

# **INNOVATION OF COMPUTER TEACHING MANAGEMENT AND ECOLOGICAL SHAPING OF THE EDUCATIONAL ENVIRONMENT**

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**ABSTRACT** – During the lockdown time, the entire educational system was warped, from elementary school to higher education. However, the most recent coronavirus sickness (COVID-19) has been reported worldwide, including China. In order to transform Shanghai into a learning city accessible to "everyone, anytime and everywhere," Shanghai is spearheading the Life-long Learning Initiative, which aims to make the city an ICT-rich environment for learning. Despite the fact that a great deal of technology has been created, very few people have thought about how to improve the way students learn with it. There are many lessons that can be gleaned from studying how to execute an innovative learning design in a technologically advanced setting. Innovative learning design in an ICT-rich context will be discussed at this conference, as well as the challenges of making e-learning advances more widely available.

## **ARTICLE HISTORY**

Received: 01/09/2023

Revised: 10/10/2023

Accepted: 15/11/2023

## **KEYWORDS**

*COVID-19*

*Ecological*

*Environment*

*Innovation*

## **INTRODUCTION**

In today's society, technology integration has gone through a series of developments that have completely reshaped the way people think, work, and live (Garrett, 2015). When it comes to preparing students for the "knowledge society," schools and other educational institutions must incorporate ICT integration into their curriculum. Integrating computer-based communication into classroom instruction is referred to as the use of ICT (Information, Communication, and Technology) in education. Teacher use of ICT in the classroom is viewed as an important part of preparing pupils for today's digital world. Using ICT to create a dynamic and proactive learning environment is great for this. It is important to integrate technology into the educational process in order to make instruction more effective, accessible, and less expensive for students, but it also refers to the advantages of connecting educational institutions to better meet the present globalisation issues.

### **Benefits of ICT to Teachers and Students**

Many methods in which ICT can be used to benefit both teachers and pupils can be found. Education through the use of new media and technology can be made more fascinating and fun by using tools such as educational movies and music to stimulate students' brains and save data in databases or databases themselves to aid students in their learning (U.S. DEPARTMENT OF EDUCATION, 2017). As a result of incorporating ICT into the curriculum, students will benefit from hands-on activities in a technology-based course that is meant to increase their comprehension of the subject matter. Moreover, it aids teachers in developing their lesson plans in a way that promotes student engagement, creativity, and curiosity. Research shows that using ICT in the classroom improves the learning process and increases students' ability to engage in active learning. It has been suggested by Hermans, Tondeur, Van-Braak, and Valcke (2008) that teachers will place greater emphasis on the integration, augmentation, and complementing aspects of ICT. As a component of the integration method, ICT can be used to help students learn difficult concepts and abilities in a certain subject area.

### **Education Innovation and Society**

As a social institution that serves the common good, education is essential to society's long-term health and well-being. This system must not only be comprehensive, long-lasting, and exceptional, but it must also adapt to the ever-changing and unpredictable nature of the globalised world. There must be a systemic and scalable change in the teaching and learning theory and practice, as well as all other parts of this complex organisation, in order to ensure that all students are adequately prepared for life and

work in the 21st century. An overview of educational innovations is presented, together with an analysis of hurdles to innovation and possible routes for successful innovation.

## **PROBLEM STATEMENT**

China is a global economic and social force, requiring qualified graduates who are proficient in English. However, Chinese university students' proficiency in English has historically been lacking, and the teacher-to-student ratio has risen dramatically. To address this, the Chinese Ministry of Education has proposed to employ ICT in language instruction, which is more cost-efficient and effective than traditional methods. This would allow institutions to cope with a rise in student numbers and a scarcity of EFL teachers if ICT was employed for self-access learning. Teachers must learn new skills, such as managing computer-based teaching activities and guiding students in self-study, to integrate ICT into language teaching. Top-down involvement is expected to be successful, but an issue may arise if the innovation is assigned to each institution's higher education arm.

## **LITERATURE REVIEW**

### **Introduction**

The differences were reported between the two categories in terms of the aims and importance of innovations, innovative features, the evaluation of innovations, and improvements needed for them.

