INSTITUTE FOR GLOBAL PROSPERITY

Dissertation

Digital Education Platforms for Sustainable Prosperity: A case study of DingTalk

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Abstract

This dissertation explored how DingTalk, as a typical digital education platform in China, can reduce the epidemic's impact on students while supporting sustainable prosperity. It aims to study the design and use of digital education platforms in the epidemic, explore in detail the role they play, and contribute to the critical literature on digital education and sustainable prosperity. Since the outbreak of the Covid-19 epidemic, students' normal learning activities have been severely affected, and their physical and mental health has been impaired. This dissertation collects web comments and news through web crawlers. This dissertation uses content analysis to qualitatively analyze this first-hand information. In order to reduce the impact of the epidemic, digital education has been undertaken to replace traditional campus education, using live broadcast platforms, interactive circles, storage platforms, high-speed information dissemination. It also has analog campus functions to provide convenient digital education tools. So that students can resume everyday teaching and improve learning efficiency. In addition, the digital education platform is committed to sustainable prosperity by promoting fair education opportunities, improving efficiency, promoting the development of related technologies, and attracting more investment in education.

Table of Contents

Abstract 3
Table of Contents 4
List of Figures 5
List of Tables 5
Acknowledgement 6
1. Introduction 7
1.1 Current context 7
1.2 Aim and objectives 7
2. Literature Review 8
2.1 The role of education in achiving sustainable prosperity 8
2.2 Current practice of digital education 11
2.3 The impact of Covid-19 on students 15
2.4 DingTalk under Covid-19 17
3. Methodology 20
3.1 Research design 20
3.2 Data collection and method 22
3.3 Scope and limitations 24
3.4 Ethics 24
3.2 Findings 24
3.3 Initial analysis 24
3.3 Main findings 24
4. Discussion 34
5. Conclusion 36
6. Bibliography 39
Appendix 45

List of Figures

Figure 1: Global online education Market 2020-2024

Figure 2: Share of countries responding to school closures with different forms of remote learning, by income group

Figure 3: Education Gini Coefficient of Provinces in China from 1996-2008

Figure 4: Evaluation indicators for Digital Education Platforms

Figure 5: The impact indicators of Digital Education from News

List of Tables

Table 1: Evaluation Indicators for Digital Education Platforms

Table 2: The number and percentage of nodes related to each topic

Table 3: Cross-related Themes and Main Findings

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Introduction

Current Context

During the Covid-19 epidemic, various schools in China postponed the opening of classes, and daily teaching was generally turned online, triggering an ultra-large-scale youth digital education experiment. According to statistics, the number of affected students worldwide has reached 1.2 billion, and more than 300 million primary, middle, and high school students in China have been affected (Beijing Commercial Daily, 2020). As of March 2020, the number of online education users in China has reached 423 million, an increase of 110.2% from the end of 2018, accounting for 46.8% of the total Internet users (Beijing Commercial Daily, 2020). Ifenxi Research Institute shows that more than 86% of students believe that the epidemic harms their studies and life. Their daily social, play and psychological conditions are also greatly affected (Ifenxi, 2021). For college graduates, participation in recruitment and job hunting has also been hit hard.

In order to support students' resumption of classes, DingTalk's online learning platform has supported 140,000 schools across the country, 3 million classes, and 6 million teachers have accumulated more than 60 million hours of teaching on DingTalk, covering 130 million students (Global Times, 2020). Therefore, questions related to digital education and DingTalk have attracted a large share of attention in debates concerning the role of digital education platforms in epidemic to support sustainable prosperity.

Aim and objectives

The impact of the epidemic on students' lives is evident. The restructuring of the education system is underway, and digital education is an essential part of achieving this change. In the past, due to the immaturity of related technologies and low demand, digital education has not been widely popularized. Therefore, the application and role of digital education in the epidemic are under-researched, so this study wants to focus on how DingTalk platforms can support sustainable prosperity in China during the epidemic. On the one hand, the research results are of academic significance, discussing the impact and role of the universal use of digital education platforms in emergencies. On the other hand, it has practical significance and can be used as a reference for China, which is undergoing education transformation due to the epidemic's impact, on how to mitigate the impact of Covid-19 scientifically and realistically on students.

This research builds from the literature on epidemics and digital education, setting the framework for evaluating digital education and conducted a case study on DingTalk, to explore its important role in promoting sustainable prosperity. By collecting user comments from Apple App Store and relevant news from People's Daily, this study can deeply explore how a digital education platform can perform its functions, improve student satisfaction and

recovery of daily study and life, whilst promoting sustainable prosperity. Thus, this research will explore the following research questions:

How can digital education platforms support sustainable prosperity under Covid-19 in China?

- **How can digital education platforms mitigate the impacts of Covid-19 on students in China?**
- **What practices do digital education platforms use to contribute sustainable prosperity in China?**

It is beyond the scope of this research to make assumptions and research on the practice of all digital education platforms in the world. On the contrary, this research will focus on China in the early stage of Covid-19, using DingTalk as a typical case study. This research is organized in the following order. First, I conduct a literature review to set up scenarios for the epidemic's impact on students, and then refer to the time of past digital education platforms to find gaps for research. Then, in the methodology section, the qualitative analysis method starting from the deductive method is described in detail, including two primary data from user reviews and news content, also make the process of content analysis through NVivo. After this, the Findings and Discussion sections introduced the results of data analysis in detail, compared it with the past literature, and found out the relevance, limitations and direction of future research. Finally, this research concludes the discussion with a clear conclusion.

