THE FACTOR INFLUENCING THE QUALITY OF ONLINE COURSES IN YAHAA SCHOOL OF BUILT ENVIRONMENT IN HAINAN PROVINCE, CHINA

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Mixed-methods embedded research design was adopted to the study perceptions towards the factor influencing the quality of online courses in Yaha School of Built Environment in Hainan province, China. The study was conducted at Yaha School of Built Environment in Hainan province, China, among freshmen, sophomores, and juniors who participated in a questionnaire survey; in a total 434 students. In addition, 10 students, freshmen through juniors, were asked to volunteer for focus group interviews, for a total of 30 people. The researcher conducted a questionnaire to collect quantitative data and a focus group interview was employed to collect qualitative data. The Index of Objective Congruence of all the instruments (+1) indicated that the elements were valid. Descriptive-statistical analysis of quantitative data showed that indicators of the general level of perception of students are regarded as high. The content analysis of the qualitative data revealed student perceptions of factors affecting the quality of online courses at Yaha School of Built Environment, as well as students' expectations and suggestions regarding the quality of online courses.

Keywords: online courses; personal factors; satisfaction factors; environmental factors; education quality

Introduction

The period of change in the future education and learning paradigm has already begun. Due to the rapid growth of technology and the ubiquity of culture, the Internet has become an integral part of people's daily lives, and in the future, everything, including education, will be
done on this vital platform. China is speeding up its efforts to create and promote online education to encourage diversity and compatibility in education.

In 2015, the global online education industry reached $155.7 billion, and the compound annual growth rate of the online education industry was 23%. The amount of China's online education market exceeded 200 billion yuan in 2017, reaching 208.91 billion yuan, a 28.1% rise in a year.

According to preliminary forecasts, China's online education business will be worth approximately 267.06 billion yuan in 2018. According to the data presented above, the Chinese online education market will continue to expand steadily in the future years.

At the end of 2019, an outbreak of COVID-19 occurred in Wuhan, China. COVID-19 quickly spread across the country. In 2020, the global spread of COVID-19 resulted in the suspension of classes for students from more than 60 countries, disrupting the original teaching plans of schools in these countries and regions (Chen et al, 2020).

In times of severe epidemics, the best way to resolve the conflict between the two is to shift classroom activities from face-to-face to online, which can effectively control crowd gathering. Therefore, the online education model in the context of COVID-19 will be an important way to prevent and control the epidemic as well as ensure the teaching schedule (Chen et al, 2020). In order to minimize the impact of the epidemic on education and to control the spread of the epidemic, online teaching has become a necessary strategy to restore normal teaching and learning during this special period.

In fact, online courses, like traditional courses, are designed to provide the audience with access to knowledge. At present, when Chinese citizens are isolated at home and the use of the Internet is expanding, the distribution of knowledge resources via the Internet has become a popular alternative for an increasing number of individuals. The vast and broad collection of the Internet resources is unmatched in the traditional educational classroom. Online resources contain a wide range of multimedia materials, teaching methods and learning projects that can provide more opportunities for students.

Second, although online learning is flexible and easy to use, students are heavily dependent on hardware devices such as the Internet, and the closure of high-risk locations due to the epidemic has made learning materials very scarce. Many underserved areas lack access to online education. The learning process slows down.

Online courses have inherent advantages and disadvantages that may support or limit the future progress in education. Therefore, this study will use a questionnaire method in which respondents provide answers by filling out a questionnaire based on their experience and perceptions of the factors that affect the quality of online classes at a university in China.

The objective of this research was to investigate the factors affecting the quality of teaching online courses at Yaha School of Built Environment, Haikou University of Economics, Haikou city, Hainan province, China during the COVID-19 pandemic.