According to El Masry and Alzaanin (2021), the professional identity (PI) of the teachers can be shaped by ecological factors. Therefore, innovations in teaching can change the educational environment in the future. Moreover, they have highlighted that intrapersonal and interpersonal factors can also affect teaching.

### ***Theoretical Framework***

Individuals' knowledge, attitudes, and behaviours have long been the emphasis of environmental education (Albirini, 2014). To address concerns regarding environmental education's lack of success in imparting knowledge of human involvement in ecosystems, we have taken a closer look at the larger social-ecological systems within which they are nested. In order to propose an "ecology of learning" and an "ecology of environmental education," we depend on frameworks produced by long-term ecological research, hierarchy theory, and the robustness of social-ecological systems. Consequently, we intend to open up new research and practices that address how environmental education might work in conjunction with other initiatives, such as local stewardship activities, to create social capital, ecosystem services and other characteristics of resilient social-ecological systems (Jeffries, 2015).

### ***Activity Theory Model***

The person wanting to implement modifications to her work-related activity system looks to other sources for support (Russell & Schneiderheinze, 2015). However, the introduction of these outside factors causes an imbalance, which in turn generates inconsistencies among the activity system's nodes. That efforts to alter a system are inherently contradictory and that seeing such conflicts in real-time is key to doing so. When anything from outside the classroom enters into the work activity system of a teacher, it creates tensions and inconsistencies among the many parts of the system. Tensions arose between the teachers' work activity goals during their cooperative efforts, illustrating how systemic contradictions might arise.

The unit's success relied on the teacher's ability to reconcile the inconsistencies she encountered during the development process.

### ***Albert Bandura's Theory***

Human behaviour, as explained by Albert Bandura's theory of social learning, is inconsistent prior to the hypothesis of A. Bandura, according to the views of J. Piaget and others, it was believed that abilities and attitudes were formed as kids grew older. So, it seems that there is an innate degree of consistency in human actions, as we have come to expect. Human conduct, according to A. Bandura, is inconsistent. Rather, it is case-specific. People's actions are influenced less by their age, personality type, or developmental stage than they are by the circumstances in which they find themselves. It is possible to draw the following conclusions from A. Bandura's theory of social learning: education is symbolic, incremental, realisable, and situational.

### ***Vygotsky's Theory***

Vygotsky's theory then comes into focus in this specific pedagogical setting, where his sociocultural theory recognises and emphasises the role of language in any social interaction as a way to spur cognitive development. Outdoor fieldwork has been used in a lot of different fields for a long time, and it's becoming more and more common with the help of information technology (Brown, 2015).

In this tradition, drone-based learning (Drones can help educate numerous subject areas for those who have the ability to have children.

### **Education Systems Globally**

Additionally, it may be beneficial to think outside the box and build our own innovative ideas. Nation-state education systems are losing their individuality and becoming more universal and homogeneous as the world becomes increasingly globalised (e.g. the Bologna process, which has brought 50 national higher education systems in Europe and beyond to a common denominator) (Kushnir, 2016). A growing body of research suggests that US universities must keep pace with other countries' educational institutions in today's highly competitive educational marketplace (Douglass, 2017). Learning from each other in the spirit of global collaboration and sharing one's successes with others is also good economically and culturally. To meet the demands and expectations of the nation-state, it is vital to keep innovating inside one's own educational system despite the convenience of having a global education system. In many ways, the diverse educational options available in other countries can help solve the problems that face American schools and institutions.

