

Original Research Article

Students' Perception of Online Learning Quality and Preference for the Online Learning Model

ABSTRACT

AimsThe traditional face-to-face learning approach at tertiary institutions was replaced by an online learning model as a result of the novel coronavirus (COVID-19) pandemic. This greatly impacts tertiary students, teachers, and administrators, especially in Ghana, where online learning hasn't been used much in the past. Preand post-COVID-19 epidemic, the current study looked at how students' perceptions of the caliber of their online learning experiences affected their acceptance of the paradigm.

Study design:The study contributes to the corpus of knowledge by evaluating how effectively the modified DeLone and McLean information systems success model relates to online learning.

Place and Duration of Study:Technical Universities in Ghana between September 2021 and May 2022.

Methodology:Structured questionnaires were used to collect primary data from 1386 students at technical universities in Ghana. The study employed multiple linear regression analysis and hypotheses were tested to ascertain the effects of class and gender on students' perceptions of the quality of and preferences for the online learning model.

Results: The result of the study revealed that the online learning system provided quality service to the students with a mean response value (mrv) between 3.74 and 4.52.It was also revealed that about 72% of the student's preference towards online learning was due to system quality, information quality and service quality provided.

Conclusion:Students must be encouraged to adopt online education, which must be appropriate, cutting-edge, and useful if they are to succeed in the digital age and remain relevant. Management of tertiary institutions is being encouraged to improve the quality of the online learning environment for both students and teachers.

Keywords: Learning preference, online learning model, information quality, service quality, systems quality.

1. INTRODUCTION

COVID-19, which originated in China, was so rapid and severe that several nations throughout the world were forced to close schools, including academic institutions. As a result, it affected about a billion pupils were affected by school closures around the world [1]. Due to the COVID-19 pandemic, institutions were under pressure to stop in-person instruction and send students home. Universities had no choice but to create online courses as a replacement to keep teaching and learning going. As a result, educational institutions

began implementing teaching and learning technologies to improve online learning throughout the globe, such as digital video conferencing platforms (Zoom, Microsoft Platform, Moodle, Webex, Blackboard, and Google Classroom)[3, 4]. Like many other nations impacted by the COVID-19 pandemic, Ghana was forced to switch to online education as an immediate replacement to finish the school year. Due to the inability to use standard face-to-face learning methods, web-based technologies and electronic learning have become well-known resources to solve any learning loss. Due to the COVID-19 epidemic, several universities worldwide have embraced online education[5].

Education authorities had no choice but to implement online learning if only as a stop-gap to ensure that tertiary education did not cease, as it makes traditional classroom learning nearly impossible due to its health effects. Tertiary education administrators accepted and developed online learning as a substitute for traditional classroom instruction to suit the needs and expectations of students. The institutions primarily intended to implement this new computer-mediated teaching and learning technique during the coronavirus pandemic [4]. However, as the pandemic worsens, it has become important to take into account online education as a long-term replacement for conventional classroom instruction at the nation's postsecondary institutions. However, using online learning is common in many regions of the world, particularly when providing distance learning[3]. Numerous studies have compared the efficacy of in-person and online learning in this context[6]. According to some research, students do better online than in person since the former is more likely to guarantee course completion, a higher rate of information acquisition, and happiness[7]. Other research has confirmed the efficiency of online learning as a teaching and learning strategy that provides a superior learning outcome to face-to-face learning[4, 8,9].

Despite the incentives cited for online learning, other research contends that it has numerous drawbacks that make face-to-face instruction preferable. According to a study by [10] that looked at students' motivation, contentment, and involvement, online learning was less effective academically for students than face-to-face instruction. Similar research comparing how well students performed in face-to-face and online learning revealed that online learners generally received worse grades[11]. Additionally, research has identified several factors that influence students' preferences for online learning systems in institutions [10]. They include a lack of qualified lecturers; sluggish internet speeds; Wi-Fi availability; infrastructure; the design of the interface; the caliber of the materials; system usage; and student adoption. In this context, Ghana's sudden shift to online education raises concerns about the caliber of instruction and students' choice of it over in-person instruction. This is so because there is disagreement among academics as to whether online learning limits quality learning or ensures it[4, 8, 10]. There is a knowledge vacuum in the existing literature as a result of the disagreement on the effectiveness of online learning as a substitute for face-to-face instruction. As a result, the current article focuses on the investigation of students' perceptions of the quality of online learning and how that affects their acceptance of the online learning model as a substitute for traditional classroom instruction in Ghanaian tertiary education, particularly since the practice is not yet widely used in the nation. This should contribute to the ongoing discussion on the quality of online education from the viewpoint of the student, who is the end user.