Literature Review

The role of education in achieving sustainable prosperity

In 2020, as the Covid-19 pandemic spread globally, most countries announced the temporary closure of schools. As of April 2020, nearly 1.6 billion children and young people were out of school (Miks & McIlwaine, 2020). Education promotes social and economic upward mobility and is the key to getting rid of poverty (Greenstone et al., 2013). Therefore, quality education is also listed to promote sustainable development (United Nations, 2015). UNESCO is responding through a series of initiatives to promote international cooperation and ensure that education is never-ending. It launched the COVID-19 Global Education Coalition in March 2020 to jointly help countries resolve gaps in content and connectivity. The Global Education Coalition is an open partnership initiated by UNESCO. It brings together more than 175 members from the United Nations family, civil society, academia, and the private sector to ensure the continuity of education for all learners (UNESCO, 2020). Moreover, it provides

children and youth with inclusive learning opportunities during this sudden and unprecedented education interruption. Specifically, the Global Education Coalition aims to help countries mobilize resources and implement innovative and environmentally-friendly solutions to provide distance education using high-tech, low-tech and non-technical methods. At the same time, it seeks fair solutions to ensure a coordinated response and avoid duplication of work. Most importantly, it provides convenience for students to return to school after reopening to prevent a sharp increase in the dropout rate (United Nations, 2015).

Education is essential to cultivate the outstanding graduates and diversity needed in today's economy and the economy that a country aspires to develop. It promotes competitiveness and growth by training professionals such as managers and engineers, medical staff, and teachers. Universities are also centres of research and innovation, cooperating with SMEs to support regional development (Word Bank, 2020). Higher education is the desire of more and more young people worldwide and the essential requirement for employment in industries that promote the global knowledge economy. Higher education has always been a key way for the poor in China to find opportunities to change their economic conditions. In an era of increasing inequality and low social mobility, improving the quality of education and educational opportunities may increase equality of opportunity for all Chinese people, thereby promoting prosperity. Therefore, higher education provides unique opportunities for personal development and equal opportunities. The fair competition enables people to get better job opportunities, promotes social collaboration, creates economic value, and promotes shared prosperity. Failure to maintain an effective higher education system may lead to social inequalities because young people are excluded from the education system, unable to learn actively, and full of uncertainty about their future education and prospects. As a result, society is faced with the enormous challenge of youth disengagement and being deprived of the graduate professionals needed to put the country on track of social cohesion and growth (Word Bank, 2020).

The Sustainable Development Goals framework takes education as a catalyst for transformation and change to play a central role. Universities can play an essential role in achieving sustainable development goals because they have long been a powerful driver of global, national, and local innovation, economic development, and social well-being. They can help shape new ways of educating global citizens and providing society with knowledge and innovation. They can contribute to the Sustainable Development Goals through learning and teaching activities, research, organizational governance, culture and operations, and external leadership. They are expected to participate in this process actively. Universities can become engines of social change (Kioupi & Voulvoulis, 2020). They train future leaders, professionals, and citizens and guide them towards sustainable development through their educational programs. Therefore, the role of higher education in achieving sustainable development goals contributes to the transition to sustainability (Brown & Lauder, 2006).

In achieving the Sustainable Development Goals and prosperity, education is indispensable, but Covid-19 makes standard education actions unsustainable. Due to the epidemic's impact, most schools cannot start classes normally, causing students to lose standard learning activities and affecting the right to education. Therefore, enabling students to obtain high-level knowledge, experience, and teaching online is particularly important. Our society is constantly trying to define and realize under the guidance of sustainable development goals. Therefore, the contribution of education is to create favorable conditions for realizing this vision. It will first require defining the abilities that learners need to develop to achieve this state, namely knowledge, skills, behaviours, and attitudes, and then their various levels of courses, pedagogy, educator training plans and learning environment (Brown & Lauder, 2006). Making up for these deficiencies in digital education and how online tools can improve students' learning efficiency and acceptance level are worth exploring.

