

Students Quality Assessment of the Interactivenesses of Virtual Teaching and Learning Platforms

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ABSTRACT

This study provides insights on students' perspectives on the functional interactivenesses of the virtual platforms used as online digitized classrooms for teaching and learning since the advent of COVID-19 pandemic. Guided by a conceptual framework, quantitative data was collected from 687 graduate students, and analyzed using the AMOS-based structural equation modelling approach. It was found that, the quality of the students systemic interactiveness with the platforms is influenced by the connectivity with colleagues, derivation of a sense of personalization and community, and ease of communication and following of instructional contents provided in the teaching process. It was concluded that the incorporation of these findings in the virtual platform design will help enhance the reputation of teaching delivery on the virtual platforms which will help enhance the expected quality of teaching-learning systemic outcome.

Keywords: Tertiary institutions, Virtual teaching-learning platform, Systemic interaction, Teaching-learning outcome, Students, COVID-19 pandemic

INTRODUCTION

Starting in the year 2020, institutions of learning, as it was with several businesses, experienced a huge disruption in their direct physical interactions with clients. For institutions of higher learning in the education sector, almost all in-person courses transitioned to virtual instruction due to the COVID-19 pandemic. That is, there has been a significant global systemic and structural shift towards virtual education among tertiary institutions, with the requisite restructuring of the face-to-face teaching-learning mechanisms into new online delivery systems. As a result, lecturers with little to no training were required to make rapid decisions about how to adjust their courses for virtual teaching. Virtual platforms are now served as online digitized classrooms used for teaching and learning in tertiary academic institutions, and which usage has gained global acceptance since the advent of COVID-19 pandemic in 2019. This pedagogic dynamics has resulted in a systemic and structural shift towards virtual education among tertiary institutions, with the requisite restructuring of face-to-face teaching-learning mechanisms into new online virtual delivery systems. Understanding the functional interactivenesses of this mechanism, with students as learners, is significant toward enhancing

the pedagogy of effectiveness students learning. This is due to the fact that such new online systems, which are digitized educational instruction media, are mostly designed by third parties who are not the direct users, there is a need to provide users, namely teachers and students, the space to share their evaluative perspectives on the effectiveness of the current approaches to such instructional design, in terms of the quality of interactivenesses they provide users. This is because, systemic interaction in virtual education, as it is with all distance education systems, includes the way the user, especially the student, interact with the online platform, fellow students, lecturers, and the educational contents of programme. In this respect, systemic interaction is recognized as a key factor in determining the quality of the online platform's functionality and effectiveness, and by implication, the reputation of its delivery. Thus, taking cognizance of argument in the extant literature that in distance education, as it is with virtual education, the transactional distance between students and teachers is not determined by their respective geographical locations, but by the quality of the interactive relationship and the balance between dialogue and other instructional events. As such, it important for designers of virtual teaching-learning platforms to understand the implication of such transactional distance, especially from the students perspectives, that should be effectively managed to engage the students to enable quality interactive teaching-learning. In this stead, it is important to provide insights on students' perspectives on the functional interactivenesses of the virtual platforms that serve as online digitized classrooms used for teaching and learning in tertiary academic institutions, and which usage has gained global significance since the advent of COVID-19 pandemic. The purpose of this research was to assess the quality of students systemic interactions with the virtual platform used in teaching them, from the perspectives of its enablement of connectivity with colleagues, derivation of sense of community and personalization, ease of communication and contents following, and how all these factors inform the quality of teaching-learning outcome, in terms of the effectiveness of systemic interaction and delivery reputation.

LITERATURE REVIEW

Several studies have been conducted in recent years to examine the influence of human factors in the design of virtual education systems. According to Sanda (2021), it is the ease of use of digital platforms complimented by the incorporation of special characteristics to the platform job designs that enables client to derive a feeling of self-attention, collaboration and cooperation are of great importance. Sanda (2021) noted that both genders tend to cherish the prevalence of communal atmosphere and a characteristic sense of care during their interactive activity with the digital platforms. In the education sector, based on the argument that virtual spaces for learning are becoming increasingly prominent in both the business and education spaces (Muñoz Cristóbal et al., 2017), the adaption of virtual platforms as classrooms to provide open online courses have created more accessible educational opportunities to many individuals (Wong et al., 2013). However, there prevail the argument that discrepancy exists between enrolment and

