



**PREDICTORS OF CHINESE SECONDARY SCHOOL STUDENTS'
BEHAVIORAL INTENTION TO USE AN ONLINE HOMEWORK SYSTEM
IN HUICHENG, CHINA**

By

CHEN LIU

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

April 2024

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April 2024

Chairman : Professor Wong Su Luan, PhD
Faculty : Educational Studies

As an active response to the popularity of technological applications in the current educational era, online homework systems have been applied to assist students learning worldwide. However, informed studies have identified that Chinese secondary school students are hesitant and unwilling to accept them for learning. Hence, it is imperative to determine the factors that predict behavioral intention to use an online homework system among students due to the great benefits this technology offers to them for learning.

This study aimed to explore the extent of behavioral intention to use an online homework system among the secondary school students in Huicheng District, Huizhou, Guangdong, China. It also determined the predictive function of eight proposed independent variables, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, interest, attitude, and technological self-efficacy, on the dependent variable behavioral intention to use an

online homework system among the students. The data were collected from the eighth graders of four selected public schools in Huicheng District (N = 1,466). A stratified random sample of 339 students was selected. Based on the data analysis from the distribution of questionnaires, the reliability testing produced an acceptable internal consistency where the Cronbach alpha value was higher than 0.70 using the SPSS 26. The descriptive statistics were then presented. The associations between the independent and dependent variables were conducted by the Pearson's Product Moment coefficient. The proportion of the variances in behavioral intention explained by the proposed variables was identified via multiple regressions. Additionally, an in-depth interview with 10 purposively selected students were followed up by the quantitative stage to explore some underestimated predictors of behavioral intention to use an online homework system among the students.

The findings in this study indicated that the students had a moderate intention to use an online homework system for learning. Besides, their intentions to use the system was predicted by many proposed variables in this study, including attitude, facilitating conditions, interest, social influence, and effort expectancy. Evidently, the students who held positive attitudes towards the system showed greater inclinations to use the system for learning based on the data analyzed ($\beta = 31\%$). Besides, the students with higher interests in using the system also had the tendency to use it for study ($\beta = 23\%$). Moreover, the adequate support of facilitating conditions, the sufficient emphasis on social influence, and the low effort expectation to use the system also promised higher possibilities to accept the technology for learning purposes among the students. More than half of the behavioral intention variance (78.5%) of using an online homework system was explained by the selected variables.

Based on the findings, the study highlighted sufficient attention should be focused on attitudes, facilitating conditions, interests, social influences, and effort expectancy. These factors were identified to predict the behavioral intentions to use an online homework among the students in the Chinese educational context. Hence, the findings provided the benefits and new insights into the current educational policies and methodologies, as well as some tips for stakeholders to adjust the design of their systems to suit the students' learning requirements.

Keywords: Behavioral Intention, Online Homework, Secondary School Students

SDG: GOAL 4: Quality Education

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PERAMAL NIAT TINGKAH LAKU PELAJAR SEKOLAH MENENGAH
CINA UNTUK MENGGUNAKAN SISTEM TUGASAN DALAM TALIAN DI
HUICHENG, CHINA**

Oleh

CHEN LIU

April 2024

Pengerusi : Profesor Wong Su Luan, PhD
Fakulti : Pengajian Pendidikan

Sebagai respons aktif terhadap populariti aplikasi teknologi dalam era pendidikan semasa, sistem tugas atas talian telah digunakan untuk membantu pembelajaran pelajar di seluruh dunia. Walau bagaimanapun, kajian yang dijalankan mendapati pelajar sekolah menengah di negara China enggan dan tidak bersedia untuk menerima penggunaan sistem tersebut dalam pembelajaran mereka. Oleh itu, adalah penting untuk menentukan faktor yang meramalkan niat tingkah laku dalam menggunakan sistem tugas atas talian ini kerana teknologi ini menawarkan manfaat besar kepada pelajar dalam pembelajaran mereka.

Kajian ini bertujuan untuk meneroka sejauh mana niat tingkah laku untuk menggunakan sistem tugas atas talian dalam kalangan pelajar sekolah menengah di Daerah Huicheng, Huizhou, Guangdong, China. Ia juga menentukan lapan pemboleh ubah yang dicadangkan: jangkaan prestasi, jangkaan usaha, pengaruh sosial, kondisi pemudah, motivasi hedonik, minat, sikap, dan efikasi sendiri teknologi, merupakan

faktor yang meramalkan niat tingkah laku dalam menggunakan sistem tugas atas talian dalam kalangan pelajar tersebut. Data dikutip daripada pelajar gred lapan di empat buah sekolah awam terpilih di Daerah Huicheng ($N = 1,466$). Satu sampel rawak berstrata yang terdiri daripada 339 pelajar telah dipilih. Berdasarkan analisis data daripada pengagihan soal selidik, ujian kebolehpercayaan menunjukkan ketekalan dalaman di mana nilai Cronbach alfa lebih tinggi daripada 0.70 dengan menggunakan perisian SPSS 26. Kemudian, statistik deskriptif dikemukakan. Hubungan antara pemboleh ubah bebas dan pemboleh ubah bersandar dikaji menggunakan koefisien korelasi Produk Momen Pearson. Nisbah variasi dalam niat tingkah laku yang dijelaskan oleh pemboleh ubah yang dicadangkan dikenal pasti melalui regresi berganda. Selain itu, temu bual terperinci dengan 10 pelajar yang dipilih secara bertujuan dijalankan sebagai langkah tambahan selepas fasa kuantitatif untuk mengkaji beberapa faktor peramal yang diabaikan dalam niat tingkah laku untuk menggunakan sistem tugas atas talian dalam kalangan pelajar.

Dapatan kajian ini menunjukkan bahawa pelajar mempunyai niat sederhana untuk menggunakan sistem tugas atas talian dalam pembelajaran. Selain itu, niat mereka untuk menggunakan sistem tersebut diramalkan oleh banyak pemboleh ubah yang dicadangkan dalam kajian ini, termasuk sikap, kondisi pemudah, minat, pengaruh sosial, dan jangkaan usaha. Ternyata, pelajar yang mempunyai sikap positif terhadap sistem tersebut menunjukkan kecenderungan yang lebih tinggi untuk menggunakannya dalam pembelajaran berdasarkan data yang dianalisis ($\beta = 31\%$). Selain itu, pelajar yang mempunyai minat yang lebih tinggi dalam penggunaan sistem juga cenderung menggunakannya untuk pembelajaran ($\beta = 23\%$). Tambahan pula, sokongan yang mencukupi dalam kondisi pemudah, penekanan yang mencukupi

terhadap pengaruh sosial, dan jangkaan usaha yang rendah dalam penggunaan sistem juga memberikan peluang yang lebih tinggi untuk menerima teknologi tersebut bagi tujuan pembelajaran dalam kalangan pelajar. Lebih daripada separuh varians niat tingkah laku (78.5%) dalam penggunaan sistem tugas atas talian dijelaskan oleh pemboleh ubah yang dipilih.

Berdasarkan dapatan tersebut, kajian ini menegaskan perhatian yang mencukupi perlu difokuskan kepada sikap, kondisi pemudah, minat, pengaruh sosial, dan jangkaan usaha. Faktor ini telah dikenal pasti untuk meramalkan niat tingkah laku dalam penggunaan sistem tugas atas talian dalam kalangan pelajar dalam konteks pendidikan China. Oleh yang demikian, dapatan ini memberikan manfaat dan pandangan baru kepada dasar pendidikan dan metodologi semasa, serta beberapa cadangan kepada pihak berkepentingan untuk menyesuaikan reka bentuk sistem mereka agar bersesuaian dengan keperluan pembelajaran pelajar.

Kata kunci: Niat Tingkah Laku, Pelajar Sekolah Menengah, System Tugas Atas Talian

SDG: *MATLAMAT 4: Pendidikan Berkualiti*

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Last, this dissertation is dedicated to my elder brother. His sudden departure from this world left me depressed and helpless. The past is like smoke but carves in my mind vividly. The scene in which the seven-year-old boy tightly held the hand of the six-year-old girl and went to school together seems to have happened just yesterday. I owe my gratitude to his accompanying in my life and his instant support whenever I request. May my dear elder brother be happy in heaven!

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Wong Su Luan, PhD

Professor
Faculty of Educational Studies
Universiti Putra Malaysia
(Chairman)

How Shwu Pyng, PhD

Senior Lecturer
Faculty of Educational Studies
Universiti Putra Malaysia
(Member)

ZALILAH MOHD SHARIFF, PhD

Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 8 August 2024

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LIST OF ABBREVIATIONS

AOHW	Attitude towards Online Homework
CERNET	China Education and Research Network
CNNIC	China Internet Network Information Center
EE	Effort Expectancy
FC	Facilitating Conditions
HM	Hedonic Motivation
ICT	Information and Communication Technology
IDC	Interest Driven Creator Theory
IOHW	Interest in Online Homework
IT	Information Technology
MLR	Multiple Linear Regression
OHW	Online Homework
PE	Performance Expectancy
SCT	Social Cognitive Theory
SEM	Structural Equation Modeling
SI	Social Influence
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reason Action
TSE	Technological self-efficacy
UTAUT	Unified Theory of Acceptance and Use of Technology
WBH	Web-Based Homework

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The popularity of information technology has witnessed great changes in almost all aspects around the world (Palvia et al., 2018; Wiggins & van der Hoff, 2021). Furthermore, education delivery models also have undergone rapid and enormous transformations with the development of technology. In fact, the growth of online education provides us a chance to learn and access information without geographic and time limitation (Magalhães et al., 2020). Online homework, as a new homework format, naturally emerges to supplement the requirement of online education for learning consolidation (Lunsford & Pendergrass, 2016; Tan & Chen, 2021). Under the trend of globalization, the development of online education in China starts booming. Simultaneously, the online homework system has also ushered in a development opportunity in China.

1.1.1 Development of online education in China

Since the late 1800s, the adaption of online education has debuted with the confluence of new technology. Its growth has also become popular in accordance with the global adoption and acceptance of the internet around the world (Huang et al., 2019; Palvia et al., 2018; Suki & Suki, 2017). If compared to the vigorous development of online education in foreign countries, changes in education have also taken place in China to echo the rapid transformations of E-learning (Cai & Chen, 2019; Zhou et al., 2020).

From the early 1920s, Chinese educators began to explore the use of technology (Alamin et al., 2015), however, the debut of technology in the teaching and learning process in classrooms was not smooth. Generally, the lack of necessary basic structures and infrastructures as well as insufficient relevant technology supports accounted for this dilemma for a long time. Then, the use of technology started to gain its priority in the late 1970s, at the end of the Cultural Revolution, hence its development was rapid, especially in the field of education. In fact, the launching of the China Education and Research Network (CERNET) resulted in universities, schools, and other educational institutions being able to communicate and connect with each other via the national technological infrastructure on the Internet in 1994.

With the promulgation of *The National Program for Invigorating Education Towards the 21st Century*, online education is developing in China, especially in the fields of higher education and compulsory education (Jiang et al., 2023). Gradually, multimedia and computer networks were applied in K12 schools in China during the late 1990s (Song, 2005). Additionally, the emphasis of education required educators to utilize the technology of Internet as reported in the 19th session of National Congress of the Party, hence the integration of technology in education has started since then. In addition, the constructive and supportive learning environments rendered by the construction of smart campus have been established with the advocacy of relevant national education policies, leading to the vast development of various online education platforms in recent years. In terms of the investment structure of an online education market in China, K12 education occupies a large market share, taking the largest proportion about 25.7% based on a survey of educational investment projects (Shen, 2017). This innovative and vigorous educational mode continues to grow at a rate of 16.1% over the last decade (Xu et al., 2018).

It is evident that many supplementary learning platforms and mobile apps have been utilized by school educators and learners during non-schooling hours after the introduction and exploitation of modern technologies. The online virtual schools, like 101 Online School (www.chinaedu.com), Shanghai Online School (class.hujiang.com), and Huanggao Online School (www.Huanggao.net) are popular in prosperous metropolis, usually offer services including online teaching, practice and test. Furthermore, any online educational apps, such as Zybang, Yuansouti and Yuantiku, have largely supported teachers and students to access text-based resources and materials (Wei, 2018).

The development and application of online education is beyond the expectation in China. Given a considerable annual increasing rate of users, it is predicted that the number of online educational users of China would surpass 120 million in a short time, in which the population of primary and secondary education took up 10% in total (Shen, 2017). According to a statistic released on April 28th, 2020 by China Internet Network Information Center (CNNIC), the number of online educational users of China reached 423 million in March 2020 (CNNIC, 2020). At the beginning of 2020, nearly 265 million Chinese students accepted online courses due to the outbreak of Covid-19. With the rush of large capital enterprises, the growth of online education is estimated to accelerate and develop at nearly 22% of compound growth in terms of market consumption from 2017 to 2022 (iiMedia Research, 2020). Suffice to say, the development of online education in China has gained an exponential growth. It is also predicted that online education will be normalized or at least become an indispensable part of students learning and is likely to change the status of China education.

