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College students' perceptions of e-learning during the COVID-19 pandemic in Shanxi province in China and the management of e-learning in the future

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Abstract

The purpose of this paper is to study the views of college students in Shanxi Province on online learning and analyze that the future is a new e-learning management. Online learning is not only the main learning method during the influenza pandemic, but also an alternative to traditional teaching. There are two main reasons for this study. First of all, since the end of 2019, COVID-19 has erupted all over the world, and students can not go to school, which has greatly affected their learning progress. Secondly, with the progress of modern technology, many learning tools make online learning possible, which can make up for the shortcomings of traditional classroom learning. The research data of this paper will collect 300 college students from Shanxi Province of China through questionnaire survey to analyze their views on e-learning.

The results show that most students believe that e-learning is a new learning method and should be encouraged, and they say they will also use e-learning in the future. At the same time, mixed learning (e-learning combined with face-to-face learning) is their favorite way. In addition, the traditional classroom model is not suitable for e-learning, and researchers suggest using ambiguity model.

Keywords: E-learning, educational management, COVID-19 pandemic, quantitative analysis, technology acceptance model (TAM), ambiguity model

Chapter 1.Introduction

1.0 Overview

This chapter introduces the background , and an analysis of the problem statement ,aims and research questions of the research. In addition, it also points out the studies that have addressed the problem,the deficiencies and significance of the study and the purpose statement.

1.1 Background

With the rapid development of information technology, teaching and learning can be completed by means of electronic learning technology. These new technologies make students no longer need to be placed in the classroom or be educated to achieve their learning goals. Since the mid-1990s, e-learning has been widely used in education. Some researchers believe that e-learning refers to the transmission of teaching materials, interactive television and CD-ROM through the Internet, intranet, extranet, satellite broadcasting, audio and video tape, etc. Others also believe that e-learning is Internet-based learning, which uses web-based communication, collaboration, knowledge transfer and training to add value to individuals and the organizations they work for (Kelly & Bauer, 2019). This paper aims to explore the students' views on online learning, because they are the main beneficiaries of online learning, so it is very important to understand their views.

A novel coronavirus infection was reported in Wuhan, Hubei since the end of December 2019. Subsequently, China's 30 provinces and autonomous regions began to respond to major public health emergencies at the first level. The Ministry of Education decided to postpone the opening of schools, and proposed that all schools should make use of online teaching to adopt the strategy of "no class suspension". National Education cloud classroom and local education resources public service platforms all provide various solutions to support teachers' online teaching, students' home-based learning and parents' cooperation and guidance in the shortest time, and work together to use the Internet to minimize the impact of the pandemic on learning. For a moment, online education has become a hot topic of social concern.

It is generally believed that the global e-learning market will show rapid and significant growth in the future. Although the current total growth rate of e-learning is 7.6%, it is higher in some regions - 17.3% in Asia, followed by 16.9% in Eastern Europe, 15.2% in Africa and 14.6% in Latin America. According to this study, due to the rapid growth of the mobile device market, there is great potential for e-learning in China. The increasing use of mobile devices with internet access means the expansion of access scope, which will support the development of e-learning in the region(Succeed., 2016).

China's major online teaching platforms, as a strong support for online learning, provide a guarantee for "class suspension". Among them, DingDing, Tencent conference and other Chinese apps are also recommended by relevant United Nations agencies to students all over the world. Among them, the number of users of Rain classroom increased by 26 million, and the monthly average number of active students exceeded

30 million, covering more than 6000 institutions; XueXiTong has 18 million new users and 13.5 million active people, covering more than 4000 schools; and DingDing users had exceeded 300 million and supported 140000 schools, 3 million classes and 130 million students in online classes(Xie,,2020).

In Colleges and universities, in addition to the Ministry of education's free access to all high-quality online courses and virtual simulation experimental teaching resources for colleges and universities across the country, CERNET also specially released the global academic resource sharing service -- CARSI, which covers 190000 journals, more than 10000 experimental videos, more than 13 million dissertations, more than 300 million patents and more than 1 billion data resources of 34 major academic resource providers at home and abroad(Xie,2020).

From these data and studies, we can see that China is making efforts to integrate e-learning into the education system, and the facts also show that China has great potential in this regard. As the mainstream teaching method during the pandemic period, online learning has been accepted and adopted by the public.

Before the COVID-19 pandemic, the main educational management mode used in universities was the College mode. The leadership mode related to this mode was away from the constraints of positions and was mainly distributed according to the abilities of members (Gronn, 2016). The college model has a strong normative orientation, which is more based on rules than research through school practice (Webb,and Vulliamy, 2014).This model is very suitable for universities with a large number of

majors. Because university teachers have professional knowledge authority, teachers need a certain degree of autonomy in the classroom, but they also need cooperation (Brundrett,2016).The college model assumes that members hold a common set of values that guide the management activities of the organization (Brundrett, 2016).However, this pattern needs to be greatly changed during the pandemic. For example, the model emphasizes the importance of the decision-making group, but the size of the group should be small enough to be heard by everyone, and the meeting is required to be held collectively in the school, which is very inconvenient during the pandemic. Moreover, this model is reached by consensus. However, it is sometimes undesirable to solve problems by agreement, and sometimes there are some problems. Consensus decision-making depends to some extent on the ethical dimension of Collegiate. It is negative to impose decisions on individuals in moral listing, which is inconsistent with the concept of consent (Brundrett,2016).

1.2 Problem Statement

The COVID-19 pandemic that swept the world was sudden, leaving no one time to prepare or help solve the problem. Distance learning has become a problem in many fields, because of the blockade of schools, the traditional teaching mode can not be carried out normally. As a result, the pandemic situation has even caused great losses to students. Some people are in the critical period of graduation, some are just entering the University, and they are still in the stage of adaptation.

Therefore, in order to minimize the impact of the pandemic on students,

schools try to complete the syllabus within the prescribed time according to the teaching calendar. Although these measures cause some inconvenience, they also lead to a new pattern of educational innovation by using network intervention. During this period, almost all universities have turned to online learning mode using Blackboard, DingDing, Zoom or other online platforms. They in the affected areas are seeking expedient to continue teaching, but it should be noted that the quality of learning depends on the level and efficiency of digital access. In terms of learners' motivation, satisfaction and interaction, there are profound differences between online learning environment and traditional classroom environment(Muthuprasad,2021).

The main problem is whether the quality of online learning is closely related to the quality of content design and implementation. In addition, the effectiveness of learning also depends on how the content adapts to the online environment, and how to understand and solve the constraints faced by students. As the main audience of online learning, the views of students are very important for this study. Therefore, this paper studies the students' perceptions on e-learning and university’s role in managing e-learning in the future, in order to make it more effective and successful.

1.3 Aims and Research Questions

Since 2020, almost all the world's students have been affected by the COVID-19 and can not study in schools. All schools have adopted online teaching to alleviate the impact of the pandemic. This paper mainly studies the views and expectations of college students on e-learning. In addition,

through the specific analysis of the research results, it will also put forward some meaningful ideas on how to manage online learning in the future.
Due to the large number of students in the world, it is difficult to collect data, so the author decided to take college students in China as an example.The author will mainly choose college students in Shanxi Province, aged between 18 and 24.

Introduce statement that the following are research questions:

1.What is the perceived usefulness and ease of use of students for e-learning?

2.What is students' attitude towards online learning?

3.What is the students' willing for online learning in the future?

4.What is the management of e-learning in the future?

1.4 Studies that have addressed the problem

The researcher searched the literature about online learning at home and abroad in recent five years, and the literature about online learning of students during the COVID-19 pandemic in recent two years for reference and research. Most of these studies are in a school or institution, using quantitative analysis method.

Some researches related to this paper are summarized as follows.

A study on the application of technology theory model, which is used in this research and was used in a study on students of Ghana Institute of technology in 2016 found that students' attitude towards online learning is that they think online learning is very necessary. Most students always believe that online learning can learn courses from all over the world anytime and anywhere, and can obtain relevant learning materials from all over the world, which can not be achieved in the traditional face-to-face classroom learning. In addition, students believe that online learning can also enable them to experience the educational way of participating in personal practice. This study also shows that it is very easy and convenient for students to use many learning platforms and learning tools of online learning. Because every student has received higher education, they are fully capable of using various tools and technologies to complete their e-learning. Especially for college students, they have a strong technical background, which enables them to easily break through the difficulties and problems of e-learning（Sandberg,2016).

According to a study in India, 307 agricultural university students were selected as the subjects to understand their views on online learning and their preferences for various attributes of online courses. The results show that students are ready for online learning during the COVID-19 pandemic. Moreover, students think that the recording test after each class can improve their learning efficiency. In addition, the research shows that the flexibility and convenience of online learning is its biggest feature, which is also the real attraction. At the same time, in the current situation, the pure network learning mode is impossible, and the mixed learning mode is the

most suitable (Muthuprasad, 2021).

In another study in India, students from 184 capital regions were studied and questionnaire was conducted by quantitative analysis. The purpose is to understand their cognition and preparation of online learning model adopted by schools during the COVID-19 pandemic. The results of the study show that students are positive about online learning, and they think online learning is the main learning mode during the pandemic. This also indirectly proves the importance and irreplaceable of online learning during the pandemic. In fact, online learning has become a new learning method, and students can further improve their learning efficiency through social media (Arshad, 2021).

Azhari conducted a questionnaire survey on 100 college students in order to understand their cognition of e-learning during the COVID-19 pandemic. The results of this study are different from those of others. The research shows that online learning is not better than the traditional face-to-face classroom learning. Because students think that the efficiency of online learning and teaching process is very low, and it has certain limitations. For example, the usability of online learning is very difficult for some students and teachers who are not familiar with network technology. In addition, students' enthusiasm in online learning is also low compared with traditional classroom learning, because of the lack of supervision of teachers and the company of students, students will have a sense of loneliness (Azhari, 2020).

In order to understand students' views on e-learning, an online questionnaire survey was conducted among 840 medical students in

Poland. The results show that during the pandemic period, network technology is the most important learning tool for students. At the same time, if online learning wants to be more widely used, it should implement effective strategies and positive methods. Students believe that online learning should not only focus on the transfer of knowledge, but also on the growth of skills (Baczek, 2021).

1.5Deficiencies in the studies above

Although the above research mainly studies students' views and expectations on online learning which are positive in nature, there are still some shortcomings. Due to time constraints, they are only limited to a small part of the population, a certain school or a certain professional part of the students, the conclusion is not very representative.In addition, when some researchers study online learning, the selected schools or institutions have not officially stared to provide courses through e-learning mode. Therefore, if they formally use e-learning tools, the views expressed by students may be inconsistent with the research(Ryan,2018).Secondly, the online learning mentioned in the above research is only a single concept. In fact, online learning is composed of various delivery methods, technologies and learning design(Muthuprasad,2021). Thirdly, almost all these studies use the method of quantitative analysis and collect data through questionnaire survey. However, the quality and quantity of samples are the most important factors in quantitative analysis, and the number of samples collected in some studies is not enough. For example, in a study on the views of students of Ghana Institute of technology on e-learning, the researchers only distributed 100 questionnaires and received only 80 responses, which is not enough for the research. If the sample size is too

small, the results may not be accurate and representative.(Sandberg, 2016).

1.6 Significance

Firstly, the research on online learning during the pandemic period is a new and hot topic, and the number of annual papers on online learning is on the rise, which proves that the rapid development of society requires education to break the existing unified planning situation. Moreover, students are the largest audience of online learning, so it is necessary to study students' perceptions and expectations of online learning.

Secondly, according recent study on e-learning,technology research and application research are the hot spots of current research, especially focusing on support technology, social software, teaching strategies and application fields. However, there is a lack of basic evaluation research, which refers to the research on the evaluation of e-learning for students who are the most direct and important group of e-learning(Wang,2021).Therefore, the study of students' evaluation of online learning can make up for this lack.

Thirdly, according to the dimension of the research content, the theoretical research explores the development path and implementation plan suitable for China's national conditions on the basis of learning from foreign advanced experience, but most of the research is still in the process of introduction and digestion, mostly focusing on online learning overview and online learning mode, For where online learning strategies and online

learning evaluation system and indicators are involved, the depth is not enough (Wang,2021). Through the analysis of students' feedback, this paper further studies the learning strategies of online learning, which can make online learning more effective as a source of university learning in the future.

Fourthly ,this research will give good recommendations to the key stakeholders of e-learning during COVID-19 pandemic.Students were encouraged to use e-learning for higher education, which provided them with the opportunity to receive education again and created a new learning environment (Romiszowski, 2019). Especially in the fully e-learning mode, students need to be more independent than traditional classroom learning, which requires them to have higher learning enthusiasm (M. Q. Huynh, Umesh,and Valacich,2020).There are many reasons why teachers are encouraged to carry out e-learning.For example,they are encouraged by schools and society; They want to reach a wider group of students; They are curious about e-Learning, and so on. E-learning technology has brought great changes to teachers and students. Under the influence of e-learning, teachers are no longer the main source of students' knowledge and skills. Teachers need mature technology to deal with this new education mode(Romiszowski, 2019).If universities want to successfully provide e-learning, they need to carry out very expensive technology upgrading, mainly including several components: broadband, management system, classrooms equipped with technology, and sufficient computer facilities. With the increase of technology, it is necessary to increase the number of corresponding technicians. In addition, institutions need to consider how to evaluate the effectiveness of e-learning, which is usually measured based on the return on investment (ROI) of technology infrastructure and curriculum content development(Sun, 2016).Now,

employers have increasingly recognized e-learning as a new model of higher education, because denying the value of e-learning will limit the number and quality of their employees. In addition, it will limit the availability of employees' participation in courses and professional development activities. Although e-learning may not meet employers' requirements for social skills, the acceptance of online degrees is generally increasing (Chaney, 2020).

Finally, there are a lot of researches on online learning in China, but few in Shanxi Province, especially on the practice of online learning. The research population selected in this paper is the college students of various universities in Shanxi Province, aged between 18-25, who are the most direct and most affected by online learning during the pandemic period. Therefore, this paper can make up for this gap to a great extent, and also help Shanxi Province to further develop online education to a certain extent.

1.7 The purpose statement

The purpose of this survey study is to test the theory of College students' perceptions of online learning during the COVID-19 pandemic in Shanxi province,China,that relates the independent variables to the dependent variable, for the college students in Shanxi province,China. The independent variable(s) will be defined as perceived usefulness , ease of use and students' attitude. The dependent variable(s) will be defined as sustainability of e-learning .

Chapter 2. Literature Review

2.0 Overview

The technological progress of the current society allows us to design online learning content in a variety of different ways. When designing online courses, we should not only consider learners' preferences and perceptions, but also consider how to make learning more effective. Learners' preferences are related to their readiness or willingness to participate in online learning and the factors that affect their readiness for online learning.In the following chapters, the researcher summarizes the knowledge learned from the literature review.

2.1Definitions of E-Learning

Each researcher has a different definition of e-learning.

First, it mainly refers to the use of network or network technology to provide information and instructions to individuals (Ong and Lai, 2020). Another researcher also believes that e-learning is a new form of education carried out by the Internet and its technology, and also includes the use of the Internet for teaching on a global scale and websites that can provide courses (Masrom,2021).Second, the researchers believe that e-learning is a special learning supported by information and communication technology (Jenkins,2019). After that, e-learning is further defined as teaching learning through computer, aiming to promote learning （ Clark,2019 ） .Third,

e-learning is defined as the use of new multimedia technologies and networks to improve the quality of learning by facilitating access to resources and services, as well as distance communication and collaboration (EC, 2019).

From the above, we can know that researchers define online learning through their familiar media. The first definition focuses on online learning through the Internet. The second one thinks that online learning is through information and communication technology. The third one thinks that online learning is through multimedia technology and the Internet.According to the above definition, e-learning can be regarded as an alternative to traditional face-to-face learning. In addition, e-learning is also a means of learning through various technologies, such as the Internet, multimedia and network, to obtain education or provide various information and technologies to assist education.

However, these definitions are only based on the media used, so we need to seek a broader definition. According to a study, e-learning provides educational media through various electronic means, including Internet, intranet, extranet, satellite TV, video tape, audio tape and CD (Koohang and Harman, 2018). Another study suggests that e-learning is a communication technology used to support teaching and learning (Masrom, 2021). From these definitions, e-learning is a broad term, which can be used to describe learning using any electronic technology. It can be seen that e-learning provides an opportunity for teaching and learning during the pandemic period, which can overcome the obstacles of time, space or geographical location of students and teachers. From the above definition, it can be concluded that compared with traditional classroom learning,

e-learning enables students to have the opportunity to study in different places and at different times, which can just solve the problem that students can not go to school during the pandemic period.

2.2 Forms of E-learning

The types of e-learning mainly include synchronous learning and asynchronous learning.

