# An Analytical Framework Considering the Effects of Online Teaching Quality on Student Satisfaction

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**Abstract**
COVID-19 spreads across the world in late 2019 has affected to several aspects of social life. One of the most important sectors, which face difficulties was education, thus most universities have transferred from traditional education to online education through the internet to make their academic year going. This study aims to review the effects of online teaching quality on student satisfaction, a positive attitude resulting from an evaluation of students' online teaching experience in higher education. Through applying the SERVQUAL model to measure the effects of online teaching quality on students' satisfaction, it can be expected to get better the online teaching quality of higher education institutions in Vietnam.
**Keywords:** Online teaching, student satisfaction, higher education, COVID-19, educational institution.
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## 1. Introduction
In recent years, a technological revolution has occurred strongly around the world. The fourth revolution has affected to all aspects of social life including education, it no longer confined teaching and learning because the presence requirement of a teacher for the course is unnecessary (Zhang & Nunamaker, 2003). In addition, the outbreak of COVID-19 caused the disruption of the original teaching plans, and thus, online teaching is considered as an essential key aspect for higher education to transfer traditional in-class face-to-face education to online courses through the internet (Santiago, 2021). In a short time period, many countries had to close educational institutions, and nearly 1.598 billion learners kept themselves separated from other people. Thanks to the closure of their educational institutions from 194 countries and the UNESCO has recognized that COVID-19 outbreaks impacted the global education system (UNESCO, 2020). As the COVID-19 pandemic spreads, the whole educational system moves toward teaching online (Martinez, 2020).

Similar to other countries, the COVID-19 pandemic set a requirement for higher education institutions to design teaching-learning strategies for post-coronavirus. In fact, all universities in Vietnam have been promoting a widespread breakthrough in the activities of teaching and learning (Linh & Trang, 2020). No one can deny that online teaching has become a concept widely discussed recently. But both the individual teachers and students as a whole are unfamiliar and challenging with online education because Vietnam is among low and middle-income countries (LMICs) with unequal access to wireless technology, exacerbating massive quality of online teaching (The World Bank, 2020). First of all, students and teachers face major challenges with online education since it takes them many times to register, manage and protect private accounts for multiple online courses on different platforms. Secondly, it sounds difficult to create opportunities for interaction in online learning environments and transform their original teaching plans which focused on students' interactions, motivations and point of view. Last but not least, all problems surrounding online teaching need to be solved, and stakeholders are not only higher education institutions but also the ministries.

Besides difficulties, Vietnamese universities have availed themselves of the opportunity to become intelligent universities and apply digital transformation to approach the quality of world education. It is clearly seen that more studies have shown a growing number of student satisfaction on the quality of online teaching in university online education. According to some studies, satisfaction in universities is affected by lecturer-student relationships, web design courses, quality of learning equipment, library facilities and so on (Aracil, 2009; Kuh et al., 2001; Sojkin et al., 2012). The study highlights the effect of online teaching quality on student satisfaction in higher education, especially for the COVID-19 pandemic. Besides, the study also contributes to online teaching quality literature by exploring the effects that influence the quality of online teaching from student's point of view in higher education.

The rest of the study is organized as follows: Section 2, shows the literature reviews of online teaching quality, student satisfaction and the effect of online teaching quality on student satisfaction in higher education. Section 3 and section 4 mention a model and methodology for evaluating the effect of online teaching quality on student satisfaction. In section 5, certain conclusions are drawn and outlines some of the study's opportunities.

## 2. Literature review on the effect of online teaching quality on student satisfaction
2.1. Online teaching
Online teaching is a new form of teaching using technology in the education environment. It differs from traditional

teaching in several ways, such as: instructor and student roles, communication, interaction and flexibility (Young, S. 2006).