**Literature Review**

**COVID-19 Pandemic**

The 2019 coronavirus disease epidemic is a global pandemic outbreak of coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory disease coronavirus 2. (SARS-CoV-2). The disease was discovered in late 2019 in Wuhan, Hubei Province, People's
Republic of China, and quickly spread to various countries worldwide in early 2020, eventually becoming a global pandemic.

More than 264 million confirmed cases have been documented worldwide as of 3 December 2021, with more than 5,238,000 deaths, making it one of the largest epidemics in human history. Estimates of illness mortality vary greatly around the world, with observed mortality rates ranging from 0.5% to 5% in most nations as of 8 February 2021 and a preliminary corrected global mortality rate of approximately 2.9%.

The outbreak in China is under control as of early 2021, although the daily rise estimates are constantly changing. Due to COVID-19, many aspects of global affairs have been affected to varying degrees.

**Online Courses**

Online courses are mostly in the form of educational films that have been published online as a teaching method, a significant component of teaching materials, and a growing educational model. Online classrooms are a modern teaching platform with essential qualities such as autonomy, sharing, and interaction that enable students to learn at a distance over the Internet. Uploading educational videos on the Internet is not only one way for teaching staff to teach and solve difficulties, but it is also an inevitable trend to promote the development of education through the informatization of network technologies.

Online courses better motivate students to study. Online classes are assisting in the creation of a wave of learning among students. According to the data, the number of users and teaching hours for online courses such as MOOCs and Eurasia General Studies is rapidly increasing, and the number of teachers involved in the development of online courses is gradually increasing.

Learning via the internet contributes to the democratization of education by encouraging students’ abilities to think freely, not rely on teachers, and study critically, making students enthusiastic about learning. Carrying out online course teaching is a way to encourage the gathering of information technology and curricular information, as well as an effective way to promote teaching reform and foster new talents, as well as the full application of educational technology in teaching.

**Overview of Hainan Province**

Hainan Province, abbreviated as Qiong, is the People's Republic of China's only province located fully in the tropics, as well as a maritime and insular province, the largest by sea and the smallest by land in the People's Republic of China, with its capital in Haikou. It has a total population of 1,081,200 people and a big migrant population throughout the winter.

Due to the impact of Covid-19, the Hainan Provincial Department of Education has launched a campaign in 2021 to promote the usage of online learning spaces. In 2021, the focus will be on promoting e-learning applications in basic, professional, higher, and continuing education.

The municipal and county departments of education will develop and accelerate the implementation of a plan to promote the use of online learning spaces. The departments of education of Haikou and Sanya will take a region-wide approach to promote the application of information technology in areas under their jurisdiction and develop an annual implementation plan in which the popularization of the application will be held in at least one
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region. Activities in 2021 will primarily focus on space creation, application deepening, exceptional selection, demonstration, and promotion (Hainan, 2021).

Data from the e-learning space is used to evaluate the teaching processes, curriculum, and application levels; to record student learning processes, conduct comprehensive quality assessments of students, and build campus culture; and to inform parents about their children's development and participation in school management. The e-learning space is being used to create learning communities and conduct learning activities in order to improve teachers' professionalism and space application skills, as well as to serve as an example and leader for excellent teachers (Hainan, 2021).

Yaha School of Built Environment

Yaha School of Built Environment is located in Haikou, Hainan Province. Yaha School of Built Environment is a joint venture of Haikou University of Economics (HUE) and Yaha Education (YAHA), was founded in 2017 on the foundation of the previous School of Construction and Engineering. The School of Habitat for Humanity currently has about 2,500 students enrolled. It has its own engineering building where instruction, research, and experiments are combined.

There are more than 60 different types of special classrooms, including more than 30 multimedia classrooms, computer classrooms, and drawing rooms. Geotechnical laboratories, material laboratories, mechanics laboratories, structural laboratories, and practical training rooms for engineering costing, engineering measurement, engineering drafting software, architectural effect drawing production, and soon have all been built by the college.