2.2.1 Synchronous learning

This form of online learning is completed in real time, and students can enter the classroom at a specified time anywhere in the world to interact with lecturers and other classroom participants (Kalpana, 2020). This kind of learning mode is carried out through electronic media, which can attract people from different places at the same time. However, the disadvantage of synchronous learning is that it needs to participate in the specified time, which will cause challenges to people in different time zones (Obasa, 2019). Therefore, in order to complete synchronous online learning, learners must be familiar with the time zone differences and know the time difference in time. Synchronous learning can include audio conference, instant messaging, web conference, video conference, application sharing and so on（Eludire and Ajao, 2021).

These online synchronous learning tools enable teachers and students to experience real classroom activities, such as getting timely feedback on Problems and communicating with other students. And by combining some

available applications, such as video conference, whiteboard and chat room, teachers and students can experience the traditional classroom atmosphere. However, due to the high technical requirements of these processes, any part of the failure will have a negative impact. Therefore, a backup plan is needed to minimize the impact of technical failures.

2.2.2 Asynchronous learning

This kind of learning means self-defined progress and time learning, which provides more flexibility, and allows learners to learn at their own speed and time compared to synchronous learning, this form of learning links learners to learning materials rather than real-time contacts with teachers (Kocur and Kosc,2019).

Asynchronous learning provides a way for learners to easily access the required resources and information. The main tools used in this form of learning are: database, document library, e-book, forum, information transfer, audio, video, network log,website links and so on (Eludire.and Ajao, 2021).The above asynchronous learning tools are helpful to learners who want to learn at their own time and speed (Hratinski, 2021).

Synchronous learning requires students to be present with teachers at the same time, while asynchronous learning requires students to study according to their own schedule. With the help of tools, students and teachers can realize learning and teaching in different spaces. In addition, students can choose the learning methods that are suitable for them. For those students who want to interact with teachers in real time and get timely feedback, they can choose to learn synchronously; For those

students who are interested in acquiring knowledge and don't care about real-time interaction, they can choose asynchronous learning to learn according to their own rhythm, which is impossible in traditional classroom.E-learning is a kind of learning which is based on electronic technology because of the same definition, type and form.

2.3Challenges and Success Factors of E-Learning

2.3.1 Challenges

Although e-learning can make up for some shortcomings of traditional classroom learning, it also has its own challenges. Nowadays, the higher education system is in a constantly changing process, so the university education must meet the needs and wishes of students. Information technology and e-learning system are the necessary factors to carry out university education, and schools are investing more and more in them(Piccoli et al,2020). However, in the era of rapid development of science and technology, one of the main challenges facing universities is to integrate innovative e-learning systems in order to promote the strengthening of teaching (Hrastinski.S., 2021).

First of all, in the e-learning environment, if students want to learn independently, they need strong motivation and a lot of discipline to complete it (Goladay and Prybutok., 2019). Because when learners learn at their own pace, they may not work hard enough compared with face-to-face learning (Cole., 2019). Motivation can improve learners' performance and learning ability, because if students are motivated to learn for some reason, it will make them insist on achieving their learning goals

(Mckeachie, 2021).

Secondly , asynchronous learning makes it impossible for students and teachers to interact in real time, which makes it impossible for students' problems to be solved in time and teachers' feedback in time (Laine, 2018; Smart and Cappel, 2019).The research conducted by Aijaya shows that students think that the interaction between students and teachers is not the best in online learning compared with traditional classroom. Students prefer the direct interaction between students and teachers in the traditional classroom (Adijaya , 2018).

Thirdly, learners will feel isolated in online learning. Because they have to complete online learning alone, and lack of contact with classmates and teachers, it may make students feel frustrated, anxious and confused due to self-study (Hara and Kling, 2016)

2.3.2 Success

First of all, e-learning can make learners flexible and convenient to learn anytime, anywhere, which means that learners can receive education anywhere in the world, rather than having to receive education and learning on campus (McDonald, 2019).

Secondly, compared with the traditional classroom learning, e-learning has teaching advantages. It can take multimedia tools as a part of learning, so that learners can use concepts realistically.

Third, e-learning can use audio, video and courseware to help show concepts and topics that are difficult to describe in traditional classroom, which can help students understand complex knowledge more accurately (Smart & Cappel,2019).

Forth,in the research of Astuti and Febrian(2019), it is found that students have a positive response to online learning. In the online learning mode, they feel more comfortable doing exercises and answering questions, because the answers in the online learning mode are easier to collect than those in the traditional classroom learning mode. Research shows that the accessibility of learning media and knowledge use technology are the key to students' success in online learning, because online learning is different from traditional classroom learning, and its use needs to be based on information and communication technology media (Astuti & Febrian, 2019)

2.4 Students' perceived usefulness of e-learning

In recent years, the exploration of students' perception and expectation of online learning has become a hot topic. Due to the growing demand for online learning during the pandemic period, people's acceptance of online learning is also higher and higher. Many studies have shown that students are satisfied with online learning. At the same time, studies also show that learners' cognition of online learning is affected by many factors (Shrestha et al., 2019).

Age, gender, computer knowledge level, personal learning ability, style

and other factors are important factors affecting students' online learning. A lot of literatures have discussed the technology acceptance theory to study students' perception of online learning. Innovation diffusion theory is one of the most relevant theories used in the research of higher education technology adoption. The research defines that learners' perception of innovation greatly influences their adoption of innovation. For some advanced cognition, innovation is regarded as compatible and superior to current value. According to the theory of technology acceptance, its two most important factors are perceived usefulness and perceived ease of use (Mlekus et al,2020).A study on the students of Polytechnic College in Ghana is based on the technology acceptance model.Its research found that students think that online learning is necessary. People think that online learning provides the possibility for human beings to learn from all over the world, which is impossible in the traditional face-to-face learning. At the same time, students believe that through online learning, they have the opportunity to experience the education method of personal practice(Sandberg ,2016).

A study shows that students' satisfaction with e-learning has little to do with the interaction between students, but has a lot to do with teachers. As a new way of learning, online learning is developing with the development of technology. All online educators need to combine education with technology to enhance the learning efficiency of online learning. In other words, online learning interaction as a necessary communication activity in the current network environment. By providing a platform for information exchange, students can have more profound thinking, which is very beneficial for students' learning. However, to maximize the value of online learning, educators must be familiar with how to use it and how to make students improve the efficiency of online learning (Zhu., 2018).

A Polish study was conducted by distributing an online questionnaire to 840 medical students. Research shows that e-learning is a powerful tool for students to learn. However, the successful implementation of e-learning in the curriculum requires a well thought out strategy and a more active approach.Students believe that e-learning should not only focus on knowledge transfer, but also pay attention to the growth of skills. Students should be able to use materials and get feedback in a timely manner. The research holds that effective strategies and positive methods are needed for online learning to be successfully integrated into the teaching and learning system..(Baczek et al,2021)A study examined students' views on strategies in online courses. The results show that learners pay more attention to teachers' participation strategies. Teachers should discuss problems with students and use online communication tools to cooperate. In addition, regular notification or email reminders and timely feedback on students' homework will also improve students' satisfaction with online learning. The conclusion of this study is that students' participation improves the satisfaction of online learning, enhances their learning motivation, reduces isolation and improves their performance in the online learning environment (Martin and Bolliger, 2018).

The process of learning is a continuous activity process, including acquisition of knowledge and skills, as well as attitude and behavior of learners. In addition, students' cognition of learning process includes many aspects. For example, the cognition of teachers, the ability of students to absorb knowledge in class, the ability of self-study of online learning and the results of students' learning evaluation, etc. The study conducted by Aswasulasikin(2020) shows that students are tired of online learning because of the lack of creativity and innovation in the teaching of online learning. The new learning mode also requires teachers to make

breakthroughs in teaching (Aswasulasikin,2021).As a new way of learning, online learning is unfamiliar to both students and teachers. In order to mobilize students' enthusiasm and participation in e-learning, learning motivation plays a crucial role. Due to the use of innovative technologies in online learning, students' motivation in online learning has increased, such as the topics of textbooks they like, and how to use computers and other media for online learning (Wida,2020).During the pandemic period, online learning becomes a must. Even online, students still have high learning motivation, including concentration, enthusiasm, independence, curiosity and self-confidence (Fitriyani, Fauzi and Sari, 2020).

A study in India used a quantitative method to conduct a questionnaire survey among university students in 184 capital regions to examine their cognition and preparation for the online learning system adopted by universities during the popularity of coviid-19. The study collected survey data from students in Delingha, Delhi University, Jamia millia islamia (Central University) and guru Gangbin sunh unrrrstura University (NCT). The results show that students have positive cognition of online learning. This also proves the importance of online learning in the period of covid-19. In fact, e-learning has become a new way of learning, through social media can further improve the learning effect(Mohammed,2020).

Arkorful's research shows that e-learning makes students more able to absorb information, even more effective than traditional classroom learning. Especially for some introverted students with slow learning speed, they do not have the courage to express their opinions in class, or even can not keep up with the progress of learning. E-learning is the best choice for them (Arkorful, 2014).

A study from the University of Maricussaleh conducted a questionnaire survey among 100 college students in order to understand students' cognition of online learning during the covid-19 pandemic.The results of this study are different from previous studies. It argues that online learning is less desirable for students than face-to-face learning. The reason is that it is inefficient in the process of learning and teaching. In addition, there are also some limitations in online learning, such as the availability of Internet network for online learning. At the same time, compared with the traditional classroom, the enthusiasm of students in online learning is also low(Teuku,2020).

2.5 Ease of use of e-learning

According to Fredrik Sandberg(2016), many learning platforms and tools are easy for students to use. Students have the ability to use a variety of tools and technologies to complete E-learning on their own. College students have a strong technical background, which enables them to easily break through the barriers of e-learning.(Fredrik Sandberg ,2016)

In online learning, the place of learning and the media for learning will also affect students' sense of experience. Teachers and students use different media. Generally speaking, students and teachers can interact online through various social media and applications, such as e-classroom, video conference, telephone, real-time chat, zoo or WhatsApp(Indira, 2019). In addition, through the use of information technology for learning, the learning atmosphere is more relaxed and comfortable (Bali, 2020). At the same time, students feel that they can have more opportunities to play

their innovative spirit.

A study in India is aimed at 307 Agricultural College Students' online learning, to understand their perception of online learning and their preferences for various attributes of online courses. The results show that most students are ready to learn online during the outbreak. At the same time, the study shows that students prefer to take recorded tests at the end of each class, which can improve the effectiveness of learning. And the flexibility and convenience of online learning is the reason why it is attractive. The study also points out that the complete network mode is impossible, and a hybrid learning mode needs to be established (Muthuprasad ,2020).

E-learning can provide the possibility of sharing information and uploading documents in different formats. At the same time, it also has some characteristics of promoting and cultivating the learning teaching process. Because it is a web-based system, there is no need to install other tools. Once installed and uploaded, students can use it for learning at any time (Raheem, 2020). Nowadays, there are many kinds of technical tools that can promote the development of e-learning, and the courses are mainly carried out by simulating the traditional face-to-face courses and activities. In addition, online distribution of documents and materials can also be carried out. E-learning mainly includes technology tools, platform, content and participants (Cohen., 2020).

Almarabeh’s research is based on TAM theory, which mainly studies students' views on the implementation of e-learning. The results show that all students think that e-learning module is both useful and easy to use.

They can understand online information and easily navigate and access documents. Based on the research on TAM conducted by the University of Jordan, it is shown that perceived and ease of use have a direct impact on students' ideas of using e-learning (Almarabeh,2020).

According to a study on the impact of E-learning on students and teachers, most respondents believe that e-learning helps to promote the process of education, and that it is conducive to students' cooperation and communication. In addition, it provides flexibility to help students better understand the course. At the same time, in the survey of students' attitude towards e-learning, it is found that their attitude is positive, and when they realize that e-learning system is easy to use, their attitude will be improved (Dookhan, 2018).

E-learning is also easy to use in providing education, accessing content and resources. Because it can improve the quality of learning and provide great help for personalized learning and meeting the needs of learners (Babu,2018). Due to the flexibility and ease of use of e-learning, it eliminates the obstacles of time and space. Students can obtain a wide range of information and learn at their own speed. At the same time, it can also interact and discuss with peers online (Arkorful.and Abaido, 2019).In addition, some studies have mentioned that online learning can also save time and money, because it does not involve going out to spend, and the uploaded learning content is synchronous and can be easily updated (Sadeghi, 2019).

2.6 Attitude Towards E-Learning

Davis et al. believe that in the technology acceptance model, attitude is a positive or negative feeling based on e-learning perception or experience. A person's attitude towards e-learning will affect their behavior of using e-learning. In addition, personal attitudes can also affect individuals' response to e-learning and their willingness to use e-learning in the future (Davis, 2016).

A study at Ghana Institute of technology found that if a person has a positive view of e-learning, it will affect his decision whether he will use e-learning in the future. Research shows that most people like the idea of e-learning. They think it is an innovative concept worthy of encouragement. However, e-learning is not suitable for learning practical courses, such as some medical nursing courses, which requires students to experience the learning process. Therefore, students prefer mixed learning mode. In order to make e-learning more widely used, researchers believe that practice oriented courses can be provided through e-learning(Fredrik , 2016)

The research on Foreign Language (EFL) students shows that although some students have a negative attitude towards e-learning, students can deal with the problems encountered in e-learning. Teachers are also constantly trying to learn, find solutions to problems, provide help for students, and make them adapt to the new learning environment as soon as possible. Despite some technical difficulties, some students still appreciate these things (M.D.G., 2020).Students generally believe that the electronic platform is a useful tool for online learning and teaching.

Students prefer a platform that allows multiple users to communicate for a long time, which not only does not cause too many technical problems, but also promotes their interaction with teachers (Popa et al, 2020).

2.7 Management of e-learning

The difference between e-learning and traditional learning is that online learning not only focuses on teaching, but also on students' learning. In other words, although the traditional classroom education is mainly teacher centered, with the development of e-learning, the center of classroom gradually changes to students (Oye, 2019).In traditional education, the evaluation of students mainly depends on teachers, who are also the main source of information for students. At the same time, the quality of education mainly depends on the professional level of teachers. However, in e-learning, evaluation can be completed with the help of tools and systems. Students can obtain all kinds of information from the network and upload it to the platform. The quality of education is affected by teachers' proficiency in the use of Technology (Nycz, 2020).

Cheung and Cable(2017) have identified eight core principles of e-learning according to Ambiguity Model , including: encouraging more contact between teachers and students and collaborative learning, and requiring quick and timely feedback, encouraging students to learn actively and allocate more time to complete tasks, at the same time, teachers should inform students of their expectations, Give full play to the diversity of the network for learning, and make rational use of online technology (Cheung and Cable,2017).

E-learning platform is to provide a system for students and teachers to help them establish a flexible professional learning environment. At the same time, these systems are regarded as a web-based learning platform, which is very helpful for the cooperation between users (Benta,2014). Through these platforms, teachers can upload and provide students with some information and resources that they can't get in the traditional classroom, and students can share their views and problems at any time and receive feedback (Martín-Blas and Serrano,2019).

The complexity and diversity of e-learning promote the development of educational process. The Ambiguity Model mainly emphasizes the instability and complexity of real life, as well as the uncertainty and unpredictability of things. Therefore, Ambiguity Model can make e-learning play its greater value and more effective role. Teachers and students must clearly know how to effectively manage the teaching process of e-learning. Tham and Werner(2015) believe that the effectiveness of e-learning depends on three factors: first, teachers should understand how to use e-learning tools to improve students' learning ability and how to interact with students; second, teachers should create a comfortable learning environment, creatively shorten the distance of students and attract their attention; and finally, teachers should create a comfortable learning environment, Students may feel isolated because they don't have real classmates, so teachers need guidance on how to make them connect (Chee, 2018).

A study of 424 universities around the world shows that due to the impact of the pandemic, most universities have to adopt e-learning. However, to manage e-learning effectively, the most important thing is to establish a

correct e-learning model. Although some universities have developed some basic e-learning methods before popularization, most are not ready for comprehensive online teaching. Therefore, in order to further develop e-learning, it is necessary to optimize the e-learning model. Ambiguity Model I is the most suitable model for e-learning. Due to the problems of e-environment, the school's organizational objectives are lack of clarity and lack of understanding of the process of e-learning. The main feature of university is ambiguity, which rejects the rational decision-making introduced by formal model(Suresh., 2018).

In addition, Sun et al.(2020) agreed that teachers should clearly understand how to create a learning environment suitable for online education, not just reproduce the traditional classroom teaching methods online, they should provide a sufficient number of projects and tasks (Sun et al, 2020). These aspects mainly include: 1. Management and development of Internet infrastructure to avoid interruption in the course; 2. Use some convenient tools to help students accept and understand information; 3. Provide reliable and diversified electronic resources; 4. Make use of social network to establish contact between students and reduce the sense of isolation; 5. Use various effective activities and skills to promote students' learning; 6. Teachers and students should actively understand the latest policies of the University and the government; 7. Teachers should understand the needs of students and correct their teaching methods in time (Huang, 2020).