1.1.2 Development of online homework in China

Homework is usually assigned by teachers to help students consolidate their learning out of schools (Cooper, 2001). The importance, usefulness, and benefits of homework for students in consolidating, mastering, and exploring the instructions are widely demonstrated (Suárez et al., 2019; Xu et al., 2016). However, traditional (paper-pencil) homework often leads to low enthusiasm and a lack of interest among students. This is because traditional homework is always focused on exam-oriented training hence, typically involving mechanical copying and repetitive exercises (Cunha et al., 2018; Rosário et al., 2019). Teachers, on the other hand, face a plethora of repetitive grading tasks, resulting in a heavy workload and insufficient and delayed feedback to students (Wei, 2018). Furthermore, it is challenging for teachers to accurately grasp the academic learning situation of individual students and their mastery of each knowledge point, hence teachers cannot assign appropriate homework to each student based on his or her learning ability (Zhao, 2023).

Considering the widespread of technology, online homework, defined as assignment distributed through an online homework system, which operates by coordinating learning activities, offering real-time feedback, evaluating learning outcomes, and personalizing individual learning plans (Parker & Loudon, 2003), has emerged as a new format of homework delivery. The development of this homework format sheds light on its advantages surpassing traditional homework (Zhu et al., 2003). With the change from a paper-pencil model to a web-based mode, the use of an online homework system can be achieved without geographic limitation. Later, the answer modes gradually became rich with elements of video and live question-answer, which

enriches the appeal and attraction of the system. Followed by the equipment of the automatic homework correction function, the system greatly liberated and alleviated the burden of educators. Finally, the application of big data analysis on the online homework system reflected the coming of real innovation (Wei, 2018). Each key point of the questions had been revealed and refined via the system, enabling students to master the required learning points and understand their academic performance by themselves. Furthermore, educators are able to design more reliable and feasible teaching targets based on the homework feedback report. Besides, this function on online homework systems can provide individualized and tailored practice for students based on their homework feedback greatly enhancing the effectiveness of students learning (Harcrow & Dunnigan, 2012). To conclude, both teachers and students benefit from the use of online homework, because the advent of this technology-supported learning tool could create learning opportunities that are more engaging and meaningful based on its equipped functions such as instant feedback (Morgan, 2013).

Taking advantage of online homework in education is acknowledged as a feature of the current era (Trussell & Gumpertz, 2020; Wiggins & van der Hoff, 2021). Besides, the gradual advancement of education reform and online teaching models such as paperless reading, paperless exams, and paperless homework have gained more and more attention and popularity in China (Zhu et al., 2003). Owing to the rapid iterative update and the use of technology, online homework systems have emerged to supplement the teaching and learning process in China subsequently. In the field of K12 education, many online homework systems, such as 17zuoye, ETS, and Ekwing, have been promoted by the government and companies to fulfill the requirements of teachers and students (Wei, 2018). The usage of the systems and applications has

consistently remained high, with user engagement levels also staying at elevated levels. Especially, the proportion of the use of systems has reached 43% in third and fourth-tier cities in China (Sina Education, 2016).

The convenient access, diversified content form, various evaluation mechanisms, interesting practice mode, and instant feedback setting of the online homework system promise a user-friendly learning interface to assist students in gaining better learning outcomes (Guo, 2018; Hao, 2021; He, 2018). Undeniably, it should alter the traditional learning and teaching modes step by step.

1.2 Policies Related to Online Homework in China

Originating from audio-visual education, educational informatization, “a term used to refer to the systematic use of Information Technology (IT) in K12 and higher education in China, is viewed as a driving force for educational modernization and quality education by the Chinese government” (Li & Ni, 2012, p.147). At the beginning, the role of educational informatization technically focused on audio and visual applications and was regarded as supplementary teaching aids and media tool that enlarged the use of informatization from school education to public education and emphasized on the significance of Information and Communication Technology (ICT) in people’s daily life.

Educational policies conducted by the Ministry of Education of China in accordance with the emergence of online homework accompanied by the development of educational informatization can be divided into three important developing stages

(Zhou, 2017). The first stage of the policies, which played as a driving force for the educational modernization establishment, were mainly released between 2000 and 2010. This is then followed by the second stage of the policies focused on promoting technical facilitations and applications that ranged from 2010 to 2016. After the landmark policy launched by the 19th National Congress of the Party in 2017, a brand-new stage of online education particularly concerning the development of online homework beckoned step by step.

The year 2000 to 2010 was defined as the 1.0 era of educational informatization of China (Chaozi, 2018). As a result, a series of educational policies relevant to the educational informatization was released by the Ministry of Education, including *Announcement on the Implementation of Xiaoxiaotong (school to school connection) in Primary and Secondary School*, *Educational Promotion Action Plan 2003-2007*, and *Standards for Educational Technical Competency of Primary and Secondary School Teachers (trial)*. All these policies contributed to accomplish and generalize the application of IT in K12 schools in terms of the teaching and learning process as a turn of the new millennium. Moreover, more students experienced the advantages provided by the new technology and acquire the basic knowledge of the applications. Hence, the precondition for the acceptance of online education, particularly the application of online homework systems, became possible and reliable among educators and teachers.

Apart from the education policies launched as stated before, another reform and development program, *The Outline of National Medium and Long-term education Reforms and development Program (2010-2020)*, was launched on 8th July 2010 by the Ministry of Education of China (Xinhua Press, 2010). The outline highlighted that

education should focus on characteristics, personality differences and development of the potential advantages of each individual student. The ICT should be highly valued because it innovatively influenced the development of education. Later, with the policies as stated in the *Ten-Year Development Plan for Educational Informatization (2011-2020)* and the *13th Five-Year Plan of Educational Informatization*, the significance of ICT on educational field is reconfirmed to achieve the equality and quality of educational goals. Generally, the pursuit of equal educational opportunities has transformed to equal and qualified education, in which the concern of education policy has shifted from educational opportunities to educational process and outcome (Kou, 2020). On the other hand, the proposal of edutainment teaching method advocating an enjoyable teaching and learning process on teachers and students has been put forward in terms of quality education (Wei, 2018).

Beginning from 2017, the 2.0 era of educational informatization of China began when the policy of well-establishment of online education was released in the report of *19th National Congress of the Party* (Chu, 2018). Following this, in 2018, *Education Informatization 2.0 Action Plan* was conducted to achieve “Three Complete Coverages, Two Promotions and One Platform” in 2022 (*Three Complete Coverages* refers to the full coverage of ICT among all faculties, school-age students and campuses, *Two Promotions* refers to the promotion of computer efficacy among teachers and students, and *One Platform* refers to the establishment of internet plus educational platform).

Ascribing to the aforementioned plans, all educators should apply ICT in their teaching and learning process, all school students should learn to use the technology and all schools should be equipped as digital campus. In order to realize the goal of two

promotions, teachers and students should generally improve their abilities of information application and literacy. Finally, the Internet plus education platform should be fully established to facilitate the use of ICT (Zhou, 2017). Therefore, teachers, particularly those in rural areas, are required to make full use of ICT, thus improve their professional abilities to fulfill the new requirements of educational policies. Students, particularly those net generation who are more accustomed to the interesting and rapid access to online information and tasks are also eager to be taught differently. There is no doubt that the constant urge of feasible online education with tailored and professional online homework becomes an indispensable part under the current educational background among teachers and students.

1.3 Factors Affecting Students' Behavioral Intention to Use Technology

Informed by past studies (Khechine et al., 2020; Tey & Moses, 2018; Yueh et al., 2015), users' behavioral intentions (BI) are defined as the possibilities of users performing or conducting particular behaviors. It is widely recognized as a core factor in predicting the actual use of technology among users (Huang et al., 2019; Venkatesh et al., 2012). For many research, the significance of students' intentions in promoting technology has been demonstrated (An, et al., 2023; Salame & Hanna, 2020).

In the educational context, different models and theories have been used to determine factors affecting the use of technology among students and teachers (Pan, 2020). Particularly, the Unified Theory of Acceptance and Use of Technology (UTAUT) model was developed by Venkatesh et al. (2003) to explain individuals' behavioral intentions or behaviors to adopt technology. Four extrinsic factors, including performance expectancy, effort expectancy, social influence, and facilitating

conditions, are mainly demonstrated to affect and predict behavioral intention to use technology among users (Abbad, 2021; Guggemos et al., 2022).

Khechine et al. (2020) further posited the UTAUT model with Intrinsic Value to determine the predictors of behavioral intention to use technology among students. The added intrinsic value, defined as the extension of hedonic motivation (enjoyment) with interest, was proven to predict students' intentions to use a system. Hence, two components of intrinsic value, hedonic motivation (enjoyment) and interest, also may affect students' intentions, respectively.

Attitude towards behaviors is uncovered to be a crucial element affecting individual intentions to perform a behavior (Ajzen & Fishbein, 1975). Furthermore, the behaviors of using information technology can be predicted by individual attitudes as well (Davis et al., 1989). Based on the Technology Acceptance Model (TAM), Huang et al. (2019) demonstrated the predictive function of student attitudes on their intentions to use technology for learning in a Chinese educational context.

Interest-Driven Creator Theory (IDC) was formulated by Chan et al. (2018) to respond to the adoption of lifelong learning habits with the foundation of interest and creation. Interest is an interaction between individuals and activities. As the primary and crucial element to cultivating learning habits in the technology-assisted learning setting, student interest may motivate and affect their intention to bridge the educational challenges and ensure their achievement of learning behaviors.

Based on Social Cognitive Theory (SCT) by Bandura (1986), self-efficacy is identified to be a key factor in judging an individual's belief in completing a task successfully.

Technological self-efficacy, on the other hand, serves as a proxy for individuals' belief in technology use (Venkatesh & Davis, 1996). As the judgment of individuals' ability to use technology to accomplish a particular task (Compeau & Higgins, 1995), technological self-efficacy may affect behavioral intention to use technology.

Drawing on concepts from the aforementioned models and theories, some salient constructs were demonstrated to affect and predict the behavioral intention of users to use technology in various contexts. In particular, intrinsic variables like hedonic motivation (Alalwan et al., 2017; Hu et al., 2020; Sitar-Tăut, 2021), interest (Aksenova et al., 2015; Wheeler & Blanchar, 2019), attitude (Albelbisi & Yusop, 2018; Huang et al., 2019; Yu et al., 2020), and technological self-efficacy (Green et al., 2015; Kirbas, 2018; Tsai et al., 2021) were discovered to influence users' BI to use technology as well. In sum, constructs including performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, interest, attitude, and technological self-efficacy may affect students' behavioral intention to use technology.

1.4 Statement of Problem

The emergence of online homework systems seems to offer an alternative to supplement the defects of traditional homework for teaching and learning with the fast growth in the use of technology in the educational context. Functions provided by systems, including customized and hierarchical homework design, immediate feedback, automatic grading, and monitoring systems, transform the relationship between online homework completion and academic performance among students (Lunsford & Pendergrass, 2016; Parker & Loudon, 2013; Rodriguez & Smith, 2016).

Even though online homework systems are designated to help students achieve better understanding and mastery of synchronous knowledge, the incorporation of online homework systems into students learning is challenging. With a Confucianism heritage culture and known as an examination-driven orientation for Asian education, it is widely acknowledged that Chinese students often suffer excessive homework and bear high exam pressure, leading to their negative attitudes towards learning and less homework completion (Chan et al, 2018; Gao & He et al., 2022; Xu, 2021). Some students also feel that doing online homework is time-consuming and meaningless because of their unsatisfying academic performance (Raman & Thannimalai, 2021). What is more, students show low interest in doing homework online because they have been forced to complete it by the fear of negative consequences, such as punishments from parents and instructors (Smith et al., 2019). Besides, when students are using the system for learning without insufficient supervision from their instructors or parents, they may engage in or become addicted to computer games rather than complete homework online (Cao & Song, 2020). Furthermore, some students have to turn to traditional homework because they lack of sufficient facilitating support, such as mobile phones or computers (Li, 2022). Still, some students are unconfident to use the system for learning because they do not know how to use it and how to download information as well as solve problems regarding software issues (Lunsford & Pendergrass, 2016; Wei, 2018). In sum, the BI of some Chinese students to use an online homework system remains low due to the contribution of all these challenges (Li, 2022; Wei, 2018; Xu, 2021).