### **Education Innovative Institute**

There have been a number of new organisations established (The International Centre for Innovation in Education, Innovative Schools Network, Center for Education Reform). The topic is regularly discussed at conferences (AERA, ASU-GSV Summit, National Conference on Educational Innovation, and The Nueva School for the Innovative Learning Conference). Yong Zhao (2012), Pasi Sahlberg (2011), Tony Wagner (2012), Mihaly Csikszentmihalyi (2013), and Ken Robinson (2013) have all produced excellent books on the subject of innovation (2015). To promote education innovation by both planting new techniques and taking proven ones to scale, the U.S. Department of Education has established an Office of Innovation & Improvement. There is still a lack of widespread adoption of new technologies in American classrooms, which could put the country at a disadvantage in global competition. Professor Jared Diamond of the University of California, Los Angeles, says in his Pulitzer Prize-winning book *Collapse: How Societies Choose to Fail or Succeed* that society's failure to anticipate issues and their outcomes may have unexpected effects (CAMP, 2014). This is one of the most important reasons why societies fail," according to Yong Zhao's interpretation of Diamond's results. Because of this incapacity, humans are more likely to strive for short-term results and seek quick gratification". It appears that educational innovation is a societal issue that reaches beyond the realm of education itself.

### **Technological Innovation on Education**

Teachers' honest confidence that technology will solve every difficulty they confront in the classroom, whether in person or virtually, is more concerning than the absence of a pedagogical framework for technology-enhanced education. There is less emphasis on the importance of pedagogical mastery in online teaching since many university instructors believe that technology can fix all instructional problems. Techno-centrism is a term used to describe this type of thinking, and it's widespread in talks about online education, according to Nickols (2011). As far as we all know, it's prevalent in universities. While computers can enhance human abilities, they cannot be used as a replacement or alternative. For technology innovation to have a beneficial impact on learning, it must be preceded by pedagogic leadership, research, and sound theory, but the reality is frequently the opposite.

### **Theory-based Innovative Education**

A thorough theory of technology-based education and significant study are needed to help limit its negative long-term effects while also maximising its positive short-term ones. As a cognitive tool, online learning's most appealing aspect – ease – is the driving force for its popularity with working adults (WALs). Convenience is the most frequently stated reason given by students in surveys of student satisfaction when rating their online learning experiences. This consumer strategy is evident not only in online higher education but also throughout the educational system as a whole. Convenience and comfort go hand in hand in reducing the amount of work and complexity involved in learning, as well as the stress associated with having to engage face-to-face with classmates and the teacher. It provides a sense of seclusion and self-fulfilment to the one doing it.

### **Barriers to Innovation in Education**

For example, the drive for educational innovation that we see in some places, the significant educational advancements of the last few decades, and daily realities in the school system all have reasons for this mismatch. When we consider education as a whole system responsible for meeting the nation's educational needs and ensuring that its citizens gain knowledge and skills throughout their productive lives, we must realise the interdependence and interdependence of all educational levels. The greater societal super system to which education is an integral component is also part of the educational system as a whole, with which it is intertwined in several nuanced and difficult ways. All of the values, regulations, and traditions of society are reflected in education because it is a social institution. This means that we must look at education as a social whole and solve its issues while taking into account the relationships and interdependencies that exist within the educational system as well as in society at large. When society promotes educational innovation, its educational system will continue and effectively adapt and progress throughout time. Education will stagnate and produce mediocre results if this does not happen. Mercantilism and consumerism are two examples of detrimental socio-cultural impacts on education that are harming the ultimate aim of education and deteriorating higher education institutions. Influenced by other negative social and cultural tendencies, Students' creativity and innovative spirit are being stifled by these factors, which include monetisation of education, entitlement, quick pleasure, and egotism. Such serious societal challenges must be dealt with quickly and decisively. As a second point, it's well known that higher education has historically been sluggish to accept new technologies for a variety of reasons.

### **Possible Solution to Education Innovation**

We must have a large number of innovators in order to produce new ideas. It's not uncommon for a bright person to spark creativity, but the flame needs a nurturing environment to grow. Educational institutions, social norms, and an advanced economy all contribute to the formation and nourishment of this environment. A stimulating microenvironment, which includes the social, cultural, and institutional contexts, as well as the immediate setting where a person works, is critical to the well-being of an individual. There must be a "respect and nurturing attitude toward prospective geniuses" in order for an environment to be considered a success, according to this definition (2013). Educators, he argues, have the power to shape such a setting.

In order for an invention to bear fruit, it must be planted in a fertile field and nurtured like a seed.