Existing literatures emphasize different learning models and many theoretical bases, and provide a basic framework for researcher to understand students' views and perception on online learning. At the same

time, these literatures also emphasize the challenges and advantages of online learning.However, in the context of the COVID-19 pandemic, there are not many papers on the cognition and preference of Chinese students for online learning. It is understandable that before the pandemic, online learning was only carried out on a limited distance education platform, and students and teachers are unfamiliar with this learning mode. At the same time,in the research of online learning, there is little research on students in Shanxi Province, probably because the proportion of traditional learning in the curriculum is higher. However, with the development of society, as well as the causes of the pandemic, online learning has been widely accepted and recognized. It is the most appropriate learning mode during this period, and students are the most direct audience of this learning mode. Therefore, in order to make online learning more effective and better serve learners, it is necessary to study students' views and perception on online learning.

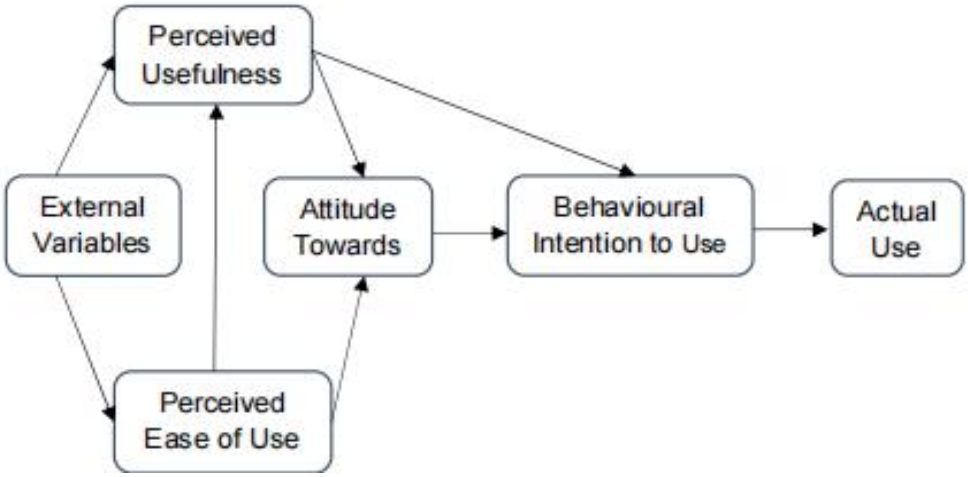
2.8 Theoretical Framework

2.8.1 Technology Acceptance Model (TAM)

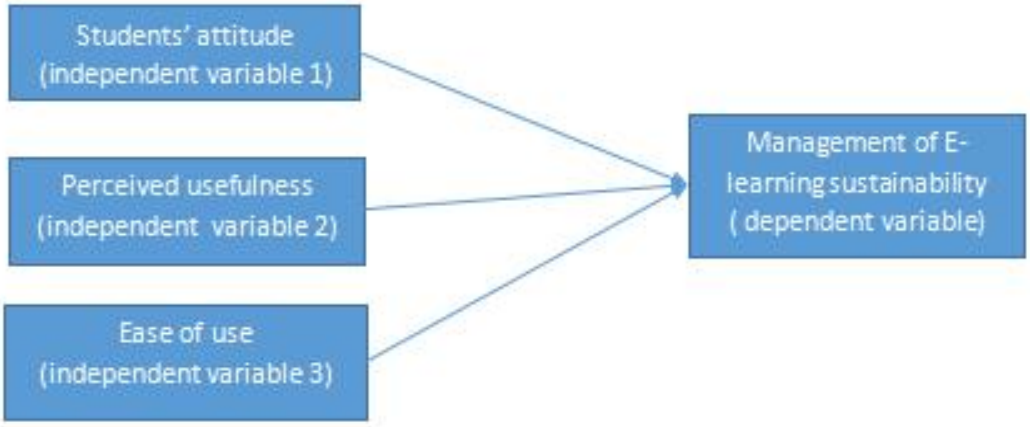
As the development and use of systems and technologies are conducive to the development of educational opportunities, the application of e-learning in higher education and students' cognition of the usefulness of this kind of learning has become a hot topic. This paper uses TAM, which is helpful to analyze students' views on e-learning (Almarabe, 2020).Technology Acceptance Model (TAM) is proposed by Davis to discuss students' cognition of e-learning. This is the main theory used in this study. TAM is a theoretical model verified by experiments and widely

used. It helps to explain and predict users' acceptance and use of information technology (Legris et al., 2015). At the same time, it helps to explain why users can accept or reject certain information technologies. The theory provides a basis for tracking how external variables affect beliefs, attitudes and willingness to use technology. The two cognitive beliefs assumed in this model are perceived usefulness (PU) and perceived ease of use (PEU). In addition, the theory further shows that these two cognitive beliefs directly or indirectly affect the user's attitude (at) to the use of technology, and also affect the user's behavior (IU) to use technology, which indirectly reflects the user's attitude towards technology and the final decision whether to continue to use it. At the same time, this model also points out the influence of external factors on the two cognitive beliefs. The TAM model is shown below (Davis, 2015).

Original Technology Acceptance Model (TAM) :



Conceptual framework(adapted to fit this study) :



TAM is a four stage process, first perceived usefulness, then perceived ease of use, which leads to the attitude towards use, and then behavioral intention (Davis,2015). Perceived usefulness is defined as "the degree to which a person believes that using a particular technology can improve his performance"(Davis,2015).At the same time, it is defined as the degree to which potential users believe that technology provides similar or better value than alternative methods of performing the same task. The application of PU in this study helps to infer students' view that e-learning provides them with a way to acquire new knowledge.Therefore, perceived usefulness can be defined as the degree to which students believe that the use of e-learning will promote their learning. In addition, it is worth noting that, because all the students surveyed in this thesis are fully studied in the campus, they can appropriately answer and infer whether they think e-learning is a good learning option.

Perceived ease of use (PEU) refers to a person who believes that using a specific technology is easy to use and does not allow too much effort

(Davis,2015). Because the use of technology is an important part in e-learning, in order to be able to participate in e-learning, students need to have a certain degree of understanding of computer and Internet technology (Lee and Witta,2019). In addition, some external factors also have an impact on perceived usefulness and perceived ease of use. These external variables include: papers indicating the importance of e-learning, news reports on online learning, family members and friends' cognition of e-learning, etc. These variables also affect the individual's attitude toward technology (Davis et al., 2020).

Attitude toward the use of Technology (AT) is defined as a positive or negative attitude based on the negative perception of technology from perception or experience. This paper argues that the use attitude is a positive or negative feeling of students on e-learning, which affects students' cognition and behavioral intention on e-learning (Ajzen and Fishbein, 2016). In addition, in TAM, if the perceived ease of use and perceived usefulness are positive or negative, then the attitude of using e-learning will also be positive or negative. Therefore, if e-learning is not easy to use as a system, it may not be accepted and considered useless. In addition, TAM has been empirically tested and supported in predicting technology cognition and adoption in various situations, including e-learning (Teo, 2017).

TAM is used as a theoretical model in this study to investigate students' cognition of e-learning. In addition, TAM's predictive ability in previous studies can explain why e-learning will be widely used as a new learning model in the future (Teo, 2017).There have been some previous studies using TAM, including a survey on online learning. This study uses the

course website acceptance model (CWAM) and structural equation modeling technology of LISREL program to test the relationship between perceived usefulness, perceived ease of use and students' attitude towards use. The study concludes that usefulness and ease of use are good determinants of acceptance and use of E-sites as an effective and efficient learning technology (Selim, 2018). In another study, the researchers concluded that computer self-efficacy is the basis of perceived ease of use before and after hands-on use. They further concluded that only after experiencing the system directly, objective usability was found to be the determinant of ease of use (Park et al, 2019). Other researchers believe that e-learning self-efficacy indirectly affects students' learning intention through perceived ease of use (Grandon et al., 2015).

2.8.2 Ambiguity Model of Educational Management

The Ambiguity Model was proposed by Bush. It mainly emphasizes the instability and complexity of real life, as well as the uncertainty and unpredictability of things. The sudden outbreak of the COVID-19 pandemic disrupted the original development plan of everything. Especially for schools, all schools have to delay or suspend the opening of school. Therefore, e-learning has become the main learning method during this period. Due to the impact of the pandemic environment, the organizational objectives of each school are not clear, and teachers and students lack understanding of the e-learning process. Cohen and March (2014) study in American higher education institutions shows that the main characteristic of university is ambiguity , which refuses the rational decision-making introduced by formal model(Cohen and March,2014).Therefore, researchers believe that decision-making will be based on the problem,

program, participants and choice opportunities of these four relatively independent individuals together, and interact. The most suitable leadership model for managing this kind of Ambiguity Model is contingency model. This kind of leadership style mainly refers to making appropriate response to the specific situation by evaluating the specific situation, rather than applying one style to different situations(Akkaya ,2021).This model is especially suitable for the situation of the impact of the outbreak on students' learning. The management of online learning can not be completely carried out according to the traditional classroom learning mode. We should make corresponding analysis and changes according to the specific situation.

Chapter 3.Research Methodology

3.0 Overview

This chapter is explained comprehensively in 7separte sections, including research design,unit of analysis,sample design, measurement and measures,data collection and data analysis. Subsequently,the chapter will be summarised and conducted in the end.

3.1 Research design

The research design serves to outline the research and all the required methods in a direct ,comprehensible structured manner .All studies must choose an appropriate method for data collection and analysis. In addition, there must be a reasonable research design for further research.The

research methods include qualitative research and quantitative research. Quantitative research can quantify other forms of data into digital form, and can be analyzed by statistical methods. At the same time, quantitative analysis can also quantify opinions and variables to measure patterns and facts(Guion, 2019).The research method adopted in this paper is quantitative analysis. Quantitative analysis (QA) is a method to analyze the quantitative characteristics, quantitative relations and quantitative changes of social phenomena(Will,2020).In addition, quantitative analysis is a method to process and sort out the research results in a certain mathematical way. Its function is to reveal and describe the interaction and development trend of social phenomena. The typical methods of collecting quantitative research method data can be online survey, questionnaire survey,etc.(Gall,2017). This paper mainly uses the method of questionnaire survey to obtain the data needed for the research.

The propose of this study is to understand students' perceptions and expectations of online learning during the COVID-19 pandemic period.This paper uses quantitative analysis method for accurate data research. Based on the purpose of this study, the focus of this study is to determine the students' attitude towards online learning and future expectations by conducting a questionnaire survey on students and analyzing the useful data collected.

3.2 Research population

Research population refers to all the participants required by researcher to achieve research objectives, including participants, events and projects

(Sckaran,2016).This paper was completed in Shanxi Province, one of the provinces in Northeast China. The reason why researcher chose Shanxi Province is that when collecting relevant data, the researcher's hometown is Shanxi Province, and she knows many college students in Shanxi, which makes it easy for her to obtain the necessary permission to carry out the research and distribute the questionnaire to the students. The main research objects of this paper are 18-24-year-old college students, regardless of gender and major. These college students include from freshmen to seniors who are about to graduate. The research focuses on full-time college students, because part-time college students are engaged in paid work while completing their studies, so it is not easy to find them on campus.Because they are the group that directly accept online learning during the pandemic period and are deeply affected by online learning, their feelings and expectations for online learning are very important for the future development of online learning.

3.3 Unit of analysis

Analysis unit is a hierarchical classification of data collected in the process of data analysis, which can be divided into individuals, groups, organizations or cultures (Sekaran,2016). In this study, the analysis unit is the group. Because the purpose of this study is to determine college students' cognition and expectation of online learning during the pandemic period. The subjects selected in this study are college students from different universities in Shanxi Province, including Shanxi University, Taiyuan University of technology, Shanxi University of Finance and economics and so on. All these meet the constraints and ensure the effectiveness of the study.

3.4 Sampling plan

Due to the lack of resources and equipment, the selection of a part of the population as the representative of the whole population is sampling . A good sampling design is important because it can detect and then select enough correct elements from a suitable target group (Sekaran,2016).It is necessary to select sample data because there is no time and resources to analyze the whole target group.

Sampling methods are divided into two categories: probable and non probable.Probability sampling means that each group member in the sample is selected with the same probability, while non probability sampling means that the members in the sample are predetermined and non random(Taherdoost,2016). Because of the large number of target groups, in order to ensure the rationality of the results, random sampling will be used in this study. The determination of sample size is through a widely accepted method: the tables of Krejcle and Morgan(2017), which lists the sample size of a given population size. Considering that there are about 100000 college students in Shanxi Province, the recommended sample size is about 300 according to the table. The sampling will be conducted in various universities in Shanxi Province.

3.5 Questionnaire Preparation

3.5.1Questionnaire Design

The beginning of the questionnaire is an introductory part, which

provides information about the subject being studied, as well as some descriptions of the respondents who filled in the questionnaire. There are 20 questions in the questionnaire and they are divided into five parts. The first part is about the personal information and background information of the respondents, including the gender, age group, grade, whether they are full-time students, etc. The last personal information problem is about the professional courses they study. There are five categories of learning atmosphere. The first category is related courses of information technology major, including statistics, mathematics, information technology, computer science, etc. The second is engineering, including electrical and electronic engineering, agricultural engineering, mechanical engineering, civil engineering and so on. The third is business major, including accounting, secretary and management, supply chain management, marketing management, etc. The fourth category is the major of art and design, including the major of fashion, art, journalist and so on. The fifth category is education major, including pedagogy, educational psychology, educational management, curriculum management, etc.

The remaining four parts of the questionnaire are based on the research questions and the conceptual framework. They include: IVs:Students' perceived usefulness of e-learning, students' perceived ease of use of e-learning, students' attitude towards the use of e-learning,and DV: E-learning sustainability . The last part of the questionnaire is to thank all the respondents for their participation.

A summary on the questions for each variable in generation the questionnaire.

Section	Description	statements	Scale Type	Source
A	Personal Information	1.Gender: a. Male b. Female 2.Age group a. 18-20 b. 21-23 c.24-26 3. Grade? a.freshman b.sophomore c.junior d.senior 4. Which of the following applies to you? a. On study leave b. Full time student c. Part-time student 5.Your major: a. IT (IT, Computer Science, Statistic and Math) b. Engineering (Agricultural , Mechanical,Civil,Electrical/Electronics) c.Business(Accounting, Finance, Business Administration, Marketing) d. Art & Design (Fashion, Industrial Art,Journalism) e.Education(Educational Management,pedagogy, Curriculum and Teaching Theory) 6.Do you have a personal computer a. Yes b. No 7.During the COVID-19 pandemic, how long do you study by the computer every day? a. Less than 1hour b. 1-2hours c. 4-6 d. more than 6 hours	Statement 1,3,4,5,6, and7:nominal scale Statement 2:ratio scale	Not applicable
B	Perceived	8.In your opinion, what do you	Nominal	Fredrik

	Usefulness of E-Learning	think best describes 'e-learning'? Choose as many that applies. a.Learning on your own at your own pace b. Watching the course recording c. Having live lectures over the internet d.Doing activities online. e.Writing and submitting assignments online f.Communicating with instructors online 9. Which of the following statements do you agree with? Choose as many that applies. a. Studying through e-learning mode provides the flexibility to study at the time convenient to the learner. b. E-learning can enable people to study, irrespective of where they are located in the world. c. There are technologies available to enable student to take tests and submit assignments electronically. d. There are electronic tools available to enable interactive communication between instructor and student . e. There can be interactive communication among students when participating in e-learning. 10. Do you believe in the effectiveness of live lectures over the internet, as is done in the classroom? a. Yes b. No 11. Asking questions and getting immediate feedback	scale	Sandberg (2016)

		when studying online is just as effective as studying face to face in the classroom? a. Yes b. No 12. Which of the following statements applies to you? choose as many that applies. a. I don't foresee any usefulness of e-learning. b. Studying through e-learning mode can increase my learning effectively, as I will have easy access to learning materials (e.g. reading documents and recorded videos) c.E-learning can improve my course performance as I will not need to travel to campus, but study at the comfort of my home. d. Using e-learning system can enable me to accomplish tasks more quickly, since I will move at my own pace.		
C	Perceived Ease of Use of E-Learning	13. For each of the following statements, please thick the extent to which you disagree or agree i.I believe e-learning platforms are user friendly. ii. It would be easy for me to find necessary information when using an e-learning platforms. 14. Please indicate to what extent you can easily handle each of the following uses of e-learning platforms: i. Attach files to learning platforms: ii. Chatting with friends and instructors	Liken scale(1= strongly disagree, 2=disagree, 3=agree, 4=strongly agree)	Fredrik Sandberg (2016)

		iii. Downloading documents: iv. Posting messages:		
D	Attitude Toward Using E-Learning	15. Please indicate whether you agree or disagree with the following statements: i. I like the idea of e-learning. ii.I think e-learning is an innovative concept and must be encouraged. iii.I think e-learning platform is fun to use iiii.I think e-learning will be the new way of learning in the future 16. Which of the following influences about e-learning applies to you during the COVID-19 pandemic? i. E-learning allowed learning to continue. a. True b. Untrue ii. I did not have problems using e-learning for studies. a. True b. Untrue iii. Studying online was a good experience for me. a. True b. Untrue iiii. My lecturers encouraged us to study online during the pandemic. a. True b. Untrue 17. For each of the following statements, please indicate to what level you agree or disagree to them: i. I don't believe e-learning is suitable for courses that need practical demonstrations. ii. I am afraid employers will not give the same preference to e-learning graduates, as they will give to people who have conventional classroom	Statement 15and 17:Liken scale(1= strongly disagree, 2=disagree, 3=agree, 4=strongly agree) Statement 16and 18:nominal scale	Fredrik Sandberg (2016)

		learning. iii.I think the learning efficiency of online learning is much lower than that of traditional classroom learning. 18.In your opinion, what do you think about the tuition cost of e-learning? a. E-learning is more costly than classroom learning. b. Both e-learning and classroom learning have the same cost. c. Classroom learning is more expensive than e-learning.		
E	E-learning sustainability	19. I think e-learning will be widely used in the future. 20. Among the following choices, please indicate which one you prefer (please choose only one): a) I prefer fully-online learning to face-to-face b) I like a combination of online learning and face-to face learning (hybrid learning) c) I am comfortable with the fully face-to-face than online learning.	Statement 19:Liken scale(1= strongly disagree, 2=disagree,3=agree, 4=strongly agree) Statement 20:nominal scale	Fredrik Sandberg (2016)

