Predicting Chinese Secondary School Students' Behavioral Intention to Use an Online Homework System

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Abstract: As a homework delivery format, online homework emerges in accordance with the development of technology to support student learning. Informed studies have demonstrated the impact of online homework on student performance, but the incorporation of online homework into student learning is still challenging, particularly in China. In order to better promote online homework, eight predictors are selected to investigate secondary school students' behavioral intention to use an online homework system based on the extended UTAUT model. Via the proportional stratified random sampling method, a minimum of 339 samples will be selected. Then, a correlational research design will be employed to address the research questions herein. Descriptive and inferential statistical analyses such as Pearson product-moment correlation and multiple linear regression (MLR) will be used for analysis. Lastly, an interpretative qualitative approach via interview will be applied to understand the factors affecting students' behavioral intention to use an online homework system as well.

Keywords: online homework, behavioral intention to use, secondary school students

1. Introduction

Online homework has become an emerging format of homework delivery in accordance with the increasing use of technology in current days, especially during the outbreak of Covid-19. The use of online homework promises many benefits for student learning (Murphy et al., 2019; Wiggins & van der Hoff, 2021). Evidence shows that students, who frequently and regularly use online homework systems, tend to gain better performance (Salame & Hanna, 2020; González et al., 2022).

Similarly, the introduction of online homework has offered Chinese students an opportunity to acquire knowledge effectively. However, research on online homework in the K12 setting in China is relatively limited (Jia et al., 2013). Studies from the aspect of user acceptance, particularly in terms of behavioral intention, are less (Cao & Song, 2020).

Online homework is designated to help students achieve better understanding and mastery of synchronous knowledge. The incorporation of online homework into student learning is challenging, however. The dissatisfied frequency of completion, poor academic performance, decreasing retentions, and procrastinating or gaming behaviors are commonly emerging when students are assigned to do online homework. Extant issues indicate that many Chinese students do not want to use online homework systems.

Given the technological advances, the visible outcome of online homework pushes the demand for the investigation of the usage of the system among Chinese students. Hence, there is a necessity to understand to what extent Chinese secondary school students' behavioral intention to use online homework systems. How will students perceive and respond to their learning when online homework is assigned for them to complete? Moreover, what factors will predict behavioral intention to use online homework among

Chinese secondary school students? It is a question that needs to be investigated urgently as students' behavioral intention to use online homework critically impacts the adoption and acceptance of this learning facilitator, and the outcome of students learning.

2. Research Objective

Current prominence of technology promises the possibility of multiple deliveries of learning in and after class. Online homework subsequently becomes a part of learning consolidation as well. This system enables students to conveniently acquire feedback, access material, then achieve better learning acquisition. Therefore, it is crucial to explore the factors predicting secondary school students' behavioral intention to use online homework systems in China. Because behavioral intention to use is regarded as a vital factor predicting the actual use behavior of technology (Venkatesh et al., 2003; Venkatesh et al., 2012). In this case, this study intends to provide empirical evidence to explore students' intention to use online homework in Chinese secondary school education settings. Accordingly, the following research questions (RQ) will be addressed:

1. What is the extent of Chinese secondary school students' behavioral intention to use an online homework system?
2. What are the relationships between performance expectancy, effect expectancy, social influence, facilitating conditions, hedonic motivation, interest, attitude, technology self-efficacy and behavioral intention to use an online homework system among Chinese secondary school students?
3. What is the proportion of the variance in Chinese secondary school students' behavioral intention to use an online homework system that can be explained by performance expectancy, effect expectancy, social influence, facilitating conditions, hedonic motivation, interest, attitude, and technology self-efficacy?
4. What is the extent of Chinese secondary school students' experience in using an online homework system?

3. Conceptual Framework

The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) is identified as one of the most matured theoretical models, providing the essential factors related to the prediction of behavioral intention to use a technology and technology use in the context of an organization (Venkatesh et al., 2012). Four core determinants of intention to use the technology are embraced in the model, including performance expectancy, effort expectancy, social influence, and facilitating conditions. Based on this model, studies on individual acceptance and use of information technology are well documented in an educational context as well (Khechine et al., 2016). The adoption of the original UTAUT model with other new variables has been commonly applied to demonstrate the technology acceptance by students (Lakhal & Khechine, 2017). Subsequently, Khechine et al., (2020) incorporated the four core determinants from the original UTAUT model with intrinsic value construct to identify the determinants of students' intention to use a learning management system.

