learning. In their study, Fard, Rostamy, & Taghiloo (2009) found out that the cultural attitudes of a society or organization needs to be open and positive to enable effective adoption of online infrastructure use for learning. It is therefore important to study the role played by attitude on eLearning plain the public universities in Kenya since most of the studies have shown that attitude of users affects online learning (Butnaru, 2021; Mok, 2021).

Kartal(2010) studied the effectiveness of multimedia approach to online instruction on 89 college students at Instabul University in Turkey by carrying out a test on computerized instructional material contents in an informal style that is personalized. The findings indicated that learning improved when the style of language used was formal and conversational integrated with more that one multimedia style.

II. METHODOLOGY

This study adopted descriptive survey research design which attempts to provide description of the social setting. Facts are gathered about an occurrence without any variable manipulation. Data is then gathered from the subjects in their natural setting. The study was conducted at MMUST

from where the participants were drawn. MMUST is a public university in Kenya based in Kakamega County, Kenya. The study focused on MMUST main campus which has a population of 7,000 students, an estimated 400 faculty members. The sample size 603 students and faculty members was determined from target population using the Yamane’s formula (Walimbwa, 2008). Stratified Sampling was used to identify the students and faculty from all the thirteen schools within the university since the population of students in different schools vary. Questionnaires and interview schedules were used to obtain data from the respondents. Validity and reliability tests were used to test the quality of data. Piloting was conducted to ensure that the tools were properly adjusted and would collect the most appropriate data needed. The inferential statistics that were used are Correlational Analysis, Regression Analysis and Analysis of Variance (ANOVA). The descriptive statistics that were used in this study include frequencies, percentages, and means. Statistical Package for Social Sciences (SPSS) Software was used for analysis.

➤ Findings

The study sought to find out student attitudes towards using online infrastructure. A five-point Likert scale was used to get answers from the respondents as shown in Table 1.

Table 1 Students Attitude on using Online Infrastructure.

Potential Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Standard Deviation
I am comfortable with online discussions.	-	172(47.9%)	25 (6.9%)	97 (26.9%)	66 (18.3%)	2.84	1.208
Participating in online discussions requires a lot of time and effort.	35(9.7%)	165(46.8%)	-	141 (39.2%)	19 (5.3%)	3.16	1.196
I spend a lot of time on an online course	-	252(70%)	49 (13.6%)	59 (16.4%)	-	3.54	0.76
Interruptions interferes with the seamless process of online discussions.	-	117(32.5%)	49 (13.6%)	148 (41.1%)	46 (12.8%)	2.66	1.065
I find using online discussions convenient.	10(2.8%)	170(47.2%)	41 (11.4%)	139 (38.6%)	-	3.14	0.976
I am comfortable using online communication tools.	10(2.8%)	170(47.2%)	41 (11.4%)	139 (38.6%)	-	3.14	0.976
I understand what am doing in an online course	10(2.8%)	163 (45.2%)	33 (9.2%)	154 (42.8%)	-	3.08	0.994
I learn and understand better while using online than face to face	-	172 (47.8%)	21 (5.8%)	45 (12.5%)	122 (33.9%)	2.68	1.363
Online courses are more beneficial than face-to-face classes.	-	212 (58.9%)	-	90 (25.0%)	58 (16.1%)	3.02	1.22
I have difficulty in typing activities in online infrastructure courses	-	66 (18.4%)	-	179 (49.7%)	115 (31.9%)	2.05	1.026
I have difficulty listening to audio in online platform	-	95 (26.4%)	-	165 (45.8%)	100 (27.8%)	2.25	1.129
I have Difficult vocabularies are used in online learning platforms	-	91 (25.2%)	-	168 (46.7%)	101 (28.1%)	2.23	1.116
I enjoy interactions with materials in online courses	42 (11.7%)	185 (51.4%)	-	93 (25.8%)	40 (11.1%)	3.27	1.272
Online instruction uses variety of media	37 (10.3%)	151 (41.9%)	-	137 (38.1%)	35 (9.7%)	3.05	1.266
Composite Mean and Std						2.87	1.117

The study sought to find out from students their attitudes towards using online pedagogical infrastructure. From table 1.0, the results show that 172(47.9%) students were comfortable with online discussions, while 163(45.2%) were not. Furthermore 200(56.5%) students said that online discussions required a lot of time and effort contrary to Winahyu (2020) who indicated that online discussions were comfortable and did not consume time. However, he cited distractions as a hindrance to effective online discussions. Despite the challenges, majority, 180(50%), indicated that online discussions were convenient compared to face-to-face discussions.