Online homework systems have emerged as an indispensable part of online education, offering opportunities for students to consolidate their acquisition (Salame & Hanna,

2020). There is a necessity to understand factors predicting the BI of users to use an online homework system to cope with the emerging challenges and promote this useful and novel consolidation format in students learning. Particularly, there is a literature gap that requires an investigation to explore secondary school students' BI to use an online homework system (Cao & He et al., 2022; Cao & Song, 2020). According to Magalhães et al. (2020), exploring the acceptance and adoption of online homework throughout schooling years, particularly for elementary, middle, and high schools' levels, is highlighted and recommended. Hence, investigating this topic is crucial, especially in the context of China.

Moreover, informed studies of technology adoption have developed and used many models and theories to explain the factors of individual intentions to adopt technology, including the Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Reasoned (TRA), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB). Among these models, the UTAUT model (Venkatesh et al., 2003) is one of the most advanced theoretical frameworks in research concerning user acceptance of technology (Chao, 2019), emphasizing on extrinsic factors influencing individual intentions to use technology.

The intention to use or adopt technology, on the other hand, is more related to the innovation-decision process of individuals (Rogers, 2003). Particularly, the perceived relative advantage relies on the characteristics of the potential adopters (Rogers, 2003; Tanye, 2016). Recent research also shows that adoption behaviors should not just be concerned about the technological issue, but it also should involve the consideration from the perspective of users, such as hedonic motivation which has been already

added to the UTAUT2 model to further study its prediction on the behavioral intention of users to use technology (Venkatesh et al., 2012). In this case, the significance of users' attitudes towards technology for learning and the advocacy of interest in IDC theory to pursue learning through technology-assisted activities also should be considered to testify their prediction on BI to use technology. Given the lack of intrinsic drivers of learning system adoption and effective use, a theoretical framework includes intrinsic factors (e.g., hedonic motivation, interest, attitude, and technological self-efficacy) should be outlined to further study the predictors of behavioural intentions to use technology among students.

Behavioural intention (BI) is the vital predictor of using the technology. In the absence of understanding the predictors on BI to use an online homework system among students, effective actions need to be taken to enhance students' intentions to use the technology to facilitate learning. To help educators make full use of the technology-assisted teaching and learning, as well as avoid students being left out from the benefits of this homework format, it is imperative to conduct the current study.

1.5 Objectives of the Study

The purpose of this study is to determine the predictors of secondary school students' BI to use an online homework system from Huicheng District, Huizhou, Guangdong, China. The objectives of the study are as follows:

1. to determine students' behavioral intention to use an online homework system;
2. to determine the extent of students' performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, interest, attitude, and technological self-efficacy towards an online homework system;

3. to determine the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, interest, hedonic motivation, attitude, technological self-efficacy, and students' behavioral intention to use an online homework system;
4. to determine the proportion of BI to use an online homework system among students can be explained by the proposed factors, including performance expectancy, effort expectancy, social influence, facilitating conditions, interest, hedonic motivation, attitude, and technological self-efficacy;
5. to explore Huicheng District's secondary school students' experience in using an online homework system.

1.6 Research Questions

The following research questions are proposed for this study.

1. What is the extent of the students' behavioral intention to use an online homework system?
2. What is the extent of the students' performance expectancy in using an online homework system?
3. What is the extent of the students' effort expectancy in using an online homework system?
4. What is the extent of social influence the students perceived in using an online homework system?
5. What is the extent of the facilitating conditions the students perceived in using an online homework system?
6. What is the extent of the students' hedonic motivation to use an online homework system?
7. What is the extent of the students' interests in using an online homework system?
8. What are the students' attitudes towards an online homework system?
9. What is the extent of the students' technological self-efficacy in using an online homework system?
10. Is there a significant relationship between the performance expectancy and the students' behavioral intention to use an online homework system?

11. Is there a significant relationship between the effort expectancy and the students' behavioral intention to use an online homework system?
12. Is there a significant relationship between the social influence and the students' behavioral intention to use an online homework system?
13. Is there a significant relationship between the facilitating conditions and the students' behavioral intention to use an online homework system?
14. Is there a significant relationship between the interests and the students' behavioral intention to use an online homework system?
15. Is there a significant relationship between the hedonic motivation and the students' behavioral intention to use an online homework system?
16. Is there a significant relationship between the attitudes and the students' behavioral intention to use an online homework system?
17. Is there a significant relationship between the technological self-efficacy and the students' behavioral intention to use an online homework system?
18. How well do the performance expectancy, effort expectancy, social influence, facilitating conditions, interest, hedonic motivation, attitude, and technological self-efficacy predict the students' behavioral intention to use an online homework system?
19. What are the Huicheng District's secondary school students' experiences in using an online homework system?

1.7 Significance of the Study

This study builds on previous research by combining user acceptance of technology theories with other factors that motivate Chinese secondary school students in Huicheng District to be engaged in an online homework system. Based on the technology acceptance in terms of students' BI to use an online homework system, the findings contribute significantly to existing literature in accepting online homework systems among Chinese secondary school students. Furthermore, the findings that highlighted the challenges faced by students, particularly secondary school students in Huizhou, can be used as reference for educators in their teaching and learning process.

In addition, the detailed findings related to the context of this study and the current status of secondary school students' BI to use an online homework system in Huicheng District, Huizhou served as a reference for educational administrators, professional associations and enterprises. In fact, the highlighted predictors may shift their long-term focus on pure teaching measures and technical supports to the intrinsic status of students based on the analysis of the relationships among the variables. Furthermore, the findings concluded from the perspectives of students who are the center of subjective learning and the end-users of the targeted technology fulfills the requirement of student-based education orientation and features the incorporation of technology into students learning in the current digital era. Hence, to echo the application of technology in education, the findings are valuable in complementing persuasive data for school educational administrators' decision-making to promote the online and offline learning modes, since the implementation and application of online homework systems gradually becomes an indispensable part in homework assignment of secondary school students.

Simultaneously, companies devoted to strengthening the development of online education may find the findings useful and informative for the perfection of online homework systems, reduction of unnecessary loss and the exploitation of the customer-targeted products. Furthermore, the analyses of factors that predict BI to use an online homework system among secondary school students are also revealed. Based on the analyses, school teachers can adjust their homework assignments with the emphasis on the key points of knowledge, as well as highlight the fallible content while teaching. Apart from this, school headmasters can provide individualized support to motivate students learning and school leaders can assess the feasibility and reliability

of promotion. In this case, the promotion of online homework systems can be successful with the supports of school leaders, the concrete teaching scheme can be conducted dedicatedly based on the efforts of school headmasters, and the instant assignment and effective feedback can be guaranteed by the schoolteachers.

In other words, to better predict, explain and promote the use of online homework systems, it is important to understand the factors predicting the behavioral intention to use the system among users. The conclusions from the study also can be used as valuable references for policy makers, company stakeholders and educators. Furthermore, the measures taken within and beyond schools to maximize the implementation, use and accept online homework systems can promote students' use of technology and increase their learning and performances. In addition, this study also can serve as a guide of literature for future researchers in related areas to further investigate in this aspect.

1.8 Limitation of the Study

This study involved four public secondary schools in Huicheng District, Huizhou, Guangdong, China, hence only the students from these schools were selected as the participants. As the public secondary schools in China, the administration, finance and teacher staff are all under the responsibility of Education Bureau, Finance Bureau, Human Resources and Social Security Bureau of Huizhou government.

The data for this study were obtained from the eighth-grade students in four public secondary schools in Huicheng District. Hence, the findings may not generalize

students in other types of public schools in other districts of Huizhou, Guangdong or other cities in China. Furthermore, the study only focused on the public secondary schools administrated and funded by the government, hence the findings may not be feasible in private secondary schools due to different administration and policies, school environments and the levels of technology implementation.

As public secondary schools are funded and owned by the government, the schools selected must abide by the education policies and regulations and implement teaching curriculum standards issued by the Ministry of National Education completely. Particularly, the study only focused on eighth-grade students at four public secondary schools in Huicheng District, therefore, the findings could not be generalized to different grades of other public secondary schools in other districts.

Referring to the participants selected for this study, they were voluntarily, hence, the participants had their own choices whether to complete the homework assigned to them via the system or not. In other words, it is not a compulsory homework that they should undertake as their traditional homework. As a result, the findings were limited and could not be generalized to schools that assign homework via the system in a mandatory context.

Last but not least, as the online homework system used was designated to the Ekwing system, it may not be directly generalized to other online homework systems, platforms, or tools. Furthermore, the data for this study were collected from the questionnaires and the interviews from the students, therefore, the types of schools, the duration of using the system, as well as gender of the participants also may impact

their reports. Due to the nature of the self-reporting instrument, there might exist biased and dishonest responses. Therefore, the participants who were invited to complete the data collection procedures may over rated or under rated their intentions to use the online homework system. It indicated that the true nature of students' extent of intention to use may not reflect.

1.9 Definition of Terms

Eleven variables are defined constitutively and operationally in the study. The data collection, data analysis as well as the generalization of the findings are all based on the guidance of the definitions as follows:

1) Online homework

Online homework refers to homework assigned via an online software system that functions by synchronizing learning activities, providing prompt feedback, analyzing learning acquisitions and customizing individual learning plan (Parker & Loudon, 2013). Additionally, online homework also refers to any computerized homework systems designed to offer automatic grading and instant feedback (Leong & Alexander, 2014). In this study, online homework is defined as assignments instructed by school teachers or instructors to students to carry out via the Ekwing system.

2) Performance expectancy towards online homework

Performance expectancy is defined as the perceptions of individuals using the system to be helpful for them to improve their job performance in an organizational context (Venkatesh et al., 2003). In the educational context, performance expectancy refers to

study performance that students perceive they can gain by adopting a system (Khechine et al., 2020). In this study, performance expectancy refers to the study performance that students believe they can achieve by using the Ekwing system.

3) Effort expectancy towards online homework

Effort expectancy is defined as the degree of ease in using the system in an organizational context (Venkatesh et al., 2003). While in the educational context, effort expectancy refers to the easiness of using the system perceived by students (Khechine et al., 2020). In this study, effort expectancy refers to the ease in using the Ekwing system perceived by the students.

4) Social influence towards online homework

Social influence is defined as the degree that individuals perceive the important others' belief in their use of the system in an organizational context (Venkatesh et al., 2003). In the educational context, social influence refers to the extent that students perceive the opinion of others, including teachers, friends, classmates, and parents about the use of the system (Khechine et al., 2020). In this study, social influence refers to the extent that students perceive the belief from parents, teachers, peers and others on their intention to use the Ekwing system.

5) Facilitating conditions towards online homework

Facilitating conditions are defined as perceptions of the existing organizational and technical infrastructure that facilitate the use of the system among users in an organizational context (Venkatesh et al., 2003). In the educational context, facilitating

conditions refer to the perception of the existing conditions made of human, organizational, and technical support for users to utilize the system (Khechine et al., 2020). In this study, facilitating conditions refer to the perceived man-made, organizational, and technical infrastructure support for students when using the Ekwing system.

6) Hedonic motivation towards online homework

Hedonic motivation is defined as the fun or enjoyment derived from the use of a system that individuals experience in a consumer context (Venkatesh et al., 2012). In educational context, hedonic motivation refers to the associated fun or pleasure that students experience in using a technology (Ain et al., 2016; Khechine et al., 2020). In this study, hedonic motivation refers to the fun or enjoyment gained from using the Ekwing system by students.

7) Interest in online homework

Interest is typically defined as a persistent propensity to engage with particular objects or activities (Hidi & Renninger, 2006). In terms of interest in homework, it refers to students' preferences to engage in completing sustained academic assignment imposed by educators in the context of school and home (Hidi & Renninger, 2006; Krapp, 2005; Xu, 2008). As a format of homework, interest in online homework is defined as students' preferences to engage in the Ekwing system for a stable and enduring period.

8) Attitude towards online homework

Attitude is defined as the positive or negative feelings predicting the implementation of using the system among users (Venkatesh et al., 2003). In educational context, attitude towards technology use refers to the extent in which students like or dislike using the technology (Davis et al., 1989; Huang et al., 2019; Teo et al., 2018). In this study, attitudes towards online homework refer to the positive or negative feelings that students experience when using the Ekwing system.

9) Technological self-efficacy towards online homework

Technological self-efficacy refers to an individuals' belief of successfully and sophisticatedly performing technology-related tools (An et al., 2022). In the educational context, technological self-efficacy is defined as an individual's belief in his or her own ability to successfully use technology to enhance learning outcome (Wang et al., 2023). Herein, technological self-efficacy is defined as student's belief in their ability to use the Ekwing system.

10) Experience in using an online homework system

Experience, regarded as users experiences, refers to how a user interacts with and perceives a system or product (Davis, 1989; Hormback & Hertzum, 2017; Norman & Nielsen, 2021). In this study, experience is defined as students' perceptions of and interaction with the Ekwing system.