2. LITERATURE REVIEW

The traditional face-to-face learning model had to give way to online learning in tertiary institutions. In this regard, the institutions were required to develop measures to guarantee the level of service quality of their online instruction. It was crucial to research the effectiveness of the online service from the standpoint of the pupils. Studies of student

acceptance of the online learning system and student views of online learning are important indicators of the quality of the learning experience and quality research service is essential to install an online learning system that students choose.

According to earlier research, the idea of quality in the online learning model predicts several well-known quality outcomes, including system quality, information quality, service quality, and learning and continuance intention [14, 15, 16, 17]. Online learning is a recognized and accepted practice around the world, even though it is not a common component of the Ghanaian educational paradigm and several higher education regulatory authorities in Ghana have questioned online diplomas [15, 17]. When a teacher and student engagement with one another using the internet, it is referred to as "online learning" because the contact takes place online [18]. The rise of online education in the computer-based industry cannot be emphasized enough. Researchers have discovered that it has not always been easy to engage students online, maintain their interest throughout the course, and attempt to reduce their attention rate [17, 19]. The elements that draw and impact learners' desire for online learning as a viable option have been the subject of research [16, 19]. This research has verified a direct link between the success of online learning and the perceived quality of the service by the learners. This study cannot overlook how learning is delivered via the internet while the COVID-19 pandemic continues into the new school year. This necessitates that educational institutions evaluate the online learning model to look at learning quality and how it can affect students' perceptions of the online learning service's service quality and learners' preference for using the online learning platform.

Ghana must concur with the rest of the world that technological advancements are fundamentally altering how individuals learn and the connection between students and teachers. The online learning revolution is particularly notable for the rising use of Internet technology to create and deliver learning [20]. The model for online learning systems is an interactive network system made up of different features that support a virtual classroom to improve the quality of teaching and learning. The use of Internet technology in educational institutions offers an efficient learning model that addresses the problem of time and space and also produces many associated benefits, such as being learner-centred and self-paced, being economical for learners, and providing the archival capability to facilitate knowledge reuse and sharing [6, 12, 15, 18, 19]. Tertiary institutions in Ghana made significant investments in online learning systems during the move to online learning during the COVID-19 epidemic. The benefits of such systems can only be realized if students think the instruction is of high quality and choose to use them instead of face-to-face instruction [20, 21]. To help academic institutions and course designers create systems that are more likely to support the online learning model, it makes academic sense to evaluate the quality of the online learning system from the perspective of the students.

Evaluating the effectiveness of online learning by highlighting some key characteristics of high-quality online education service delivery. They consist of the context's quality, the online program's structure, and the online learning model. Other factors include the course's content and communication methods, the nature of the interactions and relationships between educators and learners, and the degree to which students master the subject matter. Other studies have identified flexibility, responsiveness, student support, self-reported interaction, perceived technology utility and simplicity of use, technical help, and student happiness as qualities of great online learning [24]. Student reflection was identified by Means [25], as a crucial success component in an online learning approach. [25, 26] identified pedagogies, resources, and delivery strategies as essential for quality in online education. The research found a link between students' reflective behaviour and the success of their online learning. This indicates that to ascertain students' preferences for online

learning, it is important to include perceived quality, a psychological construct that shapes experience and reflection.