completion rates in online courses which suggests that learning online presents unique challenges to learners who may require some form of additional support to become successful (Wong et al., 2013). Some studies have shown that learners in the online teaching-learning environments tend to struggle due to the non-usage of critical self-regulated learning strategies (Azevedo, 2005), and which strategic processes have been identified by Winters et al. (2008) as enabling learners to successfully learn in online environments. In virtual teaching-learning environment, it is not the location that determines the effect of instruction, but the frequency and quality of interaction between student and lecturer (Pittinsky and Chase, 2000). According to Wulff et al. (2000), interaction includes the way students interact with fellow students, lecturers, and the educational contents of the programme. As such, the transactional distance in virtual education is not determined by geography, but rather, by the quality of the interactive relationship and the balance between dialogue and other instructional events (Moore, 1990). In this vein, it has been argued that for lecturers involved in virtual teaching to be successful it is imperative for them to understand and appreciate the relevance of the transactional distance and the extent to which it should be managed to enable effective engagement with students in interactive learning (Frith and Kee, 2003; Halpin et al., 2003; Christopher et al., 2004).

Ragan (1999) has observed that interaction in distance education is not something that happens automatically but is something that needs to be incorporated consciously into the instructional design. Thus, with the increased adaption of virtual education by academic institutions of higher learning, there is also the need to assess the effectiveness of the current approaches to instructional design using the Constructionist educational approach (Boettcher, 1997), with the quality of systemic interaction recognized as a key factor (Ragan, 1999; Wulff et al., 2000; Pittinsky and Chase, 2000). According to the constructivist educational theory, the student is viewed as an active participant who constructs knowledge in the learning process (Boettcher, 1997). This therefore requires that dialogue that supports active learning should be discursive, interactive, adaptive and reflective (Laurillard, 2002). In this regard, as observed by Chickering and Gamson (2003), effective instructional designs should include student-lecturer interaction, cooperation among students, prompt feedback and active learning. Sanda (2021) reported that most clients believe that their excitement as online shoppers is induced by the flexibility of choice, customization, character, care, and sense of community, provided by digital platforms. Thus, Sanda (2021) suggested that to generate a large network of future online shoppers, digital platforms must continually improve on the choices available to clients on digital platforms. This according to Sanda (2021), requires that firms should design their digital platforms to enable user care since this resonates with online shoppers as they feel loved on a personal level. The implication is that, digital customization is very relevant in not only in today's e-commerce (Sanda, 2021), but also in virtual education, since it makes clients feel a sense of acceptance and recognition, and also being in charge of the digital transaction themselves (Sanda, 2021). In this wise, educational institutions should incorporate such perspectives in the design of their digital platforms to create conducive

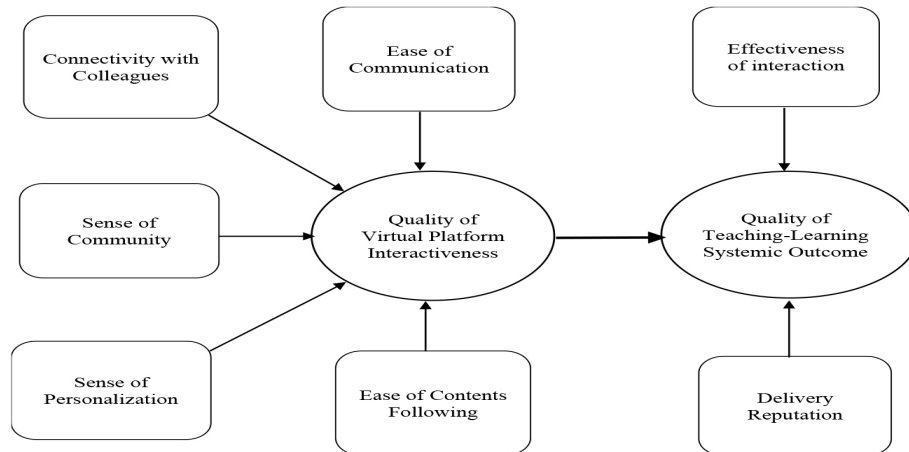


Figure 1: Conceptual model for students quality assessment of the interactivenesses of virtual teaching and learning platforms.

digital virtual teaching-learning environments that will excite their students learning experiences and knowledge construction. In this wise, the model shown in Figure 1 below is proposed for testing.