11) Behavioral intention to use an online homework system

Behavioral intention refers to the possibility that an individual conduct or perform a particular behavior (Ajzen, 1991; Tey & Moses, 2018; Yueh et al., 2015). In the educational context, behavioral intention refers to the possibility of students to use the system (Khechine et al., 2020). In this study, behavioral intention is defined as the students' intentions and willingness to use the Ekwing system.

1.10 Summary

Online homework serves as a homework format via technology allowing students to engage in learning conveniently and flexibly. Unfortunately, it appears that Chinese secondary school students do not show a high behavioral intention to use online homework systems for learning. This study will venture to provide an in-depth understanding of factors predicting students' intention to use this facilitator for learning. This chapter presents an introduction to the background of the study, policies related to online homework in China, informed factors affecting students' intention to use technology, problem statements, objectives, and research questions. Additionally, the limitations and definition of terms are elaborated as well.

REFERENCES

- Abbad, M. (2021). Using the UTAUT model to understand students' usage of e-learning systems in developing countries. *Education and Information Technologies*, 26(6), 7205-7224. <https://doi.org/10.1007/s10639-021-10573-5>.
- Adel Ali, R., & Rafie Mohd Arshad, M. (2018). Empirical analysis on factors impacting on intention to use m-learning in basic education in Egypt. *International Review of Research in Open and Distributed Learning*, 19(2). <https://doi.org/10.19173/irrodl.v19i2.3510>.
- Agyei, C., & Razi, Ö. (2022). The effect of extended UTAUT model on EFLs' adaptation to flipped classroom. *Education and Information Technologies*, 27(2), 1865-1882.
- Aijaz, A. A., Zahid, H., Wajid, H. R., & Muhammad, S. V. (2019). Extending UTAUT2 toward acceptance of mobile learning in the context of higher education. *Universal Access in the Information Society*, 18(3), 659-673.
- Ainley, M. (2017). Interest: Knowns, unknowns, and basic processes. In: O'Keefe, P., Harackiewicz, J. (Eds). *The Science of Interest* (pp.1-18), Springer. https://doi.org/10.1007/978-3-319-55509-6_1.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Aksenova, A. V., Shepetovsky, D. V., Mironova, V. E., Stepura, S. N., & Pichugova, I. L. (2015). Developing students' motivation to learn foreign language in tertiary classroom and beyond. *Mediterranean Journal of Social Sciences*, 6(5), 240-247.
- Al-Adwan, A. S., Li, N., Al-Adwan, A., Abbasi, G. A., Albelbisi, N. A., & Habibi, A. (2023). Extending the technology acceptance model (TAM) to Predict university students' intentions to use metaverse-based learning platforms. *Education and Information Technologies*, 28(11), 15381-15413. <https://doi.org/10.1007/s10639-023-11816-3>.
- Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37(3), 99-110. <https://doi.org/10.1016/j.ijinfomgt.2017.01.002>.
- Alamin, A. A., Shaoqing, G., & Le, Z. (2015). The development of educational technology policies (1996-2012): Lessons from China and the USA. *International Education Studies*, 8(6), 142-150.
- Alawadhi, A., & Abu-Ayyash, E. A. S. (2021). Students' perceptions of Kahoot!: An exploratory mixed-method study in EFL undergraduate classrooms in the UAE. *Education and Information Technologies*, 26 (4), 3629-3658. <https://doi.org/10.1007/s10639-020-10425-8>.

- Albelbisi, A., & Yusop, F. D. (2018). Secondary school students' use of and attitudes toward online mathematics homework. *The Turkish Online Journal of Educational Technology*, 17(1), 144-153.
- Allmark, P. (2002). The ethics of research with children. *Nurse Research*, 10(2), 7-19. <https://doi.org/10.7748/nr2003.01.10.2.7.c5885>.
- Alqasa, K. M., Mohd Isa, F., Othman, S.N., & Zolait, A. H. S. (2014). The impact of students' attitude and subjective norm on the behavioral intention to use services of banking system. *International Journal of Business Information System*, 15(1), 105-122.
- Almagrashi, A., Mujalli, A., Khan, T., & Attia, O. (2023). Factors determining internal auditors' behavioral intention to use computer-assisted auditing techniques: an extension of the UTAUT model and an empirical study. *Future Business Journal*, 9(1), 74.
- Alshehri, A. A. (2017). The perception created of online homework by high school students, their teacher and parents in Saudi Arabia. *Journal of Education and Practice*, 8 (13), 85-100.
- Altun, E. (2008). 6th, 7th, and 8th graders' attitudes towards online homework assignment sites. *Turkish Online Journal of Educational Technology*, 7(4), 5-18.
- An, X., Chai, C. S., Li, Y., Zhou, Y., Shen, X., Zheng, C., & Chen, M. (2023). Modeling English teachers' behavioral intention to use artificial intelligence in middle schools. *Education and Information Technologies*, 28(5), 5187-5208. <https://doi.org/10.1007/s10639-022-11286-z>.
- An, F. H., Xi, L. J., Yu, J. Y., & Zhang, M. H. (2022). Relationship between technology acceptance and self-directed learning: Mediation role of positive emotions and technological self-efficacy. *Sustainability*, 14(16), 10390. <https://doi.org/10.3390/su141610390>.
- Anderson, G., & Arsenault, N. (2005). *Fundamentals of Educational Research (2nd ed.)*, Taylor and Francis.
- Andrews, J., Ward, H., Yoon, J. (2021). UTAUT as a model for understanding intention to adopt AI and related technologies among librarians. *The Journal of Academic Librarianship*, 47(6), 102437. <https://doi.org/10.1016/j.acalib.2021.102437>.
- Arasaingham, R. D., Martorell, I., & McIntire, T. M. (2011). Online homework and student achievement in a large enrolment introductory science course. *Journal of College Teaching*, 40(6), 70-79.
- Ary, D., Jacobs, L.C., Sorensen, C., & Razavieh, A. (2018). *Introduction to research in education (10th ed.)*. Canada. Nelson Education, Ltd.

- Ayaz, A., & Yannartas, M. (2020). An analysis on the unified theory of acceptance and use of technology theory (UTAUT): Acceptance of electronic document management system (EDMS). *Computer in Human Behavior Reports*, 2, 1-7. <https://doi.org/10.1016/j.chbr.2020.100032>.
- Babbie, E. (1990). *Survey research methods*. Wadsworth.
- Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research and Method in Education*, 5(6), 66-70.
- Balta, N., Perera-Rodríguez, V., & Hervás-Gómez, C. (2018). Using Socrative as an online homework platform to increase students' exam scores. *Education and Information Technologies*, 23, 837-850. <http://doi.org/10.1007/s10639-017-9638-6>.
- Banas, K., Thejll-Madsen, T., Tobar-Henríquez, A., & Murzyn, E. (2023). Attitude and peer norm predict how students use lecture recordings. *Computers & Education*, 207, 104933. <https://doi.org/10.1016/j.compedu.2023.104933>.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.
- Bandura, A., (1997). *Self-efficacy: The exercise of control*. WH Freeman and Company.
- Barnsley, A. (2014). Analysis of the effects of online homework on the achievement, persistence, and attitude of developmental mathematics students [Doctoral dissertation, University of Alaska Fairbanks]. ProQuest Dissertations & Theses. <http://www.proquest.com/enUS/products/dissertations/individuals.shtml>.
- Bartlett, K., Higgins, J. E., Bartlett, J. W., & Kotrlik, C. C. H. (2001). Determining Appropriate Sample Size in Survey Research. *Information, Technology, Learning, and Performance Journal*, 19(1), 43-50.
- Batucan, G. B., Gonzales, G. G., Balbuena, M. G., Pasaol, K. R., Seno, D. N., & Gonzales, R. R. (2022). An extended UTAUT model to explain factors affecting online learning system amidst COVID-19 pandemic: The case of a developing economy. *Frontiers in Artificial Intelligence*, 5, 768813. <https://doi.org/10.3389/frai.2022.768831>.
- Behrens, J. T. (1997). Principles and procedures of exploratory data analysis. *Psychological Methods*, 2(2), 131-160. <https://doi.org/10.1037/1082-989X.2.2.131>.
- Bilquise, G., Ibrahim, S., & Salhieh, S. E. M. (2023). Investigating student acceptance of an academic advising chatbot in higher education institutions. *Education and Information Technologies*, 29(5), 6357-6382. <https://doi.org/10.1007/s10639-023-12076-x>.

- Bonham, S., Beichner, R., & Deardorff, D. (2011). Online homework: Does it make a difference? *Physics Teacher*, 39(5), 293–297. <https://doi.org/10.1119/1.1375468>.
- Branch, K. J., & Butterfield, A. (2017). Board # 19: Development and usage of an online homework system in a chemical engineering curriculum [Conference]. *ASEE Annual Conference and Exposition*. Columbus, Ohio. <https://peer.asee.org/27801>.
- Bu, F., Wang, N., Jiang, B., & Jiang, Q. (2021). Motivating information system engineers' acceptance of privacy by design in China: An extended UTAUT model. *International Journal of Information Management*, 60, 102358. <https://doi.org/10.1016/j.ijinfomgt.2021.102358>.
- Burch, K.J., & Kuo, Y.J. (2010). Traditional vs. online homework in college algebra. *Mathematics and Computer Education*, 44 (1), 53–63.
- Cai, H., & Chen, M. (2019). Research on the construction and development of digital education resources in the intelligent age. *Modern Distant Education*, 3, 74-81.
- Caitlin, N.C., & Dustin, T.Y. (2018). Retrieval practice in the form of online homework improved information retention more when spaced 5 days rather than 1 day after class in two physiology courses. *Advances in Physiology Education*, 42(2), 305-310. <https://doi.org/10.1152/advan.00104.2017>.
- Cao, J., Feng, X., & Chen, L. (2020). Text analysis of educational informatization policy in China from 1989 to 2019. In *Proceedings of 2020 Ninth International Conference of Educational Innovation through Technology* (pp.107-111). IEEE.
- Cao, M., & Song, J.H. (2020). Research on user experience of online homework and its influencing factors: reflection on the promotion and application of online homework. *Modern Educational Technology*, 30(2), 79-84. <https://doi.org/10.3969/j.issn.1009-8097.2020.02.011>.
- Cao, M., Zhu, X. Y., & Shen, S. S. (2022). A study on grade 7-12 students' online learning performance with their parental involvement: Investigation and research report I on online teaching in primary and secondary schools in Jiangsu province. *Journal of East China Normal University (Educational Sciences)*, 40(4), 16-28. <https://doi.org/10.16382/j.cnki.1000-5560.2022.04.002>.
- Chan, T. W., Looi, C. K., Chang, B., & Chen, W. L. et al., (2019). IDC theory: creation and the creation loop. *Research and Practice in Technology Enhanced Learning*, 14(26), 1-29. <https://doi.org/10.1186/s41039-019-0120-5>.
- Chan, T.W., Looi, C.K., Chen, W. L., & Wong, L. H. et al., (2018). Interest-driven creator theory: Towards a theory of learning for Asia in the twenty-first century. *Journal of Computer Education*, 5(4), 435-461. <https://doi.org/10.1007/s40692-018-0122-0>.
- Chang, A. (2012). UTAUT and UTAUT2: A review and agenda for future research. *Journal of The Winners*, 13(2), 106-114. <https://doi.org/10.21512/tw.v13i2.656>.

- Chang, C. B., Wall, D., Tare, M., Golonka, E., & Vatz, K. (2014). What else do college students “do” while studying? An investigation of multitasking. *Computers & Education*, 75, 19-29. <https://doi.org/10.101016/j.compedu.2014.02.004>.
- Chao, C. M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in Psychology*, 10, 1652. <https://doi.org/10.3389/fpsyg.2019.01652>.
- Chaozi, L.E.I. (2018). Education Informatization: From the version 1.0 to 20. *Journal of East China Normal University (Educational Sciences)*, 36(1), 98.
- Che, L. N. (2022). A study on the application of Ekwing.com in English listening and speaking teaching of junior high school. [Master's thesis, Xi'an University of China]. CNKI. <https://doi.org/10.27684/d.cnki.gxndx.2022.003050>.
- Chen, W. L., Chan, T. W., Wong, L. H., & Looi, C. K. et al., (2020). IDC theory: Habit and the habit loop. *Research and Practice in Technology Enhanced Learning*, 15(10), 1-19. <https://doi.org/10.1186/s41039-020-00127-7>.
- Cheng, K.K., Thacker, B., Cardenas, R.L., & Crouch, C.H. (2004). Using an online homework system enhances students' learning of physics concepts in an introductory physics course. *American Journal of Physics*, 72 (11), 81–93. <https://doi.org/10.1119/1.1768555>.
- Chiu, J. I., & Tsuei, M. (2023). Effects of a Motion Graphic on Escalator Safety on College Students' Behavioural Intention, Determined Using the Unified Theory of Acceptance and Use of Technology. *Education and Information Technologies*, 28(5), 5453-5470. <https://doi.org/10.1007/s10639-022-11195-1>.
- Chiu, C.-M., & Wang, E. T. G. (2008). Understanding web-based learning continuance intention: The role of subjective task value. *Information & Management*, 45(3), 194-201. <https://doi.org/10.1016/j.im.2008.02.003>.
- Chu, H. Q. (2018). Chinese Version 2.0 for Education Modernization. *Educational Research*, 12, 9-17.
- Chua, P. Y., Rezaei, S., Gu, M. L., Oh, Y., & Jambulingam, M. (2018). Elucidating social networking apps decisions: Performance expectancy, effort expectancy and social influence. *Nankai Business Review International*, 9(2), 118-142.
- CNNIC. (2020). The 45th China statistical report on internet development. www.cac.gov.cn/2020-04/27/c1589535470378587.html.
- Cochran, W.G. (1977). *Sampling techniques (3rd ed.)*. John Wiley & Sons.
- Cohen, J. (2013). *Statistical power analysis for the behavior science*. Routledge.
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research Methods in Education (8th ed.)*. Routledge.

- Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19(2), 189-211. <https://doi.org/10.2307/249688>.
- Compeau, D., Correia, J., & Thatcher, J. B. (2022). When constructs become obsolete: A systematic approach to evaluating and updating constructs for information systems research. *MIS Quarterly*, 46(2), 679-711. <https://doi.org/10.25300/MISQ/2022/15516>.
- Cooper, H. (2001). *The battle over homework (2nd ed.)*, Corwin Press.
- Cooper, H., Lindsay, J. J., Nye, B., & Greathouse, S. (1998). Relationships among attitudes about homework, amount of homework assigned and completed, and student achievement. *Journal of Educational Psychology*, 90(1), 70-83. <https://doi.org/10.1037/0022-0663.90.1.70>.
- Cooper, H., Robinson, J. C., & Patall, E. A. (2006). Does homework improve academic achievement? A synthesis of research, 1987-2003. *Review of educational research*, 76(1), 1-62.
- Corno, L., & Mandinach, E. B. (2004). What we have learned about student engagement in the past twenty years. *Big theories revisited*, 4, 299-328.
- Creswell, J. W. (2011). Controversies in mixed methods research. *The Sage handbook of qualitative research*, 4, 269-284.
- Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks.
- Creswell, J. W., & Shope, R. Clark, V. L. P., & Green, D. O. (2006). How interpretive qualitative research extends mixed methods research. *Research in the Schools*, 13(1), 1-11.
- Cronbach, L. J. (1951). Coefficient alpha and internal structure of tests. *Psychometrika*, 16(3), 297-334. <https://doi.org/10.1007/bfo231055>.
- Cunha, J., Rosário, P., Núñez, J. C., Nunes, A. R., Moreira, T., & Nunes, T. (2018). "Homework feedback is...": Elementary and middle school teachers' conceptions of homework feedback. *Frontiers in Psychology*, 9, 310687. <https://doi.org/10.3389/fpsyg.2018.00032>.
- Dahl-Leonard, K., Hall, C., & Peacott, D. (2024). A meta-analysis of technology-delivered literacy instruction for elementary students. *Educational Technology Research and Development*, 1-32. <https://doi.org/10.1007/s11423-024-10354-0>.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13(3), 319-339. <https://doi.org/10.2307/249008>.

- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22(14), 1111-1132. <https://doi.org/10.1111/j.1559-1816.1992.tb00945.x>.
- Denscombe, M. (2010) *The good research guide: For small-scale social research projects (4th ed.)*. McGraw-Hill International.
- Dettmers, S., Trautwein, U., Ludtke, O., Geotz, T., Frenzel, A., & Pekrun, R. (2011). Students' emotions during homework in mathematics: Testing a theoretical model of antecedents and achievement outcomes. *Contemporary Educational Psychology*, 36(1), 25-35. <https://doi.org/10.1016/j.cedpsych.2010.10.001>.
- Dewey, J. (1913). *Interest and effort in education*. Houghton Mifflin.
- Doan, T. T. T. (2021). The effect of perceived risk and technological self-efficacy on online learning intention: An empirical study in Vietnam. *Journal of Asia Finance, Economics, and Business*, 8(10), 385-393.
- Dong, Y. (2018). The applied research of digital assignment platform in fourth grade English teaching of primary school. [Master's thesis, Hebei Normal University of Science and Technology]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1018113584.nh>.
- Doorn, J., Janssen, S., & O'Brien, M. (2010). Student attitudes and approaches to online homework. *International Journal for the Scholarship of Teaching and Learning*, 4(1), 1-13. <https://doi.org/10.20429/ijstl.2010.040105>.
- Dorko, A. (2020). Red X's and green checks: A model of how students engage with online homework. *International Journal of Research in Undergraduate Mathematics Education*, 6(3), 446-474. <https://doi.org/10.1007/s40753-020-00113-w>.
- Du, J., Xu, J., & Fan, X. (2016). Investigating factors that influence students' help seeking in math homework: A multilevel analysis. *Learning and Individual Differences*, 48, 29-35. <https://doi.org/10.1016/j.lindif.2016.03.002>.
- Dumas, J. S., & Redish, J. C. (1999). *A practical guide to usability testing*. Intellect Books Ltd.
- Ebadi, S., & Raygan, A. (2023). Investigating the facilitating conditions, perceived ease of use and usefulness of mobile-assisted language learning. *Smart Learning Environments*, 10(1), 30. <https://doi.org/10.1186/s40561-023-00250-0>.
- Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L. & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Eds.), *Achievement and achievement motives: Psychological and sociological approaches* (pp. 75-146). WH Freeman and Company.

- Eichler, J. F., & Peeples, J. (2013). Online homework put to the test: A report on the impact of two online learning systems on student performance in general chemistry. *Journal of Chemical Education*, 90(9), 1137-1143. <https://doi.org/10.1021/ed30006264>.
- Elias, A. L., Elliott, D. G., & Elliott, J. A. W. (2017). Student perceptions and instructor experiences in implementing an online homework system in a large second-year engineering course. *Education for Chemical Engineers*, 21, 40-49. <https://doi.org/10.1016/j.ece.2017.07.005>.
- Elmehdi, H. M., Ibrahim, A. M., & Haba, U. A. (2013). An evaluation of web-based homework delivery systems: University of Sharjah experience. *International Journal of Emerging Technologies in Learning*, 8 (4), 57-62. <https://doi.org/10.3991/ijet.v8i4.2966>.
- Epley, J., & Smith, D. (2015). Learner characteristics, online engagement, and student success rates. *International Journal of Education and Social Science*, 2(4), 103-116.
- Fan, H., Xu, J., Cai, Z., He, J., & Fan, X. (2017). Homework and students' achievement in math and science: A 30-year meta-analysis, 1986–2015. *Educational Research Review*, 20, 35–54. <https://doi.org/10.1016/j.edurev>.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An introduction to theory and research*. Addison-Wesley.
- Flick, U. (2006). *An introduction to qualitative research*. Sage Publication.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education (10th ed.)*. McGraw Hill Education.
- Francis, J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. & Grimshaw, J. (2010). What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychology and Health*, 25(10), 1229-1245.
- Fulano, C., Cunha, J., Núñez, J. C., Pereira, B., & Rosário, P. (2018). Mozambican adolescents' perspectives on the academic procrastination process. *School Psychology International*, 39(2), 196-213. <https://doi.org/10.1177/0143034318760115>.
- Gall, M., Gall, J., & Borg, R. (2007). *Educational research: An introduction (8th ed.)*. Pearson Education.
- Gao, Y. (2021). An empirical study on “Work Together App” English online homework assignment and correction in primary school during epidemic period. [Master's Thesis, Liaoning Normal University of China]. CNKI. <https://doi.org/10.27212/d.cnki.glnsu.2021.001662>.

- Gao, R., He, T., Liao, Y., Liu, X., Fan, Y., Su, Y., Zuo, H., & Mo, L. (2022). An investigation on the academic burden of Chinese students ranging from primary schools to universities based on a word association test in Guangdong Province. *International Journal of Environmental Research and Public Health*, 19(4), 2481. <https://doi.org/10.3390/ijerph19042481> .
- Gao, L., Vongurai, R., Phothikitti, K., & Kitcharoen, S. (2022). Factors influencing university students' attitude and behavioral intention towards online learning platform in Chengdu, China. *ABAC ODI Journal Vision. Action. Outcome*, 9(2), 21-37. <https://doi.org/10.14456/abacodijournal.2022.2> .
- Gay, L. R., Mills, G. E., & Airasian, P. (2018). *Educational research: Competencies for analysis and applications* (12th ed.). Pearson.
- George, D., & Mallery, M. (2009). *Using SPSS for Windows step by step: A simple guide and reference*. Allyn & Bacon.
- Gerhart, L. M., & Anderton, B. N. (2021). Engaging students through online video homework assignments: A case study in a large-enrolment ecology and evolution course. *Ecology and Evolution*, 11(11), 5777-5789. <https://doi.org/10.1002/ece3.7547>.
- Giannakoulas, A., & Xinogalos, S. (2018). A pilot study on the effectiveness and acceptance of an educational game for teaching programming concepts to primary school students. *Education and Information Technologies*, 23, 2029-2052. <https://doi.org/10.1007/s10639-018-9702-x> .
- Glesne, C. (1999). *Becoming qualitative researchers*. Addison Wesley Longman.
- Göllner, R., Damian, R. I., Rose, N., Spengler, M., Trautwein, U., Nagengast, B., & Roberts, B. W. (2017). Is doing your homework associated with becoming more conscientious?. *Journal of Research in Personality*, 71, 1-12.
- González, J.A., Giuliano, M. & Pérez, S.N. (2022). Measuring the effectiveness of online problem solving for improving academic performance in a probability course. *Education and Information Technologies*, 27(5), 6437-6457. <https://doi.org/10.1007/s10639-021-10876-7>.
- Green, M., Caldwell, B., Helms, M., Linsey, J., & Hammond, T. (2015). Using natural sketch recognition software to provide instant feedback to statics homework (truss free body diagrams): Assessment of a classroom pilot. In *2015 ASEE Annual Conference and Exposition* (pp. 1671), Seattle, Washington. <https://doi.org/10.18260/p.25007>.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, 18(1), 59-82. <https://doi.org/10.1177/1525822X05279903>.
- Guggemos, J., Moser, L., & Seufert, S. (2022). Learners don't know best: Shedding light on the phenomenon of the K-12 MOOC in the context of information literacy. *Computers & Education*, 188, 104552. <https://doi.org/10.1016/j.compedu.2022.104552> .

- Guo, Q. (2018). Experimental research on online operation platform to mathematics teaching in primary school. [Master's thesis, Nanchang University]. CNKI. <https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CMFD&dbname=CMFD201802&filename=1018146225.nh>.
- Hagger, M., Sultan, S., Hardcastle, S., & Chatzisarantis, N. (2015). Perceived autonomy support and autonomous motivation towards mathematics activities in educational and out-of-school context is related to mathematics homework behaviour and attainment. *Contemporary Educational Psychology*, 41, 111-123.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2018). *Multivariate data analysis: A global perspective (8th ed.)*. Pearson.
- Hao, H. X. (2021). An English online homework tutoring system supported by internet database. *Hindawi Journal of Mathematics*, 1-12. <https://doi.org/10.1155/2021/5960185>.
- Harttelina, R. L. B. & Ayuk, H. (2021). What can hedonic motivation do on decisions to use online learning service? *International Journal of Data and Network Science*, 5(2), 121-126. <https://doi.org/10.5267/j.ijdns.2021.2.002>.
- Hassenzahl, M., Diefenbach, S., & Göritz, A. (2010). Needs, affect, and interactive products: Facets of user experience. *Interacting with Computers*, 22(5), 353–362. <https://doi.org/10.1016/j.intcom.2010.04.002>.
- He, J. L. (2018). The practical research of information-based teaching software in junior middle school physics teaching. [Master's thesis, Sichuan Normal University]. CNKI. <https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CMFD&dbname=CMFD201901&filename=1018157441.nh>.
- He, Z. (2018). Design and practice of primary school collaborative learning activities based on homework platform. [Master's thesis, East China Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1019810905.nh>.
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>.
- Herodotou, C., Maguire, C., McDowell, N., Hlosta, M., & Boroowa, A. (2021). The engagement of university teachers with predictive learning analytics. *Computers & Education*, 173, 104285. <https://doi.org/10.1016/j.compedu.2021.104285>.
- Herrero, Á., & San Martín, H. (2017). Explaining the adoption of social networks sites for sharing user-generated content: A revision of the UTAUT2. *Computers in Human Behaviour*, 71, 209-217. <https://doi.org/10.1016/j.chb.2017.02.007>.
- Hidi, S. (2006). Interest: A unique motivational variable. *Educational Research Review*, 1(2), 69-82. <https://doi.org/10.1016/j.edurev.2006.09.001>.

- Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research*, 70(2), 151–179. <https://doi.org/10.3102/00346543070002151>.
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41(2), 111–127. https://doi.org/10.1207/s15326985ep4102_4.
- Hornbæk, K., & Hertzum, M. (2017). Technology acceptance and user experience: A review of the experiential component in HCI. *ACM Transactions on Computer-Human Interaction*, 24(5), 1-46. <https://doi.org/10.1145/3127358>.
- Hu, S., Laxman, K. & Lee, K. (2020). Exploring factors affecting academics' adoption of emerging mobile technologies-an extended UTAUT perspective. *Education and Information Technologies*, 25, 4615–4635. <https://doi.org/10.1007/s10639-020010171-x>.
- Huang, F., Teo, T., & Zhou, M. M. (2019). Chinese students' intention to use the internet-based technology for learning. *Educational Technology Research and Development*, 68, 575-591. <https://doi.org/10.1007/s11423-019-09695-y>.
- Huicheng Education Bureau. (2021). The fourteenth five-year plan for educational development in Huicheng district, Huizhou city. http://www.hcq.gov.cn/hzhcjy/gkmlpt/content/4/4474/post_4474892.html#2154.
- Huizhou Statistics Bureau. (2022). Huizhou's economic development in 2021. Retrieved from http://www.huizhou.gov.cn/hztjj/gkmlpt/content/4/4534/post_4534970.html#1030.
- Hussein, Z. (2017). Leading to intention: The role of attitude in relation to technology acceptance model in E-learning. *Procedia Computer Science*, 105, 159-164. <https://doi.org/10.1016/j.procs.2017.01.196>.
- iiMedia Research. (2020). 2019-2020 China's online education industry development research report. www.sohu.com/a/373022673_533924.
- Jia, J.Y. (2014). *Intelligent web-based English instruction in middle schools*. IGI Global.
- Jia, J.Y., Chen, Y.H., Ding, Z.H., Bai, Y., Yang, B. J., Li, M., & Qi, J. (2013). Effects of an intelligent web-based English instruction system on students' academic performance. *Journal of Computer Assisted Learning*, 29(6), 556-568.
- Jiang, Y., Shang, J., & Jiao, L. (2023). Review of China's online education policy, 1999-2022. *ECNU Review of Education*, 6(1), 155-182. <https://doi.org/10.1177/20965311221099581>.
- Johnson, R. B., & Christensen, L. (2017). Educational research: Quantitative, qualitative, and mixed approaches (6th ed.). Sage Publications.

- Kabra, G., Ramesh, A, Akhtar, P., & Dash, M. K. (2017). Understanding behavioral intention to use information technology: Insights from humanitarian practitioners. *Telematics and Informatics*, 34(7), 250-1262.
- Kaur, B. (2011). Mathematics homework: A study of three grade eight classrooms in Singapore. *International Journal of Science and Mathematics Education*, 9, 187-206.
- Kang, M., Liew, B. Y. T., Lim, H., Jang, J., & Lee S. (2015). Investigating the determinants of mobile learning acceptance in Korea using UTAUT2. In G. Chen, V. Kumar, Kinshuk, R. Huang, & S. Kong (Eds.), *Emerging issues in smart learning. Lecture notes in educational technology* (pp. 209-216). Springer Berlin Heidelberg.
- Kerlinger, F. N. & Lee, H. (2000). *Foundations of behavioral research* (4th ed.). Harcourt College Publishers.
- Kersey, E., Max, B., Akarsu, M., Bloome, L., Suazo, E., & Hoffman, A. (2019). Use of written curriculum in applied calculus. *International Journal of Research in Education and Science*, 5(2), 457-467.
- Khechine, H., Raymond, B., & Augier, M. (2020). The adoption of a social learning system: Intrinsic value in the UTAUT model. *British Journal of Educational Technology*, 51(6), 2306-2325. <https://doi.org/10.1111/bjet.12905>.
- Kirbas, A. (2018). Student views on using smart boards in turkish education. *Universal Journal of Educational Research*, 6(5), 1040-1049. <https://doi.org/10.13189/ujer.2018.060525>.
- Kong, S. C. (2016). A framework of curriculum design for computational thinking development in K-12 education. *Journal of Computers in Education*, 3(4), 377-394. <https://doi.org/10.1007/s40692-016-0076-z>.
- Kong, S. C., Chiu, M. M., Lai, M. (2018). A study of primary school students' interest, collaboration attitude, and programming empowerment in computational thinking education. *Computers & Education*, 122, 178-189. <https://doi.org/10.1016/j.compedu.2018.08.026>.
- Kou, S. (2020). Application of education informatization promoting educational equity in remote areas of China. *International Journal of Information and Education Technology*, 10(8), 608-613. <https://doi.org/10.18178/ijiet.2020.10.8.1432>.
- Krapp, A. (2002). An educational-psychological theory of interest and its relation to SDT. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of Self-Determination Research* (pp. 405-430). The University of Rochester Press.
- Krapp, A. (2005). Basic needs and the development of interest and intrinsic motivational orientations. *Learning and Instruction*, 15(5), 381-395. <https://doi.org/10.1016/j.learninstruc.2005.07.007>.

- Krishna, M., Tsen, T. Y., Loh, C. T., & Vikniswari, V. K. (2019). Habit and hedonic motivation are the strongest influences in mobile learning behaviors among higher education students in Malaysia. *Australasian Journal of Educational Technology*, 35 (4), 174-191. <https://doi.org/10.14742/ajet.4432>.
- Lai, C. (2015). Modeling teachers' influence on learners' self-directed use of technology for language learning outside the classroom. *Computers & Education*, 82, 74-83. <https://doi.org/10.1016/j.compedu.2014.11.005>.
- Lakhal, S., & Khechine, H. (2021). Technological factors of students' persistence in online courses in higher education: The moderating role of gender, age and prior online course experience. *Education and Information Technologies*, 26(3), 3347-3373. <https://doi.org/10.1007/s10639-020-10407-w>.
- Lally, P., & Gardner, B. (2013). Promoting habit formation. *Health Psychology Review*, 7(1), S137-S158. <https://doi.org/10.1080/17437199.2011.603640>.
- Lazarova, K. (2015). The role of online homework in low-enrolment college introductory physics courses. *Journal of College Science Teaching*, 44(3), 17-21. <https://www.jstor.org/stable/43631934>.
- Leong, K., & Alexander, N. (2014). College students' attitude and mathematics achievement using web-based homework. *Eurasia Journal of Mathematics, Science & Technology*, 29(3), 233-246.
- Li, F. (2022). Application research of online homework platform in junior high school English listening teaching. [Master's Degree]. Haerbin Normal University. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1022454627.nh>.
- Li, G.F., & Ni, X. P. (2012). Use of technology to support the learning and teaching of English in China. In *Perspectives on Teaching and Learning English Literacy in China* (pp. 145-160). Springer Netherlands. https://doi.org/10.1007/978-94-007-4994-8_10.
- Li, S., Christian, S., Meghan, B., Adar, B. E. (2015). Family support their children's success in science learning by influencing interest and self-efficacy. *Journal of Research in Science Teaching*, 53(3), 450-472. <https://doi.org/10.1002/tea.21251>.
- Li, S. H. (2020). Research on the design and application of English homework in rural primary schools based on the platform of teaching resources: Take an application of job net as an example. [Master's thesis, Shandong Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1020031361.nh>.
- Li, Y., Zhang, X., Lu, F., Zhang, Q., & Wang, Y. (2014). Internet addiction among elementary and middle school students in China: A nationally representative sample study. *Cyberpsychology, Behavior, and Social Networking*, 17(2), 111-116. <https://doi.org/10.1089/cyber.2012.0482>.

- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Sage Publications.
- Liu, H. (2020). Teaching research on improving junior high school students' oral English based on Ekwing platform hierarchical assignments. [Master's thesis, Xi'an University of China]. CNKI. <https://doi.org/10.27684/d.cnki.gxndx.2020.003965>.
- Liu, S. K. (2019). A study on the present situation and countermeasures of primary school English extracurricular homework implementation based on WeChat platform. [Master's thesis, Inner Mongolia Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1019842459.nh>.
- Locklear, D. (2012). Using online homework in a liberal arts math course to increase student participation and performance. [Doctoral dissertation, University of North Carolina College of Management and Technology]. <https://gradworks.umi.com/34/99/3499869.html>.
- Lu, Q. (2017). Research on online homework system application in high-grade elementary school mathematics: A case study of "M Study". [Master's Thesis, Tianjin Normal University]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1017189445.nh>.
- Lunsford, M. L., & Pendergrass, M. (2016). Making online homework work, *Primus*, 26(6), 531-544. <https://doi.org/10.1080/10511970.2015.1110219>.
- Luo, L. (2021). A practical study on the cultivation of English listening and speaking ability of Rural primary school students based on M-Learning task platform. [Master's thesis, Hebei Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1021587196.nh>.
- Magalhães, P., Ferreira, D., Cunha, J., & Rosário, P. (2020). Online vs traditional homework: A systematic review on the benefits to students' performance. *Computers & Education*, 152, 103869. <https://doi.org/10.1016/j.compedu.2020.103869>.
- Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative health research*, 26(13), 1753-1760. <https://doi.org/10.1177/1049732315617444>.
- Maxwell, P., Smoker, K., & Stites-Doe, S. (2018). Does the homework format really matter? The impact of online homework assignments and learning style fit on accounting students' learning engagement and academic achievement. *Journal of Educational Multimedia and Hypermedia*, 27(3), 343-366. <https://www.learntechlib.org/primary/p/178529/>.
- McCollum, B., Morsch, L., Shokoples, B., & Skagen, D. (2019). Overcoming barriers for implementing international online collaborative assignments in chemistry. *Canadian Journal for the Scholarship of Teaching and Learning*, 10(1), <https://doi.org/10.5206/cjsotl-rcacea.2019.1.8004>.

- Metwally, A. H. S., Chang, M., Wang, Y., & Yousef, A. M. F. (2021). Does gamifying homework influence performance and perceived gameful experience? *Sustainability*, 13(9), 4829. <https://doi.org/10.3390/su13094829>.
- Metwally, A. H. S., Yousef, A. M. F., & Yining, W. (2020). Learning analytics and perceived experience of gamifying homework assignments. *In Proceedings of the 12th International Conference on Computer Supported Education* (pp. 673-683).
- Miles, M. B., Huberman, A. M., and Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed). Sage Publications.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. <https://doi.org/10.1287/isre.2.3.192>.
- Morgan, A. (2013). Factors influencing student use of online homework management systems. *Recognizing Excellence in Business Education*, 98, 98-112.
- Morse, J. M. (2015). Data were saturated. *Qualitative Health Research*, 25(5), 587-588. <https://doi.org/10.1177/1049732315576699>.
- Mueller, C., & Walzen, A. (2020). Is willingness to communicate associated with more positive online chat experiences? *JALA Journal*, 42(2), 103-120. <https://doi.org/10.37546/JALTJJ42.2-1>.
- Murphy, C. A., & Stewart, J. C. (2015). The impact of online or F2F lecture choice on student achievement and engagement in a large lecture-based science course: Closing the gap. *Journal of Asynchronous Learning Network*, 19(3), 91-110. <https://doi.org/10.24059/olj.v19i3.536>.
- Murphy, R., Roschelle, J., Feng, M. Y., & Mason, C. A., (2020). Investigating efficacy, moderators and mediators for an online mathematics homework intervention. *Journal of Research on Educational Effectiveness*, 13(2), 235-270. <https://doi.org/10.1080/19345747.2019.1710885>.
- Nabulsi, L., Nguyen, A., & Odeleye, O. (2021). A comparison of the effects of two different online homework systems on levels of knowledge retention in general chemistry students. *Journal of Science Education and Technology*, 30, 31-39. <https://doi.org/10.1007/s10956-020-09872-2>.
- Nakamura, J., & Csikszentmihalyi, M. (2014). *The concept of flow*. In M. Csikszentmihalyi (Eds.), *Flow and the foundations of positive psychology* (pp. 239-263). Springer.
- Ni. A., & Cheung, A. (2022). Understanding secondary students' continuance intention to adopt AI-powered intelligent tutoring system for English learning. *Education and Information Technologies*, 28(3), 3191-3216. <https://doi.org/10.1007/s10639-022-11305-z>.
- Norman, D., & Nielsen, J. (2021). *The definition of user experience*. Nielsen Norman Group.