[27] discovered that an executive committee, technology infrastructure, student services, and teacher services were among the criteria for quality in online learning. As crucial aspects of high-quality online education, [27, 28] included institutional support; course development; teaching and learning; course structure; student support; faculty support; and evaluation and assessment. According to [29] the instructor's attitude, enthusiasm, and real dedication toward instruction delivery via online education courses determine much of the quality of instruction. [29, 230] highlighted timely feedback, consistency in information delivery, relevance, learning objectives, and technical assistance as factors that contribute to the quality of online education. This claim was made in collaboration with [30], who said that administrative, teaching and learning support are all useful indicators of the quality of online learning. According to the relevant literature, improving student expectations and experience is necessary to improve the quality of online learning service delivery and make it more student-centred [27, 31]. To make students content with the online learning model, institutions must see students as consumers and do their utmost to provide the greatest online educational services that satisfy their quality expectations [30, 31]. To put it another way, the quality of online learning may refer to the discrepancy between the student's service expectations and his or her learning expectations [34, 35].

School management might need to create customer service techniques that offer students the finest online service quality as students become more complicated and online learning becomes a standard component of university education [33, 35]. The DeLone and McLean information systems success model may hold the key to comprehending and putting those tactics into practice. This study concentrated on the updated DeLone and McLean information systems success model in the context of online learning and proposed a research model to examine how three quality dimensions (system quality, information quality, and service quality) affect learners' perceptions of the quality of online learning and preferences to use the online learning service based on the learners' expectations and experiences [36, 37]. This study's purpose was to provide a theoretical basis and empirical evidence for predicting and explaining antecedents of online learning service usage and to provide important guidelines for academic institutions in their designing and implementing online learning systems. The following research queries need to be resolved, to accomplish this: (1) How do students in Ghana's tertiary institutions feel about the quality of the country's online learning system? (2) How does the choice of using the online learning model depend on how well students perceive the quality of the online learning environment? (3) Do gender and class affect students' opinions on the quality of their education and their preferred online learning model? (4) What is the overall impact of students' preferences for online learning models on their perception of the quality of online learning? To what extent may students who learn online use the updated DeLone and McLean information systems success, model?

The updated DeLone and McLean information systems success model's relevance to the online learning model was examined in this study [37]. The research model assumes that system, information, and service quality all have an impact on how well students perceive the value of online learning, which in turn has an impact on how much students choose to utilize online learning platforms. These justifications result in students' perceptions of the system's quality, information quality, service quality, and the impact of quality (system, information, and service) on students' preferences.

3. METHODS

One thousand nine hundred and eighty questionnaires were given out to participants in this study, and of them, 70% (1386) were totally completed and submitted for further data analysis. A convenience sampling technique was employed for this study due to the absence of a sampling frame. This allows the researchers to gather data that would not have been possible otherwise. The constructs for the measurement scales were adapted from the updated DeLone and McLean information systems success model, that is, perceived information quality, perceived service quality, and perceived system quality as independent variables; and online learning preference as the dependent variable. The questionnaires were designed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This study sought to investigate the impact of students' perceived quality of online learning on their preference for the online learning model, and data were gathered through an online survey of 1386 students from all ten Technical Universities in Ghana.

3.1 Multiple Regression

The study considered a multiple linear regression model as the study variable y depends on more than one explanatory or independent variable. This model is a generalization of the simple linear regression model which allows the mean function $E(y)$ to depend on more than one explanatory variable [38, 39]. It is assumed that, the study model would take the form $y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_k X_k + \varepsilon$ and the n observations will also follow the same model satisfying the equations below:

$$\begin{aligned} y_1 &= \alpha_0 + \alpha_1 X_{11} + \alpha_2 X_{12} + \dots + \alpha_k X_{1k} + \varepsilon_1 \\ y_2 &= \alpha_0 + \alpha_2 X_{21} + \alpha_2 X_{22} + \dots + \alpha_k X_{2k} + \varepsilon_2 \\ &\vdots \\ &\vdots \\ y_n &= \alpha_0 + \alpha_1 X_{n1} + \alpha_2 X_{n2} + \dots + \alpha_k X_{nk} + \varepsilon_n \end{aligned}$$

