1 introduction

* 1. background of the study
     1. importance of the topic

本世纪以来信息技术的不断发展向传统的教学模式发出了挑战，将新型技术和教学内容结合的呼声也越来越高（Ginns & Ellis 2007）。利用电子设备和网络平台进行教学不受时间和空间的限制，新馆疫情爆发更使得电子学习成为唯一可行的教学手段。近几年来，中国各大高校电子化学习趋势越来越显著，慕课、Ismart、雨课堂等各种教学管理平台被广泛应用，这为笔者研究大学生电子学习接受度提供了契机。电子学习接受度和电子学习关系密切，Tsain Lin（2001）认为学生对电子学习的接受度直接决定了其学习行为和学习效果。近十年来，there has been an increasing interest in 对电子学习接受度的影响因素。探究不同因素对电子学习接受度的影响程度可以针对性地提升学生电子学习的效率，为学校、老师、电子平台提供优化教育模式的建设性意见。

Since the beginning of this century, the continuous development of information technology has challenged the traditional teaching mode. The voice of combining the new technology with the teaching content is getting louder (Ginns & Ellis 2007). The use of electronic devices and network platforms for teaching is not limited by time and space, and COVID-19 also makes electronic learning(e-learning) the only feasible teaching means. In recent years, the trend of e-learning in Chinese universities has become increasingly significant. Various teaching platforms such as MOOCs, Ismart and Rain Class have been widely used, which provides an opportunity for the research to study the acceptance of e-learning among college students. There is a close relationship between e-learning acceptance and e-learning. Tsain Lin (2001) believes that students' acceptance of e-learning directly determines their learning behaviors and effects. In the last decade, there has been an increasing interest in the factors affecting e-learning acceptance. Exploring these factors can improve the efficiency of students' e-learning, and provide constructive suggestions for schools, teachers and electronic platforms to optimize the education model.

* + 1. Necessity of the research

先前国内外都有对e-learning acceptance的研究，但绝大部分是在中国疫情全面放开前开展的，可能不能真实反映当下中国大学生对e-learning接受程度的情况。2022年12月7日，中国疫情全面放开，标志着学生从疫情期间的全面线上学习和线上线下结合学习的学习模式转换到了全面线下学习的模式。在这个背景下，我们有理由认为学生对e-learning的态度发生了改变，此前学生应学校硬性要求上网课，对e-learning更多是强制接受，现在学生有更多的自主性去选择是否e-learning以及以什么方式e-learning，学生是否还能有效利用电子设备和媒体有效提升学习效率。在全面放开后这个问题还缺少相关研究调查。

Many previous researches on e-learning acceptance have been conducted at home and abroad. However, most of the research were carried out before the full liberalization of pandemic in China, which may not truly reflect the current e-learning acceptance among Chinese college students.

On December 7, 2022, China was fully released from the epidemic control system, marking the transition of students from the mode of comprehensive online learning and combination of online and offline learning during the epidemic to the mode of comprehensive offline learning. In this context, it is reasonable to believe that students' attitude towards e-learning has changed. Before, students were required to take online courses by the school, so they were more forced to accept e-learning. Now, students have more autonomy to choose whether to e-learn and how to e-learn. It is unknown whether students can keep effectively using electronic devices and media to improve learning efficiency. There has been a dearth of research on this issue since the liberalization of pandemic in China.

在重庆大学，学生的e-learning acceptance差别很明显。这种差距在不同专业，不同年级的学生上表现地更为突出，因此在重庆大学探究factors affecting e-learning acceptance是非常有必要的。

In Chongqing University, the difference of students' e-learning acceptance is obvious. This gap is more prominent in students of different majors and grades. Therefore, it is very necessary to explore factors affecting e-learning acceptance in Chongqing University.

* 1. Hypotheses or research questions
     1. Definition of e-learning

E-learning is defined as ‘‘a method of teaching and learning that fully or partially signifies the educational model used, based on the use of electronic media and devices as tools for enhancing availability of training, communication, and interaction, and that helps in accepting novel ways of com-prehending and establishing learning’’ .

根据这个定义，电子学习关键要素是electronic media and devices，目的是提高学习有效性，这有助于我们归纳e-learning acceptance的影响要素。

According to this definition, the key elements of e-learning are electronic media and devices, with the purpose of improving the effectiveness of learning, which helps us to conclude the factors affecting e-learning acceptance.