METHODOLOGY

In this research, a model reflective of the dynamic interaction was firstly proposed to serve as study framework. Guided by this framework, a data was collected from six hundred and eighty-seven graduate students in a Ghanaian university using a structured questionnaire. The measured factors entailed include the quality of students interaction with the virtual platform used in teaching them throughout the semester, from the perspectives of its enablement of connectivity with colleagues, derivation of sense of community and personalization, ease of communication and contents following, and how all these factors inform the quality of teaching-learning outcome, in terms of the effectiveness of systemic interaction and delivery reputation. All the respondents are Master Degree students enrolled in variety of master programmes at the University of Ghana Business School. The questionnaire entailed a synopsis that explained the purpose of the study. Due to the COVID situation, during which there was no direct contact with students, the question was posted online on a platform that all students can access. The completed questionnaires were returned by each respondent and dropped in a special sealed box provided for such purpose by the researcher.

In the data analysis, the stepwise approach was used. The data was collated and firstly analyzed descriptively. Secondly, the data was analyzed inferentially using the structural equation modelling (SEM) approach. In this approach, the analysis of moment structures (AMOS) was used as the analytical technique as applied by (Sanda and Kuada, 2016). This analytic procedure has the advantage of maximizing the validity of the estimates (Sanda and Kuada, 2016; Di Stefano et al., 2009). The AMOS graphics statistical software was used as the analytical tool. The tool facilitates the conduct

of analyses for multiple levels of variables using a range of in-built statistical techniques (Sanda and Kuada, 2016). In testing the predictability of measured individual factors that constitute the various components of the conceptual model shown in Figure 1, path analysis was conducted. The analysis was started by loading each of the latent variables in the conceptual model (i.e., Figure 1) in the AMOS software in order to assess the model-fitness of their respective measurable indicators (factors). Factor predictiveness was interpreted using factor loadings greater than 0.50 (Tabachnick and Fidell, 2012; Forsell et al., 2020, Amankwah and Sanda, 2021). The model fit was interpreted using the path coefficient benchmark value of 0.7 or higher as proposed by Schumacker and Lomax (2004) in order to ensure robustness. The criteria used to determine model fit are the Chi Square (CMIN) value, which is the absolute test of model fit and the Comparative Fit Index (CFI) value. A CMIN value below 0.05 implies model acceptance. For the CFI, a value close to 1.0 indicates a very good model fit.

RESULTS AND DISCUSSION

Demographic Distribution of Study Participants

All the six hundred and eight-seven (687) questionnaires administered were retrieved and all were found to be complete and usable for the analysis. The gender distribution of the respondents showed that 374 (54.40%) were graduate female students and 313 (45.60%) were graduate male students.

Structural Analysis of Systemic Virtual Platform Model

A confirmatory structural analysis was conducted to assess the systemic interrelations between the quality of students' interaction with the virtual platform used in teaching them throughout the semester, from the perspectives of its enablement of connectivity with colleagues, derivation of sense of community and personalization, ease of communication and contents following, and how all these factors inform the quality of teaching-learning outcome, in terms of the effectiveness of systemic interaction and delivery reputation. The AMOS-generated standardized path diagram showing the standardized indicator loadings of the respective latent variables in the tested structural model is shown in Figure 2 below. Based on the goodness of fit statistics, it is evident that the overall model fit appears quite good. This is because the estimated CMIN (χ^2) value of 62.27 ($df = 13$) has a probability level of 0.00 which is lesser than the 0.05 used by convention. Therefore, the null hypothesis that the model fits the data is accepted. The model has a Comparative Fit Index (CFI) value of 0.94, which is close to 1.0, and as such, indicated an acceptance of the null hypothesis that the tested model has a good fit.

The results, as highlighted in Figure 2 above, firstly, showed that the measured factors relative to the virtual platform's enablement of students' connectivity with colleagues (IP32), Sense of Community (IP34), ease of communication (IP35), ease of contents following (IP36), and delivery reputation (IP31) showed significant predictiveness. In this regard, five indicators

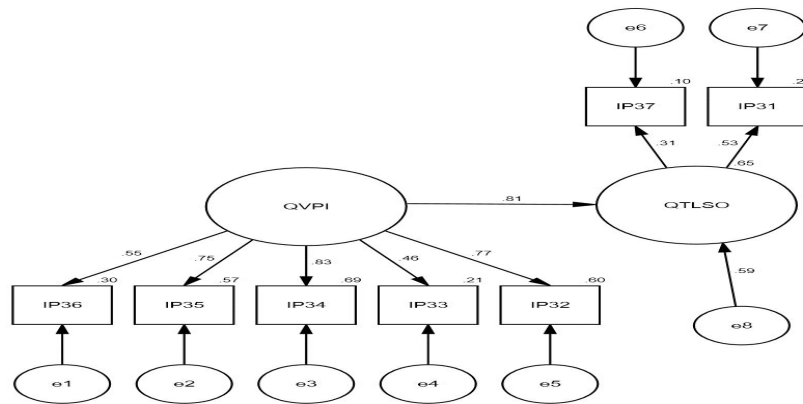


Figure 2: AMOS-generated path diagram showing standardized indicator loadings in the structural model for students systemic quality assessment of the interactivenesses of virtual teaching and learning platforms.