These equations can also be written as

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} = \begin{bmatrix} 1 & x_{11} & x_{12} & x_{13} & \dots & x_{1k} \\ 1 & x_{21} & x_{22} & x_{23} & \dots & x_{2k} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 1 & x_{n1} & x_{n2} & \dots & \dots & x_{nk} \end{bmatrix} \begin{bmatrix} \alpha_0 \\ \alpha_1 \\ \alpha_2 \\ \vdots \\ \alpha_k \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \vdots \\ \varepsilon_n \end{bmatrix}$$

or $y = X\alpha + \varepsilon$ where $y = (y_1, y_2, \dots, y_n)'$ is a $n \times 1$ vector of n observation on the study variable

$$X = \begin{bmatrix} 1 & x_{11} & x_{12} & x_{13} & \dots & x_{1k} \\ 1 & x_{21} & x_{22} & x_{23} & \dots & x_{2k} \\ 1 & x_{31} & x_{32} & x_{33} & \dots & x_{3k} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 1 & x_{n1} & x_{n2} & \dots & \dots & x_{nk} \end{bmatrix}$$

is a $n \times k$ matrix of the n observations of each of the k explanatory variables. The first column of X is taken to be $(1, 1, \dots, 1)$ if the intercept is considered in the model. $\alpha = (\alpha_1, \alpha_2, \dots, \alpha_k)$ is $k \times 1$ vector of the regression coefficients and $\varepsilon = (\varepsilon_1, \varepsilon_2, \dots, \varepsilon_n)$ is a $n \times 1$ vector of the random error component of the model. Thus, C is said to be the set of all possible vectors (α) , where C is a k -dimensional real Euclidean space. Our aim is to find a vector $C' = (c_1, c_2, \dots, c_k)$ from C that minimises the sum of squares deviation of the ε_i 's. That is:

$$S(\alpha) = \sum_{i=1}^n \varepsilon_i^2 = \varepsilon' \varepsilon = (y - X\alpha)'(y - X\alpha) \text{ for any given } X \text{ and } y$$

A minimum is obtained as $S(\alpha)$ is a real-valued and a differentiable function. **Thus;**

$$S(\alpha) = y'y + \alpha'X'X\alpha - 2\alpha'X'y$$

Differentiating $S(\alpha)$ with respect to α

$$\frac{dS(\alpha)}{d(\alpha)} = 2X'X\alpha - 2X'y$$

$$\frac{d^2S(\alpha)}{d\alpha^2} = 2X'X$$

This gives the normal equation given by

$$\frac{dS(\alpha)}{d(\alpha)} = 0$$

$$\Rightarrow 2X'X\alpha - 2X'y = 0$$

$$\Rightarrow X'XC = X'y$$

It is assumed that the $\text{rank}(X) = k$, then $X'X$ is a positive definite and the unique solution of the normal equation is:

$$C = (X'X)^{-1}X'y$$

Since $\frac{d^2S(\alpha)}{d\alpha^2} = 2X'X$ is at least a non-negative definite, C minimize $S(\alpha)$. Therefore,

$C = (X'X)^{-1}X'y$ is known as Ordinary Least Square Estimator of α .

The goodness-of-fit for an Ordinary Least Square regression can be measured as:

$$R^2 = 1 - \frac{SSR}{SST} = \frac{SSE}{SST}$$

Where,

$$SST = \sum_{i=1}^n (y_i - \bar{y})^2$$

SST is the total sum of square deviation and is a measure of the variations of y_i 's around the mean \bar{y}

$$SSE = \sum_{i=1}^n (y_i - \hat{y}_i)^2 = \sum_{i=1}^n \varepsilon_i^2$$

SSE is the residual or error sum of squares and measures the lack of the regression model.

$$SSR = \sum_{i=1}^n (\hat{y}_i - \bar{y})^2$$

SSR is the sum of **squares due to the regression**. This measures the variations in y that can be explained by the regression model. The R^2 is called the coefficient of determination and

measures the percentage of variation of Y around \bar{Y} that is explained by the regression equation. The closer the observed points are to the estimated regression line, the better the fit, the higher the R^2 . R^2 lies between 0 and 1. The test for the significance of the regression model in the case of multiple linear regression analysis is carried out using the analysis of variance. The test is used to check if a linear statistical relationship exists between the response variable and at least one of the predictor variables. It tests for the overall adequacy of the model.

