Perception of Undergraduate Students on Online Learning of Statistics Courses

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ABSTRACT

This study analyzes undergraduate students' perception of online learning of statistics courses. Online learning is an essential method of teaching and imparting knowledge to students in this era of modern technologies and it has come to stay. Online learning turns out to be student-centered, where they take part fully in the learning process, and teachers only supervise and guide them. However, their perception on this learning approach is very key to the effectiveness of the whole process. The targeted populations were the students taking statistics courses which include both the major and non-major students at a Nigerian University. The study includes the administration of a questionnaire that was made available online to the targeted population. Data gathered from the survey were analyzed and results indicated that the students' perceptions were relatively positive towards the online approach and actually have some advantages on the students. The importance of E-learning as a tool for teaching statistics students to both majors and non-majors was more evident in this research. A comparison between students who major in statistics and the non-majors indicated no significant difference (P=0.220). However, effective implementation of online learning into the statistics curriculum especially in developing countries requires a well-structured strategy and more active approaches to improve students' perception and interest positively.

KEYWORDS: Online learning, Traditional physical learning, Perception, E-learning

INTRODUCTION

The closure of schools put it difficult for academic institutions to deal with the unexpected move from physical learning to online learning due to the covid-19 pandemic, which disrupted teaching in various institutions worldwide. Physical classes had to peg to protect students, lecturers, and citizens. On the other hand, the pandemic also triggered new ways of teaching since most countries imposed restrictions; these gave birth to different ways of teaching via e-learning. To manage the impact of the lockdown appropriately, most private and few government schools had to look for an alternative way to teach their students. Modern technology permits online learning to be the main medium of teaching the modules in the time of the pandemic.

Retnoningsih (2017) explains that online learning is a learning process that is eased and supported by information and communication technology. Likewise, Saifuddin (2017) said that online learning is distance learning that couples students with their learning resources using the internet, physically apart, but can relate and connect. Roach and Lemasters (2006) explain that online learning initiated students' use of additional resources to discover their abilities as independent learners. Volang and Lord (2000) described online learning as a teaching method administered utilizing the internet and software applications. The rapid spread of this technique needs to be investigated to know the student perception, among other things, about the online learning process. Prior investigation has revealed that the adoption of online learning was assumed to be growing among the students who undergo it since it is a more workable way to absorb and takes the least time. Hence, students learn in the convenience of their homes.

Evidence suggests that student misses social/environmental interactions, which is only present in physical learning or face-to-face learning (Ury and Ury (2005).

Online education in Nigeria is still in the early stage of development. In Nigeria, this transition has been both positive and negative for most private universities, and government schools are still adopting it. Hancock (2002) stated that student-centered instruction, like the online learning approach, has benefitted many new technologies by using the internet and other advanced technological tools to share, extend knowledge, and transfer. Technology makes things easier and more accessible; thus, it can also be limited, especially in developing countries like Nigeria, where many students face a challenge in terms of access to the internet. Also, attendance and active participation in online sessions make adopting it a challenge. Seok et al. (2010) a study on mentioned that there was a positive correlation between students and teachers in their perception of teaching and learning. Physical classroom settings usually provide immediate feedback to teachers and students about the quality of the lesson taught. In the regular classroom setting, a teacher can observe students' body language and response levels to help the teacher immediately adjust their teaching approach to best suit the student's needs and the lesson's objectives. On the other hand, the current realities all over the world are such that online learning is unavoidable henceforth. Adedoyin and Soykan (2020) concluded that education would become face-to-face, online, and hybrid instructions.

As online learning is growing gradually, we need to have an insight into how students perceive and react to the online learning approach since perception is vital to motivation and the learning effectiveness of the whole process.