When someone's need is adequately and appropriately met, it is known as quality (Crosby, 1979). Quality is also defined as the willingness of users to pay for their desires (Drucker, 1985). According to Santos (2003), in the online environment, online service quality is manifested by the positive reviews of users - through the process of providing and instructing to use products or service. Higher education has full characteristics of economics in the national economy (Shank et al.,1995). Therefore, the quality of online teaching can be known as the comments, feedbacks, and assessments from students mentioned during and after a period of time when participating in online learning.

## 2.2. Satisfaction and student satisfaction

According to previous studies, there are multiple definitions of satisfaction. In general, they are related to expectations and experiences. More exactly, when researching concepts related to satisfaction, they will emphasize reviews or consumer's responses during the evaluation process (Giese et al., 2000). Satisfaction is the measured distance between perceived real value and previous expectation (Oliver, 1981). Accordingly, satisfaction is the user's perception of the product's performance in terms of expectations and reality (Tse et al., 1988). In other words, satisfaction can also be understood as an experience with expected results (Hom, W. C., 2002). Therefore, it helps others feel pleased when their needs and wants are fulfilled (Saif, N. I., 2014). From a marketing point of view, satisfaction refers to feelings of happiness or disappointment when an user compares expectation to actual use of products or services (Kotler, P. & Keller, K., 2012). Users (also known as customers) feel satisfied when products or services which are provided meet or exceed their expectations (Sigala et al., 2006). It depends quite a lot on previous expectations and actual perception of usage (Mukhtar et al., 2015). When they have high or low expectations of products and services, it will directly affect their satisfaction. Therefore, satisfaction is influenced by emotional factors.

Student satisfaction is said to be the assessment and perception of learning experiences (Astin & A.W, 1993). Student satisfaction is also the basis to reinforce their loyalty when participating in learning activities (Navarro et al., 2005). Besides, it is an important psychological factor affecting student learning motivation and a decisive factor for the success of education (Bui Kien Trung, 2016). On the other hand, student satisfaction is a relative assessment based on expectations and experiences (Mukhtar et al., 2015). Elliot & Shin (2002) pointed out that students' subjective perceptions of learning outcomes have a significant effect on their satisfaction. From previous studies, Weerasinghe (2017) defined student satisfaction as a short-term attitude resulting from a measuring of students' educational experience, services and facilities.

## 2.3. Online teaching quality and student satisfaction

Sloan quality framework pointed out 5 pillars to evaluate the effectiveness of online teaching: student (customer) satisfaction, faculty (employee) satisfaction, student access, learning effectiveness and institutional cost-effectiveness (Moore JC, 2005). Meanwhile, Abel R (2005) found the main reasons for success of online teaching are: leadership and motivation, study program, lecturer support, students (result, services, satisfaction) and the number of students registering. Therefore, it can be seen that student satisfaction is one of the principal factors when evaluating the quality of online teaching.

In higher education, where online teaching is being focused due to the fourth revolution and the COVID-19 pandemic, evaluating student satisfaction is considered one of the top targets. Because students are the main customers of higher education, consequently colleges and universities have to find the best way to respond to students - their main client base (Robinson & Long, 1987; Bordelon, 2012; Allen & Seaman, 2013). To innovate the quality of online teaching, higher education institutions need to understand the satisfaction of this customers' main group. According to Guest et al. (2018), considering the understanding of how online teaching is viewed from students' point of view is necessary. Understanding student satisfaction regarding online teaching is the first step for developing a successful online learning environment.

In the world, a lot of studies have been done by higher education institutions to show the impact of online teaching quality on student satisfaction (Udo et al., 2011; Uppal et al., 2018)

Several factors have been shown to have an important influence when considering the relationship between online teaching quality and the satisfaction of students. Rubin et al. (2013) administered surveys to 605 students who experienced the online curriculum at Midwestern university and found that technology used in online lessons made a significant difference to the experience of teaching and learning. Another conclusion of this research was the satisfaction of students with LMS (Learning Management System) has an important impact on online teaching. Meanwhile, many studies found that the quality of student interactions in online teaching is closely interrelated with the satisfaction of students (Dziuban et al., 2015). According to Kuo et al. (2013), the interaction structure plays a crucial role in an online teaching environment. And faculty and student interaction is a determining factor of students' sense of satisfaction (Powers & Rossman, 1985).