The data shows that most students, 252(70%) spent a lot of time in an online course. Most students, 196(53.9%) also agreed that interruptions interfere with seamless online learning process. This is attributed to lack of adequate equipment, inconsistent electricity supply and unreliable internet connectivity making online courses to even take longer time as indicated by (Rimba, Izlan, & Sakka, 2020).

Furthermore, 180(50%) students were comfortable using online communications tools, while 139(38.6%) were not comfortable. A larger portion of the students, 173(48.0%) agreed that they understood what they did in an online course while 154(42.8%) of the students did not understand. This implies confusion among students since the number of those who didn't understand what they were doing was almost the same as those who understood what they were doing. Students however indicated that they did not have any difficulty in typing activities, listening to audio

files and with the vocabulary used in an online course as shown by 294(81.7%), 265(73.6%) and 269(74.8%) students who disagreed respectively. The findings also showed that online courses are more beneficial than face-to-face courses since majority of the learners 212(58.9%), agreed or strongly agreed with this statement. This implies that there has been effort to use a variety of media in the online learning platform thus making online learning more appealing and interesting. This agrees with the findings by Zozie (2020) in which 63% of the studied population agreed that using a variety of media improves the attitude of learners towards using the platform.

Online infrastructure at the university uses a variety of media. This is supported by 188(52.2%) who agreed or strongly agreed with the statement and the majority of the student respondents, 225(63.1%), also indicated that they enjoy interactions with these materials used for learning.

These findings show a general positive attitude of the students towards using online infrastructure for learning despite the challenges that they face. This is confirmed by the results from the interview in which ODEL technicians witnessed a positive surge on the number of students who use the online learning platform.

➤ Faculty Members Attitude

The study sought to find out from faculty members, their attitude towards using online infrastructure. A five-point Likert scale was used to get answers from the respondents as shown in Table 2.

Table 2 Members of Faculty Attitude of Online Infrastructure

	Potential Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std
1	Online teaching is the most preferred teaching approach.	53(30.6%)	67(38.7%)	34(19.7%)	4(2.3%)	15(8.7%)	2.2	1.16
2	I do not need training on the use of online infrastructure for teaching.	27(15.6%)	65(37.6%)	48(27.8%)	21(12.1%)	12(6.9%)	2.57	1.106
3	The current practice of online teaching is satisfactory, and the university should continue using it.	25(14.5%)	37(21.4%)	42(24.3%)	62(35.8%)	7(4%)	2.94	1.147
4	The university e-learning system does not support online consultations for learners.	19(11%)	48(27.7%)	45(26%)	43(24.9%)	18(10.4%)	2.96	1.178
5	Students need to be trained on the use of online learning infrastructure to enable participation in online classes.	13(7.5%)	35(20.2%)	45(26%)	44(25.5%)	36(20.8%)	3.32	1.224
6	Online learning is not a viable alternative for learning compared to face-to-face environments.	33(19.1%)	49(28.3%)	28(16.2%)	38(22%)	25(14.4%)	2.84	1.353
7	Teacher-student interaction is limited in online learning environments.	28(16.2%)	40(23.1%)	44(25.4%)	43(24.9%)	18(10.4%)	2.9	1.242
8	There is no way of knowing if my students did the reading in the online infrastructure.	32(18.5%)	39(22.5%)	29(16.8%)	69(39.9%)	4(2.3%)	2.85	1.201
9	Online Interpersonal communication interaction is limited.	29(16.8%)	41(23.7%)	45(26%)	54(31.2%)	4(2.3%)	2.79	1.129