Perception is defined as an act of apprehending through the senses or of the mind. Similarly, it can be defined as the ability to see, hear, or be conscious of things through sense organs. The way students regard, understand, and interpret the teaching method must be balanced. Furthermore, Munhall (2008) said perceptions are studied by exploring individual voices that can be expressed, for example, through "narratives, storytelling, behavior, and reactions to individuals or groups." Rakhmat (2000) explains that perception gives meaning to stimulus-response in resuming information and predicting messages, which involves attention, hope, motivation, and memory. Following this, Michotte (2019) defines perception as a phase of the total process of action that allows us to adjust our activities to the world in which we live. Also, Hermawan & Tyas (2018) state that perception is the starting process of an individual in explaining sensory feelings to give meaning to their domain. Thus, this indicates that perception is a person's reaction to what they receive within their environments, but this might differ from actuality.

METHODOLOGY

Research Design

This study adopts the use of primary data through questionnaire administration. The study was designed to evaluate students' perception of online learning of statistics courses and use the result to improve instruction and course delivery.

Target Population

The study focused on students studying mathematics, statistics, and computer sciences as major students and those taking it as an applied course, referred to as non-major students, at Redeemer's University, Ede, Osun State, Nigeria. The Departments covered in the survey were: Mathematics and Statistics, Computer Sciences, Anatomy, Biochemistry, Biological Sciences, Physiology, Physiotherapy, Chemical Sciences, Physical Sciences, and Engineering.

Students in the 2nd, 3rd, and 4th year of study participated in the survey. In contrast, students in the 1st year were not included since they still needed substantial exposure to online learning at the university.

Instrument

The instrument used was the questionnaire designed by Baczek M. et al. (2012) that used a 5-point Likert scale (1= extremely unenjoyed, 5= extremely enjoyable). The questionnaire was modified into five parts to suit the objectives of this research work. This will remain the questionnaire adopted because the complete questions were used to evaluate the students' perception of online learning.

Firstly, the students were asked about their demographic details, I.T. skills, and whether they had participated in online learning before the pandemic.

Secondly, they were given six options about the advantages and disadvantages of E-learning, from which they were to pick as many as were true and applicable to them.

Thirdly, students were asked to compare physical learning and e-learning in terms of capability to master learning objectives: knowledge, statistical skills, and social competencies, student activities during physical learning and e-learning (1-Extremely ineffective, 2-Very ineffective, 3-Somewhat effective, 4-Effective, 5-Extremely effective)

Fourthly, the students were asked to rate their level of acceptance of online classes using the 5-point Likert scale. (1-Extremely unenjoyable, 2-Very unenjoyable, 3-Somewhat enjoyable, 4-Enjoyable, 5-Extremely enjoyable)

Lastly, the students were asked to rate their performance in statistics courses they have taken before now.

RESULT AND DISCUSSION

Hypotheses

There are three hypotheses for this study. They are:

H1: perception of major and non-major students on online learning of statistics is the same.

H2: perception of students on online learning of statistics and their I.T. skills are independent.

H3: performance of students in statistics is correlated with perception of online learning.

Data Description

There were 106 respondents in this study; 62 (58.5%) were males, and 44 (41.5%) were females. The age of the respondents ranged from 15 years to 23 years. 61 (57.5%) had participated in e-learning before the pandemic, while 45 (42.5%) had not participated in e-learning before. A total of 83 (78.3%) respondents categorize their I.T. skills as moderate, 14 (13.2%) as high, and 9 (8.5%) as low.

H1: perception of major and non-major students on online learning of statistics is the same.

The perception was represented by two variables: (i) perception score, which was the average of the scores from items on effectiveness, activities, and enjoyment rate; (ii) perception of the students on what their performance would be in the statistics course taken online. The results (Table 1) suggested that the student's perceptions of online learning are the same for the two groups of students (Majors and Non-Majors).Table 1: Independent t-test Between Majors and Non-Majors

Test Variable	Mean Difference	Standard Error Difference	P-value
Perception Score	0.0419	0.1167	0.721
Performance Perception	-0.1239	0.1563	0.430

H2: perception of students on online learning of statistics and their I.T. skills are independent

For the purpose of this test, the perception was classified into Negative (those with an average perception score of less than 3) and Positive (those with an average perception score of more than 3). On the other hand, I.T. Skill Ratings were classified into; low, moderate, and High. 85.8% of the respondents had positive perceptions of online learning (Table 2), while 78.3% stated they had moderate I.T. skills (83 out of 106). A test of independence between I.T. skills and the perception of students on online learning was not significant (Table 3).