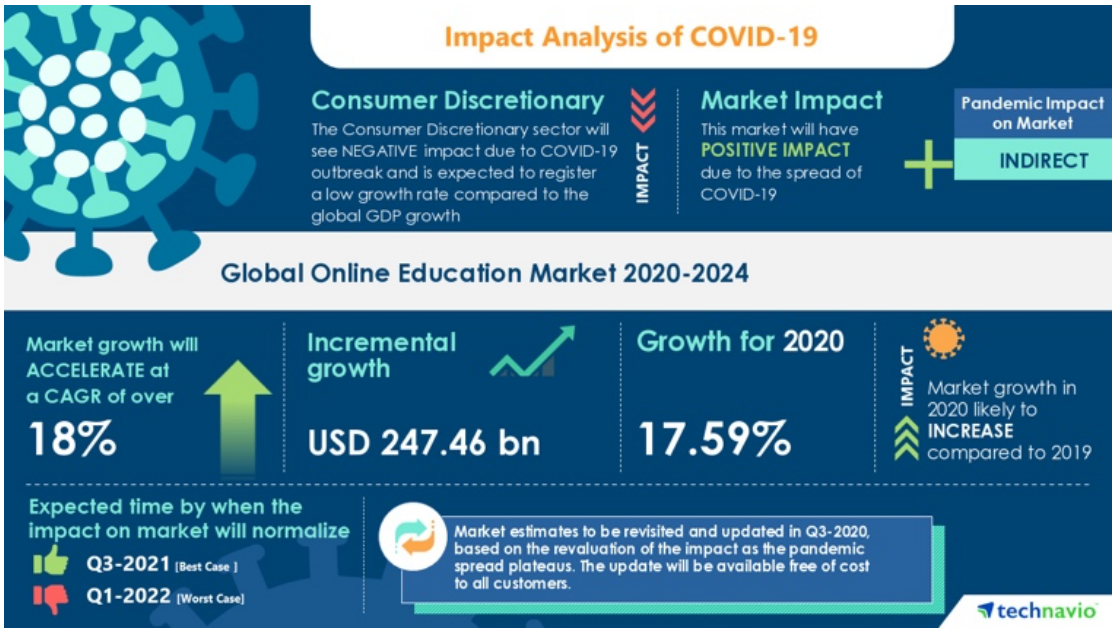
Education is an integral part of the essential elements that support the prosperity of a country, including the enrollment rate, outcomes, and quality of the four stages of education (preschool education, elementary school, middle school, and higher education), as well as the skills of the adult population. Amir Khorram-Manesh's research shows that educational initiatives can increase the necessary public knowledge and skills and help understand and implement the recommendations made by the authorities (Manesh, 2020). However, they must involve the correct and appropriate target groups, conduct appropriate and continuous assessments, and repeat them within a pre-designed evidence-based period. During a pandemic, no country was spared from the pandemic, but national education affected the spread and prevention of the epidemic to a certain extent (Manesh et al., 2020). In countries that are not prosperous, there is no complete infrastructure, and network communication and communication between people are not efficient, resulting in stagnation of information on the epidemic situation and delayed circulation of epidemic prevention information policies (Manash, 2020). This situation will lead to people lacking a basic understanding of emergency measures to prevent and control the epidemic. Education is critical to target the spread and prevention of the epidemic and work to establish health and safety, population-based management methods, and promote communication and evaluation.

Therefore, when the Covid-19 pandemic severely undermines prosperity, the reshaping and adaptation of the education system is an essential factor in promoting sustainable development and prosperity. The popularization of digital education has allowed the continuous expansion of high-quality education. When people have educational equity, they will promote fair opportunities, improve social mobility, and promote local economic development and prosperity and innovation to restore the severe damage of the epidemic. How digital education platforms support sustainable and prosperous development is one of the questions of this research.

Current practice of Digital Education

In recent years, educational technology has developed rapidly and received high investment. In 2019, global investment in education technology reached 18.66 billion U.S. dollars, and by 2025, the overall digital education market is expected to reach 350 billion U.S. dollars (Li & Lalani, 2020). Since the outbreak of Covid-19, the use of online learning software has increased significantly. Take the BYJU'S platform as an example, since the world's most valuable educational technology company announced that it would open live courses for free, the number of new students has increased by 200% (Li & Lalani, 2020).

Graph1. Global online education Market 2020-2024. (Technavio, 2020)



During the Covid-19 pandemic, Zoom was chosen by many agencies and individuals. Zoom provides video, high-quality audio, and screen sharing, making it ideal for virtual meetings and online collaboration. In many universities, students, staff, and teachers can easily use it. Teachers can use the different functions of Zoom to create an interactive learning environment. These features include a virtual whiteboard to explain concepts and annotations, a lounge to create small collaborative group work, voting for student feedback, and chat to facilitate classroom discussions. In addition, Zoom can store video recordings for future playback (Derar, 2020).

Research carried out by Derar, investigates student's attitudes and perceptions, their learning and participation in the context of Zoom and face-to-face conferences. Investigate students' attitudes and perceptions, their learning, and participation in Zoom and FTF conferences. The questionnaire surveys students' attitudes towards using Zoom, students' perception of the impact of using Zoom on their learning, student's perception of their classroom participation when using Zoom, and students' comparison of face-to-face and Zoom meetings (Derar,

2020). Derar's research results show that students are not completely satisfied with the learning experience during the transition period. Many factors may have contributed to the results of this research. Teachers are not ready to deal with this sudden change, which requires a new platform, designing alternative activities, and delivery methods.

Alaul Alam believes that online media can ensure that students and teachers have multiple interests in supporting teaching and learning (Alam, 2020). Different studies have shown that online courses are beneficial to students who like to learn independently. The most important thing to discuss is that students have enough opportunities to have cognitive and metacognitive strategies to accomplish their learning goals. In addition, they do not need additional preparation to connect themselves to the Internet, no matter when and where. In Bangladesh, online classrooms have established strong communication between students and teachers in the crisis, created a good impression, produced positive results, and helped students avoid all kinds of anxiety(Alam, 2020). Both students and teachers have expressed the importance of timely and supportive feedback when trying to "build a relationship of trust and comfort" (Alam, 2020). Similarly, digital education can provide students flexible interaction and participation options. In addition, the higher the digitalization of the country, the more likely it is to create digital natives, expose and manage everything online. It is always easy to stand on a virtual platform (Orlando & Attard, 2015).