3.5.2 Pilot test

The questionnaire is mainly aimed at Chinese college students, so it is necessary to translate the questionnaire into Chinese form. The Chinese and English versions of the questionnaire were verified by Ms Ng Wen Lee , who is the lecturer of English at the Center of Liberal Arts and Languages, INTI International University. - Ms Ng is bilingual land can is competent is both English and Chinese (Mandarin) .She went through the questionnaire and verified the Chinese translation. She gave some input and changes were done by the researcher accordingly to the translated version. In addition, the first draft of the questionnaire was tested by three randomly selected students. The purpose of the test is to determine whether the respondents are easy to understand the questions in the questionnaire and whether it is necessary to modify the format of the questionnaire. The test results show that the respondents are difficult to judge the options of some multiple-choice questions. For example, the answer options for some questions are: strongly agree, agree, disagree and strongly disagree. However, respondents felt that some of the choices were not satisfactory in choosing their point of view. To solve this problem, the researcher added “undecided”,which is more intuitive and allows the respondents to choose. Other questions in the questionnaire have also been adjusted to allow room for respondents who have not yet determined that they want to express their views clearly. Other questions in the test have been included in the final version of the questionnaire. For example, the question of whether to use e-learning to simulate practice and respondents' views on e-learning related costs were added. In addition, it must be clear that e-learning contains different definitions, types and forms. The word "E-Learning" used in the questionnaire and papers does not refer to a specific type or form of e-learning, but refers to any type or form of

e-learning.

Improved Questionnaire

Section	Description	statements	Scale Type	Source	Why
A	Personal Information	1. Gender: （性别） a. Male （男性） b. Female（女性） 2.Age group（年龄组） a. 18-20 b. 21-23 c.24-26 3. year（年级） a. freshman （大一） b. sophomore（大二） c.junior（大三） d.senior（大四） 4. Which of the following applies to you? （以下哪一项适合于您？） a. Full time student （全日制学生） b. Part-time student（非全日制学生） 5.Your major: （您的专业是） a. IT (Information Technology,Computer Science, Statistic and Math) （信息技术专业,信息技术,计算机科学，统计学和数学） b. Engineering (Agricultural , Mechanical, Civil engineering, Electrical/Electronics)（工程专业：农业，机械，土木，电气\电子） c. Business (Accounting, Finance, Business Administration, Marketing) （商务专业：会计，金融，工商管理，市场营销）	Statement 1,3,4,5, 6, and7:nominal scale Statement 2:ratio scale	Not applicable	Add Chinese (feedback from Ms Ng)

		d. Art & Design (Fashion, Industrial Art,Journalism) (艺术与设计专业：时尚，工业艺术，新闻） e．Education(Educational Management, pedagogy, Curriculum and Teaching Theory)（教育专业：教育管理学，教育学，课程与教学论） 6.Do you have a personal computer （您有个人电脑吗？） a. Yes （有） b. No （没有） 7..During the COVID-19 pandemic, how long do you study by the computer every day?（在疫情期间，您每天用电脑学习多长时间？） a. Less than 1hour（低于 1 小时） b. 1-3hours（1-3 小时） c. 4-6 hours （ 4-6 小时 ） d. more than 6 hours（多于 6 小时）			
B	Perceived Usefulness of E-Learning	8. In your opinion, what do you think best describes ‘e-learning’? Choose as many that applies. (在您看来，以下哪几项最能描述在线学习?选择所有您认为合适的选项。） a. Learning on your own at your own pace （以适合自己的速度自学） b. Watching the course recording（观看教学视频回放） c. Having live lectures over the internet（通过互联网上直播课） d.Doing activities online.（参与线上课堂活动） e.Writing and submitting assignments online（在线写和提交作业） f.Communicating with	Nominal scale	Fredrik Sandberg (2016)	

		instructors online（在线与讲师交流） 10. Which of the following statements do you agree with? Choose as many that applies.(你同意以下哪种说法？选择所有您认为合适的选项。） a. Studying through e-learning mode provides the flexibility to study at the time convenient to the learner. （在线学习给学生提供了学习时间上灵活性） b. E-learning can enable people to study, irrespective of where they are located in the world. （在线学习可以在任何地方进行） c. There are technologies available to enable student to take tests and submit assignments electronically.（学生可以通过在线的方式参加考试和提交作业） d. There are electronic tools available to enable interactive communication between instructor and student .（教师和学生可以使用电子工具进行互动交流） e. There can be interactive communication among students when participating in e-learning.(学生可在线上课堂进行互动交流） 11. Do you believe in the effectiveness of live lectures over the internet, as is done in the classroom? 您认为上在线直播课的有效性跟在学习课堂上课一样吗？ a. Yes （是的） b. No(不是）			

		12. Asking questions and getting immediate feedback when studying online is just as effective as studying face to face in the classroom?（在学校课堂上面授学习时，学生可提出问题并获得即时的反馈。在线上学习时，学生也能提出问题并获得即时的反馈嘛？） a. Yes b. No 13. Which of the following statements applies to you? choose as many that applies.（以下哪项适合您？选择所有您认为合适的选项。） a. I don't foresee any usefulness of e-learning. (我认为在线学习没有什么用。） b. Studying through e-learning mode can increase my learning effectively, as I will have easy access to reference materials and lecture videos)（通过在线学习模式可以有效地提高我的学习效率，因为我可以很容易地获得参考资料和教学视频） c.E-learning can improve my course performance as I will not need to travel to campus, but study at the comfort of my home.(在线学习可以提高我的学习程成绩，因为我不需要去学校，而是在家里舒适的学习） d. Using e-learning system can enable me to accomplish tasks more quickly, since I will move at my own pace.（使用在线学习系统可以让我更快地完成学习任务，因为我可以按照适合自己的速度学习）			
C	Perceived Ease of	14. For each of the following statements, please thick the	Liken	Fredrik	Add

	Use of E-Learning	extent to which you disagree or agree: （对于下列各项陈述，请指出您对该项陈述的认同程度） i. I believe e-learning platforms are user friendly.（我相信在线学习平台是方便使用的） ii. It would be easy for me to find necessary information when using an e-learning platforms. 在使用在线学习平台时，我很容易找到我需要的资料。 15. Please indicate to what extent you can easily handle each of the following uses of e-learning platforms:（请说明您在在线学习平台上完成以下每项学习任务的 难易程度：） i. Attach files to learning platforms:（将文件附加到在线学习平台） ii. Chatting with friends and instructors : （与同学和老师交流） iii. Downloading documents:（下载文件） iv. Posting messages: （留言）	scale(1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree) (1=Very difficult 2=Difficult 3=Undecided 4=Easy 5=Very easy	Sandberg (2016)	“undecided” (feedback from students, because they are difficult to judge the options)
D	Attitude Toward Using E-Learning	15. Please indicate whether you agree or disagree with the following statements: (对于下列各项陈述，请选出您对该项陈述的认同程度） a) I like the idea of e-learning.（我喜欢在线学习这一想法。） b) I think e-learning should be implemented in university. （我认为大学应该实施在线学习）	Statement 15and 17:Liken scale(1=strongly disagree,	Fredrik Sandberg (2016)	Add “undecided” (feedback from students,becau

		c) I think e-learning platform is fun to use. （我认为在线学习平台使用起来很有趣） d) I think e-learning will be the new way of learning in the future（我认为在线学习是未来的学习方式） 16. Which of the following influences about e-learning applies to you during the COVID-19 pandemic? （在疫情期间，下列关于在线学习的影响说法中，哪些符合您的情况？） a) E-learning allowed learning to continue. （在线学习使学生可以继续学习） a. True（对） b. Untrue （错） b) I did not have problems using e-learning for studies.（我在线学习时没有遇到任何问题） a. True b. Untrue c) Studying online was a good experience for me. （在疫情期间，我有一个很好的在线学习体验） a. True b. Untrue d) My lecturers encouraged us to study online during the pandemic.（我的老师鼓励我们在疫情期间上网学习） a. True b. Untrue 17. For each of the following statements, please indicate to what level you agree or disagree to them: （对于以下各项陈述，请指出您对该项陈述的认同程度） a) I don't believe e-learning is suitable for courses that need practical demonstrations.（我认为在线学习不适合需要体验式学习的课程） b) I am afraid employers will	2=disagree, 3=undecided, 4=agree, 5=strongly agree) Statement 16and 18:nominal scale		se they are difficult to judge the options)

		not give the same preference to e-learning graduates, as they will give to people who have conventional classroom learning.（我认为雇主更愿意雇用获得传统学位的毕业生，而不是获得在线学位的毕业生。） c)I think the learning efficiency of online learning is much lower than that of traditional classroom learning.（我认为在线学习的效率低于传统课堂学习的效率） 18.In your opinion, what do you think about the tuition cost of e-learning?（在您看来，在线学习的费用如何？） a. E-learning is more costly than classroom learning.（在线学习的费用高于传统课堂学习） b. Both e-learning and classroom learning have the same cost.（在线学习的费用与传统课堂学习相同） c. Classroom learning is more expensive than e-learning.（传统课堂学习的费用高于在线学习）			
E	E-learning sustainability	19. I think e-learning will be widely used in the future.（我认为在线学习在未来会被广泛应用） 20. Among the following choices, please indicate which one you prefer (please choose only one):（以下哪项陈述最能描述您的情况，只能选择一项） a) I prefer fully-online learning to face-to-face（与面授学习相比，我更喜欢全面的在线学习在线学习） b) I like a combination of online learning and face-to face	Statement 19:Liken scale(1=strongly disagree, 2=disagree,3=undecided,	Fredrik Sandberg (2016)	Add “undecided” (feedback from students,because they are difficult

		learning (hybrid learning)（我喜欢混合学习，即在线学习和面授歇息相结合的学习方式） c) I am comfortable with the fully face-to-face than online learning.（与全面的在线学习相比，我更喜欢面授学习）	4=agree, 5=strongly agree) Statement 20:nominal scale		to judge the options)

3.5.3 Reliability, Descriptive analysis,Pearson correlation analysis and Generalizability test

Reliability refers to the extent to which this method can be relied on to produce the same results if it is used repeatedly (Saunders.,2019). In order to achieve the reliability of the questionnaire, the structure of the questionnaire is very clear, avoiding guiding the investigators to choose inconsistent options. In addition, bias is an important threat to reliability. Therefore, in order to ensure the objectivity of the questionnaire, all the students participating in the questionnaire are anonymous.

Descriptive analysis is a type of data analysis, which describes, displays and summarizes the data in a constructive way, so as to form a model in line with various conditions of the data.Descriptive analysis is one of the important steps of data analysis. It can provide relevant conclusions of data distribution, and help detect data input errors and outliers, so that researchers can identify the relationship between variables, so as to provide convenience for further statistical analysis(Rawat,2020).

Pearson correlation coefficient is a test method to measure the statistical relationship or correlation between two continuous variables. Because it needs a covariance based method, it is considered to be the best method to measure the relationship between variables of interest to researchers. It provides information about the degree or correlation between variables and the direction of their relationship. This is very favorable for the following variable analysis(Rawat,2020).

Generalizability refers to the inductive method applied by researchers in the academic environment. It can be defined as an extension of research results and conclusions, from a study conducted in a sample population to the whole population (Saunders,2019). Although the reliability of this expansion is not absolute, it is statistically possible. Because the generalizability of research needs a large number of population data, quantitative research provides the best basis for generalized generalization. The larger the sample data, the more generalizable the results are. Since this study is conducted in various universities in Shanxi Province of China, and the subjects of the survey are college students, the results of this study are not suitable to be summarized as the representative of the whole Chinese students. This is because these students only include college students, not non college students and part-time college students.

3.6 Data Collection and Analysis

Questionnaire is mainly used for data collection, because most people think it is the best way to ensure that researchers can collect the opinions of other investigators as comprehensively as possible within the specified time. A total of 350 questionnaires were sent out and 86%, and the time of questionnaire distribution and collection was about four weeks.The questionnaire was distributed to the students of Shanxi Universities randomly through the “Wen Juan Xing” which is an app made in China. In

this way, the safety of students can be ensured during the pandemic period, and the time for students to participate in learning can also be provided.

Due to the wide scope of the survey, the distribution of the questionnaire and the collection of data are random sampling. Random sampling is a kind of sampling technology, which is one of the most convenient and simple ways to collect data from the total population. In random sampling, the probability of each sample being selected is equal. The random samples are unbiased representatives of the total population. However, if the sample is not representative of the population, this is called sampling error(Taherdoost,2016).

The data are analyzed and interpreted by SPSS. After the SPSS installed on the laptop is formatted, the questionnaire is entered into the database one by one. Each questionnaire used in the analysis was assigned a unique reference number, corresponding to the row number of the SPSS data table. This will make it easy to track the questionnaire throughout the analysis and further validate it if necessary. In order to ensure the accuracy of the data, after all the questionnaires are input, the researchers will randomly select the questionnaires and cross check with the corresponding data to correct the errors. After data input, descriptive statistics are generated, presented and discussed. After the analysis of each question on the questionnaire, and further explore these problems, in order to solve the various problems studied. This analysis is guided by four basic factors. The theory used in this study is the theme under TAM, which mainly includes: perceived usefulness, perceived ease of use, attitude to use, and final intention to use.

3.7 Conclusion

This chapter describes the research methods in detail, and selects the questionnaire survey as the data collection method. All the questions answered by the respondents will get accurate research results. Through the analysis of the data and information collected from the survey, the researchers get the corresponding research results and purposes. The results will be discussed in Chapter 4.

Chapter 4 Research Finding

4.0 Overview

This chapter analyzes the results of the questionnaire. The researcher distributed a total of 350 questionnaires, of which 300 were returned. There are 20 questions in the questionnaire, which is divided into five parts: Personal information; Perceived usefulness of e-learning; Ease of use of e-learning; Attitude towards using e-learning and Intention of using e-learning.

4.1Findings

4.1.1Reliability test

Variable	Cronbach's Alpha	N of Items
Perceived Usefulness of E-learning	0.701	8
Ease of E-learning	0.878	2

Attitude of Using E-learning	0.949	4
Overall	0.842	14

Table 1 Reliability statistics

Reliability testing is an important step to check internal consistency and as well as the attributes of the measurement scale. In this study, Cronbach Alpha is used as the measure of reliability. The above table gives the Cronbach Alpha values for each variable. The data here is output through SPSS.

If the reliability value of Cronbachα is between±0.41 and±0.70, it indicates that the item meets the medium reliability of the measurement scale, while a value greater than±0.70 indicates high internal consistency. As shown in the table above, the value of Cronbach's α is higher than 0.80, so it has good internal consistency for further analysis.

4.1.2Descriptive analysis

Option	Subtotal	Proportion
Male	128	42.67%
Female	172	57.33%
Number of people filled in effectively	300	

Table 2 Demographic Data of 300 Respondents

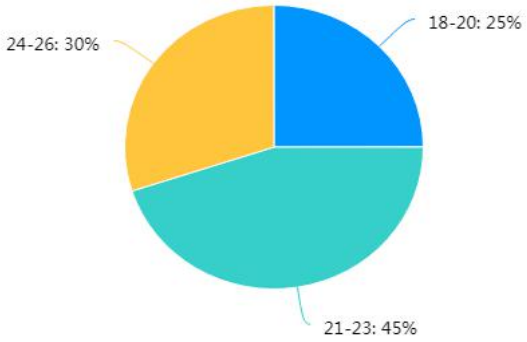


Figure 1 Age of Respondents

The respondents included 42.67% male and 57.33% female. Among them, 25% of the respondents belong to the 18-20 age group, 45% are 21-23 years old and 30% are 24-26 years old. These age groups are completely in line with the age range of college students.