### **Education Environment in China**

Because of Hong Kong's cross-cultural sophistication and ability to provide wide-ranging viewpoints in higher education, studying there is seen as an experience that takes place outside of China's borders (jingwai jiaoyu). It has been found that the methods of instruction used in Hong Kong, Australia, and Canada are virtually identical. In Australia and Canada, a continuum that comprised information transmission, transmission of organised knowledge, interaction between students and teachers, and facilitation of intellectual development could also be applied to Hong Kong. However, the proportion of front-of-class lecturing may be bigger in Hong Kong than in Western societies. Generally, non-local students have recognised wider international exposure as an irreplaceable advantage of studying in Hong Kong. Students from the People's Republic of China have also reported challenges in adjusting to Hong Kong's teaching, learning, and social environments (HONG KONG IDEAS CENTRE, 2020). As stated in Hong Kong's 2010 policy address, the primary goals of higher education policy were to turn the city into a centre of learning and to increase internationalisation. Specifically, such a policy intends to recruit more non-local students to enrol in degree and doctorate programs in Hong Kong. The principal aims of the strategy are to attract bright students from other countries and to establish an international environment on campuses so that Hong Kong students can widen their horizons. In the long run, it's envisaged that Hong Kong would become a regional educational mecca (Secretary of State for Foreign and Commonwealth Affairs, 2016). In the 2017/18 academic year, the level of non-students in Hong Kong reached 17,050, not including many self-financed programmers. For undergraduates, 63.7 per cent came from mainland China, while for postgraduate research degree holders, 83.5 per cent were from the same country. To enable this growth in non-local enrolment, the quotas for undergraduate, non-local school admissions at University Grants Committee-funded institutions were adjusted by 20 per cent. At the graduate level, no quota exists for – anti-student admission to undertake postgraduate studies on a self-financed basis.

### **Computer Teaching Management**

Nowadays, technological advancements are increasingly encroaching on a wide range of human endeavours. Higher education continues to be impacted by technology. Most educational institutions now have computer labs where students can get the knowledge they need to succeed in the workforce. Classrooms must be equipped with the most cutting-edge educational technologies in order to thrive in today's educational landscape. It's never easy to incorporate technology into education. Allowing students to use instructional technologies while still keeping the class productive and well-managed is the largest problem. The teaching and learning process will fail if the classroom is badly managed. Instructing computer lab sessions can be challenging because of the difficulty of keeping students engaged, the difficulty of grading lab tests, and the difficulty of teaching visually impaired pupils. On the contrary, a happy learning environment in well-managed classrooms boosts student performance, academic engagement and achievement. College computer lab management approaches, on the other hand, tend to be obsolete and put staff workers under a lot of stress. A computer classroom is not the same as a traditional classroom. Students' demands for individualised attention necessitate travelling from one student to the next, which is time-consuming and ineffective. In most cases, this causes the remainder of the class to lose interest or become apathetic until the teacher has finished dealing with the rest of them.

### **Innovations of Computer Teaching Management Globally**

Among the many ICT tools utilised in today's education arena are computers and the Internet, as well as electronic delivery systems such as radios, televisions, and projectors, among others. It has been shown that school is an important setting for pupils to engage in a wide variety of computer activities, while home serves as a complementing site for regular engagement in a more focused set of computer activities. ICT is increasingly being used in teaching, learning, and testing. The use of information and communication technology (ICT) in education is widely seen as a potent force for good. Studies have proven that the proper use of ICT can improve educational quality and relate

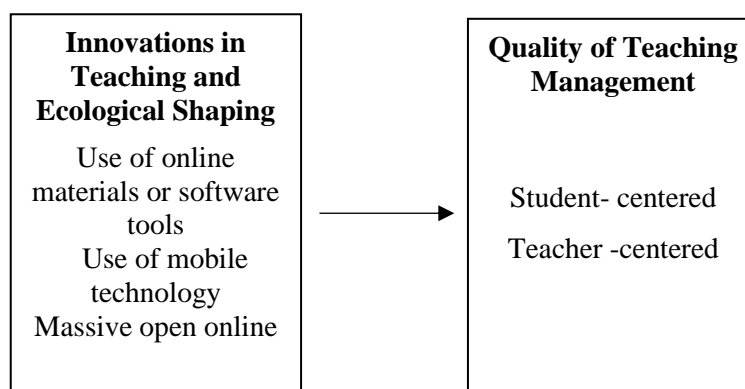
learning to real-world contexts. It has been noted by Weert and Tatnall (2005) that learning is a continual lifelong activity in which learners modify their expectations by pursuing knowledge that departs from the traditional methods of education. New information will be required of them as time passes, and they must be ready to seek it out.