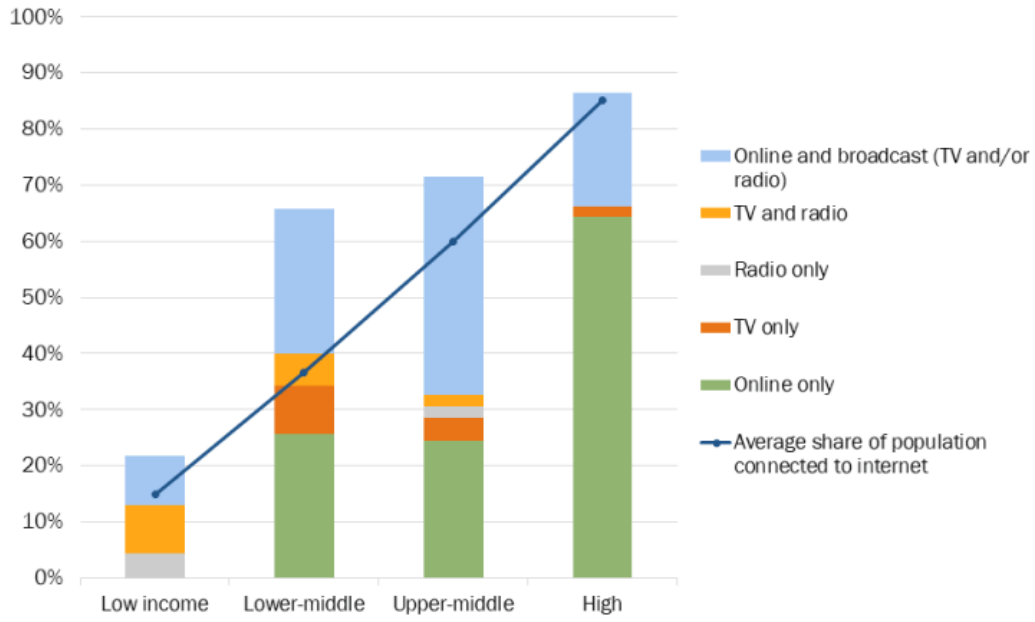
Edeh Michael Onyema and others investigated the impact of COVID-19 on education. The data was collected through a structured questionnaire of 200 respondents, including teachers, students, parents, and policymakers, who come from different countries such as Nigeria, Bangladesh, India and Saudi Arabia (Onyema et al., 2020). The results indicate that COVID-19 has adverse effects on education, including interruption of studies, reduced access to education and research facilities, unemployment, and increased student debt. The survey results also show that many educators and students rely on technology to ensure continued online learning under Covid-19. However, weak infrastructure and poor digital skills will hinder the development of digital education, including broadband problems and lack of electricity. The study emphasizes the devastating impact of COVID-19 on the education sector and the adoption of technology by all educational institutions, educators, and learners.

However, in the practice of digital education under Covid-19, there are also many unsatisfactory parts. The most important factors affecting the success of e-learning during the Covid-19 pandemic are technical knowledge management, management support, raising students' awareness of using e-learning systems, and requirements for high-level information technology for teachers, students, and universities (Alqahtani & Rajkhan, 2020). Arora and Srinivasan believe that the main challenges are network problems, lack of training, and lack of awareness. Those who have not adopted virtual classrooms believe that lack of understanding is the most important reason, followed by lack of interest and doubts about the practicality of virtual courses. Low attendance, lack of personal contact, and lack of

interaction due to connection issues are the main disadvantages of virtual courses (Arora & R. Srinivasan, 2020).

In addition, Derar also mentioned the issues of fairness and access (Derar, 2020). Students who lack access to equipment will find it difficult to participate in digital education. This gap can be seen between countries and classes. For example, according to OECD data, although 95% of students in Switzerland, Norway, and Austria have computers to complete their studies, only 34% of students in Indonesia have computers (Li & Lalani, 2020). The figure below shows that less than 25% of low-income countries offer any type of distance learning, most of which use television and radio. In contrast, nearly 90% of high-income countries offer distance learning opportunities, and almost all of these opportunities are provided online (Vegas, 2020). It can be seen that economic inequality and income differences between countries are some of the important reasons for the inequality of international digital education opportunities.

Graph 2. Share of countries responding to school closures with different forms of remote learning, by