- Nuria. S., & Gabriela, Z. (2008). Blending classroom instruction with online homework: A study of student perceptions of computer-assisted L2 learning. *ReCALL*, 20(2), 208-224. <https://doi.org/10.1017/S0958344008000621>.
- Nutan, M. T. H., & Demps, E. L. (2014). Online assessments in pharmaceutical calculations for enhancing feedback and practice opportunities. *Currents in Pharmacy Teaching and Learning*, 6(6), 807-814. <http://dx.doi.org/10.1016/j.cptl.2014.07.010>.
- O'Keefe, P. A., Horberg, E. J., & Plante, I. (2017). The multifaceted role of interest in motivation and engagement. In P.A. O'Keefe, J.M. Harackiewicz (Eds.), *The Science of Interest*. Springer, Cham. https://doi.org/10.1007/978-3-319-55509-6_3.
- Padgett, C., Moffitt, R. L., & Grieve, R. (2021). More than words: Using digital cues to enhance student perceptions of online assignment feedback. *Internet and Higher Education*, 49, Article 100789. <https://doi.org/10.1016/j.iheduc.2020.100789>.
- Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS*. Maidenhead.
- Pallant, J. (2013). *SPSS survival manual*. McGraw-Hill Education.
- Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., & Sindhi, S. (2018). Online education: Worldwide status, challenges, trends, and implications. *Journal of Global Information Technology Management*, 21(4), 233-241. <https://doi.org/10.1080/1097198X.2018.1542262>.
- Pan, X. (2020). Technology acceptance, technological self-efficacy, and attitude toward technology-based self-directed learning: Learning motivation as a mediator. *Frontiers in Psychology*, 11, 564294. <https://doi.org/10.3389/fpsyg.2020.564294>.
- Parker, L. L., & Loudon, G.M. (2013). Case study using online homework in undergraduate organic chemistry: Results and student attitudes. *Journal of Chemical Education*, 90(1), 37-44. <https://doi.org/10.1021/ed300270t>.
- Patil, H., & Undale, S. (2023). Willingness of university students to continue using e-Learning platforms after compelled adoption of technology: Test of an extended UTAUT model. *Education and Information Technologies*, 28(11), 14943-14965. <https://doi.org/10.1007/s10639-023-11778-6>.
- Patton, M. Q. (2002). *Qualitative Evaluation and Research Methods* (3rd ed.). Sage Publications.
- Phillips, D. C. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational researcher*, 24(7), 5-12.

- Raffaghelli, J. E., Rodríguez, M. E., Guerrero-Roldán, A. E., & Baneres, D. (2022). Applying the UTAUT model to explain the students' acceptance of an early warning system in higher education. *Computers & Education*, 182, 104468. <https://doi.org/10.1016/j.compedu.2022.104468>.
- Rahi, S., Mansour, M. M. O., Alghizzawi, M., & Alnaser, F. M. (2019). Integration of UTAUT model in internet banking adoption context: The mediating role of performance expectancy and effort expectancy. *Journal of Research in Interactive Marketing*, 13(3), 411-435. <https://doi.org/10.1108/JRIM-02-2018-0032>.
- Raman, A., & Thannimalai, R. (2021). Factors impacting the behavioral intention to use e-learning at higher education amid the Covid-19 pandemic: UTAUT2 model. *Psychological Science and Education*, 26(3), 82-93. <https://doi.org/10.177759/pse.2021260305>.
- Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social isolation and acceptance of the learning management system (LMS) in the time of COVID-19 pandemic: An expansion of the UTAUT Model. *Journal of Educational Computing Research*, 59(2), 183-208. <https://doi.org/10.1177/0735633120960421>.
- Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: A comprehensive guide*. (4th ed.). Jossey-Bass.
- Renninger, K. A., & Hidi, S. (2016). *The power of interest for motivation and engagement*. Routledge.
- Rentler, B. R., & Apple, D. (2020). Understanding the acceptance of e-learning in a Japanese university English program using the technology acceptance model. *APU Journal of Language Research*, 5, 22-37. https://doi.org/10.34409/apujlr.5.0_22.
- Richards-Babb, M., Curtis, R., Georgieva, Z., & Penn, H. J. (2015). Student perceptions of online homework use for formative assessment of learning in organic chemistry. *Journal of Chemistry Education*, 92(11), 1813-1819. <https://doi.org/10.1021/acs.jchemed.5b00294>.
- Richards-Babb, M., Drelick, J., Henry, Z., & Robertson-Honecker, J. (2011). Online homework, help or hindrance? What students think and how they perform. *Journal of College Science Teaching*, 40 (4), 81–93.
- Robinson, J.P., Shaver, P. R., & Wrightsman, L. S. (1991). Criteria for scale selection and evaluation. *Measures of personality and social psychological attitudes*, 1(3), 1-16.
- Rodriguez, Jr., R.P., & Smith, L.M. (2016). Using an online homework management system in tax accounting: Does it advance learning? *International Journal of Learning Technology*, 11 (1), 44-65. <https://doi.org/10.1504/IJLT.2016.076062>.
- Rogers, E. (2003). *Diffusion of Innovations*. Free Press.

- Roman, C., Delgado, M.A., & García-Morales, M. (2021). Socrative, a powerful digital tool for enriching the teaching-learning process and promoting interactive learning in Chemistry and Chemical Engineering studies. *Computer Applications in Engineering Education*, 29 (6), 1542-1553. <https://doi.org/10.1002/cae.22408>.
- Rosário, P., Cunha, J., Nunes, A. R., Moreira, T., Núñez, J. C., & Xu, J. (2019). "Did you do your homework?" Mathematics teachers' homework follow-up practices at middle school level. *Psychology in the Schools*, 56(1), 92-108. <https://doi.org/10.1002/pits.22198>.
- Rosário, P., Núñez, J. C., Vallejo, G., Nunes, T., Cunha, J., Fuentes, S., & Valle, A. (2018). Homework purposes, homework behaviors, and academic achievement. Examining the mediating role of students' perceived homework quality. *Contemporary Educational Psychology*, 53, 168-180. <https://doi.org/10.1016/j.cedpsych.2018.04.001>.
- Roschelle, J., & Burke, Q. (2019). Commentary on interest-driven creator theory: A US perspective on fostering interest, creativity, and habit in school. *Research and Practice in Technology Enhance Learning*, 14(1), 13. <https://doi.org/10.1186/s41039-019-0107-2>.
- Roschelle, J., Feng, M. Y., Murphy, R. F., & Manson, C. A. (2016). Online mathematics homework increases student achievement. *AERA Open*, 2 (4), 2332858416673968. <https://doi.org/10.1177/2332858416673968>.
- Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. Sage Publications.
- Salkind, N. J. (Ed.). (2005). *Encyclopedia of human development*. Sage Publications.
- Salame, I. I., & Hanna, E. (2020). Studying the impact of online homework on the perceptions, attitudes, study habits, and learning experiences of chemistry students. *Interdisciplinary Journal of Environmental and Science Education*, 16(4), e2221. <https://doi.org/10.29333/ijese/8543>.
- Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24, 509-530. <https://doi.org/10.1007/s10639-018-9786-3>.
- Sarmiento, C. P. (2017). Student perceptions of online homework in mathematics of accounting and finance. *Advanced Science Letters*, 23 (2), 1122-1125. <https://doi.org/10.1166/asl.2017.7513>.
- Schiefele, U. (1996). Topic interest, text representation, and quality of experience. *Contemporary Educational Psychology*, 21(1), 3-18. <https://doi.org/10.1006/ceps.1996.0002>.
- Sechrest, L., Fay, T. L., & Zaidi, S. H. (1972). Problems of translation in cross-cultural research. *Journal of Cross-Cultural Psychology*, 3(1), 41-56.

- Sekaran, U., & Bougie, R. (2010). Theoretical framework in theoretical framework and hypothesis development. *Research methods for business: A skill building approach*. Wiley.
- Shadiev, R., & Wang, X. (2022). A review of research on technology-supported language learning and 21st century skills. *Frontiers in Psychology, 13*, 897689. <https://doi.org/10.3389/fpsyg.2022.897689>.
- Shang, X. L. (2019). Research on design and application of the primary school English personalized assignment based on the online homework platform. [Master's thesis, Northwest Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&fileName=1019049476.nh>.
- Sheeran, P., Maki, A., Montanaro, E., Avishai-Yitshak, A., Bryan, A., Klein, W. M. P., Miles, E., & Rothman, A. J. (2016). The impact of changing attitudes, norms, and self-efficacy on health-related intentions and behavior: A meta-analysis. *Health Psychology, 35*(11), 1178–1188. <https://doi.org/10.1037/hea0000387>.
- Shen, Z. (2017). Analysis of the development trend of online education in China. *Educational Journal, 6*(5), 159-163. <https://doi.org/10.11648/j.edu.20170605.13>.
- Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1998). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research, *Journal of Consumer Research, 15*(3), 325-343. <https://doi.org/10.1086/209170>.
- Sitar-Tăut, D. A. (2021). Mobile learning acceptance in social distancing during the COVID-19 outbreak: The mediation effect of hedonic motivation. *Human Behavior and Emerging Technologies, 3*(3), 366-378. <https://doi.org/10.1002/hbe2.261>.
- Sina Education. (2016). Release of the 2016 annual online education user white paper. <http://edu.sina.com.cn/1/2016-11-24/doc-ifyyawmn9990170.shtml>.
- Smith, J., Lee, C., & Kim, S. (2019). Middle school students' perceptions of homework: A qualitative study. *Journal of Educational psychology, 111*(4), 652-667.
- Smolinsky, L., Olafsson, G., Marx, B. D., & Wang, G. (2018). Online and handwritten homework in calculus for STEM majors. *Journal of Educational Computing Research, 57*(6), 1513-1533. <https://doi.org/10.1177/0735633118800808>.
- Smyth, J., Chen, H., Donzella, V., & Woodman, R. (2021). Public acceptance of driver state monitoring for automated vehicles: Applying the UTAUT framework. *Transportation research part F: Traffic psychology and behaviour, 83*, 179-191. <https://doi.org/10.1016/j.trf.2021.10.003>.

- Sobti, N. (2019). Impact of demonetization on diffusion of mobile payment service in India: Antecedents of behavioral intention and adoption using extended UTAUT model. *Journal of Advances in Management Research*, 16(4), 472-497. <https://doi.org/10.1108/JAMR-09-2018-0086>.
- Sohu News. (2022). 2021 GDP Rankings of Guangdong Cities. https://www.sohu.com/a/522041776_100182943.
- Solyst, J., Thakur, T., Dutta, M., Asano, Y., Petersen, A., & Williams, J. J. (2021). Procrastination and gaming in an online homework system of an inverted CS1. In *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education* (pp. 789-795). <https://doi.org/10.1145/3408877.3432440>.
- Song, J., Liang, G., Liu, G., & Walls, R. (2005). Are teachers in China ready to teach in the 21st century? *Journal of Technology and Teacher Education*, 13, 197-209.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research*. Sage Publications.
- Suárez, N., Regueiro, B., Estévez, I., Ferradás, M. D. M., Couñago, M., & Rodríguez, S. (2019). Individual precursors of student homework behavioral engagement: The role of intrinsic motivation, perceived homework utility and homework attitude. *Frontiers in Psychology*, 10, 445527. <https://doi.org/10.3389/fpsyg.2019.00941>.
- Suki, N.M., & Suki, N. M. (2017). Determining students' behavioral intention to use animation and storytelling applying the UTAUT model: The moderating roles of gender and experience level. *The International Journal of Management Education*, 15, 528-538. <http://dx.doi.org/10.1016/j.ijme.2017.10.002>.
- Sun, H. T. (2023). Research on blending teaching design of English listening and speaking in junior high schools based on the Ekwing system. [Master's thesis, Qupu Normal University of China]. CNKI. <https://doi.org/10.27267.d.cnki.gqfsu.2023.0002999>.
- Sun, M., Du, J., Xu, J., & Liu, F. (2019). Homework goal orientation scale: Measurement invariance and latent mean differences across gender and grade level. *Psychology in the Schools*, 56, 465-477. <https://doi.org/10.1002/pits.22206>
- Susana, R., Isabel, P., Bibiana, R., & Iris, E. (2020). Intrinsic motivation and perceived utility as predictors of student homework engagement. *Revista de Psicodidáctica (English ed.)*, 25(2), 93-99. <https://doi.org/10.1016/j.psicod.2019.11.001>.
- Symonds, J. E., & Gorard, S. (2011). Death of mixed methods? Or the rebirth of research as a craft. *Evaluation & Research in Education*, 23(2), 121-136. <https://doi.org/10.1080/09500790.2010.483514>.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (4th ed.). Harper Collins.

- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48, 1273-1296. <https://doi.org/10.1007/s11165-016-9602-2>.
- Tan, D. Y., & Chen, J. M. (2021). Bringing physical physics classroom online challenges of online teaching in the new normal. *The Physics Teacher*, 59(6), 410-413. <https://doi.org/10.1119/5.0028641>.
- Tang, D., & Odeleye, O. (2023). Students' perceptions on the impact of online homework systems on their performance in a general chemistry course. *Journal of Science Education and Technology*, 32(5), 710-721.
- Teo, T., Huang, F., & Hoi, C. K. W. (2018). Explicating the influences that explain intention to use technology among English teachers in China. *Interactive Learning Environments*, 26(4), 460-475. <https://doi.org/10.1080/10494820.2017.1341940>.
- Tey, T.C.Y., & Moses, P. (2018). UTAUT: Integrating achievement goals and learning styles for undergraduates' behavioral intention to use technology. *EAI Endorsed Transactions on e-Learning*, 5(17), 155573. <https://doi.org/10.4108/eai.25-9-2018.155573>.
- The Guangdong Network of ICT in Education. (2016). Huizhou, Guangdong: Improve teaching quality and build a high-quality education highland. https://web.ict.edu.cn/p/2016/sxdt_0301/2655.html.
- Tian, S., & Yang, W. (2023). Modeling the use behavior of interpreting technology for student interpreters: An extension of UTAUT model. *Education and Information Technologies*, 1-30. <https://doi.org/10.1007/s10639-023-12225-2>.
- Trussell, H. J., & Gumpertz, M. L. (2020). Comparison of the effectiveness of online homework with handwritten homework in electrical and computer engineering classes. *IEEE Transactions on Education*, 63(3), 209-215. <https://doi.org/10.1109/TE.2020.2971198>.
- Tsai, C., Cheng, Y., Tsai, Y., & Lou, S. (2021). Impacts of AIOT implementation course on the learning outcomes of senior high school students. *Education Science*, 11(2), 82. <https://doi.org/10.3390/educsci11020082>.
- Utomo, P., Kurniasari, F., & Purnamaningsih, P. (2021). The effects of performance expectancy, effort expectancy, facilitating condition, and habit on behavior intention to use mobile healthcare application. *International Journal of Community Service & Engagement*, 2(4), 183-197. <https://doi.org/10.47747/ijcse.v2i4.529>.
- Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision sciences*, 27(3), 451-481.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies, *Management Science*, 45(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>.

- Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 24, 115-139. <https://ssrn.com/abstract=3681106>.
- Venkatesh, V., Davis, F. D., & Morris, M. G. (2007). Dead or alive? The development, trajectory and future of technology adoption research, *Journal of the Association for Information System*, 8(4), 268-286. <https://doi.org/10.17705.1jais.00120>.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27(3), 425-478. <https://doi.org/10.2307/30036540>.
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178. <https://doi.org/10.2307/41410412>.
- Vygotsky, L. S. (1978). *Mind in society: The Development of higher psychological processes*. Harvard University Press.
- Wang, C-H., Shannon, D., & Ross, M. (2013). Students' characteristics, self-regulated learning, technological self-efficacy, and course outcomes in online learning. *Distance Education*, 34(3), 302-323. <https://doi.org/10.1080/01587919.2013.835779>.
- Wang, N. (2020). A research on the evaluation of senior grade English online homework in rural primary schools: Take "17zuoye" for example. [Master's thesis, Hebei University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1020753095.nh>.
- Wang, Y., Wang, Y., Pan, Z., & Ortega-Martín, J. L. (2023). The predicting role of EFL students' achievement emotions and technological self-efficacy in their technology acceptance. *The Asia-Pacific Education Researcher*, 1-12. <https://doi.org/10.1007/s40299-023-00750-0>.
- Wang, X. (2021). Research on personalized online learning system model based on internet of things technology and data mining. In 2021 *IEEE 4th International Conference on Information Systems and Computer Aided Education, ICISCAE*, (pp. 344-348). IEEE. <https://doi.org/10.1109/ICISCAE52414.2021.9590659>.
- Wang, Y. L. (2018). A Research on the effective factors of primary school teachers' online learning. [Master's thesis, School of Educational Science, Nanjing Normal University of China]. CNKI. <https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CMFD&dbname=CMFD201901&filename=1018262510.nh>.
- Wang, Y. L. (2021). An action research on the effects of the online homework platform on primary school oral English learning. [Master's thesis, Northwest Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1021660681.nh>.

- Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). Sage Publications.
- Wei, L. P. (2018). Middle school students' online homework result data association rules analysis and learning quality diagnosis research. [Master's thesis, Northwest Normal University of China]. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&fileName=1018159021.nh>.
- Wheeler, S. R., & Blanchard, M. R. (2019). Contextual choices in online physics problems: Promising insights into closing the gender gap. *Frontiers in Psychology*, 10(3), 594, 1-14. <https://doi.org/10.3389/fpsyg.2019.00594>.
- Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. *Developmental Review*, 30(1), 1-35. <https://doi.org/10.1016/j.dr.2009.12.001>.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68-81. <https://doi.org/10.1007/BF02209024>.
- Wiggins, H. & van der Hoff, Q. (2021). Using an online homework system for fostering self-directed learning. *International Journal of Technology in Education and Science*, 5(3), 323-335. <https://doi.org/10.46328/ijtes.199>.
- Wong, L. H., Chan, T. W., Chen, W. L., Looi, C. K., Chen, Z. H., Liao, C. C. Y., King, R. B., & Wong, S. L. (2020). IDC theory: Interest and the interest loop. *Research and Practice in Technology Enhanced Learning*, 15(3), 1-16. <https://doi.org/10.1186/s41039-020-0123-2>.
- Wong, L. H., Chan, T. W., Chen, Z. H., & Liao, C. C. Y. (2016). The IDC theory: Curiosity, flow, and meaningfulness for interest development. In D. Gao, Y. T. Wu, T. W. Chen (Eds.,) In *Workshop Proceedings of the 20th Global Chinese Conference on Computers in Education* (pp. 76-83).
- Xinhua Press. (2010). The outline of national medium and long-term education reforms and development Program (2010-2020). https://www.gov.cn/jrzg/2010-07/29/content_1667143.htm.
- Xu, J. (2008). Models of secondary school students' interest in homework: a multilevel analysis. *American Educational Research Journal*, 45 (4), 1180-1205. <https://doi.org/10.3102/0002831208323276>.
- Xu, J. (2012). Secondary students' interest in homework: What about race and school location? *School Community Journal*, 22(2), 65-86.
- Xu, J. (2018). Reciprocal effects of homework self-concept, interest, effort, and math achievement. *Contemporary Educational Psychology*, 55, 42-52. <https://doi.org/10.1016/j.cedpsych.2018.09.002>.

- Xu, J. (2020). Individual and class-level factors for middle school students' interest in math homework. *Learning and Motivation*, 72, 101673. <https://doi.org/10.1016/j.lmot.2020.101673>.
- Xu, J. (2022). A profile analysis of online assignment motivation: Combining achievement goal and expectancy-value perspectives. *Computers & Education*, 177, 104367. <https://doi.org/10.1016/j.compedu.2021.104367>.
- Xu, J. (2021). Homework goal orientation, interest, and achievement: Testing models of reciprocal effects. *European Journal of Psychology of Education*, 36(2), 359-378. <https://doi.org/10.1007/s10212-020-00472-7>.
- Xu, J., & Corno, L. (2022). Extending a model of homework: A multilevel analysis with Chinese middle school students. *Metacognition and Learning*, 17(2), 531-563.
- Xu, J. Z., Fan, X. T., & Du, J. X. (2018). A study of the validity and reliability of the online homework emotion regulation scale. *Measurement*, 115, 243-248. <https://doi.org/10.1016/j.measurement.2017.10.050>.
- Xu, J., & Qiu, X. Y. (2021). The influence of self-regulation on learner's behavioral intention to reuse e-learning system: A moderated mediation model. *Frontiers in Psychology*, 12, 763889. <https://doi.org/10.3389/fpsyg.2021.763889>.
- Xu, J., Yuan, R., Xu, B., & Xu, M. (2016). Modelling students' interest in math homework. *Journal of Educational Research*, 109(2), 148-158. <https://doi.org/10.1080/00220671.2014.928252>.
- Xu, X. X. (2021). Research on the practical application of primary school mathematics online homework. *Primary School Teaching Research*, 7, 93-94. <https://www.fx361.com/page/2021/0906/8820733.shtml>.
- Xu, Y. N. (2019). The design and application of primary school English listening and speaking assignment based on online homework platform. [Master's thesis, Northwest Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1019049478.nh>.
- Yan, J. K. (2018). A study on the use and improvement of app platform in English homework in primary school: Taking two primary schools in Changchun as an example. [Master's thesis, Jilin Normal University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1019018057.nh>.
- Yang, Y.X. (2021). Research on English learning tools to improve students' listening and speaking abilities. [Master's thesis, Xi'bei Normal University of China]. CNKI. <https://doi.org/10.27410/d.cnki.gxbfu.2021.000584>.
- Yang, S. (2013). Understanding undergraduate students' adoption of mobile learning model: A perspective of the extended UTAUT2. *Journal of Convergence Information Technology*, 8(10), 969-979. <https://doi.org/10.4156/jcit.vol8.issue10.118>.

- Yang, W. J. (2020). Action research on improving junior high school students' oral English via online learning, *English Teachers*, 5, 45-48.
- Yu, L. J., Lai, N. Y. G., Liew, C. P., Tan, J., Noum, S. Y. A.-L. E. (2020). Using web-based visual aids and assignment in enhancing students' learning in materials engineering course. In *Proceedings of 2020 IEEE International Conference on Teaching, Assessment, and Learning for Engineering* (pp. 606-609). <https://doi.org/10.1109/TALE48869.2020.9368376>.
- Yushau, B., & Khan, M. A. (2014). Student perceptions of online homework in preparatory year precalculus course. *International Journal of Mathematical Trends and Technology*, 8(1), 12-17. <https://doi.org/10.14445/22315373/IJMTT-V8P503>.
- Yueh, H. P., Huang, J. Y., & Chang, C. (2015). Exploring factors affecting students' continued Wiki use for individual and collaborative learning: An extended UTAUT perspective. *Australasian Journal of Educational Technology*, 31(1), 16-31. <https://doi.org/10.14742/ajet.170>.
- Zerr, R. (2007). A quantitative and qualitative analysis of the effectiveness of online homework in first-semester calculus. *Journal of Computers in Mathematics and Science Teaching*, 26 (1), 55-73.
- Zhang, Q. (2022). Research on personalized homework practice of junior high school mathematics based on wisdom homework platform. [Master's thesis, Nanchang University of China]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&filename=1022661913.nh>.
- Zhang, R. (2021). Research on the current situation and improvement strategy on online English homework design in primary school. [Master's thesis, Xi'an University]. CNKI. <https://doi.org/10.27684/d.cnki.gxndx.2021.000679>.
- Zhang, S. Han, P. P., & Qi, Y. (2017). The acceptance and influencing factors of e-learning platform in primary school students: Taking Jiaoke platform as an example. *China Audio-Visual Education*, 368, 85-90.
- Zhao, J. B. (2023). Research on the teaching mode of English listening and speaking in junior high school based on the intelligent learning assistance platform of Ekwing. [Master's thesis, Nanchang University of China]. CNKI. <https://doi.org/10.27232/d.cnki.gnchu.2023.002853>.
- Zhou, L. J., Li, F. M., Wu, S. S., & Zhou, M. (2020). School's out, but class's on, the largest online education in the world today: Taking China's practical exploration during the COVID-19 epidemic prevention and control as an example. *Best Evidence in Chinese Education*, 4(2), 501-519. <http://dx.doi.org/10.2139/ssrn.3555520>.
- Zhou, W. J. (2017). A study on the effectiveness of listening and speaking of English based on the online homework platform. [Master's thesis, Chongqing Normal University]. CNKI. <https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CMFD&dbname=CMFD201801&filename=1017188802.nh>

- Zhou, Y. (2020). Application research on primary school English homework app: Taking Shanghai W primary school as an example. [Master's thesis, Shanghai Normal University]. CNKI. <https://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=cdmd&fileName=1020809067.nh>.
- Zhu, L. (2018). The current situation and trend of the development of online homework for primary and secondary schools in China. *In Proceeding of the 22nd Global Chinese Conference on Computers in Education* (pp.1149-1153).
- Zhu, Z. T., Gu, X. Q., & Wang, Q. Y. (2003). A panorama of online education in China, *Educational Technology in the Asia-Pacific Region: Perspectives, Issues, and Divides*, 5, 23-27.