### **Ecological Shaping of Education**

In the 1930s, people started to use ecological principles and different perspectives to look at how people learn and how things work in ecology. In 1932, an American education scholar named Waller took the lead in proposing the idea of "classroom ecology" in the book "Social Sociology." In the 1940s, psychologists Buck and Wright from the University of Kansas started studying kids' behaviour in the natural world. They wrote the book "A Boy's Day." In the 1950s, with the development of science and technology, the growth of industry, and the rise in the number of people, the education industry also made a lot of progress. The rise and popularity of mass media like radio and TV have helped to spread the word about family and public education. This means that education has become a part of society as a whole, and it has become a part of people's lives as well (Rajaram, 2013)

Because of this, new ways of looking at education have become an inevitable part of education research. In line with this development, people are now looking at educational issues through the lens of ecology. Research at this time was mostly done by German scholars Busemann and Popp, and a Japanese scholar named Shiya Otani wrote a book called "Educational Environment" based on their research. Since the 1970s, the United Nations has held three international conferences on how to keep people alive. This helps the ecology of education.

### **Conceptual Framework**



Source: Develop by Researcher

**Figure 1.** Conceptual Framework

The research conceptual framework describes the whole study. The use of online materials, mobile technology, massive open online courses, flipped classrooms, and simulation are the variables of independence, and, finally, the results are based on the student-centred and teacher-centred. These two students and teacher-centred means the quality of teaching management.

### **Summary**

It is a good idea to include technology in the classroom. Teachers must be more creative in adapting and customising their own teaching materials and procedures as a result of their utilisation (Reid, 2002). Cooperative learning, problem-solving, and the constructivist approach are among the most commonly utilised teaching methods for dealing with the issues of ICT use in the classroom (Wright, 2019). According to Palak and Walls (2009) and Tezci (2011a), integrating technology into the classroom will not have the desired effect unless classroom practices are student-centered. Consequently, the use of ICTs in education cannot be undertaken as a stand-alone strategy, and so on.

## **METHODOLOGY**

In a broader sense, research can be described as the systematic collection and analysis of data and information in order to enhance understanding in any area. Systematic procedures are used in research to find answers to intellectual and practical concerns. A study or experiment intended to discover and interpret facts, revise existing ideas or laws in light of new facts, or put such new or revised theories or laws into practice are all examples of research, according to Webster's Collegiate Dictionary. The movement from the known to the unknown is seen by some as a movement in and of itself. You are actually embarking on a journey of discovery.

### **Research Design**

There are a number of questions that require a more qualitative approach. The researcher will use deductive reasoning for this study. The quantitative result should, therefore, be backed up with expert qualitative input. Using the explanatory design, researchers can use qualitative data to explain significant (or no significant) results, outliers, or surprise outcomes. This is a common use of the design (Cornali, 2015).

### **Population and Sampling**

This study's participants will consist of five lecturers and ten students from four reputable Chinese universities.

Objectives have influenced every form of research. Directly or indirectly, clarify the study's topic matter. The study's goals make it clear to which group the research findings can be applied or to which group they can be generalised. Researchers call this type of group the "population". Researchers have also used the term "universe," although there is a subtle distinction between these two terms. It's easier to understand if you look up the terms and their definitions. What is the Meaning of Life? Each unit that has a variable attribute under investigation is referred to as a universe. Its Purpose in the Universe According to the dictionary's definition, a "universe" is a collection or set of all entities with the variable attribute under investigation.