In addition, it is gradually constructing experimental training rooms for VR, BIM, GIS, 3D printing and digital processing, architectural physics, architectural models, engineering measurement, and drone tilt photography, among other things.

Due to the impact of Covid-19, the school will discontinue offline teaching in 2021 and switch to exclusively online courses. The school will use the Ding Ding platform. Teachers employ blended learning as the core idea of the Ding Ding platform, integrating teacher interaction, resource management, high-quality course building, teaching achievement presentation, and teaching management assessment in a new generation of online teaching platform.

The platform replaces the former classroom teaching method, and students can easily enter the learning platform to study a specific course anytime, anywhere using modern online tools. Through this platform, teachers provide many learning tools to enhance individual and collaborative learning. Students' ability to learn independently and learning efficiency are enhanced when teaching online courses through the participation of teachers and students (Zhang, 2018).

The impact of personal factors

Styles of learning

The term "learning style" refers to a student's individual learning style, that is, how the student consumes and remembers information, thinks, and solves problems. This is one of the most important aspects influencing student achievement.

This is one of the most important aspects influencing the effectiveness of student learning. With the development of the Internet and information technology, especially with
the rapid spread of information education, with the development of the Internet and information technology, especially with the rapid spread of information education, the number of online learning is increasing. Systems and courses of individual training are being created. One-to-one classrooms and online learning platforms are becoming more and more popular. Online courses are created at many levels of education and in various forms of education. Online courses are rapidly becoming more and more important in teaching and learning processes at all levels of education and in all types of higher education.

There are more and more online learning tools in various fields. Online courses are becoming more widely recognized, particularly in higher education, and learning style theory research is being applied to improve the learning results of online courses. According to research, learners perform better in online courses when the teaching styles and tactics are aligned with their learning styles.

Motivation factors
Motivation is an internal drive that motivates students to learn, as well as the desire to motivate and help them learn. It is classified as internal or external motivation. Internal motivation encourages students to continue learning, whereas external motivation discourages students from continuing to learn once achieving learning goals.

As a result, it is crucial to fully activate learners' internal motivation in e-learning so that they are eager to study (Zhou, 2013). When confronted with a large amount of information and an unsupervised situation in an online learning environment, learners can actively, actively, and autonomously choose to accept and understand information driven by their desire to learn. As a result, learning motivation in online learning is critical to the learning efficiency of online courses.

Teachers and students are in a relatively isolated state in a networked learning environment, and the effectiveness of learning primarily depends on the self-awareness and motivation of students. Motivation is an internal force that influences the behavior of students in the learning process. This can inspire students to develop a strong desire to learn, great enthusiasm for learning, and encourage them to actively apply a range of learning behaviors to gain information and construct knowledge in a meaningful way (Zhao, 2009).

Online courses require students to choose their own learning materials, media, and technology, and to carry out their learning activities largely autonomously. Students can easily become confused and disoriented when faced with a plethora of educational and pedagogical knowledge. Motivation acts as a compass, directing students' learning behavior towards a specific learning goal. Learners select meaningful information that interests them from the complex information available, ignore irrelevant information, and engage in meaningful learning behavior until they reach their learning goals.

Factors affecting student satisfaction with

Network self-efficiency
From the student's perspective, the factors that determine satisfaction are, first of all, the student's attitude towards computers and the student's self-efficacy. Online learning relies heavily on the computer network as a support tool. As a result, students' opinions about computers and the Internet play a critical role in determining satisfaction (Zhang & Shi, 2019).
For example, when students are not afraid of the complexity of computing, a more positive attitude towards them increases the chances of successful learning, while a negative attitude reduces the interest of students.

Student interest in online courses is high before the studies and drops dramatically after the studies; while online course pass rates are high, learner satisfaction is often poor. According to the data, student satisfaction was significantly influenced by the perceived quality and perceived value of an online course, and student expectations had an indirect impact on learning satisfaction, which in turn influenced students' willingness to continue doing the course, with student perceived quality of the course having the most significant impact on learning satisfaction (Xu, 2018).