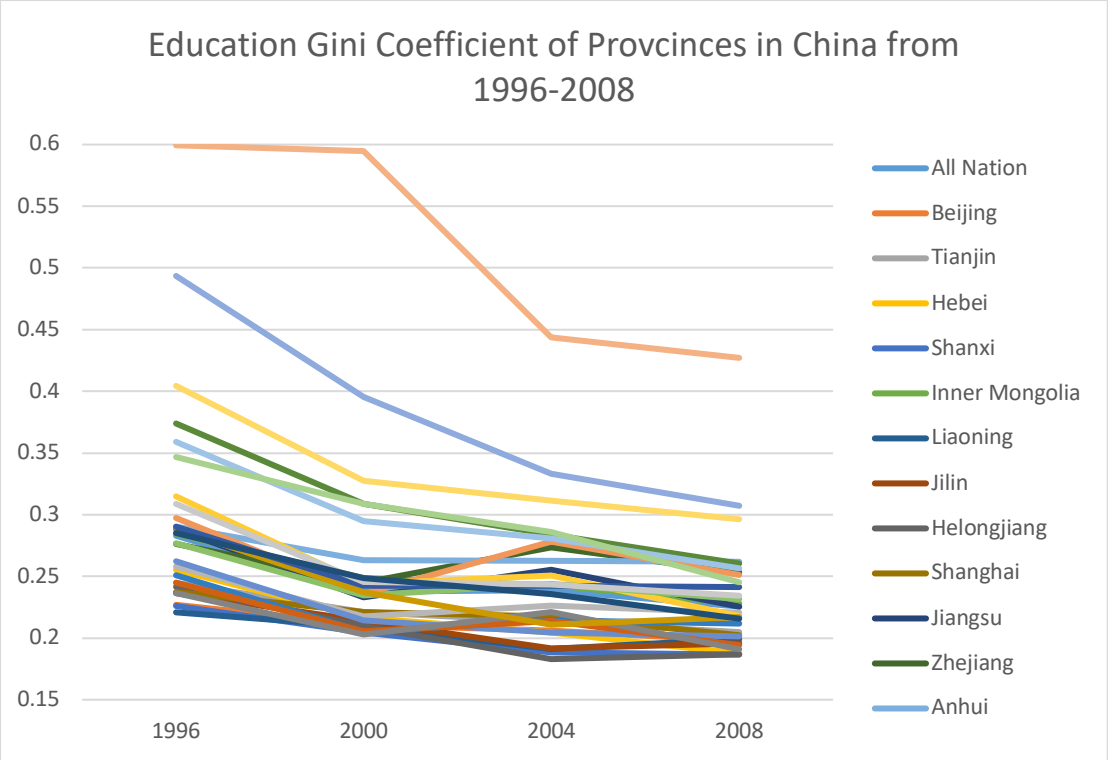


income group. (Centre for Global Development and the World Bank,2020)

The results of Yang, Huang, and Liu's research show that, in recent years, the level of educational inequality in each province of China has been lower than before, education Gini coefficients everywhere are decreasing and getting closer, but the gap between different regions still exists (Yang, Huang & Liu, 2014). In the past, attempts at digital education in China included the massive opening of online courses (MOOD) and establishing a distance higher education system (H & A, 2016). In 1998, the Ministry of Education of China decided to allow traditional universities to conduct online distance education on a trial basis, and it

became popular in 2003 (Li, Zhou & Fan). Because distance higher education has not yet established a student financial aid system, students have fewer opportunities to obtain scholarships, grants, and loans. The lack of universality and financial support made it have not achieved significant results (H & A, 2016).

Graph 3. Education Gini Coefficient of Provinces in China from 1996-2008. (Li, 2013)



However, during the epidemic, the implementation of nationwide digital education and policy support gave greater impetus to online learning opportunities (Li, Zhou & Fan). In February 2020, the Ministry of Education of China issued the 'Guiding Opinions on Doing a Good Job in the Organization and Management of Online Teaching in Regular Colleges and Universities during the Period of Epidemic Prevention and Control' (China Youth Daily, 2020). The government requires primary and secondary schools to close their campuses, but not stop classrooms and education, and open all high-quality online courses and virtual simulation experiment teaching resources to universities across the country for free. Although this policy can reduce the risk of spreading the epidemic on campus, it still brings many challenges. There is no rehearsal and transition to start nationwide digital education. Students' habits cannot be changed, some teachers do not adapt to online operations, and some areas have no stable network connection.

Although there are still many challenges in digital education in China, the Chinese government and enterprises are working hard to make up for the shortcomings. Major universities in China have opened online courses accessible to the people of the whole

country. The leading Chinese digital education platform also stores, disseminates, and shares course content and available resources through digital education. The Ministry of Education of China and digital education companies have helped deploy Internet hardware equipment for areas without network signal coverage and students who lack Internet equipment (OFweek, 2020). Current research has explored many issues related to digital education, including lack of electronic equipment and incomplete network coverage. However, the disadvantages of offline education in China include lack of teachers, unequal resources, significant regional differences, and lack of flexibility. Digital education can solve these problems. Therefore, this research will focus on how digital education makes up for these shortcomings and support China's sustainable prosperity.

The impact of Covid-19 on students

During the COVID-19 outbreak, students were forced to isolate themselves at home due to the disruption of their regular lifestyles. The weakening of social connections can create stress in the entire population, leading to lower mental and emotional health (Salari et al., 2020). To curb the spread of the Covid-19 epidemic, most governments have temporarily closed educational institutions, which has affected more than 91% of students worldwide (Andria Pragholapati, 2020). Take China as an example. All educational institutions in China have started digital education since March 2020. Approximately 24.9% of students felt anxious due to the epidemic (Andria Pragholapati, 2020). Living in the city, living with parents, and stable family income are protective factors to prevent students from anxiety during the epidemic (Irwan, Dwisona & Lestari, 2020). Covid-19 stressors, namely economic stressors, daily life impacts, and academic delays, are positively correlated with the anxiety level of Chinese students during the epidemic. In contrast, social support and anxiety are negatively correlated (Irwan, Dwisona & Lestari, 2020). The results of another psychological impact study showed that during the COVID-19 pandemic, students were tired of studying at home for the first two weeks after online learning. However, as time goes by, students are getting used to this new way. At the same time, the parents of multiple anxiety study subjects had lower incomes, because they must buy quotas to be able to participate in online learning (Andria Pragholapati, 2020).