10	There is highly impersonal communication among students and faculty members in online education	23(13.3%)	51(29.5%)	47(27.2%)	41(23.7%)	11(6.3%)	2.8	1.134
11	Teaching online lacks impact on my face-to-face courses and instructions	26(15%)	68(39.3%)	28(16.2%)	40(23.1%)	11(6.4%)	2.66	1.173
12	Best teaching practices are transferable from traditional face-to-face to online learning classes.	48(27.7%)	42(24.3%)	24(13.9%)	59(31.1%)		2.54	1.22
13	Students can learn less in e-Learning class.	47(27.2%)	39(22.5%)	49(28.3%)	27(15.6%)	11(6.4%)	2.51	1.223
14	There is more academic dishonesty (cheating, plagiarism) in online classes	25(14.5%)	52(30.1%)	63(36.4%)	29(16.8%)	4(2.2%)	2.62	1.002
15	I lack experience in preparing online content (i.e., presentations) and modules	13(7.5%)	68(39.3%)	36(20.8%)	49(28.3%)	7(4%)	2.82	1.055
16	Faculty cannot be replaced by technological tools	13(7.5%)	64(37.1%)	57(32.9%)	32(18.5%)	7(4%)	2.79	0.979
17	Time commitment for developing online class is comparable to that in face-to-face classes	34(19.7%)	47(27.2%)	40(23.1%)	52(30%)	—	2.64	1.11
18	I am less creative and innovative when using e-learning.	31(17.9)	58(33.5)	34(19.7)	50(28.9)	—	2.6	1.088
19	Using e-learning is very costly to the University.	20(11.5%)	70(40.5%)	42(24.3%)	34(19.7%)	7(4%)	2.64	1.05
20	E-learning does not influence students' academic grades.	29(16.8%)	44(25.4%)	47(27.2%)	46(26.6%)	7(4%)	2.76	1.141
21	University administrators do not support online learning	21(12.1%)	24(13.9%)	87(50.3%)	41(33.7%)	—	2.86	0.919
22	I prefer using google meet or zoom or Microsoft teams to the online learning platform used by the university.	9(5.2%)	45(26%)	29(16.8%)	67(38.7%)	23(13.3%)	3.29	1.145
	Composite Mean and Std						2.77	1.09

The study sought to establish faculty members' attitudes towards application online infrastructure in facilitating learning. From table 2.0, majority of the faculty, 120(69.3%) disagreed that online teaching is the most preferred teaching approach. Most faculty members, 92(53.2%), also disagreed that they do not need training on the use of online infrastructure for teaching. This is confirmed by the findings from the interviews which show that faculty members indeed need training. This is further supported by Zozie (2020), Mohammed (2020) and Salmon (2018) who all found out that faculty members need training to be able to use the online learning platform effectively.

The results show that 69(39.8%) agreed that the current practice of online teaching is satisfactory, and the university should continue using it, while 62(35.9%) disagreed and the rest were neutral. On the other hand, 67(38.7%) disagreed that university e-learning system does not support online consultations for learners, 61(35.3%) agreed and 45(26.0%) of the respondents were undecided.

On whether the students needed to be trained on the use of online learning infrastructure to enable participation in online classes, many respondents 80(46.3%) agreed that indeed training was necessary for students. The results further show that 82(47.4%) indicated that online learning is

a viable alternative for learning while 63(36.4%) indicated that online learning is not a viable alternative for learning and the rest were neutral. This implied that both faculty members and students need training for successful online learning.

The results show that 68(39.2%) of the respondents disagree that teacher-student interaction was limited in online learning environments, 44(25.4%) were neutral while 61(35.3%) agreed that teacher-student interaction is limited in online learning environments.

Most faculty members indicated that best teaching practices are not transferable from traditional face-to-face classes to online classes. This is observable from 90(52.0%) of the faculty who disagreed with the statement that these practices are transferable. This agrees with the lecturer's opinion during the interview that there is need for training of faculty members on designing online instructional materials that will not increase the cognitive load in the learners. Papia (2016) similarly agrees that cognitive load can be greatly reduced if properly designed instructional material is used for online learning leading to greater chances of content retention. The results of the study further indicate that many faculty members, 86(49.7%), indicated that students can learn more in an online learning class while

49(28.3%) indicated that students can learn less. This points to a positive attitude and implies that online learning should be encouraged by providing necessary resources. These findings are in agreement with those of Hart and Laher (2015), who in their study, majority of the respondents (68.2%) indicated that they learn better in the online platform.