Previous research has shown that online self-efficacy affects student motivation, learning processes, and learning outcomes. Students with high online self-efficacy, for example, are more likely to have good academic and information information-seeking skills, as well as a positive attitude towards the online learning environment.

**Classroom interactivity**

Since the outbreak of COVID-19, online courses have become a widespread form of teaching in universities, and the satisfaction of university students with online courses is an important indicator and benchmark for measuring and improving the level of online teaching.

There are various types of student-teacher interactions, such as teacher evaluation, encouragement and guidance, student responses and reactions to the teacher, etc. Some studies suggest that student-student interaction decreases during the online learning process, while student-teacher interaction remains constant throughout the learning process. Some studies suggest that student-teacher interaction is the most important predictor of online learning satisfaction. Student-teacher interaction is the most important factor influencing learner satisfaction (Xu et al, 2017).

**The influence of environmental factors**

**Support services for online learning**

Online Learning Support Services are activities offered by schools and teachers to help students with a variety of learning challenges. One of the most significant and immediate factors influencing effective learning behavior and learning habits is providing students with comprehensive, timely and convenient learning support services.

Students' impression that online learning makes people feel good, increases their self-confidence and makes them continue learn online (Wang, 2017).

One of the current e-learning support services is teacher support, in which teachers pay attention to online communication with students and provide timely and serious e-learning tutorials and answers to questions; on the other hand, through the hardware and software technology of the e-learning platform to provide communication, control, and feedback services, in which students can easily receive help and feedback, and facilitate discussion, collaboration, and cooperation.

**Network resources**

Online learning is a product of the development of modern educational technologies that are open and interactive, which makes learning more autonomous, flexible and free.
Network resources have a large amount of information, easy access to resources, can optimize resource allocation, stimulate students' feelings and other characteristics, high-quality resource network courses can ensure the sharing of high-quality resources, so that students can study on their own, to meet the learning needs of learning resources, which they get maximum benefits from (Fan, 2018).

First, online learning resources play an important role in promoting the successful use of teaching strategies and methods that reflect a subjective view of education and quality education in subject education, for example, collaborative learning, autonomous exploration, appropriate teacher involvement, and so on. Secondly, it can increase interest in learning as well as improve learning efficiency. The use of rich network resources in teaching, modeling of case-studies, the integration of network resources with textbooks will enrich the content and form of teaching, stimulate students' interest, and improve learning efficiency, according to the characteristics of higher vocational students. This can further expand the sources of information and provide up-to-date information (Fan, 2018).

With the advancement of network teaching, the network now has a far-reaching impact on learning. The openness of the network environment, the variety of resources, and the ease with which resources may be accessed, and other characteristics cause network information resources to evolve into a new type of teaching resource that is widely employed in online education.

**Methodology**

**Research design**

This study followed the steps shown in Tab.1:

<table>
<thead>
<tr>
<th>Study Steps</th>
<th>Principals</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Requesting for approval letter</td>
<td>1 principal</td>
<td>YAHA School of Built Environment</td>
</tr>
<tr>
<td>2 Designing questionnaire</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 Reliability test</td>
<td>3 experts and 30 students</td>
<td>-</td>
</tr>
<tr>
<td>4 Assigning questionnaire</td>
<td>1452 students</td>
<td>YAHA School of Built Environment</td>
</tr>
<tr>
<td>5 Focus group interview</td>
<td>30 students</td>
<td>YAHA School of Built Environment</td>
</tr>
<tr>
<td>6 Data collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Data analysis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 1 – Steps of the conducted research (compiled by co-authors)*

**Population and sample of the study**

The population of this study consisted of 1,452 students from Yaha School of Built Environment at Haikou University in Hainan province, China. The survey was conducted among 428 freshmen including 256 males and 172 females, aged 17-18; 489 sophomore including 278 males and 211 females, aged between 18 and 19; 535 junior students including
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335 males and 200 females, aged between 19-20. Due to the curriculum, however, the senior students were off-campus most of the year and were not able to participate in the study. Therefore, this study, which according to Taro Yamane formula required at least 317 respondents, focused on the first year, the second year and the third-year students.