As students' regular lifestyle changes, their mental health is also affected. A study conducted by Hu et al. shows that subjective well-being (SWB) is the primary indicator of mental health. It is a broad category of phenomena, including people's emotional response, domain satisfaction, and overall life satisfaction judgment. SWB is measured using General Wellbeing Schedule (GWS) as proposed by Hu. Through the use of structured questionnaires, this study used other covariates such as sociodemographic factors, self-rated physical health, perceived social support, and loneliness (Hu et al., 2020). SWB contains the following six dimensions: satisfaction and interest in life, health problems, vitality, depression or happy mood, control of emotions and behaviour and relaxation and tension. More than 1,000 sample questionnaires showed that about 40% of participants did an inactive physical exercise in their leisure time, and about 90% of participants had longer screen time (Hu et al., 2020). At

the same time, research shows that ICT facilities, through communication and communication technologies, such as social platforms, gamification, mobile medical, interactive coaching, and other online platforms, can prevent and carry out rehabilitation crisis-oriented interventions. In this regard, WHO and national authorities have been encouraging implementing a "technology use" support system during the Covid lockdown, including reducing Internet costs and increasing Internet access speed (Ammar et al.,2020).

At the same time, the spread of information in the media, especially the spread of coronavirus pranks, made students more uneasy and sadder. From January to March 2020, hoax news about the coronavirus has been spread 50 times. The topics include coronavirus infection, treatment, and prevention of coronavirus infection, and social behaviour in response to the virus. Students tend to focus their discussions on issues close to their communities, such as school closures and local news. Some information makes students feel anxious and unwilling to complete their studies and homework (Pragholapati, 2020).

In the face of public health emergencies, the mental health of students is greatly affected. Communities, families and institutions of higher learning need to pay attention, help and support them. It is recommended that the government cooperate with schools to solve this problem and provide students with high-quality and timely crisis-oriented psychological services (Andi Wahyu Irwan, Dwisona & Mardi Lestari, 2020). There have been many studies on changes in students' lifestyles in the context of pandemics and their harmful effects on health and education experience.

In summary, Covid-19 pandemic can cause mental stress such as anxiety, depression, restlessness among students, and unfair educational opportunities caused by lack of equipment. This research will focus on the impact of the epidemic on students and how it undermines prosperity. How to alleviate these adverse impacts by digital education platforms is also explored in this study. Using DingTalk as a case study, this research discusses how online platforms can simulate classrooms and share materials freely to improve sustainable prosperity. The students' experience will be an essential source of information. The research will analyze their comments to study how DingTalk can play a role in mitigating impacts in the epidemic.

DingTalk under Covid-19

Alibaba is one of the largest Internet companies in China, and Alibaba launched DingTalk in 2014 as a communication software dedicated to improving the efficiency of collaboration between organizations. DingTalk includes 13 educational sections, an intelligent lesson preparation platform for teachers, online classrooms, and assignments for students, and a home-school address book for parents. DingTalk focuses on digital information management and builds exclusive circles of students, teachers, and parents to improve communication

efficiency, making it stand out among various digital education platforms. DingTalk includes several functions: the automatic establishment of private group chats, live broadcasts, video conferences, courseware uploads, online homework, and assessments according to the teaching class, which fully meets the teaching needs. DingTalk also provides a detailed introduction on how to perform software installation, video conferencing, live broadcasting, and course use to make it easier to use (Xiao, 2020). All-round functions and low barriers to use, making it popular.

To meet the demand for digital education during the epidemic, DingTalk designed an epidemic exclusive digital education program at the beginning of the epidemic and contacted more than 2,700 local education bureaus. Then the Chinese government vigorously promoted DingTalk, and it is used by more than 400 million people and 17 million organizations (DingTalk, 2021). In fact, before the outbreak of the epidemic, DingTalk had already made efforts in digital education. As of 2017, DingTalk has launched digital university services and cooperate with Chinese universities to build a digital education platform (DingTalk, 2021). In 2019, DingTalk began to spread its education system significantly, penetrating the public school system from top to bottom. Finally, when the epidemic occurred in 2020, most public schools chose DingTalk to carry out online teaching without thinking. In March 2020, UNESCO recommended a list of applications and platforms for schools and parents, and DingTalk became the first live teaching platform of the United Nations (UNESCO, 2020). The penetration of digitalization in the whole process of teaching, scientific research, and administrative management will promote the efficient use of high-quality educational resources by teachers and students (DingTalk, 2021). Since then, DingTalk has reached cooperation with the education departments of various provinces and cities in China and has become one of China's most widely used digital education platforms.

DingTalk also has its criticized side and the challenges it has been facing. Complex functions and seamless communication are its advantages, and it may also be a disadvantage. When studying on campus, breaks between classes and weekends give students a chance to breathe, but digital education blurs the distinction between class and get out of class. Tasks posted by teachers on DingTalk will be reminded forcibly, no matter when it is, even in the middle of the night. However, complicated functions are a high threshold for beginners, especially elementary school students, who may only use their parents to help them operate. It deviates from the original intention of digital education to be fast and convenient. When the communication starts without resistance, it means that the task and surveillance are invisible. Therefore, when DingTalk first began to be widely used, in March 2020, tens of thousands of students gave it low scores on the app store to express their dissatisfaction. How to simplify the complex and grasp the flexible teaching time is the challenge facing DingTalk.