The study also intended to assess if there is more academic dishonesty (cheating, plagiarism) in online classes. From the table the results indicate that 77(44.6%) disagreed that there is more academic dishonesty (cheating, plagiarism) in online classes, while 63(36.4%) were neutral and 33(19%) of the respondents agreed. This implies that little academic dishonesty is experienced in online learning platform. However, most students 306(85%) indicated that they have never taken exams online (see Table 4.1). Furthermore, 81(46.3%) of the faculty disagreed that faculty members lack experience in preparing online content (i.e., presentations) and modules, 36(20.8%) were neutral while 56(32.4%) agreed.

The data show that 77(44.6%) of the respondents disagree that faculty members cannot be replaced by technological tools, 57(32.9%) remained undecided while 39(22.5%) agreed they can be replaced.

The study sought to investigate whether time commitment for developing online classes is comparable to that in face-to-face classes. (The amount of time needed for course preparation is the same in both modes) and the result from the table show that a large number 81(46.9%) disagreed with the statement while 52(30.0%) agreed and the rest were undecided whether the time commitment is comparable.

The data also indicates that most of the respondents, 89(51.4%), disagreed that faculty members are less creative and innovative when using e-learning, 50(28.9%) agreed and the rest were undecided. The mean score was 2.6 with a standard deviation of 1.088. This implies that the majority of the respondents accepted that faculty members were creative and innovative when using e-learning.

Furthermore, the data show that majority of respondents, 90(52.1%), disagreed that using e-learning is very costly to the university. This implies that if online learning is implemented properly, it can be cost effective compared to face-to-face classroom learning. This contradicts the student’s opinion which indicated that online learning is very costly to the university. Zozie(2020) agrees with this finding that indeed online learning is cost effective.

The study sought to find out whether E-learning does not influence students’ academic grades and the results show that 73(42.2%) disagreed, 47(27.2%) were neutral while 53(30.6%) agreed that indeed it does not influence students’ academic performance. The mean score was 2.76 with a standard deviation of 1.41. This shows that a notable number disagreed that E-learning does not influence students’ academic grades. The mean score of the item was below the composite mean of 2.77 indicating a negative influence on the composite mean. The standard deviation was above the composite standard deviation of 1.09 indicating a wider spread in response for the item than the variable.

Lastly, most respondents 90(52.0%) agreed that faculty members prefer using Google Meet or Zoom or Microsoft teams to the online learning platform used by the university, while 54(31.2%) disagreed and 29(16.8%) were undecided. This points to the fact that MOODLE is not easy to use and therefore faculty members opt to use applications that they understand better. This is confirmed by the interview results in which one lecturer said:

“... I prefer using simple applications like google meet and zoom, students also understand these applications much better, however if both faculty members and students can properly be inducted on how the platform operates, we have no problem using the likes of Big Blue Button(BBB)...ID9.”

On whether university administrators do not support online learning most faculty members, 87(50.3%), were neutral that university administrators do not support online learning. This implies that the faculty were not sure whether the university administrators indeed support online learning. Generally, there is a notable indecision from the faculty regarding various items. This points to a possible need for investigation as to why the members of faculty are neither agreeing nor disagreeing on various items regarding the use of online infrastructure for learning.

From the data collected, simple linear regression test was used to confirm the attitude of the members of faculty. The study utilized the following null hypothesis which was tested at 0.05 level of significance.

- H_{05} : Attitude of users of Online infrastructure has no effect on learning.

The results are shown in Table 3, 4 and 5.