Taking data from 2653 courses offered since 2011, Guest et al. (2018) used a difference-in-differences approach to assess the impact of a shift from conventional learning to online learning of courses on student satisfaction. After analyzing the results, it appears that the effect sizes are about 25-30% of a standard deviation and that online teaching is regarded as less satisfying.

Udo et al. (2011) used a modified SERVQUAL model which consists of 5 factors: empathy, responsiveness, assurance, reliability and website content to assess the impacts of online teaching quality on student satisfaction. After analyzing data from 203 students, the final result showed that 4 out of 5 factors (empathy, responsiveness, assurance, website content) play important roles in online teaching and affect student satisfaction. Specifically, website content has the most positive influence and reliability is insignificant on how students evaluate online teaching quality. Finally, the researchers made a recommendation that institutions of higher education should pay more attention to factors that have a great impact on student satisfaction.

Another study using SERVQUAL to estimate the effects of online teaching quality on learner satisfaction is the research of Uppal et al. (2018). In this study, exploratory factor analysis was carried out to inquire into the validity and reliability of the model and the multiple regression analysis. The factors were selected to analyze include: 5 factors of SERVQUAL (tangibility, assurance, reliability, empathy, responsiveness) and 2 additional factors (learning content, course website). Results reveal that 5 out of 7 dimensions (except empathy, reliability) have a positive interrelation with student satisfaction. However, this study focused on high-level concepts instead of discussing how low-level online teaching success dimensions (motivation, experience,...) affect student satisfaction of online teaching quality. Therefore, the researchers encourage additional studies to examine the relationship between low-level online teaching factors and student satisfaction.

In Vietnam, studies about online teaching in Vietnam are mostly from the perspective of the faculty member instead of the student. Besides, few studies have been carried out to evaluate the effects of online teaching quality and student satisfaction. Therefore, we decided to propose a model for higher education institutions to evaluate the effect of online teaching quality on the satisfaction of student.

## 3. Model

Service quality model illustrates how to attain desired quality in providing service to customers. Since the 1980s, after researching theoretical basis, scientists have proposed a number of empirical models to assess quality service, such as Gronross Model (Grönroos, 1984), SERVPERF model (Cronin & Taylor, 1992), Online service quality assessment model (Han & Baek, 2004), HEdPERF model (Firdaus, 2005),  SERVQUAL model (Parasuraman et al., 1988),...

After researching, we proposed SERVQUAL to measure the effects of online teaching quality on student satisfaction in higher education. This is the most common model of service quality and a reliable customer scale which used to assess service quality supply in a wide range of different industries (Uppal et al., 2018). SERVQUAL is also a method to find and resolve problems related to the service quality (Parasuraman et al., 1988). The authors shown that the gap between expectation and perception consists of 5 following dimensions:

(1) "Tangibles" comprises infrastructure, equipment, and appearance of human resources, documents, objects... In an online teaching environment, it includes knowledge, online materials, tools and devices. They have to be well-prepared, useful, practical, innovative to support learning and teaching activities and stimulate students' thinking ability (Bui Kien Trung, 2016).

(2) "Reliability" reflects the ability to accomplish the promised service dependably and precisely. In higher education, student's reliability is measured by their belief in the school's brand for many years (Bui Kien Trung, 2016). In other words, reliability is also assessed by the effectiveness of the training program. When the students have any problems, the lecturers always punctually answer.
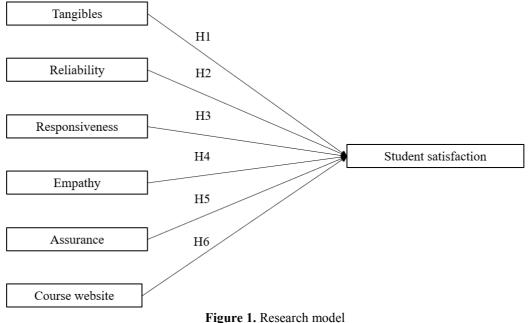
(3) "Responsiveness" is the readiness to support customers and product services rapidly. Theoretically, in previous studies, responsiveness is the fact that companies punctually meet customer's demand (Tunc and Gupta, 1993; Chen et al., 2004). In higher education, responsiveness expresses that the academic manager and lecturer enthusiastically provide information about the online teaching process and respond to student's questions quickly, promptly, completely.