Besides, in accordance with the advancement of the transformation in the digital technology era, the echo of adoption habits of lifelong learning and acquisition of compelling skills is responded with the assumption of Interest-Driven Creator Theory (IDC) (Chan et al., 2018). Literature also has demonstrated that students who are able to explore their own learning through activities assisted by technology and motivated by their own interests can excel in academics and develop into lifelong learners (Roschelle & Burke, 2019). Therefore, with the acceptance of four core determinants and the adoption of Interest-Driven Creator Theory (IDC) as a lens, the proposed research framework in the current study intends to include interest, hedonic motivation, attitude, and technology self-efficacy as well. Therefore, there are eight

predicting factors in the conceptual framework: performance expectancy, effect expectancy, social influence, facilitating conditions, interest, hedonic motivation, attitude, and technology self-efficacy as shown in Figure 1.
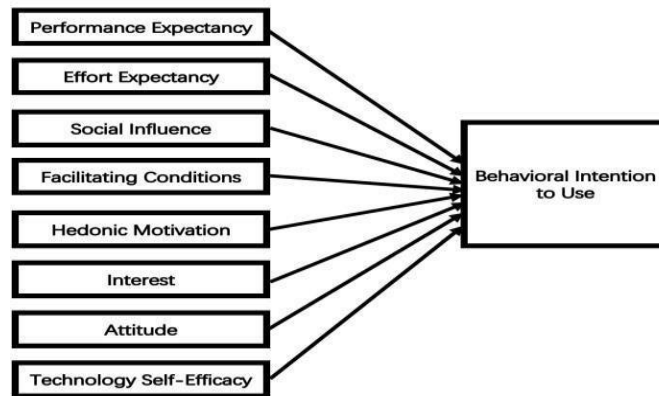

Figure 1. Proposed Conceptual Framework

4. Research Methodology

4.1 Research Design

The study will employ a correlational research design to determine the relationships between the selected predictive variables and the dependent variable. This non-experimental research method is appropriate to ascertain there exists a relationship or to use relationships to predict (Franenkel et al., 2015). Based on the correlational study, the relationship between the independent variables and the dependent variable will be examined. Simultaneously, the degree of the association based on the recorded correlation coefficients will be used to predict an outcome. Subsequently, a semi-structured interview will be conducted to unveil potential predictors of behavioral intention to use an online homework system among students as well.

4.2 Population and Sample Size

The accessible population for this study is 1,466 eighth-grade students at four public schools in the Huicheng District, Huizhou, Guangdong. Based on Cochran's (1977) formula, the sample size is 226. In case there is no response or incomplete answers, oversampling is recommended. Therefore, based on the formula of Bartlett et al., (2001), there are 339 informants out of 1,466 in the sample size in this study. Given that Multiple Linear Regression (MLR) is used in this study, the minimum sample size is required to meet the criteria of MLR. According to Tabachnick and Fidell (2001), the formula for calculating sample size requirements should consider the number of independent variables of the study as $N > 50 + 8m$ ($50 + 8*8 = 114$). Accordingly, a minimum of 339 samples will be included in this study based on the general rule of thumb to select as large a sample as possible from a population (Creswell, 2012).

4.3 Sampling Technique

Proportionate stratified random sampling will be used in this study. Due to the characteristics of the selected schools, the proportionate stratified random sampling technique is appropriate to ensure the representatives of a population. The stratum is the types of schools in this study, including nine-year consistence schools, junior high schools, and middle schools. Subjects are randomly selected from the strata one by one until the desired sample size is achieved. Each number is selected in accordance with a subject in the population so as to represent the population. For the interview, 10 interviewees will be purposively selected.

4.4 Data Collection and Analysis

The data will be collected via an online structured questionnaire, followed by a semi-structured interview. The whole process of data collection is supposed to last eight weeks. Descriptive and inferential statistical analyses will be employed to address the above-mentioned research questions. Via the employment of descriptive statistics, the properties of data collected from the respondents by frequency, percentage, maximum, minimum, mean and standard deviations will be summarized and described to answer RQ 1 in order to outline the status of students' behavioral intention to use the systems. Pearson product-moment correlation and multiple regression will be determined and identified to address RQ 2 and RQ 3. Finally, an interpretative qualitative approach via interview will be employed to answer RQ 4, so as to find out potential or underestimated factors.

5. Proposed Contribution

The findings of this study will contribute to existing conclusions in the acceptance of online homework among Chinese secondary school students, in terms of their behavioral intention to use the system. The highlight of predictors may shift the long-term focus on pure teaching measures and technical support to the intrinsic status of students as well. Additionally, conclusions drawn from the study can be used as a valuable reference for policymakers, company stakeholders and educators.

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