Table 3 Model Summary of Attitude towards Infrastructure for E- Learning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1(faculty members)	.396 ^a	.157	.152	1.730
2(students)	.313 ^a	.198	.195	.544
a. Predictors: (Constant), Attitude towards online infrastructure for E-learning				
b. Dependent Variable: Effects of Online Infrastructure on Learning				

Table 4 ANOVA on Attitude towards Infrastructure for E- Learning

Model		Sum of Squares	df	Mean Square	F	Sig.
1(faculty members)	Regression	95.146	1	95.146	31.776	.000 ^b
	Residual	512.022	171	2.994		
	Total	607.168	172			
2(students)	Regression	11.484	1	11.484	38.833	.000 ^b
	Residual	105.869	358	.296		
	Total	117.353	359			
a. Dependent Variable: Effects of Online Infrastructure on Learning						
b. Predictors: (Constant), Attitude towards online infrastructure for E-learning						

In Tables 3, 4 and 5, using data from faculty members’ questionnaire, linear regression model was fitted to explain attitude towards online infrastructure for learning. All the assumptions of regression analysis were met. The overall model for lecturer respondents explains 15.7% variation of learning and it is significantly useful in explaining learning in public universities, $F(1, 171) = 31.776, p < .05$. With

one-unit increase of lecturer attitude towards online pedagogical infrastructure, learning in public universities increases by 1.311, which was found to be a significant change, $t(171) = 5.637, p < .05$. Therefore at 5% level of significance the null hypothesis was rejected. This implied that there is effect between online infrastructure users’ attitude and learning in public universities.

Table 5 Regression Coefficients of Attitude towards Infrastructure for E- Learning

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
2(faculty members)	(Constant)	2.105	.691		3.045	.003
	Attitude of faculty members towards online infrastructure for E-learning	1.311	.233	.396	5.637	.000
1(students)	(Constant)	1.592	.217		7.340	.000
	Attitude of students towards online infrastructure for E-learning	.465	.075	.313	6.232	.000
a. Dependent Variable: Effects of Online Infrastructure on Learning						

On the other hand, data from the students’ questionnaire was fitted to explain attitudes of students towards online infrastructure for e-learning. All the assumptions of regression analysis were met. The overall model explains 19.8% variation of Learning in public universities, and it is significantly useful in explaining Learning in public universities, $F(1, 358) = 38.833, p < .05$. With one-unit increase in students’ attitude towards online infrastructure use for e-learning, learning in public universities increases by .465, which was found to be a significant change, $t(358) = 6.232, p < .05$. Therefore at 5% level of significance the null hypothesis was rejected. This implied that attitude of online infrastructure users affects learning in public universities.

These findings are supported by Khadiza & Meher (2022) who in Bangladesh found that the public university students’ attitude has positive effect on; the online interaction, the use of internet, self-efficacy, and the self-determination of the students.

Nwankwo (2015) and Kooli, Zidi, & Jamrah(2019) carried out studies on the student’s learning experience and perceptions, and attitudes of online course content users and interaction respectively. They found that there was a general negative attitude towards the implementation of the online learning platforms. They suggested that the main reason was the hurried implementation of the online systems.

III. CONCLUSION

Regarding the attitude towards the use of online infrastructure in learning, the findings of this study were inconsistent with the findings from most previous studies. Several previous studies on online learning found faculty members and students have a negative attitude towards using online pedagogical infrastructure(Fard, Rostamy, & Taghiloo, 2009; Hart & Laher, 2015; Winahyu, 2020; Rimba, Izlan, & Sakka, 2020). However, the current study found that faculty and students have positive attitude towards online learning platforms. The difference between the findings of this research and most previous studies on the research topic could be the effect of time since most of the previous studies were conducted before covid-19 when people did not see the need for e-learning. Faculty members’ and students’ attitude toward e-learning could have changed because of emergence of covid-19 pandemic. This explains why the current study identified that faculty and students have a relatively more favorable attitude toward e-learning when compared to the same cases in previous studies.

RECOMMENDATION

There is need for developing reliable support structure so that student and faculty using online infrastructure have their issues resolved. These issues often accumulate thereby making users feel inefficient in applying online learning platform to promote learning. Universities should employ technical staff who have technological skills and expertise to solve problems on online learning at the university. Instructional Material Designers should also ensure adequate, reliable, and quality learning resources to make online learning easier. Finally, policy makers need to formulate policies that promote online learning across universities locally and globally.

SUGGESTIONS FOR FURTHER RESEARCH

This study recommends that a similar study be conducted in the future, using comparative data from public and private universities to establish the key differences in handling online learning infrastructure in public and private universities. This will yield more conclusive results and increase researchers' ability to generalize the results to represent all the universities. A study should be conducted on the level of satisfaction in using online learning among students in public universities.

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