Table 2: IT Skill Rating and Perception Class Cross-tabulation

			Perception Class		Total
			Negative	Positive	
IT Skill Rating	Low	Count	3	7	10
		% within IT_Skill_Rating	30.0%	70.0%	100.0%
	Moderate	Count	12	71	83
		% within IT_Skill_Rating	14.5%	85.5%	100.0%
	High	Count	0	13	13
		% within IT_Skill_Rating	0.0%	100.0%	100.0%
Total		Count	15	91	106
		% within IT_Skill_Rating	14.2%	85.8%	100.0%

The result suggests that the perception of students on online learning of statistics and their I.T. skills are independent, which is majorly positive. This disposition of the students towards online learning should be encouraged with well-developed implementation strategies.

Table 3: Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.217[a]	2	.121
Likelihood Ratio	5.625	2	.060
N of Valid Cases	106		

H3: performance perception of students in statistics is significantly correlated with their perception of online learning.
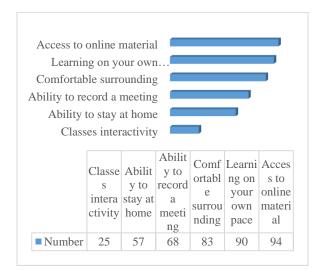
In this study, performance was only based on the student's expectations of their performance, and we, therefore, refer to it as Performance Perception. There was a low positive correlation between performance perception and the student's perception of online learning, as reflected in Table 4.
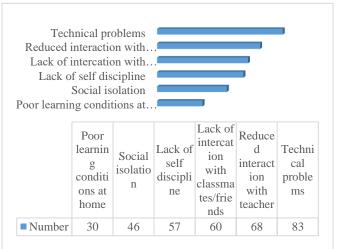
Table 4: Correlation between Students Perception on Online Learning and Their Performance Perception

		Perception Score	Performance Perception
Perception Score	Pearson Correlation	1	.287[**]
	Sig. (2-tailed)		.003
	N	106	106
Performance Perception	Pearson Correlation	.287[**]	1
	Sig. (2-tailed)	.003	
	N	106	106

A descriptive analysis of Advantages and Disadvantages of Online Learning

Perceptions of the students on the advantages and disadvantages of online learning are presented in Figure 1. The highest advantages of the e-learning chosen by the respondent were access to online material and the least classes interactivity. The majority of the respondent chose technical problems with I.T. equipment and poor learning condition at home as the least of the disadvantages. Successful implementation of an online learning scheme may benefit from diligent consideration of the points listed.

	Classes interactivity	Ability to stay at home	Ability to record a meeting	Comfortable surrounding	Learning on your own pace	Access to online material
■ Number	25	57	68	83	90	94

ADVANTAGES OF E-LEARNING

	Poor learning conditions at home	Social isolation	Lack of self discipline	Lack of intercation with classmates/friends	Reduced interaction with teacher	Technical problems
■ Number	30	46	57	60	68	83

DISADVANTAGES OF E-LEARNING

Figure 1: Students' Perceptions on Advantages and Disadvantages of Online Learning

CONCLUSION

Students' perception of online learning plays a vital role in their learning process. Online learning was the focus of this study because of the recent shift in this direction. A survey of the undergraduate student of a Nigeria University showed a positive perception of the students on online learning, which was not dependent on their I.T. skills and positively correlated with their expected performance in statistics courses. Perception is the same for both major and non-major students.

There is a need to evaluate the student's perception of the advantages and disadvantages of online learning with the positive perception of the students on online learning reflected in the study. It is imperative to act on the advantages and disadvantages indicated by the students.

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