* + 1. TAM

The Technology Acceptance Model (TAM) proposed by Davis [13] has been employed in various researches of e-learning acceptance and has proved its effectiveness as compared with the other theoretical models [15]. This research apply TAM to study the e-learning acceptance of students in CQU.

According to TAM, two personal beliefs will affect the attitude towards e-learning. One is perceived usefulness, which indicates whether one thinks e-learning is useful. Another is perceived ease of use, which indicates one thinks how easy e-leaning is to use. Perceived usefulness and attitude toward using will both affect behavior intention to e-learning, which finally determine the actual system use.

1.2.3 external variables

Davis认为，很多external variables会影响TAM的两种个人信念。Abdullah and Ward [24] identified 152 external factors by reviewing 107 published articles in the duration of ten years. 他们从中抽象出三种外部变量的特征，即设计特征，用户特征和任务特征。综合他们的研究和本项research的初步观察，external variables被进一步细化为几个factors。这些factors就是我们研究的对象。research question 就是研究这些factors对e-learning acceptance影响的程度，以及如何解释不同factors的影响。

Davis considered that many external variables affect two personal beliefs in TAM. Abdullah and Ward identified 152 external factors by reviewing 107 published articles in the duration of ten years. They abstracted the characteristics of three external variables, namely design characteristics, user characteristics and task characteristics. Based on their research and the preliminary observation of this research, external variables are further refined into several factors (see figure). Those are the factors that we're looking at, factors affecting e-learning acceptance. The research question is to study the impact of these factors on e-learning acceptance and how to explain the impact of different factors.

* 1. Methods and purpose

本项研究使用问卷调查研究e-learning acceptance. factors affecting e-learning acceptance会在问卷中以问题形式被具体化。问卷将在一款叫做“问卷星”的软件上投放。预计覆盖人数70人，其中50人是重庆大学各个专业，各个年级的学生，为使得研究更具泛化能力，还将向非重庆大学的大学生投放不超过20份问卷。问卷将收集学生专业、年级、自我对e-learning acceptance的评价以及自己在factors affecting e-learning的具体表现，问题答案使用likert scale设计，将不同factors对应问题的答案作为每个factor的其中一项得分。最终汇总各个factors的得分，取平均值，进行主成分分析和线性拟合。

This study uses a questionnaire to study e-learning acceptance. Factors affecting e-learning acceptance will be specific in the form of questions. The questionnaire will be released on a software called "问卷星". It is expected that 70 people will be covered, among which 50 will be students of various majors and grades in Chongqing University. In order to make the research more generalized, no more than 20 questionnaires will be sent to non-Chongqing University students. The questionnaire will collect students' majors, grades and their self-evaluation of e-learning acceptance as well as their specific performance in factors affecting e-learning. The answers to the questions will be designed by likert scale. The answers to questions related to different factors are used as one of the scores for each factor. Finally, the score of each factor is summarized, and the average value is taken for principal component analysis and linear fitting.

* 1. Research purpose

该研究旨在探究不同因素对e-learning acceptance的影响程度，对结果进行讨论，解释这种影响的内在联系。

This study aims to explore the influence of different factors on e-learning acceptance, discuss the results and explain the internal relationship of such influence.

本研究的结果可以为学校、老师、学生、电子教学平台等提供有数据支撑的建设性意见。本项目根据不同e-learning acceptance对学生群体进行划分，考虑年级、专业等因素，使得教学管理者可以跨越他自己学科的限制，以更广阔的研究视野窥探整个学生群体的e-learning acceptance，从而在大体上革新教学模式，普及e-learning。

The results of this study can provide constructive suggestions supported by data for schools, teachers, students and e-learning platforms. This project divides the student groups according to different e-learning acceptance, considering grade, major and other factors, so that the teaching administrator can cross the restrictions of his own discipline and explore the e-learning acceptance of the entire student group from a broader research perspective. So that they can generally innovate teaching mode and popularize e-learning.

同时，本项目挖掘对学生e-learning影响较大的因素，可以帮助教学管理者在纷杂的电子学习普及和教学模式改进的方案中聚焦于一些更具有实用性的点，针对性拟定教学方案。

At the same time, this project excavates the factors that have a great influence on students' e-learning, which can help teaching managers focus on some more practical points in the complicated schemes for the popularization of e-learning and the improvement of teaching mode, making targeted teaching schemes.