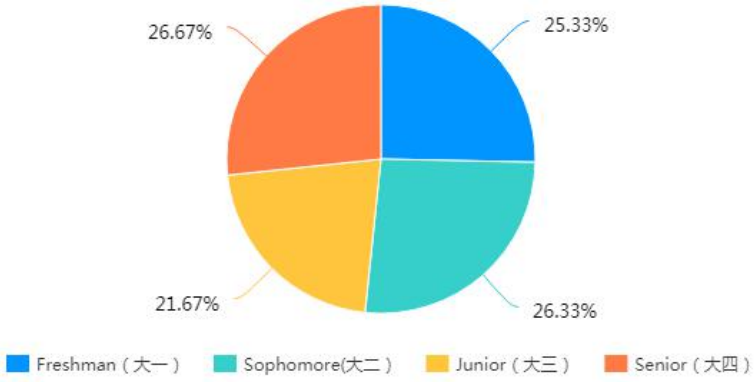


Figure 2 Year of Respondents

At the same time, the respondents are reasonably distributed in different grades: Freshman 25.33%, sophomore 26.33%, junior 21.67%, senior 26.67%. At the same time, 96% of the students are full-time students. These data can basically represent the student level of various universities

in Shanxi.

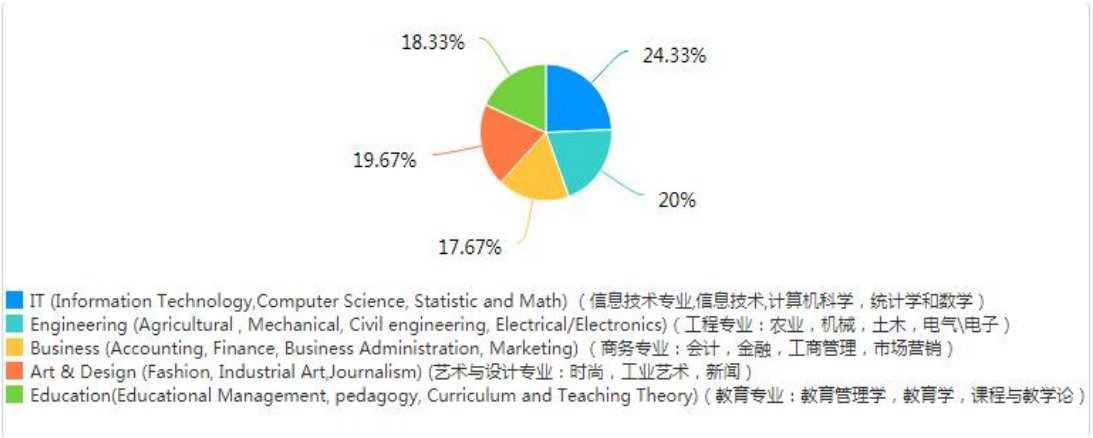


Figure 3 Major of Respondents

The majors of the respondents are widely distributed. Among them, information technology major accounts for 24.33%, engineering major accounts for 20%, business major accounts for 17.67%, art design major accounts for 19.67%, and education major accounts for 18.33%. Therefore, in this paper, the views from different student groups are fair.

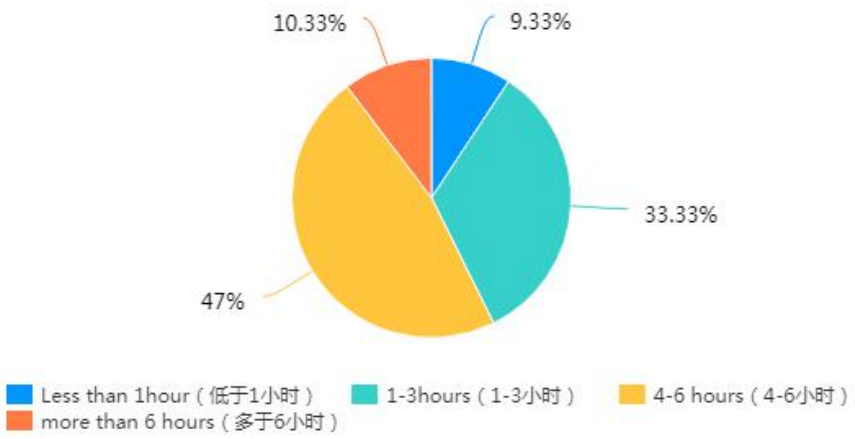


Figure 4 Time to Study with Computer

The survey also shows that almost all respondents have personal computers, and only 4% don't have. In addition, 47% of the respondents use computers to study for 4-6 hours a day, 33.33% use computers to study for 1-3 hours, and 10% use computers for more than 6 hours. 33%, accounting for 9.33% less than an hour. It can be concluded that almost all college students have experience in using computers.

4.1.3Pearson correlation analysis

In order to explore what extent the dependent variable(DV)of this study is related to the independent variables(IVs) as stated in the following research hypotheses,correlation analysis is used.

Hypothesis 1(H1)- There is a significant relationship between perceived usefulness of e-learning and sustainability of e-learning in universities in Shanxi province,China

Hypothesis 2(H2)- There is a significant relationship between ease of use e-learning and sustainability of e-learning in universities in Shanxi province,China

Hypothesis 3(H3)- There is a significant relationship between students' attitude and sustainability of e-learning in universities in Shanxi province,China

perceived usefulness of e-learning	Pearson Correlation	.892**
	Sig. (2-tailed)	.000
ease of use e-learning	Pearson Correlation	.754**
	Sig. (2-tailed)	.000
students' attitude	Pearson Correlation	.749**
	Sig. (2-tailed)	.000

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 Pearson's Correlaton for Students'Perception

A correlation coefficient greater than 0.8 indicates a high correlation, a moderate correlation between 0.5 and 0.8, a low correlation between 0.3 and 0.5, and less than 0.3 indicates no correlation.Based on the correlation results (as shown in above table),it is revealed that the correlation coefficient between the IVs including “perceived usefulness of e-learning”, “ease of use e-learning” and “students’ attitude”and the DV “ sustainability of e-learning” are 0.892,0.754,and 0.749 respectively.In addition ,the p-value is smaller than 0.05(where Sig. value=0.000).It shows that there is a linear relationship between these variables.

This signifies that there is a significant relationship between “perceived usefulness of e-learning”, “ease of use e-learning” , “students’ attitude”and “ sustainability of e-learning” and hence,it can be said that the research hypotheses of H1,H2 and H3 is tenable ,and there is a strong relationship between each pull factor and the sustainability of e-learning in universities in Shanxi Province,China.

4.2 Discussion

4.2.1Perceived Usefulness of E-Learning

4.2.1.1 Understanding of E-Learning

Option		Gender		Total
		Male	Female	
Learning on your own at your own pace	Unselected	29.17%	34.62%	32.00%
	Selected	70.83%	65.38%	68.00%
Total		24	26	50
Watching the course recording	Unselected	45.83%	50.00%	48.00%
	Selected	54.17%	50.00%	52.00%
Total		24	26	50
Having live lectures over the internet	Unselected	54.17%	57.69%	56.00%
	Selected	45.83%	42.31%	44.00%
Total		24	26	50
Doing activities online	Unselected	62.50%	61.54%	62.00%
	Selected	37.50%	38.46%	38.00%
Total		24	26	50
Writing and submitting assignments online	Unselected	66.67%	57.69%	62.00%
	Selected	33.33%	42.31%	38.00%
Total		24	26	50
Communicating with instructors online	Unselected	70.83%	50.00%	60.00%
	Selected	29.17%	50.00%	40.00%
Total		24	26	50

Table 4 Definition of E-learning

In order to understand the respondents' understanding of e-learning, some common features in relevant definitions, forms and types of e-learning are provided for them to choose.The results show that 44% of the respondents believe that e-learning is a live class on the Internet. In addition, 52% of people believe that they can watch the playback of teaching videos through e-learning. This is richer than the early understanding of e-learning, which is only online learning.

As can be seen from the table 4, 68% of the respondents believe that e-learning can be learned at their own pace. This is achieved through asynchronous tools, and it is also one of the characteristics of full online

learning. However, 38% of respondents believe that e-learning can enable students to participate in online classroom activities, 38% of students believe that e-learning can write and submit homework online, and 40% of students believe that e-learning can communicate with teachers in real time. These are realized through synchronization tools. In addition, these people also believe that e-learning is a combination of synchronous learning and asynchronous learning.

As shown in the table 4, 52% of respondents also believe that e-learning should be enhanced through multimedia, because they believe that e-learning should include watching pre-recorded videos. This result can be compared with three types of e-learning (fully online, network assisted and hybrid learning), because they all use multimedia tools to assist and strengthen teaching.According to the above data, when referring to the word "E-Learning", almost all respondents have their own understanding and opinions, but these are inseparable from the characteristics of e-learning.

4.2.1.2 Features of e-learning

Features of e-learning	Agree
Studying through e-learning mode provides the flexibility to study at the time convenient to the learner.	67%
E-learning can enable people to study, irrespective of where they are located in the world.	74.33%
There are technologies available to enable student to take tests and submit assignments electronically.	66%
There are electronic tools available to enable interactive	52%

communication between instructor and student .	
There can be interactive communication among students when participating in e-learning.	46.67%

Table 5 Features of E-learning

The feature of e-learning are shown in the table5. Among them, 67% of the respondents believe that the e-learning platform provides students with flexibility in learning time, and 74.33% of the respondents believe that e-learning can be carried out anywhere. In addition, it can be seen that 66% of the respondents agree that the e-learning platform can manage students' exams and homework online, and 55% of the respondents believe that e-learning provides the possibility for the interaction between teachers and students. Finally, 46.67% of the respondents agreed that students could interact in e-learning.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.251[a]	2	0.027
Likelihood Ratio	7.337	2	0.026
N of Valid Cases	300		

a.0 cells (.0%) have expected count less than5. The minimum expected count is 42.92.

Table 6Gender and View on Interaction Among Students - Chi-Square Tests

In order to understand male's and female's views on the possibility of students' interaction in e-learning, the researcher compared them through Chi-Square Tests, as shown in the table 6. The chi square test results in the above table show that there is a significant correlation between gender and

students' e-learning ideas to achieve interaction, χ 2（2，N=300）=7.251，p=0.027 。 This view shows that although a high proportion of female respondents (38.46%) believe in the possibility of interaction between students, on the other hand, male respondents (37.50%) also believe that e-learning can meet the interaction between students.

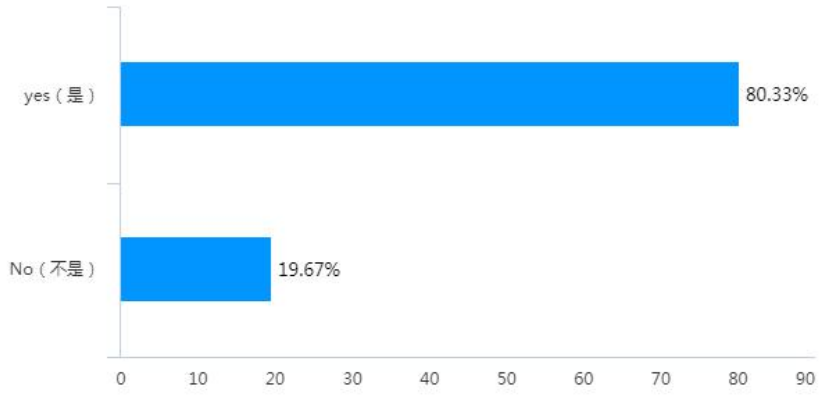


Figure 5 Effectiveness of E-learning

As for the effectiveness of online live classes through e-learning, 80% of the respondents think it can be basically consistent with the effectiveness in traditional classes, while 20% of the respondents think it is different.

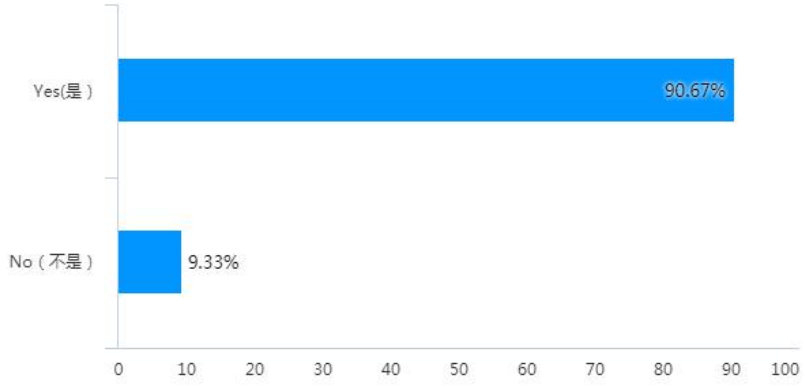


Figure 6 Timely Feedback from Teachers in E-learning

On the other hand, 90% of the respondents believe that students can receive timely feedback from teachers when conducting e-learning, just like traditional classroom learning, but 10% of the respondents are skeptical.

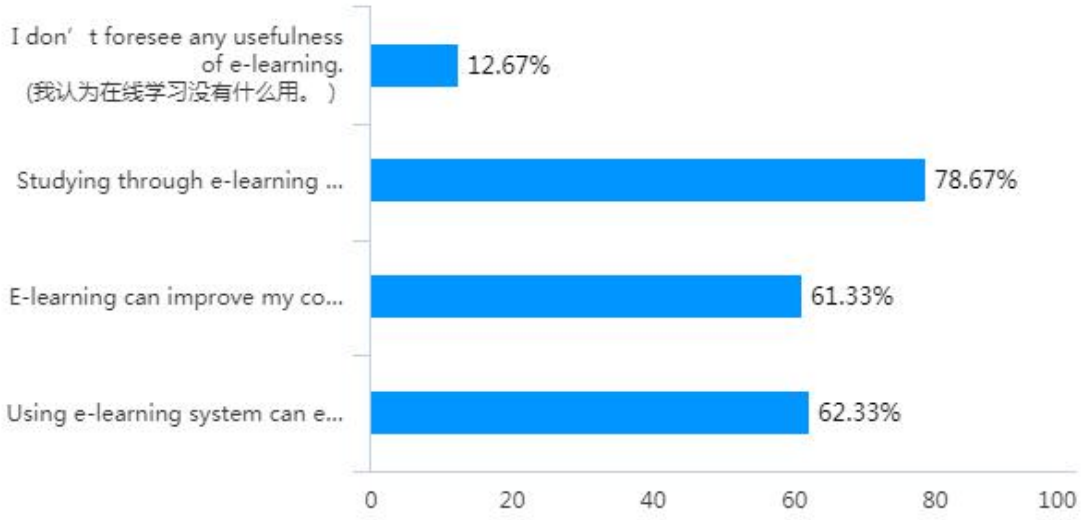


Figure 7 Usefulness of E-learning

The response to the usefulness of e-learning shows that only 12% of respondents believe that e-learning is not useful for their learning, and nearly 88% of respondents disagree with this view. In addition, respondents specifically described the "usefulness" of e-learning, which is mainly reflected in: 1. E-learning can improve learning efficiency and easy access to reference materials (79%); 2. E-learning can improve academic performance (61%); 3. E-learning helps to complete learning tasks faster and learn at your own speed (62%).

4.2.2 Perceived Ease of Use of E-Learning

Easy Usage of E-Learnin	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Total

g Platform						
User friendly	6%	3%	8%	59%	24%	100 %
Easy for me to find necessary informatio n	3%	5%	10%	58%	24%	100 %
Average	4.5%	4%	9%	58.5 %	24%	100%

Table 7 Ease of Use E-learning

The ease of use of e-learning is shown in the table 7. 59% of the respondents believe that the e-learning platform is easy to use. Secondly, 8% of the respondents are hesitant about the ease of use of e-learning. In addition, 24% of respondents strongly agree that the e-learning platform is easy to use. However, 3% do not think e-learning platform is easy to use, and 6% strongly oppose it.

Level of Easy Using IT	Very easily	Easily	Undecided	Difficult but Will try	Very difficult	Total
Attach files	22%	59%	12%	4%	3%	100%
Chatting	22%	62%	9%	6%	1%	100%
Downloading documents	24%	63%	7%	3%	3%	100%
Posting messages	24%	62%	9%	3%	2%	100%
Average	23%	61.5%	9%	4%	3%	100%

Table 8 Level of Easy Using IT

As for the difficulty of operating the e-learning platform, on average, 61.5% of the respondents think that the e-learning platform is easy to

operate, and they are willing to use it to complete various activities. At the same time, 23% of respondents said that e-learning platform is very easy for them to use. In addition, 9% of people have no decision on their IT skill level.However, the data also shows that 4% of respondents believe that although it is difficult for them, they are willing to try. The remaining 3% said they would not use these functions at all, which is very difficult for them.