Hypothesis

$$H_0: \alpha_1 = \alpha_2 = \dots = \alpha_k = 0$$

H_a : at least one of the α_i 's $\neq 0$

Test Statistics

$$F = \frac{MSR}{MSE} = \frac{\frac{SSR}{k}}{\frac{MSE}{n-k-1}}$$

The test has $F(k, n - k - 1)$ distribution. Thus, we reject H_0 if $F_{cal} > F_{\theta, (k, n-k-1)}$, θ is the level of significance of the test.

3. RESULTS AND DISCUSSION

A reliability/validity test using Cronbach Alpha; resulting in a reliability/validity coefficient of 0.928 which is above the recommended minimum of 0.7 [40, 41] was conducted on all 20 test items (variables) used in the study (see Table 1).

Table 1: Reliability/Validity test

N	%	Cronbach's Alpha	Number of Items
1386	100	0.928	20

It can be inferred from Table 1 that the variables assigned for the study were about 93% reliable to be used for descriptive-exploratory analysis of the study [41]. The study achieved a response rate of 73%.

4.1 Respondents Profile

This section of the study presents the respondents profile in relation to gender, year of study and use of communication device (Table 2 refers).

Table 2 presents the demographics characteristics of the respondents. Results in Table 2 shows that respondents (students) were skewed towards male. This accounted for 785 (57%) of the total respondents. Whereas 559 representing 40% were females. However, 42 (3%) of out of the total respondents prefer not to indicate or refused to declare their sex. Majority of 616 (45%) of the students were in their first year (level 100) of study, 463(22%) were in year two (level 200), 242(18%) in their third-year (level 300) while 65 of the students representing only 5% indicated final year (level 400). On the use of communication device for the online learning, the respondents were skewed towards mobile phones. This accounted for (1301) 94% of the total respondents. 50(4%) asserted to laptop computer, 17

(1%) student indicated tablet while the remaining 14 (1%) of the students practiced on desktop computer.

Table 2: Respondents Profile

Attributes	N	Frequency	Percentage
Gender	1386		
Male		785	57.0
Female		559	40.0
Prefer not to say		42	3.0
Year of study	1386		
Year one		616	45.0
Year two		463	22.0
Year three		242	18.0
Year four		65	5.0
Device use	1386		
Mobile Phone		1301	93.8
Tablet		17	1.2
Laptop Computer		50	4.0
Desktop Computer		14	1.0

It is evident to say that most (94%) of the students has only mobile phone which is not the best device for online learning.

4.2 Perceived System Quality

This section of the study sought to determine how respondents perceived the quality of the online learning system as done in their various institutions (Table 3 refers).

Table 3: Perception of System Quality

S/N	Statement/Item	Rating				
		SD	D	N	A	SA
1	Operation of an online learning system is reliable.	201 (14.5%)	301 (21.7%)	357 (25.8%)	329 (23.7%)	198 (14.3%)
2	Online learning system allows information to be readily accessible to me.	129 (9.3)	261 (18.8%)	296 (21.4%)	470 (33.9%)	230 (16.6%)
3	It takes too long for using online learning system to respond to my requests.	153 (11.0%)	304 (21.9%)	335 (24.2%)	453 (32.7%)	141 (10.2%)
4	I find online learning system easy to use	226 (16.3%)	311 (22.4%)	270 (19.5%)	409 (29.5%)	170 (12.3%)

SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

The statement "operation of an online learning system is reliable" saw most of the respondents (357) representing the greater percentage of 26% remaining neutral, 329 (24%) and 198 (14%) of the student agree and strongly agree respectively to the statement while 301(22%) and 201 (15%) of the student indicated disagree and strongly disagree to the statement (see Table 3). This indicates that about 859 of the respondents (students) representing 63% do not think the operation of the online learning system is reliable. 470 (33.9%) and 230 (16.6) agree and strongly agree correspondingly to the statement "online learning system allows information to be readily accessible to me". 261(18.8%) and 129 (9.3%) also indicated disagree and strongly disagree respectively to the statement while 296 (21.4%) could not agree or disagree with the statement. Therefore, majority of the respondents (700) constituting about 51% of the student, however, attest to the fact that the online learning system allows information to be readily accessible to them easily. There was diverse opinion to the statement "it takes too long for using online learning system to respond to my requests" as 335 (24%) remained neutral. 453 (32.7%) and 141 (10.2%) opted for agree and strongly agree to the statement while 304 (21.9) and 153 (11.0%) also disagree and strongly disagree to the statement. Since 50% of the students did not agree to the statement, it suggests that it does not take too long using online learning system to respond to their requests. Also, the students were partly divided as 579 (41.8%) agree and strongly agree to the statement "I find online learning system easy to use" while 537 (38.7%) disagree and strongly disagree to the statement. 270 (19.5%) however, could not take a decision on the statement. It can be established that most of the students find the online learning system not easy to use as at least 50% of the students did not agree to the statement. The findings in Table 3 show that respondents were generally satisfied with the online learning system and thus students have a positive perception about the system quality of the online learning model (Table 3 refers).