Chen et al. evaluated Chinese digital education platforms. Taking DingTalk as an example, they conducted sentiment analysis on online user comments to determine the factors affecting

digital education platform satisfaction. Further, they used the BP neural network model to predict digital education platform satisfaction. (Chen et al., 2020). Summarize the influencing factors that affect user experience, namely platform applicability, platform service type, platform privacy, platform teaching type, platform function, platform design environment, and network technology environment (Chen et al., 2020). The results show that the simpler the interface of the platform, the easier it is to operate, which can improve user satisfaction. With the increase in the types of electronic products, the use of the platform should be expanded, and the development of each port of the tablet should be increased. To increase the utilization and penetration rate of online teaching and education platforms, customer service is essential. Furthermore, while setting up software functions, the platform should strengthen the types of functions and improve the quality of interactive devices. Finally, a stable network technology environment is essential for improving teaching quality (Chen et al., 2020).

Yang and Zhang's research results show that users' online learning satisfaction mainly depends on users' perception of the usefulness and quality of courses, the quality of platform and website services, and the degree of expectation (Yang & Zhang, 2020). Chen et al. used coverage, participation, quality, student achievement, usefulness, ease of use, ease of learning and satisfaction to measure digital education (Chen et al., 2020). Dhawan believes that accessibility, affordability, flexibility, learning pedagogy, life-long learning, and policy are elements highly related to digital education (Dhawan, 2020). The analysis of DingTalk as a digital education platform in this research will start from the user experience and the platform itself, and set up eight elements to measure digital education platforms, including user satisfaction, willingness to continue using, collaboration efficiency, learning outcomes, platform availability, interaction quality, information quality and system quality.

Table 1. Evaluation Indicators for Digital Education Platforms

Evaluation Indicators for Digital Education Platforms	
The Primary Indicators	**The Secondary Indicators**
User satisfaction	Learning needs
	Use feeling
	Attractive
Willingness to continue using	Recommend to others
	Increase the frequency of use
	Usage frequency
Efficiency	Communication efficiency
	Cooperation efficiency
	Interaction efficiency
Learning outcomes	Performance improvement
	Homework completed
	Classroom acceptance
Platform availability	Learnability
	Easy to browse
	Interface design
	Learning record
Interaction quality	Learner participation
	Practice feedback
	Home-school contact
Information quality	Accuracy
	Timeliness
	Completeness
System quality	High concurrent access
	Stability
	Responsiveness

In summary, Covid-19 and the quarantine policy have adversely affected people's lifestyles, both physically and spiritually. As one of the crucial factors in achieving prosperity, education needs to be taken seriously and played its role in the epidemic. In China's past experience, inequality in education is a serious issue, and the widespread implementation of digital education is expected to promote equal use of resources and equal educational opportunities. The storage and transportation of big data have become the norm. Digital education platforms dominated by DingTalk are also working hard to replicate the offline education model and take advantage of the high efficiency, vital storage, and flexibility of online collaboration. In this process, DingTalk is also continuing to eliminate the adverse effects of the epidemic on students' studies and life.

Therefore, in the continuous attempts of digital education, previous studies have investigated students' satisfaction with digital education and its drawbacks. Therefore, this research will focus on the online learning function of DingTalk, which mitigates the adverse effects of

students, and the role of supporting sustainable prosperity under Covid-19 in China. This research uses a web crawler to collect the evaluation of Chinese students on DingTalk and public digital education data to build a measurement system to measure DingTalk digital education platform, including user experience and platform usage, a total of eight indicators. Based on 2,200 comments on DingTalk, find out the comments related to the primary indicators and secondary separately, categorize and sort out comprehensive evaluations expressed on Likert scales, finally identify critical points worth noting.

Methodology

Research Design

This research will investigate how digital learning platforms can support education for sustainable prosperity. Research by Castelló-Climent, Chaudhary, and Mukhopadhyay shows how higher levels of education will lead to higher levels of development, and that the role digital skills can bring to economic growth for the country and social mobility to young people (Castelló-Climent, Chaudhary & Mukhopadhyay, 2017). The minister called it "a channel to prosperity" (Davies & Eynon, 2018). I present the case study of DingTalk, the most used digital learning platform during the COVID-19 epidemic in China, to explore the epidemic's impact on student lifestyles and prosperity and expand the understanding of the relationship between digital education and sustainable prosperity.

A case study, according to Thomas, is to conduct a detailed study of a single object and explore how to derive the overall unified trend based on the particularity of a typical case (Thomas, 2021). Therefore, DingTalk was used as a specific research object because it is the digital education platform used by the most Chinese people. The United Nations have also recommended it as a tool for online learning in the epidemic. The case study for DingTalk provides a genre that does not focus on a large number of people but focuses on more minor subjects. It can have a more comprehensive understanding of digital education's background, relationships, processes, and practices. As a productive, insightful, or enlightening means, the case study can apply typical conclusions and strong beliefs to a broader range of objects (Hamilton & Corbett-Whittier, 2013).