4.2.3Attitude Towards E-Learning

Opinion of E-Learning	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Total
like the idea of e-learning	2%	7%	9%	60%	22%	100%
e-learning should be implemented in university.	2%	4%	12%	61%	21%	100%
e-learning platform is fun to use.	2%	7%	10%	60%	21%	100%
e-learning will be the new way of learning in the future.	3%	3%	11%	61%	22%	100%
Average	3%	5%	11%	60%	21%	100%

Table 9 Opinion of E-Learning

As for the respondents' views on e-learning, according to the data in the table 9, 60% like e-learning, 22% strongly like e-learning, 9% is undecided, 7% don't like e-learning. 61% believed that e-learning should be implemented in universities, 21% strongly agreed, 12% undecided and 4% disagreed.In addition, 60% of the respondents thought that using e-learning platform was very interesting, but 7% disagreed, while 10%

undecided.On the other hand, 79% of people think that e-learning is a new way in the future and should be encouraged, and 11% and 3% of people have not decided and disagree respectively.

4.2.3.1 Influence of External Factors on Attitude Formation Towards E-Learning

External factors on attitude formation	Positive view	Negative view	Total
E-learning allowed learning to continue.	92%	8%	100%
Have no problems using e-learning for studies.	69%	31%	100%
a good experience	89%	11%	100%
My lecturers encouraged us to study online	90%	10%	100%
Average	85%	15%	100%

Table 10 External Factors on Attitude Formation

TAM model indicates that external factors will also affect people's attitude towards e-learning. Therefore, some questions were raised to seek the impact of external factors on the respondents' attitude towards e-learning, including: e-learning is the continuation of learning, learners have no problem with the use of e-learning, a good e-learning experience and teachers' encouragement.

It can be seen from the table 10 that 92% of the respondents believe that

e-learning is the continuation of learning, and 69% believe that e-learning is easy to use, and they have no problems in operation. In addition, 89% of people have had a good e-learning experience, and 90% of people are encouraged by teachers to use e-learning. From these answers, it can be seen that most respondents have a positive external impact on e-learning.

In addition, as for the fact that e-learning is not suitable for courses with practical demonstration, the data are as follows: 48% agree with this view and 10% strongly agree; However, 11% have not yet decided; 18% disagreed and 13% strongly disagreed.

4.2.3.2 Opinion about Employers Acceptance of E-Learning Certificates

Gender	Afraid of employers' discrimination against e-learning			Total
	Agree	Undecided	Disagree	
Female	60 35%	17 10%	95 55%	172 100%
Male	37 29%	49 39%	42 32%	128 100%
Total	97 32%	66 22%	137 46%	300 100%

Table 11 Opinion about Employers Acceptance of E-Learning Certificates

Almost everyone is concerned about the certificate recognition of e-learning during simultaneous interpreting. It can be widely accepted by employers as well as traditional classroom learning. Therefore, the respondents were informed in this regard, and the data collection is shown in the table above. Among them, 46% thought that they would be recognized as traditional classroom learning, 22% remained neutral, and

32% thought that e-learning would be discriminated against.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	35.789[a]	2	.000
Likelihood Ratio	36.266	2	.000
Linear-by-Linear Association	16.226	1	.000
N of Valid Cases	300		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 28.16.

Table 12 Male and Female on the Recognition of E-Learning——Chi-Square Tests

It further analyzes the views of male and female on the recognition of e-learning.From the table 12, it can be seen that 55% of female think they will not be discriminated against, 10% remain neutral and 35% think they will be discriminated against. While 32% of male believed that they would not be discriminated against, 39% remained neutral and 29% believed that they would be discriminated against. After that, chi square test was used for further analysis, and the results showed that, χ2（2，N=300）=35.789，p=0.0001 。 Therefore, there is a statistically significant relationship between gender and fear of employer discrimination against e-learners.

4.2.3.3 Cost of E-Learning

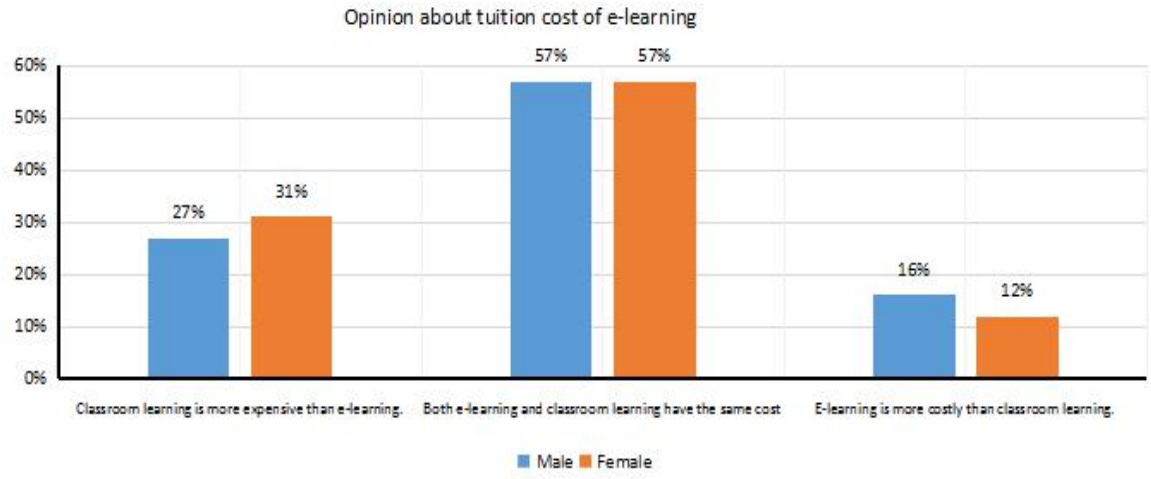


Figure 8 Cost of E-Learning

According to the graph 8, 57% of the respondents believe that the cost of e-learning is the same as that of classroom learning, 29% believe that the cost of classroom learning is higher than that of e-learning, and 14% believe that the cost of e-learning is higher than that of classroom learning. Further compare the views of male and female respondents to understand their views on e-learning and classroom learning costs, as shown in the figure above. Most male (57%) and female (57%) respondents agree that e-learning is consistent with the cost of classroom learning. Secondly, more men (16%) than women (12%) think that the cost of e-learning is higher than that of classroom learning. On the contrary, more women (31%) than men (27%) think that the cost of classroom learning is higher than that of e-learning.

4.2.4 E-learning sustainability

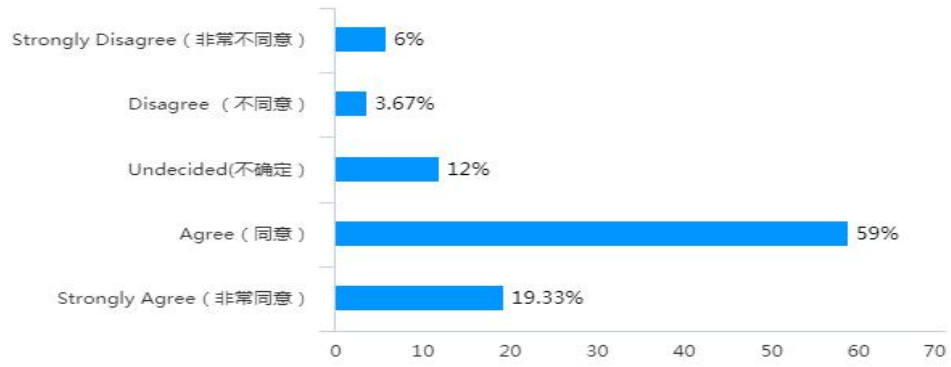


Figure 9 Respondents' Views on the Future Use of E-Learning

Researchers want to know whether respondents think e-learning will be widely used in the future. The data collected are shown in the figure above. 59% of the respondents believe that e-learning will be widely used in the future, and nearly 20% strongly agree with this view. 12% of the respondents were not sure whether e-learning would be widely used, almost 4% did not think e-learning would be widely used in the future, and 6% strongly opposed it.

Choice of learning modes	Responses
Fully e-learning	42%
Hybrid learning(e-learning&face-to-face)	43%
Fully face-to-face learning	15%
Total	100%

Table 13 Choice of E-Learning Modes

Table 13 shows the respondents' views on the preferred learning model in the future. 42% people like complete online learning; 43% of people like Hybrid learning mode, which is the combination of e-learning and face-to-face learning; Only 15% of people like the traditional face-to-face learning.

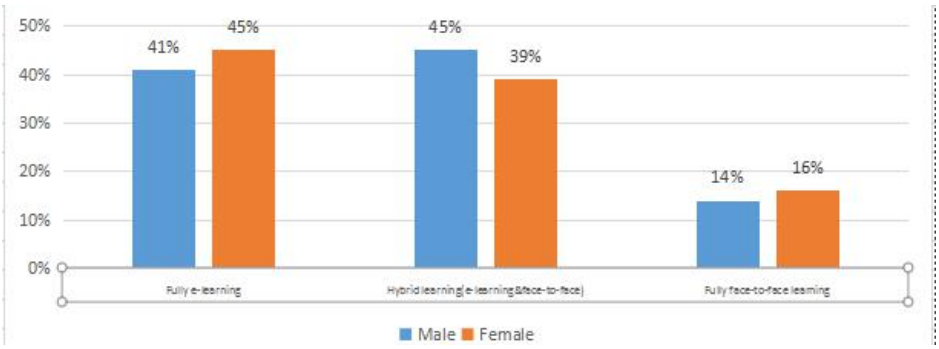


Figure 10 Male and Female 's Choice of E-Learning Modes

From the graph 10, male respondents (45%) prefer Hybrid learning mode, while female respondents (45%) prefer full e-learning. Although both male and female respondents agree that Hybrid learning mode is their preferred learning mode in the future, female respondents (16%) are higher than male respondents (14%)in terms of traditional face-to-face learning. However, this difference is not statistically significant.

Chapter 5 Conclusion and Recommendations

5.1 Conclusion

Since the end of 2019, the world has been affected by the pandemic. Especially for students, schools have to suspend classes or postpone the opening of school to prevent the spread of the pandemic. China's Ministry of Education decided to implement the strategy of "suspension of school without suspension" to deal with the crisis. For a time, China's online education platform has become a strong support for e-learning.

This paper aims to understand students' cognition of e-learning and

suggestions on e-learning management during the COVID-19 pandemic. This paper mainly takes college students in Shanxi Province of China as the research object, and uses technology acceptance model (TAM).Educational management modelis different to show the difference / change in the education setting as a result of Covid -19. The main research method is quantitative analysis, and the relevant data are collected through a questionnaire survey.The main finding of this paper is that e-learning is considered to be useful and will be widely used in the future. In addition, the management model of e-learning should be changed accordingly from college mode to Ambiguity Model.

5.1.1Perceived Usefulness of E-Learning

The perceived usefulness of e-learning includes many aspects.First,people's cognition of e-learning has changed. It is not limited to online learning, but also includes learning anytime, anywhere, at your own speed, taking live classes, watching video playback, etc. These are impossible in traditional face-to-face learning.Second, most students believe that the efficiency of e-learning is the same as that of traditional classroom learning. Students believe that e-learning provides students with flexibility in learning time, and can also be carried out anywhere(Mlekus et al.,2020). In addition, students can submit their homework online and even take exams. E-learning can also enable students and teachers, students and students to interact and communicate.Moreover, teachers can also give timely feedback to students' problems through electronic tools.Third,the study learned that almost all students think e-learning is very useful, especially during the pandemic. Students believe that e-learning model can effectively improve learning efficiency, because

students can easily obtain more reference materials and knowledge than classroom learning(Mlekus et al,2020).E-learning can also improve learning comfort, because students do not need to go to school for education, but can study freely at home. At the same time, e-learning system can enable students to complete their learning tasks faster, because students can learn in a rhythm and way suitable for themselves.

5.1.2 Ease of Use of E-Learning

This study also found that students generally believe that e-learning platforms and tools are easy to use. Almost all students have the ability to use various online tools and technologies to complete a series of operations, including attaching files, communicating with teachers and students, downloading, leaving messages and so on. Moreover, they can easily find the information they need(Raheem.,2020).Because they have been taught about computer use since primary school, they have a good technical background and can adapt to the use of computer and network technology during the COVID-19 pandemic.

5.1.3 Attitude Towards E-Learning

In this study, people hold different attitudes towards e-learning. Most students like the new learning mode of e-learning and think that e-learning should be implemented in universities, which is an innovative concept worthy of encouragement and strengthening. Moreover, they also think that online learning is an interesting experience(M.D.G,2020). In addition, schools and teachers also encourage everyone to complete learning tasks

through e-learning during the pandemic. However, some respondents believe that e-learning is not suitable for courses that need practice, because e-learning cannot communicate face-to-face. In addition, this paper also shows that the cost of e-learning is almost the same as that of traditional face-to-face learning, and there is no great difference.Most respondents prefer to accept the mixed learning model in the future, that is, the combination of e-learning and traditional face-to-face learning.

5.2 Recommendation

5.2.1 Sustainability of E-Learning

Affected by the COVID-19 pandemic, the world has a new understanding of e-learning, and the acceptance of e-learning is also rising sharply(Huang,2020).This study also shows that almost all students show that they will use e-learning in the future, and they prefer mixed learning. This paper further points out that complete classroom learning is the most disliked learning mode of students. Students' preference for e-learning is also an enlightenment to school education: schools should vigorously develop e-learning. According to TAM model, perceived usefulness and ease of use will affect people's attitude towards e-learning. In addition, these will affect people's decision whether to use e-learning (Raheem,2020).

However, before the outbreak of the pandemic, the main teaching method adopted by various schools was face-to-face teaching. Therefore, in order to make e-learning sustainable, schools must strive to obtain learning activities completed through complete brain learning or network

assisted learning. Moreover, researcher thinks that resources should be allocated so that students can benefit from single learning. In addition, in order to solve the problem of cost or employer discrimination as soon as possible, the government and schools should invest in personnel training and obtain appropriate e-learning technologies(Bączek et al,2021). Researcher also believes that because students prefer blended learning, schools can also cooperate with institutions that have mastered e-learning technology to meet students' learning needs.

5.2.1.1 Students

E-learning provides students with a new educational model. Due to the impact of the pandemic, students have experienced a new learning environment. In this environment, they need information technology skills to succeed. Especially in fully online courses, students must be more independent than in traditional classes. This requires students to have high learning enthusiasm and motivation (Huynh,2020). Moreover, with the advent of the digital age and the improvement of students' computer literacy, the technical maturity required for e-learning is no longer a problem. However, they will be tired and disappointed with ordinary e-learning. Therefore, the learning effect of adding some analog and digital games may be better (Woodill, 2021).

5.2.1.2 Teachers

E-learning requires teachers to have skilled information technology skills. Teachers' technical support for e-learning plan faces many challenges,

mainly including lack of professional knowledge and skills, and do not understand how to change the teaching design to make it effective for e-learning courses. In addition, they lack confidence in using these electronic sequences for teaching (Ecar, 2019).Teachers also need to be concerned about students' acceptance of e-learning teaching. In addition, in order to increase perceived usefulness, teachers should change the type of teaching content, increase the fun of e-learning, provide timely feedback for students' problems, and encourage students to interact with them to improve the acceptance of e-learning. In addition, the time required for teachers to create and manage e-learning courses also needs to be considered. Because teachers spend almost twice as much time in electronic courses as in traditional courses (Doughty et al, 2020). Unless some incentives are provided to encourage teachers to use e-learning technology, they are likely to resist the additional workload.

5.2.1.3 Universities

For universities, budget constraints are the primary problem of institutions. Budget constraints make it difficult to widely implement e-education. The existing technical infrastructure of colleges and universities needs to be further upgraded to meet the large demand for electronic technology during the pandemic (Microsystems,2020). Colleges and universities need to be equipped with sufficient broadband, course management system, professional technical teachers and sufficient computer facilities. At the same time, they also need to increase corresponding technical support personnel(ECAR,2020).Another factor that institutions need to consider is how to evaluate the effectiveness of e-learning, mainly through the return on investment (ROI) of infrastructure

and curriculum content development (ECAR, 2020).

5.2.1.4 Employers

Employers' ideas have also changed with the wide application of e-learning. They are more and more positive that e-learning is an acceptable educational model. Many students have to use e-learning during the pandemic, and some students receive higher education in order to start or improve their career. If employers do not support e-learning, they may limit the number and quality of their employees, and may prevent students to continue their courses by electronic means (Gunasekaran, 2020). Employers should take a positive view of e-learning and increase their recognition of online degrees.