4.3 Perceived Information Quality

This section sought to find out how the respondents (students) perceived the quality of information on the online learning system (see Table 4).

Table 4: Perceived Information Quality

S/N	Statement/Item	Rating				
		SD	D	N	A	SA
1	The information provided by online learning system is accurate	62 (4.5%)	151 (10.9%)	349 (25.2%)	612 (44.2%)	212 (15.3%)
2	The information from online learning system is up-to-date enough for my purpose.	91 (6.6%)	293 (21.1%)	348 (25.1%)	485 (35.0%)	169 (12.2%)
3	The information content in online learning system meets my needs.	130 (9.4%)	300 (21.6%)	370 (26.7%)	426 (30.7%)	160 (11.5%)
4	Online learning system provides me with a complete set of information.	146 (10.5%)	307 (22.2%)	326 (23.5%)	436 (31.5%)	171 (12.3%)

SD = Strongly Disagree, D = Disagree, N = Neutral A = Agree, SA = Strongly Agree

Results on Table 4 shows that 612 (44.2%) and 212 (15.3%) respectively agree and strongly agree to the statement: “the information provided by online learning system is accurate”, 349 (25.2%) remained neutral about the statement, while 62 (4.5%) and 151 (10.9%) respectively disagree and disagree strongly to the statement. It can be deduced that most (60%) of the students believe the information provided by online learning system is accurate. The statement “the information from online learning system is up-to-date enough for my purpose” saw 91 (6.6%) and 293 (21.1%) respectively of the respondents saying they disagree and disagree strongly to it. However, 485 (35.0%) and 169 (12.2%) of the students respectively agree and agree strongly to the statement while quite a number of 384 forming 25% of the respondent remained neutral. Since only 47% (less than 50%) agree and agree strongly to the statement. It cannot be resolved that the information from online learning system is up-to-date enough for their intended purpose. Less than half of the respondents (42.2%) together agree and agree strongly to the statements “the information content in online learning system meets my needs”, 430 (30.5%) of the respondents together also disagree and disagree strongly to this statement while 370 (26.7%) remained neutral to the statement. With only 42% of the respondents together indicated agree and strongly agree. Thus, one cannot firmly say that the information content in online learning system meets needs of the respondents. About 603 (33.8%) only of the respondents together agree and agree strongly to the statement “online learning system provides me with a complete set of information”, 326 (23.5) were neutral to the statement while 453 (32.7%) of the respondents together also disagree and strongly disagree to the statement. Thus, it can be inferred from Table 4 that the information and the content of the information provided by the online learning system is not up-to-date, not complete and does not meet the needs of students, however the little information it does provides is very accurate.

4.4 Perceived Service Quality

An assessment of respondent’s perception on the quality of service provided by the online learning system was undertaken. It is believed that when quality service is provided, the student will continue to use the online learning system. Table 5 below gives the results.

Table 5: Perceived Service Quality

Statement/Item	MRV	SD
Grading in the course was fair and consistent.	4.10	0.260
Assignments were distributed fairly throughout the semester.	3.74	0.050
Graded assignments, test, etc., were returned promptly	4.00	0.209
The instructor could be contacted for consultation	4.52	0.105
The instructor satisfactorily answered questions.	3.70	0.188

MRV = Mean response value, SD = Standard deviation

Statements concerning the quality of service provided by the online learning system were asked and respondents were asked the extent to which they agree to these statements. The mean responses values and standard deviation of the responses to these statements were used to evaluate how respondents perceived the quality of service provided by the online learning system. The higher the mean response value indicates a high level of agreement to the statement (see Table 5) with 3.70 being the minimum and 4.52 the maximum out of a

mean value of 5.00. The low standard deviation values also indicates that the responses are not widely spread from the average response concerning the quality of service. This also shows that the variables (statements) received a favorable response from the respondents (students) (see Table 5). Hence, it can be concluded that the online learning system provide quality service to the students.