### **Data Collection**

Primary data, which are considered the key data, confirms the opinion on the research issue with the latest updates from a sample of respondents at will. Preliminary data are collected from the study intentionally and are considered to be questionnaires in the research study.

### **Measurement/Trustworthiness**

The quality of a person or business that gives others trust in its credentials, talents, and dependability to do certain duties and fulfil given responsibilities.

## **RESULTS**

### **Introduction**

During the process of data collection, accurate data collection is necessary to protect the quality assurance and integrity of the research.

### **Design of the Questionnaire**

For this study, a questionnaire survey will be used as the research instrument. Because a questionnaire can be seen as the most widely used data collection technique within a survey, the respondent is asked to answer the same set of questions. The researcher hopes to use a questionnaire with two sections called part 1 and 2. Part 1 is divided into two parts, A and B. Section 'A' consists of gathering demographic data. Part B consists of measuring independent variables with suitable questions. The respondents can rate these questions by using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (Strongly agree) in section B. The researcher hopes to administer the questionnaire by using a Google form by considering the convenience of the respondents.

## Conclusion

The discussion chapter included the way and procedure of how the study is conducted in a proper way. The researcher followed positivism as the research philosophy, quantitative study under the deductive approach and the survey method as the data collection process under the purposive sampling technique with minimum interference in the natural study setting. For data collection purposes, the questionnaire has been distributed among 384 respondents. By referring to the next chapter, the users can review analysed data with meaningful justifications.

## DATA ANALYSIS

### Introduction

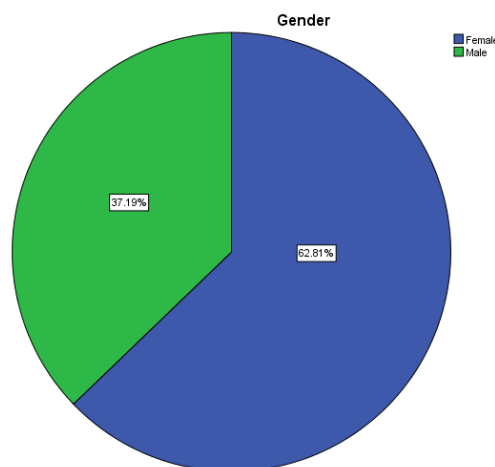
The main objective of this research is to examine the factors of the quality of the Chinese education system in universities. The chapter consists of an analysis of data and a vital interpretation of the analysis. Through this chapter, users have the ability to find dependent and independent variables in the form of descriptive and inferential statistics. At the same time, it provides better conclusions through logical directions to make possible actions and plans for users. For that, the researcher has included data preparation and cleaning process, test reliability and validity, descriptive and inferential statistics, multiple regression analysis, and hypothesis testing under the statistical package for social science (SPSS) software. At the same time, purposive -sampling techniques are used as the sampling technique under non-probability sampling.

### Data Preparation and Cleaning

To develop valuable and unbiased information, data should be acquired from respondents who are well aware of the research subject. For the purpose of generating effective information, collected data should always be from the correct respondents to match with the research area. Therefore, data preparation and cleaning are the most important factors. Therefore, under the frequency analysis, we measure whether the data we have entered are correctly entered or not. We measure the accuracy of entered data for analysis purposes. Under the missing values, we measure whether the respondents have answered the questions properly without missing some questions. The researcher collected data by using a Google form with filtering questions by giving the respondents a chance to fill out the questionnaire or refuse to answer. Therefore, missing values were not there to remove.

### Sample Profile of the Respondents

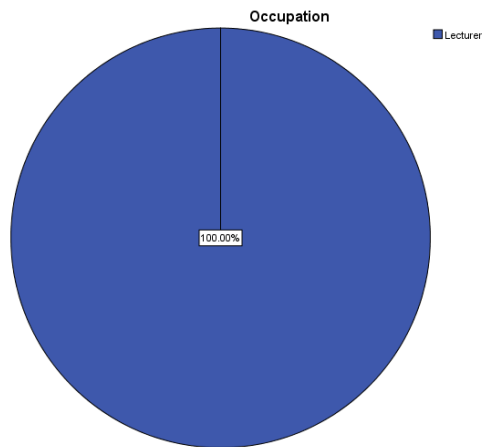
#### *Distribution of Gender Categories*



According to this figure, 119 (37.2%) were males, and (62.8%) were females out of the 320 respondents. The female number of respondents was higher than the male respondents.