Hence, altogether 434 students participated in this survey. In addition, 10 students from each year were voluntarily selected for focus group interviews. Therefore, a total of 30 students with mixed genders and education levels were involved in the focus group interviews.

Research instruments

Both quantitative and qualitative methods were used in this study. A 5-point Likert scale questionnaire and a set of focus group interview questions were used to collect the data. The questionnaires and focus group interviews were conducted anonymously to ensure that respondents participating in the study were not subjected to any undue pressure.

The questionnaire was divided into two parts: the first part contained basic information about the students, and the second part included questions based on three aspects: personal factors, satisfaction, and environmental factors.

For the focus group, 30 students from the first to the third year of the university were selected. The interview questions followed the theoretical questions. Questions included students' family background, the impact of personal factors on an online course, factors that affect student satisfaction with an online course, and the impact of environmental factors on an online course for interviews.

Validity

This thesis introduced the concept of IOC to better assess the effectiveness of research tools. This measure can only be used to evaluate univariate items or items that measure certain combinations of skills.

The research instruments in this study were evaluated by three experts, each of whom was an experienced English teacher in China. The validity test result for all instruments was +1, which is higher than 0.67, indicating that all instruments were acceptable for further data collection.

Reliability

Reliability refers to the consistency and stability of test results, or the extent to which measurements are error-free so that they give consistent results.

To assess the reliability of the questionnaire, the researchers conducted a reliability test on another group of 30 students from Yaha School of Built Environment before conducting the actual study.

And according to the formula of Taro Yamane, about 434 people participated in the survey.

The Cronbach alpha scale was used to measure the reliability of elements (as shown in Tab. 2).
The researcher tested the reliability of the questionnaire, the result confirmed whether each of the questionnaire items was acceptable with the rating scale of 0.85.

**Data analysis**
To interpret the mean student response scores for each influencing factor, the researcher used the interpretation procedure shown in Tab. 3.

**Table 3 - Interpretation of Mean Score of Influencing Factors**
(compiled by co-authors)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Answer</th>
<th>Perception Level</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Strongly agree</td>
<td>Highest</td>
<td>4.05 - 5.00</td>
</tr>
<tr>
<td>4</td>
<td>Agree</td>
<td>High</td>
<td>3.05 - 4.49</td>
</tr>
<tr>
<td>3</td>
<td>Moderated</td>
<td>Medium</td>
<td>2.05 - 3.49</td>
</tr>
<tr>
<td>2</td>
<td>Disagree</td>
<td>Low</td>
<td>1.05 - 2.49</td>
</tr>
<tr>
<td>1</td>
<td>Strongly disagree</td>
<td>Lowest</td>
<td>1.0 - 1.49</td>
</tr>
</tbody>
</table>

**Discussion and conclusion**

**Data analysis do questionnaire**

*Student general information*
The following data were obtained using the Taro Yamane formula calculation method (Tab. 4).

The survey involved 434 students, including 242 male and 192 female students.

Male students accounted for 55.76% and female students accounted for 44.24% with 44 students of 17-18 years old, 196 students of 19-20 years old, 194 students of 21-22 years old. 17-18 years old students made up 10.14%, 19-20 years old students made up 45.16%, and 21-22 years old students made up 44.7%.
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Including 52 freshmen, 204 sophomores and 178 juniors, freshmen accounted for 11.98%, sophomores for 47% and juniors for 41.01%.