4.5 Perceived Quality of online learning and Students Preference of the Online Learning Model

Regression analysis was applied to establish the impact of perception of the quality of the online learning system on the preference of students for the program. The quality of the online learning was perceived in terms of system quality, quality of information and quality of service. These were the independent variables in our regression analysis (see Table 6).

Table 6: Regression Coefficient

Model 1	Un standardized Coefficients		Standardized Coefficients	T-value	P-value
	B	Std. Error	Beta		
Constant	0.466	0.337		1.383	0.051
1. System quality	0.461	0.098	0.401	4.704	0.000
2. Information quality	0.151	0.078	0.228	1.936	0.001
4. Service quality	0.213	0.033	0.218	6.455	0.000

a. *Dependent variable: Preference of online learning*

The regression coefficient (see Table 6) shows that there is a positive linear relationship between the independent variables (System quality, Information quality and Service quality) with the dependent variable (preference of students toward the online learning). An increase in System quality, Information quality and Service quality by one unit would increase preference of students toward the online learning by 0.461, 0.151 and 0.213 respectively. The regression equation is given by:

$$\text{Preference of online learning} = 0.466 + 0.461 \text{ system quality} + 0.151 \text{ information quality} + 0.213 \text{ service quality.}$$

The results also indicate all the independent variables (System quality, Information quality and Service quality) are all statistically significant at 5% level of significant in determining the preference of students toward the online learning as shown by their respective p-values of 0.000, 0.001 and 0.000

Table 7: Analysis of Variance of Students' Perception and Preference

Model	Source	Sum of Squares	D.F	Mean square	F	Sig.
1	Regression	42.875	3	14.292	11.6006	0.000
	Residual	8.621	7	1.232		
	Total	51.496	10			

a. *Predictors: (Constant), system quality, information quality and service quality*

b. *Dependent variable: Preference of online learning*

Analysis of variance (ANOVA) test revealed an F-value of 11.6006 and a P-value of 0.000. As observed, the P-value is far less than the alpha level ($\alpha_{0.05}$) thus implying that the independent variables contributed significantly to the variations in the dependent variables. That is the overall model is statistically significant. It can be inferred that system quality; information quality and service quality really influence preference of students toward the online learning at 5% level of significance. (See Table 7).

Table 8: Summary of Regression Model of Students' Perception and Preference

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	0.717 (a)	0.723	0.701	0.1214

Predictors: (Constant), system quality, information quality and service quality

Result from Table 8, show that system quality, information quality and service quality accounted for 72% (R Square, 0.723) of the total variation in preference of students toward the online learning. Hence, it can be resolved that system quality, information quality and service quality have a great impact on student's preference on online learning.

4. CONCLUSION AND RECOMMENDATION

Findings of the study revealed that most of the students has only mobile phone for the online learning which is not the best device for online learning. The operation of the online learning system is not really reliable though the online learning system allows information to be readily accessible. The study shows that students were generally satisfied with the online learning system and thus students have a positive perception about the system quality of online learning model. The results of the study showed that the information and the content of the information provided by the online learning system is not up-to-date, not complete and does not meet the needs of students, however the little information it provides is very accurate. The study also reveal that the online learning system provide quality service to the students.

It is recommended that since the state of students perceived quality affect their preference of online learning, managers of tertiary institutions must do everything to improve the quality of online education. By so doing, students' choice of online learning model as an alternative or a blend to face-to-face learning can be encouraged during and even beyond the Covid-19 pandemic. Regulators of tertiary education in Ghana, must include online learning policy as part of the education policy in Ghana. This should include policy on systems infrastructure and internet facilities that will provide the backbone of quality online learning. Teachers should take advantage of the current learning environment to update their skills in the electronic-based instructional facilities in order to provide the best online learning platform for students.

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