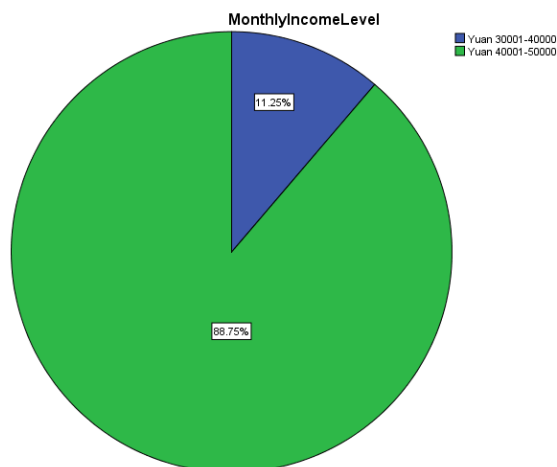


***Distribution of Employee Status***



According to this figure occupation category, all of the respondents were lecturers, representing 320 (100%) of the total respondents because data gathering was done by only focusing on university lecturers to protect the quality of the research and to get accurate data.

***Distribution of Income Level***



The highest percentage of monthly income level is between Yuan 40001-50000. It represents 284 (88.8%) of the total respondents. The lowest percentage of the income rate at the value between Yuan 30001-40000. It represents 36 (11.3%) of the total respondents.

**Reliability and Validity Analysis**

***Reliability***

Table 0.1

Variable	Cronbach's Alpha Value
Online Materials	0.961
Mobile Technology	0.852
Massive online course	0.911
Flipped classroom	0.839
Simulation	0.741
Quality of the Chinese education system	0.929

***Validity***

Table 0.2

Variable	KMO Values	Bartlett's Test of Sphericity Values
Online Materials and software tools	0.790	0.000
Mobile technology	0.813	0.000
Massive open online course	0.820	0.000
Flipped classrooms	0.793	0.000
Simulation	0.623	0.000
Quality of the Chinese education system	0.858	0.000

### Inferential Statistics

#### Correlation Analysis

Table 0.3

Variable	N	Pearson's Correlation Coefficient	P.Value
Online Materials	320	0.593	0.000
Mobile Technology	320	0.556	0.000
Massive Online course	320	0.659	0.000
Flipped classrooms	320	0.652	0.000
Simulation	320	0.744	0.000

### Descriptive Statistics

Table 0.4

Variable	Mean	Std.Deviation
Online materials	4.06	0.832
Mobile Technology	4.07	0.722
Massive Online courses	3.94	0.701
Flipped classrooms	3.56	0.535
Simulation	3.76	0.493
Quality of the Chinese education system	3.97	0.854

Table 0.5

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
5	.694	.481	.476	.61825	2.023

a. Predictors: (Constant), OMMeanValue, MTMeanvalue, MOCMeanValue, FCMeanvalue, SMeanvalue

b. Dependent Variable: QCESMeanValue

Table 0.6

#### ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	112.799	3	37.600	98.370	.000
	Residual	121.548	318	.382		
	Total	234.348	321			

a. Dependent Variable: QCESMeanValue

b. Predictors: (Constant), OMMeanValue, MTMeanvalue, MOCMeanValue, FCMeanvalue, SMeanvalue

## DISCUSSION

The current study has been conducted to examine the impact of online materials and software tools, mobile technology, massive online courses, flipped classrooms and simulation on the quality of

the Chinese education system among university students. The findings emphasise that the online materials and software tools, mobile technology, massive online courses, flipped classrooms and simulation on the quality of the Chinese education system among university students are hypothesised. Therefore, the entire hypothesis has been accepted because all the hypotheses are at the accepted level.

## ACKNOWLEDGEMENT

We would like to thank City University Malaysia for the financial assistance through research grants with CTY202200212.

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