Table 4 – Demography of the research
(compiled by co-authors)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>242</td>
<td>192</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17-18</td>
<td>44</td>
</tr>
<tr>
<td>19-20</td>
<td>196</td>
</tr>
<tr>
<td>21-22</td>
<td>194</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of Study</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>52</td>
</tr>
<tr>
<td>Sophomore</td>
<td>204</td>
</tr>
<tr>
<td>Junior</td>
<td>178</td>
</tr>
</tbody>
</table>

Perceptions items

Table 5 – Perceptions items
(compiled by co-authors)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>SD</th>
<th>Level of perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Factors</td>
<td>4.40</td>
<td>0.776</td>
<td>High</td>
</tr>
<tr>
<td>Satisfaction Factor</td>
<td>4.36</td>
<td>0.774</td>
<td>High</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>4.37</td>
<td>0.696</td>
<td>High</td>
</tr>
<tr>
<td>Total questionnaire</td>
<td>4.38</td>
<td>0.774</td>
<td>High</td>
</tr>
</tbody>
</table>

According to the results showed that the total students’ level of perception items was considered as of a high level with mean (x) score of 4.38 and SD 0.774. By looking through each factor, it was found that Personal factors were rated with the highest mean score (=4.40, SD=0.776); the second high was for Environmental factor (=4.37, SD=0.696) and then Satisfaction factor (=4.36, SD=0.774) respectively.

Data analysis of focus group interview

The interview section included 10 interview questions, and 30 respondents were interviewed in their native Chinese language. The researcher recorded the interview and then transcribed, translated, analyzed, and summarized it. The researcher translated the interviews from Chinese into English without altering the content of the recordings. The main theme of focus group interviews has been based on ten questions.

The results of students' focus group interview were summarized and analyzed according to the thematic content as follows.
Personal Factors
Most of the participants hope to gain more knowledge, also hope to get more opportunities to communicate with teachers. And get good grades. It will be helpful for future work. Second, most of the participants prefer the autonomous learning method and cooperative teaching method. The students believe that cooperative learning can exercise teamwork skills and can better accomplish learning tasks, and gives them the freedom to control their learning time and methods.

Satisfaction Factor
Most of the participants enjoyed the interaction with a teacher in the online course. They believe that interacting with a teacher can enhance their communication skills, solve problems in a timely manner, and also increase their interest in learning, and they really enjoyed the atmosphere of the teacher. Second, most participants felt that it was the convenience and freedom of online courses that motivated them to engage in online learning. Since the place of study for online courses is not fixed, you can freely manage your study time and tasks.

Environmental Factor
Some participants mentioned the abundance of online course resources that encourage them to get involved in online learning. Since there are many teaching methods in the rich resources of the curriculum that can develop students' personality and improve learning efficiency, they believe that sharing course resources on the Internet has increased the variety of course teaching, increased their interest in learning, and improved the quality of education.

Discussion
By looking through each factor, it was found that Personal factors were rated with the highest mean score ($\bar{x}=4.40$, $SD=0.776$); the second high was for Environmental factor ($\bar{x}=4.37$, $SD=0.696$) and then Satisfaction factor ($\bar{x}=4.36$, $SD=0.774$) respectively. All factors were rated as high. And these results showed that online or web-based education helped enhance students’ learning and solve learning problems as it acted as an effective communication tool and platform for teaching and learning. Subsequently, this led to student satisfaction in their studies.

Another conclusion of this study was to understand the current teaching situation of online courses at Yaha School of Built Environment based on the analysis of the results of focus group interviews, Haikou University of Economics, Haikou city, Hainan province, China.

The findings showed that teaching at Yaha School of Built Environment is still in its early stages, with many areas that needed to be improved. Some participants, for example, believed that there were significant issues with current teaching methods. Students were put under a lot of pressure as a result of the teacher’s poor teaching methods, which had a negative impact on their learning.

They hoped that the teachers would change the teaching method, that they would study in a relaxed and interesting learning environment, and that the learning pressure would be reduced.
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