5.2.1.5 Educational Management Model

Researcher thinks that if e-learning can become a more effective learning method in the future, it needs to adopt an educational model different from traditional classroom learning. Researcher suggests using Ambiguity Model of educational management,because it can deal with the instability and complexity in the e-learning process, as well as its uncertainty and unpredictability(Akkaya,2021).The main feature of universities is ambiguity. Especially during the pandemic, many situations are unpredictable. Therefore, the original formal college model is not suitable for the current form because, for example, it emphasizes the importance of decision-making groups, but the size of the groups should be small enough for everyone to hear, and the meetings are required to be

held collectively in schools, which is very inconvenient during the influenza pandemic. Moreover, the first mock exam was achieved through consensus. However, it is sometimes not advisable to solve problems by agreement, and sometimes there are some problems(Cohen and March,2014). The decision-making of Ambiguity Model can be based on the combination and interaction of four relatively independent individuals: problem, scheme, participant and choice opportunity.

5.3 Study limitations &Suggestions for future research

This study mainly analyzes students' perception on e-learning during the COVID-19 pandemic period from Shanxi province ,China, and management of e-learning in the future.However, it also has some limitations.

5.3.1 Language Barriers

Since the subjects of this survey are Chinese native speakers, language barriers may be the source of biased data in the process of data collection. Although researchers use the bilingual questionnaire to improve the quality of data collection, there are inevitably some errors in the conversion between Chinese and English, which may be inconsistent with the original intention. Therefore, future researchers are encouraged to conduct multiple pilot tests to avoid the deviation of results due to errors.

5.3.2 Limited Scope of Research

It has to be kept in mind as this study focuses in examining the students' perception of e-learning in Shanxi province .Although the survey respondents came from different universities in Shanxi province,the population of this research may not be entirely representative of all students who used e-learning.In addition, the population fr this study is considered small because this research is focused on Shanxi province college students.Therefore,future studies with larger sample size form other areas of China would be needed in order to corroborate the findings of this research.Apart from that,this study focuses merely on students' perception of e-learning .Future researches are encouraged to include how to improve e-learning to meet students' desire.

5.3.3 Quantitative method of research

With the fact that quantitative research sometimes can leave out the meanings and does not concerned with the detailed picture of variables based on the information given on the questionnaires only, it is strongly suggested that mix study which involve both quantitative and qualitative research approaches should be adopted by future researchers in order to uncover deeper reasons from the respondents.By using qualitative research ,thick description of participants' feelings ,opinions and experiences will be able to collect by the researchers .Therefore, they will be able to understand the events and viewpoints from different individuals even better.

6. Personal reflection

Since the end of 2019, school education has been affected by the COVID-19 pandemic. Almost all over the world have adopted the way of e-learning to complete the task of teaching. Based on this form, the researcher chose the research topic:College students' perceptions of e-learning during the COVID-19 pandemic: Shanxi province, China and the management of e-learning in the future.Moreover, the research site is selected in the researcher's hometown - Shanxi Province, which facilitates the collection of data. Through this research and some relevant literature, researcher understands that e-learning is an effective and recognized learning model, which will have great development in the future.In addition, in the process of research, researcher also learned many new skills, such as how to make a high-quality questionnaire; SPSS can be used for data statistics and analysis; Word, Excel can be skillfully used, etc; At the same time, researcher also improves the writing skills.

In the whole research process, researcher also encountered many difficulties. For example, there is little literature on e-learning during the COVID-19 pandemic; Many data collected make analysis difficult; The respondents are Chinese students,so research needs to use a bilingual questionnaire, which result in a lot of questionnaire content; In the later stage, the time is very tense, and so on. However, with the help of teachers and students, these difficulties were overcome.

Finally, researcher would like to thank my supervisor very much. She patiently guides her to improve thesis step by step, and gives timely and

detailed feedback for every draft. In addition, she also helped researcher provide some relevant literature.In the later research, researchers will arrange time reasonably to avoid the waste of time; In data analysis, more comprehensive and accurate analysis should be carried out to make the results more reasonable and representative.

7.Reference

Adijaya, N., 2018. Persepsi Mahasiswa dalam Pembelajaran Online. Wanastra, 10(2), pp.105-110.

Astuti, P. and Febrian, F., 2019. Blended Learning Syarah: Bagaimana Penerapan dan Persepsi Mahasiswa. Jurnal Gantang, 4(2), pp.111-119.

Aswasulasikin, A., 2021. Persepsi Mahasiswa Terhadap Kuliah Daring dimasa Pandemi Corona Virus Disease (COVID-19). [online] Doi.org. Available at: <https://doi.org/10.15408/sjsbs.v7i8.15734> [Accessed 15 August 2021].

Akkaya, A., 2021. Theories of educational management and leadership. Educational Review, pp. 1-2.

Almarabeh, T., 2020. 49.Students'perceptions of E-Learning at the University of Jordan. Indonesian Journal of Education Methods Development, 4(1).

Arkorful, V. and Abaido, N., 2019. The role of e-learning, the advantages and disadvantages of its adoption in Higher Education. Int. J. Educ. Res., 2, pp.397-410.

Ajzen, I. and Fishbein, M., 2016. Attitudes and the Attitude-Behavior Relation: Reasoned and Automatic Processes. European Review of Social Psychology, 11(1), pp.1-33.

Arshad Khan, M., 2021. Students' Perception towards E-Learning during COVID-19 Pandemic in India: An Empirical Study. [online] Res.mdpi.com. Available at: <https://res.mdpi.com/d_attachment/sustainability/sustainability-13-00057/article_deploy/sustainability-13-00057.pdf> [Accessed 15 August 2021].

Azhari, T., 2020. Students' Perception on Online Learning During the Covid-19 Pandemic (A Case study of Universitas Malikussaleh Students). [online] Atlantis-press.com. Available at: <https://www.atlantis-press.com/article/125951807.pdf> [Accessed 15 August 2021].

Brundrett, M., 2015. What lies behind collegiality, legitimation or control?Educational Management and Administration. [online] researchgate.net. Available at: <https://www.researchgate.net/publication/249751841_What_Lies_Behind_Collegiality_Legitimation_or_ControlAn_Analysis_of_the_Purported_Benefits_of_Collegial_Management_in_Education> [Accessed 15 August 2021].

Baczek, M., 2021. Students' perception of online learning during the COVID-19 pandemic (A survey study of Polish medical students). [online] Ncbi.nlm.nih.gov. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7899848/pdf/medi-100-e24821.pdf> [Accessed 15 August 2021].

Benta, D., Bologa, G. and Dzitac, I., 2014. E-learning Platforms in Higher Education. Case Study. Procedia Computer Science, 31, pp.1170-1176.

Bali, S., 2021. Students' perceptions toward online learning and face-to-face learning courses. [online] doi.org. Available at: <https://doi.org/10.1088/1742- 6596/1108/1/012094> [Accessed 15 August 2021].

Babu, D. and Sridevi, D., 2018. Sridevi, D.K. Importance of E-learning in Higher Education: A study. Int. J. Res. Cult. Soc., 2, pp.84-88.

Chaney, E., 2020. Pharmaceutical Employers' Perceptions of Employees or Applicants with E-Degrees or Online CourseworkPharmaceutical Employers' Perceptions of Employees or Applicants with E-Degrees or Online Coursework. Curriculum, Instruction, and Media Technology, p.100.

Clark, R., 2019. E-learning and the science of instruction. San Francisco: Jossey-Bass..

Cohen, M. and March, J., 2014. Leadership and Ambiguity: The American College President. AAUP Bulletin, 61(3), p.255.

Cheung, C. and Cable, J., 2017. Eight Principles of Effffective Online Teaching: A Decade-Long Lessons Learned in Project Management Education. Proj. Manag. World J., 6, pp.1-16

Chee Meng Tham and Werner, J., 2018. Designing and Evaluating E-Learning in Higher Education: A Review and Recommendations. Journal of Leadership & Organizational Studies, 11(2), pp.15-25.

Cole, M., 2019. Student learning motivation and psychological hardiness: Interactive effects on students' reactions to a management class. [online] jstor.org. Available at: <https://www.jstor.org/stable/40214231> [Accessed 15 August 2021].

Cohen, M. and March, J., 2014. Leadership and Ambiguity: The American College President. AAUP Bulletin, 61(3), p.255.

.Dookhan, K., 2018. ATTITUDE TOWARDS E-LEARNING: THE CASE OF MAURITIAN STUDENTS IN PUBLIC TEIS. [online] researchgate.net. Available at: <https://www.researchgate.net/publication/329628131_ATTITUDE_TOWARDS_E-LEARNING_THE_CASE_OF_MAURITIAN_STUDENTS_IN_PUBLIC_TEIS> [Accessed 15 August 2021].

Davis, F., 2016. User acceptance of computer technology: A comparison of two theoretical models. [online] jstor.org. Available at: <http://www.jstor.org/pss/2632151> [Accessed 15 August 2021].

Davis, F., 2015. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), pp.319-340.

Doughty, P., Spector, J. and Yonai, B., 2020. Time, Efficacy and Cost Considerations of e-Collaboration in Online University Courses. Revista Brasileira de Aprendizagem Aberta e a Distância, 2.

EC.(Commission of the European Communit), 2019. Communication From the Commission to the Council, the European Parliament:E-Learning action plan. Journal of International Wildlife Law & Policy, pp.108-120.

ECAR, 2019. This is Why we Teach: Igniting a Passion for Learning in Linked CoursesRespondent Summary: Evolving Campus Support Models for E-Learning Courses. About Campus: Enriching the Student Learning Experience, 10(1), pp.23-26.

Eludire, A. and Ajao, T., 2021. A comparative study of synchronous and asynchronous E-learning resources. Science, Engineering and Technology. International Journal of Innovative Research, 2(11).

Fitriyani, Y., Fauzi, I. and Sari, M., 2020. Motivasi Belajar Mahasiswa Pada Pembelajaran Daring Selama Pandemik Covid-19. Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 6(2), p.165.

Gronn, P., 2016. Where to next for educational leadership?. [online] emerald.com. Available at: <https://www.emerald.com/insight/content/doi/10.1108/09578230810863235/full/html> [Accessed 15 August 2021].

Golladay, R. and Prybutok, V., 2019. Critical success factors for the online learner. Journal of Computer Information Systems, 40(4), pp.69-71.

Grandon, E., Alshare, O. and Kwan, O., 2015. Factors influencing student intention to adopt online classes: A cross-cultural study. Journal of Computing Sciences in Colleges, 20(4), pp.46-56.

Guion, D., 2019. riangulation: Establishing the Validity of QualitativeStudies. [online] researchgate.net. Available at: <https://www.researchgate.net/publication/347809071_Triangulation_Establishing_the_Validity_of_Qualitative_Studies> [Accessed 15 August 2021].

Gall, M., 2017. Educational research: An introduction (8th ed.). New York, NY: Pearson Education., 23(8), pp.602-602.

Gunasekaran, A., 2021. E-learning: research and applications. Industrial and Commercial Training, 34, pp.44-53.

Hara, N. and Kling, R., 2016. Students' distress with a web-based distance education course: An ethnographic study of participants' experiences. Information, Communication and Society, 3(4), pp.557-579.

Huynh, M., Umesh, U. and Valacich, J., 2020. E-Learning as an Emerging Entrepreneurial Enterprise in Universities and Firms. Communications of the Association for Information Systems, 12, pp.48-68.

Hrastinski, S., 2021. A study of asynchronous and synchronous e-learning methods discovered that each support different purposes. [online] educause.edu. Available at: <http://net.educause.edu/ir/library/pdf/eqm0848.pdf.> [Accessed 15 August 2021].

Hara, N. and Kling, R., 2016. Students' distress with a web-based distance education course: An ethnographic study of participants' experiences. Information, Communication and Society, 3(4), pp.557-579.

Huang, R., 2020. Handbook on Facilitating Flexible Learning During Educational Disruption: The Chinese Experience in Maintaining Undisrupted Learning in COVID-19 Outbreak. [online] .computer.org. Available at: <https://ieeecs-media.computer.org/tc-media/sites/5/2020/06/07190645/bulletin-tclt-2020-0202002.pdf> [Accessed 15 August 2021].

Huynh, M., Umesh, U. and Valacich, J., 2020. E-Learning as an Emerging Entrepreneurial Enterprise in Universities and Firms. Communications of the Association for Information Systems, 12.

Indira, D., 2019. ONLINE LEARNING. IERI, 3(8), pp.32-34.

Jenkins, M., 2019. E-learning Series: A Guide for Senior Managers, Learning and Teaching Support Network (LSTN) Generic Centre, United Kingdom.. [online] Sciepub.com. Available at: <http://www.sciepub.com/reference/122230> [Accessed 15 August 2021].

Kelly, T. and Bauer, D., 2019. Managing Intellectual Capital — via E-Learning — at Cisco. [online] springer.com. Available at: <https://link.springer.com/chapter/10.1007/978-3-540-24748-7_24> [Accessed 15 August 2021].

Koohang, A. and Harman, K., 2018. Open Source: A Metaphor for E-Learning. Informing Science: The International Journal of an Emerging Transdiscipline, 8, pp.075-086.

Kalpana, V., 2020. Future Trends in E-Learning. International Conference on Distance Learning and Education,.

Kocur, D. and Kosc, P., 2019. E-learning Implementation in Higher Education. Acta_Electrotechnica et Informatica. 9(1), pp.20-26.

Krejcie, R. and Morgan, D., 2017. Determining Sample Size for Research Activities. Educational and Psychological Measurement, 30(3), pp.607-610.

Laine, L., 2018. Is e-learning effective for IT training?. T +D, 57(6), pp.55-60.

Legris, P., Ingham, J. and Collerette, P., 2015. Why do people use information technology? A critical review of the technology acceptance model. Information & Management, 40(3), pp.191-204.

Lee, C. and Witta, L., 2019. Online students' perceived self-efficacy: Does it change? Paper presented at the national convention of the Association for Educational Communications and Technology. Atlanta, GA, 103(4).

Muthuprasad, T., Aiswarya, S., Aditya, K. and Jha, G., 2021. Students' perception and preference for online education in India during COVID -19 pandemic. Social Sciences & Humanities Open, 3(1), p.100101.

Masrom, M., 2021. Technology acceptance model and e-learning.In: 12th International Conference on Education. [online] utm.my. Available at: <http://eprints.utm.my/5482/1/MaslinMasrom2006_Techn.pdf> [Accessed 15 August 2021].

McKeachie, W., 2021. College and University Teachers McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers. [online] amazon.com. Available at: <https://www.amazon.com/Teaching-Tips-Strategies-Research-University/dp/0669194344> [Accessed 15 August 2021].

McDonald, D., 2019. Improved training methods through the use of multimedia technology. Journal of Computer Information Systems, 40(2), pp.17-20.

Mlekus, L., Bentler, D., Paruzel, A., Kato-Beiderwieden, A. and Maier, G., 2020. How to raise technology acceptance: user experience characteristics as technology-inherent determinants. Gruppe. Interaktion. Organisation. Zeitschrift für Angewandte Organisationspsychologie (GIO), 51(3), pp.273-283.

Martin, F. and Bolliger, D., 2018. Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment. Online Learning, 22(1).

M.D.G, A., 2020. Is the online learning good in the midst of Covid-19 Pandemic? The case of EFL learners. SSRN Electronic Journal, 10, pp.1-10.

Martín-Blas, T. and Serrano-Fernández, A., 2019. The role of new technologies in the learning process: Moodle as a teaching tool in Physics. Computers & Education, 52(1), pp.35-44.

Microsystems, S., 2020. E-Learning Framework. Technical White Paper, 8(1), pp.1-40.

Nycz, M., 2020. The basics for understanding e-learning. In Principles of Effffective Online Teaching. Buzzetto-More, N.A., Ed.; Informing Science Press: Santa Rosa, CA, USA, pp.1-17.

Ong, C. and Lai, J., 2020. Gender differences in perceptions and relationships among domnants of e-learning acceptance. Computers in Human Behavior, 22(5), pp.816-829.

Obasa. A., 2019. Federal University of Technology,8.he development of an integrated virtual classroom. Journal of African Real Estate Research, pp.23-41.

Oye, N., 2019. Iahad, N.A. E-Learning Methodologies and Tools. Int. J. Adv. Comput. Sci. Appl., 3, pp.48-52.

Piccoli, G., Ahmad, R. and Ives, B., 2020. Web-Based Virtual Learning Environments: A Research Framework and a Preliminary Assessment of Effectiveness in Basic IT Skills Training. MIS Quarterly, 25(4), p.401.

Popa, D., Repanovici, A., Lupu, D., Norel, M. and Coman, C., 2020. Using Mixed Methods to Understand Teaching and Learning in COVID 19 Times. Sustainability, 12(20), p.8726.

Park, S., Nam, M. and Cha, S., 2019. An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. British Journal of Educational Technology, 12(3), pp.150-162.

Romiszowsk.A., 2019. How’s the E-learning Baby? Factors Leading to Success or Failure of an Educational Technology Innovation. Educational Technology, 44(1), pp.5-27.

Ryan, S., 2018. Is online education right for you?. American Agent & Broker, 73(6), pp.54-58.

Raheem, B., 2020. The Role of E-learning in Covid-19 Crisis. Int. J. Creat. Res, (8), pp.3135-3138.