(i.e., connectivity with colleagues, sense of community, ease of communication, ease of contents following and delivery reputation) have factor loadings (R) with factor loadings whose values are approximately or greater than or equal to the 0.5 threshold (Tabachnick and Fidell, 2012; Forsell et al., 2020, Amankwah and Sanda, 2021). Therefore, four factors are predictive of the unobserved variable “quality of virtual platform interactiveness (QVPI)”. This implies that the quality of students interaction with the virtual platforms that are used to teach them in the COVID-19 period is largely informed by their ability to connect with their colleagues ($R = 0.77$, $R^2 = 0.59$), their derivation of a sense of community ($R = 0.83$, $R^2 = 0.69$), the ease of communication ($R = 0.75$, $R^2 = 0.56$) and the ease of contents following on the platform ($R = 0.55$, $R^2 = 0.30$). Also, only one factor is predictive of the unobserved variable “quality of teaching-learning systemic outcome (QTLSO)”. This is the platform’s delivery reputation ($R = 0.53$, $R^2 = 0.28$).

On the other hand, the quality of the measured factors relative to the virtual platform’s enablement of students sense of personalization (IP33) and effectiveness of interaction (IP37) showed non-significant predictiveness. This implies that the quality of students interaction with the virtual platforms that are used to teach them in the COVID-19 period was not informed by the platforms’ Sense of Personalization ($R = 0.46$, $R^2 = 0.36$) and its interactive effectiveness ($R = 0.31$, $R^2 = 0.10$). Secondly, the results showed that the unmeasured variables relative to the quality of virtual platform interactiveness (QUPI) and the quality of teaching-learning systemic outcome (QTLSO) showed significant predictiveness between the two with a factor loading of more than the 0.7 threshold (Schumacker and Lomax, 2004). In this stead, the quality of virtual platform interactiveness significantly predicts the quality of teaching-learning systemic outcome ($R = 0.81$, $R^2 = 0.66$).

Factoring the above findings in the conceptual model, Figure 3 shown below is obtained to serves empirical model for understanding students systemic quality expectation of the interactivenesses of virtual teaching and learning platforms.

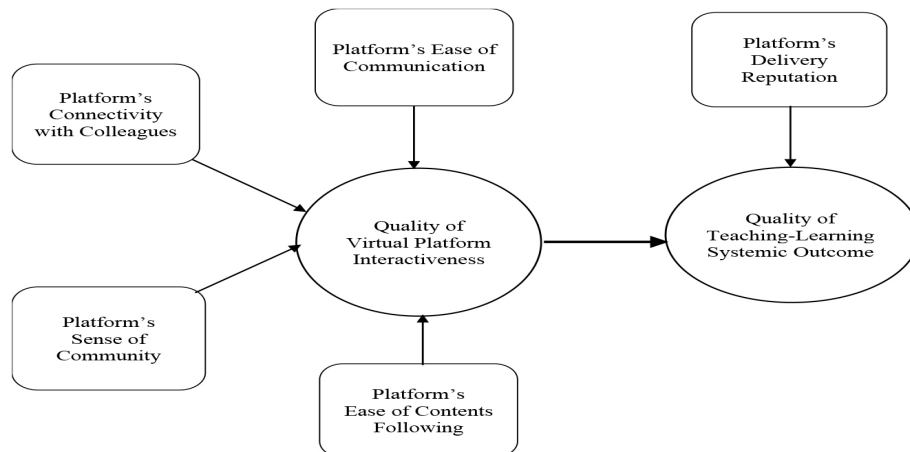


Figure 3: Empirical model for assessing students quality expectation of the systemic interactivensses of virtual teaching and learning platforms.

CONCLUSION

This study has provided understanding on the dynamics of students' cognitive expectations of the quality of their systemic interactions with virtual platform used in teaching them as a result of the COVID-19 situation. Based on the findings, it is concluded that in designing the virtual platforms used in the teaching-learning system, the quality of the students systemic interactivensses with the platforms could be enhanced by ensuring that the connectivity with their colleagues is not constrained, and also enable them to derive a sense of personalization and community, while finding it easy to communicate and follow instructional contents provided in the teaching process. this will help enhance the reputation of teaching delivery on the virtual platforms which will help enhance the expected quality of teaching-learning systemic outcome.

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