(4) "Empathy" is known as the care and sharing customers receive from the service firm. It is the basis of happiness and helps people communicate with each other (Hall & Schwartz, 2019). This factor evaluates the understanding and reacting ability to the students' thoughts and feelings in the online teaching process of higher education institutions.

(5) "Assurance" is expressed in several aspects consisting of knowledge, spirit, the ability to inspire and confidence. When any customers has questions, they will be fully and properly explained with a respectful attitude. It also represents the certainty and the responsibility's lecturers for knowledge. According to previous studies, assurance is evaluated the various aspects: classroom information, working attitude, professional knowledge, ... to measure student satisfaction in the online teaching process.

Besides, we introduce the sixth dimension (6) "Course website" to evaluate the effect of online teaching

quality on student satisfaction. Course website is utilized to display, organize information and technical basis that have an effect on student satisfaction (Uppal et al., 2018). Thanks to the support of technology, students can study everytime, everywhere, not just on campus. Course website includes communication tools, for example Zoom, Teams and Google Classroom…, which help teachers have more options to transmit knowledge and students have time to study effectively.

The model can be determined as follows (see Figure 1):



**Figure 1.** Research model

This research presents the following hypotheses:

*H1. Tangibles positively impacts on student satisfaction*
*H2. Reliability positively impacts on student satisfaction*
*H3. Responsiveness positively impacts on student satisfaction*
*H4. Empathy positively impacts on student satisfaction*
*H5. Assurance positively impacts on student satisfaction*
*H6. Course website positively impacts on student satisfaction*

**4. Methodology for evaluating the impact of online teaching quality on student satisfaction**
Structural equation modeling (SEM) is a popular and modern technique with a dramatic increase in publications. The popularity of SEM is expressed in the number of published studies which has increased significantly over the years (Hair et al., 2016). There are two main approaches to evaluate structural equation models: CB-SEM (Covariance-based structural equation modeling) and PLS-SEM (Partial least squares structural equation modeling). PLS-SEM is used to develop theories in exploratory research.

PLS-SEM would be a better option for analysis to consider the effect of online teaching quality on student satisfaction in higher education. Because (1) In terms of data requirements, CB-SEM requires the data to have a normal or large distribution, and PLS-SEM is an alternative method because the data does not have a normal distribution. PLS-SEM can process complex models with many relationships as well as formative measurement model while CB- SEM only processes reflective measurement model. (2) In terms of sample size, PLS-SEM is considered as a perfect replacement of CB-SEM to research on a small scale and this method is implemented in many different fields. (Hair et al., 2012; Ringle et al., 2012). The data is assessed through the following steps: checking the reliability of the scale, checking the validity of the collected samples including convergence and discrimination between underlying concepts and testing hypotheses research (Anderson & Gerbing, 1988).

PLS-SEM can be used to demonstrate the relationship between online teaching quality and student satisfaction. And then, it is also utilized to quantify the effect of online teaching on student satisfaction.

**5. Conclusions**
This study presents a framework and proposes the methodology to determine and evaluate the effects of online teaching quality on student satisfaction. In addition, this study also emphasizes the important role of online teaching in higher education institutions. In Vietnam, online teaching is becoming more and more popular due to COVID-19. However, few studies have been conducted to illustrate the impact of online teaching quality on student satisfaction. As a result, the model we proposed can be expected to improve the online teaching quality of

higher education institutions in Vietnam.

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