Rawat, A., 2020. What is Descriptive Analysis?- Types and Advantages | Analytics Steps. [online] Analyticssteps.com. Available at: <https://www.analyticssteps.com/blogs/overview-descriptive-analysis> [Accessed 15 August 2021].

Succeed., D., 2016. Docebo Learning Suite: Learn. Develop. Succeed.. [online] Docebo. Available at: <https://www.docebo.com/landing/contactform/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf> [Accessed 15 August 2021].

Sandberg, F., 2016. Students' Perceptions of E-Learning. [online] Diva-portal.org. Available at: <https://www.diva-portal.org/smash/get/diva2:925978/FULLTEXT01.pdf> [Accessed 15 August 2021].

Sun, M., 2016. E-Learning Framework. Technical White Paper February,.

Smart, K. and Cappel, J., 2019. Students' Perceptions of Online Learning: A Comparative Study. SSRN Electronic Journal, 5.

Shrestha, E., Mehta, R., Mandal, G., Chaudhary, K. and Pradhan, N., 2019. Perception of the learning environment among the students in a nursing college in Eastern Nepal. BMC Medical Education, 19(1)..

Sadeghi, M., 2019. A Shift from Classroom to Distance Learning: Advantages and Limitations. International Journal of Research in English Education, 4(1), pp.80-88.

Suresh, M., 2018. The impact of using smartphones on the academic performance of undergraduate students. Knowledge Management & E-Learning: An International Journal, pp.1797-1800.

Sun, L., Tang, Y. and Zuo, W., 2020. Coronavirus pushes education online. Nature Materials, 19(6), pp.687-687.

Selim, H., 2018. An empirical investigation of student acceptance of course websites. Computers & Education, 40(4), pp.343-360.

Sekaran,, U., 2016. RESEARCH METHODS FOR BUSINESS: A SKILL BUILDING APPROACH SEVENTH EDITION. Long Range Planning, 26(2), p.136.

Saunders, M., 2019. 8.Harlow, England: Pearson Education Limited. Research Methods for Business Students, (4th Ed). Qualitative Market Research: An International Journal, 3(4), pp.215-218.

Teo, T., 2017. Modelling technology acceptance in education: A study of pre-service teachers. [online] doi.org. Available at: <http://dx.doi.org/10.1016/j.compedu.2008.08.006> [Accessed 15 August 2021].

Taherdoost, H., 2016. Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. SSRN Electronic Journal,.

Webb, R. and Vulliamy, G., 2014. A Deluge of Directives: conflict between collegiality and managerialism in the post‐ERA primary school. British Educational Research Journal, 22(4), pp.441-458.

Wang, H., 2021. Research status and Enlightenment of e-learning in China. [online] Mip.book118.com. Available at: <https://mip.book118.com/html/2016/0106/32793526.shtm?ivk_sa=1024320u> [Accessed 15 August 2021].

Wida, S., 2020. RESPON MAHASISWA PADA MATA KULIAH DARING. Child Education Journal, 2(1), pp.48-52.

Will., 2020. How Quantitative Analysis (QA) Works. [online] Available at: <https://www.investopedia.com/terms/q/quantitativeanalysis.asp> [Accessed 15 August 2021].

Woodill, G., 2021. What is the Definition of E-Learning?. [online] e-student.org. Available at: <https://e-student.org/what-is-e-learning/> [Accessed 15 August 2021].

Xie, Y., 2020. Characteristics, problems and innovation of "non-stop" online teaching method during COVID-19 Pandemic. [online] Ixueshu.com. Available at: <https://www.ixueshu.com/h5/document/2e1c32172b661dd8366186dd306ae1b9318947a18e7f9386.html> [Accessed 15 August 2021].

Zhu, X., 2018. Facilitating Effective Online Discourse: Investigating Factors Inflfluencing Students' Cognitive Presence in Online Learning. University of Connecticut Graduate School,.

Appendix 1:Questionnaire

I'm currently completing a Master of Education Management at INTI International University, Malaysia. My topic for the final project is on " College students' perceptions of e-learning during the COVID-19 pandemic: Shanxi province, China ". All responses are confidential. This questionnaire is aimed at getting your responses on your perception about e-learning. Please tick the possible answer where appropriate. Kindly provide answers candidly as possible.

我目前正在马来西亚的英迪国际大学完成教育管理硕士学位。毕业论文的主题是“COVID-19 流行期间大学生对在线学习的看法：以中国山西省为例”。本问卷旨在了解您对在线学习的看法，请勾选您的答案。所有回复都是保密的，请尽可能诚实作答。

A. Personal Information (个人信息）

1. Gender: （性别）

a. Male （男性） b. Female （女性）

2.Age group（年龄组）

a. 18-20 b. 21-23 c.24-26

3. year（年级）

a. freshman （大一）b. sophomore（大二） c.junior（大三） d.senior（大四）

4. Which of the following applies to you? （以下哪一项适合于您？）

a. Full time student （全日制学生）

b. Part-time student（非全日制学生）

5.Your major: （您的专业是）

a. IT (Information Technology,Computer Science, Statistic and Math)（信息技术专业,信息技术,计算机科学，统计学和数学）

b. Engineering (Agricultural , Mechanical, Civil engineering, Electrical/Electronics)（工程专业：农业，机械，土木，电气\电子）

c. Business (Accounting, Finance, Business Administration, Marketing)（商务专业：会计，金融，工商管理，市场营销）

d. Art & Design (Fashion, Industrial Art,Journalism) (艺术与设计专业：时尚，工业艺术，新闻）

e . Education(Educational Management, pedagogy, Curriculum and Teaching Theory)（教育专业：教育管理学，教育学，课程与教学论）

6.Do you have a personal computer （您有个人电脑吗？）

a. Yes （有） b. No （没有）

7..During the COVID-19 pandemic, how long do you study by the computer every day?（在疫情期间，您每天用电脑学习多长时间？）

a. Less than 1hour（低于 1 小时） b. 1-3hours（1-3 小时）

c. 4-6 hours（4-6 小时） d. more than 6 hours（多于 6 小时）

B. Perceived Usefulness of E-learning （在线学习的感知有用性）

8. In your opinion, what do you think best describes 'e-learning'? Choose as many that applies. (在您看来，以下哪几项最能描述在线学习?选择所有您认为合适的选项。）

a. Learning on your own at your own pace （以适合自己的速度自学）

b. Watching the course recording（观看教学视频回放）

c. Having live lectures over the internet （通过互联网上直播课）

d.Doing activities online.（参与线上课堂活动）

e.Writing and submitting assignments online（在线写和提交作业）

f.Communicating with instructors online（在线与讲师交流）

10. Which of the following statements do you agree with? Choose as many that applies.(你同意以下哪种说法？选择所有您认为合适的选项。）

a. Studying through e-learning mode provides the flexibility to study at the time convenient to the learner.（在线学习给学生提供了学习时间上灵活性）

b. E-learning can enable people to study, irrespective of where they are located in the world.（在线学习可以在任何地方进行）

c. There are technologies available to enable student to take tests and submit assignments electronically.（学生可以通过在线的方式参加考试和提交作业）

d. There are electronic tools available to enable interactive communication between instructor and student .（教师和学生可以使用电子工具进行互动交流）

e. There can be interactive communication among students when participating in e-learning. (学生可在线上课堂进行互动交流）

11. Do you believe in the effectiveness of live lectures over the internet, as is done in the classroom? 您认为上在线直播课的有效性跟在学习课堂上课一样吗？

a. Yes （是的） b. No(不是）

12. Asking questions and getting immediate feedback when studying online is just as effective as studying face to face in the classroom?（在学校课堂上面授学习时，学生可提出问题并获得即时的反馈。在线上学习时，学生也能提出问题并获得即时的反馈嘛？）

a. Yes b. No

13. Which of the following statements applies to you? choose as many that applies.（以下哪项适合您？选择所有您认为合适的选项。）

a. I don't foresee any usefulness of e-learning. (我认为在线学习没有什么用。）

b. Studying through e-learning mode can increase my learning effectively, as I will have easy access to reference materials and lecture videos) （通过在线学习模式可以有效地提高我的学习效率，因为我可以很容易地获得参考资料和教学视频）

c.E-learning can improve my course performance as I will not need to travel to campus, but study at the comfort of my home.(在线学习可以提高我的学习程成绩，因为我不需要去学校，而是在家里舒适的学习）

d. Using e-learning system can enable me to accomplish tasks more quickly, since I will move at my own pace.（使用在线学习系统可以让我更快地完成学习任务，因为我可以按照适合自己的速度学习）

C. Perceived Ease of Use of E-Learning （在线学习的易用性）

14. For each of the following statements, please thick the extent to which you disagree or agree: （对于下列各项陈述，请指出您对该项陈述的认同程度）

i. I believe e-learning platforms are user friendly.（我相信在线学习平台是方便使用的）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

ii. It would be easy for me to find necessary information when using an e-learning platforms. 在使用在线学习平台时，我很容易找到我需要的资料。

a. Strongly Disagree b. Disagree c. Undecided d. Agree e. Strongly Agree

15. Please indicate to what extent you can easily handle each of the following uses of e-learning platforms: （请说明您在在线学习平台上完成以下每项学习任务的 难易程度：）

i. Attach files to learning platforms:（将文件附加到在线学习平台）

a. Very difficult（非常困难） b. Difficult（困难） c. Undecided（不确定） d. Easy（容易）e. Very easy(非常容易）

ii. Chatting with friends and instructors : （与同学和老师交流）

a. Very difficult（非常困难） b. Difficult（困难） c. Undecided（不确定） d. Easy（容易）e. Very easy(非常容易）

iii. Downloading documents: （下载文件）

a. Very difficult（非常困难） b. Difficult（困难） c. Undecided（不确定） d. Easy（容易）e. Very easy(非常容易）

iv. Posting messages: （留言）

a. Very difficult（非常困难） b. Difficult（困难） c. Undecided（不确定） d. Easy（容易）e. Very easy(非常容易）

D. Attitude Toward Using E-learning （使用在线学习的态度)

15. Please indicate whether you agree or disagree with the following statements: (对于下列各项陈述，请选出您对该项陈述的认同程度）

a) I like the idea of e-learning.（我喜欢在线学习这一想法。）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

b) I think e-learning should be implemented in university.（我认为大学应该实施在线学习）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

c) I think e-learning platform is fun to use.（我认为在线学习平台使用起来很有趣）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

d) I think e-learning will be the new way of learning in the future（我认为在线学习是未来的学习方式）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

16. Which of the following influences about e-learning applies to you during the COVID-19 pandemic?（在疫情期间，下列关于在线学习的影响说法中，哪些符合您的情况？）

a) E-learning allowed learning to continue. （在线学习使学生可以继续学习）

a. True（对） b. Untrue （错）

b) I did not have problems using e-learning for studies.（我在线学习时没有遇到任何问题）

a. True b. Untrue

c) Studying online was a good experience for me.（在疫情期间，我有一个很好的在线学习体验）

a. True b. Untrue

d) My lecturers encouraged us to study online during the pandemic.（我的老师鼓励我们在疫情期间上网学习）

a. True b. Untrue

17. For each of the following statements, please indicate to what level you agree or disagree to them: （对于以下各项陈述，请指出您对该项陈述的认同程度）

a) I don't believe e-learning is suitable for courses that need practical demonstrations. （我认为在线学习不适合需要体验式学习的课程）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

b) I am afraid employers will not give the same preference to e-learning graduates, as they will give to people who have conventional classroom learning.（我认为雇主更愿意雇用获得传统学位的毕业生，而不是获得在线学位的毕业生。）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

c)I think the learning efficiency of online learning is much lower than that of traditional classroom learning.（我认为在线学习的效率低于传统课堂学习的效率）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

18.In your opinion, what do you think about the tuition cost of e-learning? （在您看来，在线学习的费用如何？）

a. E-learning is more costly　than classroom learning. （在线学习的费用高于传统课堂学习）

b. Both e-learning and classroom learning have the same cost. （在线学习的费用与传统课堂学习相同）

c. Classroom learning is more expensive than e-learning. （传统课堂学习的费用高于在线学习）

E. E-learning sustainability　（在线学习的可持续性）

19. I think e-learning will be widely used in the future.（我认为在线学习在未来会被广泛应用）

a. Strongly Disagree（非常不同意） b. Disagree （不同意）

c. Undecided(不确定） d. Agree（同意） e. Strongly Agree（非常同意）

20. Among the following choices, please indicate which one you prefer (please choose only one): （以下哪项陈述最能描述您的情况，只能选择一项）

a) I prefer fully-online learning to face-to-face （与面授学习相比，我更喜欢全面的在线学习在线学习）

b) I like a combination of online learning and face-to face learning (hybrid learning) （我喜欢混合学习，即在线学习和面授歇息相结合的学习方式）

c) I am comfortable with the fully face-to-face than online learning.（与全面的在线学习相比，我更喜欢面授学习）

- The End-（结束）

Thank you for your time. （感谢您的参与)

Appendix 2 :Meeting with supervisor notes

Meeting 1

Date of Meeting	18/5 Tuesday　10-11.30pm
Progress Made	Shared research methods notes:

	quantitative, qualitative and mixed methods.
Agreed Action	Read as many research papers and to dicide on a topic
Student Signature	**Niu Hongmin**
Supervisor's signature	**Phawani V**

Meeting 2

Date of Meeting	25/5- Friday (3-4.30pm)
Progress Made	Students shared ideas on her topic. Share a brief project paper. Instructor gave feedback. – Topic on students' perceptions on e-learning must be more focused. Questionnaire sample must be more than 300. Instructor share via email the following: 1. Attachment 1 - Can use this study. This is in India. You can check for China situation. 2. Attachment 3 – can use this Technology acceptance model. 3. Attachment 4- sample questionnaire 4. Attachment 5 – TIPEC model and sample questionnaire. 5. Attachment 6 – your project work. I have highlighted key points. (refer to email 29/5)
Agreed Action	Student to read attachment materials as above. Student to work on feedback given in no 5 above. # Project abstract and title to be

	submitted by 3rd June 2021
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 4

Date of Meeting	1 June 2021
Progress Made	In- depth feedback given to student research framework, sampling design and scope.
Agreed Action	Serious work to start. Student to submit the following via Blackboard Assignment platform by 9th June 2021. 1. Write the background to study – write as much as possible 2. Read and understand the framework- download past researches that used the same framework. (you must have at least 3 sample papers with you- I'll check in class next Tuesday) 3. Questionnaire design: i) Type out the questions ii) Highlight what changes you have made – can email me before next Monday iii) Translate into Chinese and get 5 people to verify this. Note: Abstract sent to MQA this week. Copy provided to student.
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 4

Date of Meeting	6 June 2021

Progress Made	Chapter 1 done . Good. Feedback given on improvements to be made.
Agreed Action	1. Work on studies done globally in your areas of research. 2. What deficiencies do you see in the research.
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 5

Date of Meeting	10/6/2021
Progress Made	Chapter 2 Literature review good progress shown
Agreed Action	Read more into research evidence here and find the gaps in the research – more improvements needed to this chapter.
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 6

Date of Meeting	18/6/2021
Progress Made	Chapter 2 – good progress and chapter 3 started
Agreed Action	1. To compete the research methodology and prepare for proposal defence. 2. Update sources- should be the last five years. 3. Prepare survey instrument
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 7

Date of Meeting	23/6/2021

Progress Made	Proposal defence slides prepared.
Agreed Action	1. To make improvements based on supervisor's feedback. 2. Fine-tune chapters 1-3. 3. Pre-test survey questionnaire and get feedback . Send survey questions (English and Chinese to Ms en Lee for feedback)
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 8

Date of Meeting	5/7/2021
Progress Made	1. Work on feedback from proposal defence and translation feedback from Wen Lee. 2. Work on feedback by MQA in incorporating educational management models and theories into work
Agreed Action	NO 1&2 above based on my sharing of research papers and notes on education management theories and models.
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 9

Date of Meeting	13/7/2021
Progress Made	Education management models' incorporation not up to the mark. Need to improve on this. Survey questionnaire ready to be distributed after pre-test.
Agreed Action	Improve on the write-up of the education management models. Need to have a critical perspective.

Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 10

Date of Meeting	23/7/2021
Progress Made	Chapter 4 : Findings progressing well.
Agreed Action	1. To check and verify that all research questions and hypotheses are tackled. 2. Explain the salient features of the graphs and charts.
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 11

Date of Meeting	28/7/2021
Progress Made	Chapter 5 : Conclusions tacked well
Agreed Action	1. Tie up conclusions to chapter 4. Add citations if necessary. 2. Add, Recommendations to the various stakeholders, Limitations of research and Future research
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V

Meeting 12

Date of Meeting	13/8/2021
Progress Made	Final meeting to tie up loose ends

Agreed Action	Check coherence from chapters 1-5 Check referencing Follow format as per MEM Proje handbook
Student Signature	Niu Hongmin
Supervisor's signature	Phawani V