This research consists of four significant steps, and a combination of primary and secondary data was collected. The first step is to use public second-hand questionnaires to study how the epidemic affects students' lifestyles and undermine prosperity. The second step is to obtain comments on DingTalk from students aged 7-22 on the AppStore through a web crawler to study users' evaluations of digital education and form a basis to explore how it functions as an online learning platform. The third part is to obtain news related to digital

education in People's Daily, the authoritative Chinese media, through a web crawler, and study what practices digital education platforms do use to contribute to sustainable prosperity in China. In the comprehensive study of the role of online education in the epidemic, second-hand data will also be used as important data to analyze the role of digital education under Covid-19 in China and how it works to support sustainable prosperity.

Data Collection and method

Primary data

User experience and evaluation comments are important data sources to evaluate the role and influence of digital education platforms. This research obtained DingTalk's public user evaluation comments from the Apple APP Store through web crawlers. China began to launch comprehensive online classes in February 2020. Therefore I focused on 1500 user feedbacks of DingTalk from 12th February 2020 to 12th May 2020, including the text of the review, the star rating given, and the review date. Through preliminary screening of these evaluations, after removing too short content, 150 meaningful evaluation comments were gathered. Users' comments of DingTalk allow it to evaluate the digital education media from the perspective of personal experience.

News media's reports on digital education can supplement the impact and effect of online learning of the epidemic from a more macro perspective. Use web crawlers to obtain news related to digital education published by People's Daily, one of China's most critical official media. The screening method is to search news headlines that contain the following words related to digital education: "digital education", "online learning", "online class", and "DingTalk". By screening these news, repetitive and irrelevant content is removed, and finally, 20 articles are left for analysis. News can be used to explore how online education can contribute to fair opportunities, efficiency improvements, and resource sharing when the Chinese education system is disrupted.

Analysis

This research will use a standard qualitative deductive analysis method, applying a diverse theoretical framework to identify critical elements related to digital education throughout the case study, and conduct a deeply content analysis. The use of deductive reasoning is based on the existing theory and predicted patterns of digital education. The "top-down" approach collects observations and data to address the hypotheses and make a confirmation (or not) of original theories. The qualitative analysis is chosen because it focuses on understanding digital education platforms like DingTalk, focusing on the epidemic's impact on student lifestyles and prosperity, and then providing a universal understanding of the relationship between digital education and sustainable prosperity.

Moreover, this study will use content analysis to identify, analyze, and report patterns in the data (Virginia Braun & Victoria Clarke, 2006). The data included 1,500 comments of primary and middle school students on DingTalk at the beginning of the epidemic, the content of digital education reports by the news media during the epidemic, and the results of surveys on the epidemic's impact on students. Comments and news are transcribed or exported to Excel, cleaned, formatted, and then imported into the qualitative data management program NVivo12 for analysis. This research follows the coding process in three main stages: (1) immersing in the data, looking for available sub-nodes, (2) reducing data through theme coding and topic generation, and (3) analyzing and explaining the results. After flexibly selecting and building a practical framework, using this as the nodes for analysis, it is possible to carry out a rich, detailed, and complex description of the relevant data of digital education.

In order to obtain practical information, this research first collected ten previous studies on online education in the epidemic and summarized their way of evaluating digital education platforms. It turns out that these evaluation methods are mainly based on the two perspectives of system ease of use and user satisfaction. This article selects some essential factors from these papers to form the primary indicators for this research to evaluate DingTalk. They are also regarded as the first-level nodes when using NVivo coding, a total of eight, namely user satisfaction, willingness to continue using, efficiency, outcomes, platform availability, interaction quality, information quality, and system quality. In order to explain these indicators in more detail, this study uses NVivo to filter first-level nodes and other comments that appear with these nodes and are extremely frequent, forming the second-level nodes.

The analysis of news content adopts another framework, and the coding of news content is relatively uncomplicated. According to the comments and news, five perspectives are set to measure the impact of digital education: education system, educational opportunity, technology, economy, and society. Setting these five aspects as first-level nodes, then use NVivo to classify and analyze these news content, forming the second-level nodes.

Secondary data

The second-hand resource can also be cited as supplementary materials for analysis and explanation. In order to first explore how the Covid-19 pandemic undermines prosperity and affects students' lifestyles, this study will use the conclusions of other researchers' questionnaires on 'students' learning and living conditions during the epidemic' released by Xi'an Jiaotong University in May 2020. The questionnaire surveyed a total of ten cities in Shanxi Province. The target subjects were primary and middle school students. The questions included family status, learning status, equipment conditions, and psychological status. A total of 12,000 survey reports were made. In addition to the questionnaire survey results, other articles on digital education in Covid-19 will also serve as secondary data to supplement my research.

Scope and limitations

This research focuses on the practice and results of digital education platforms in China. All first-hand crawler data and second-hand questionnaire results are conducted for middle and elementary school students along the southeast coast of China. Students in the western and central regions are not in an area where DingTalk is frequently used, and students in kindergartens and graduate students and above are excluded. However, due to Chinese students' wide age and geographical span, the analysis results cannot reflect the differences between groups with different demographic characteristics. Moreover, the case study of a typical digital education platform may also bias the results and fail to reflect the situation in China as a whole because there are more than a dozen online education platforms in China. More than 280 million students have been affected by the epidemic, so it is not easy to draw universally meaningful conclusions. Therefore, the content of this study is how the digital education platform exemplified by DingTalk can play a role in the epidemic and promote sustainable development. However, it does not represent the general conclusion of all digital education in China.

Ethics

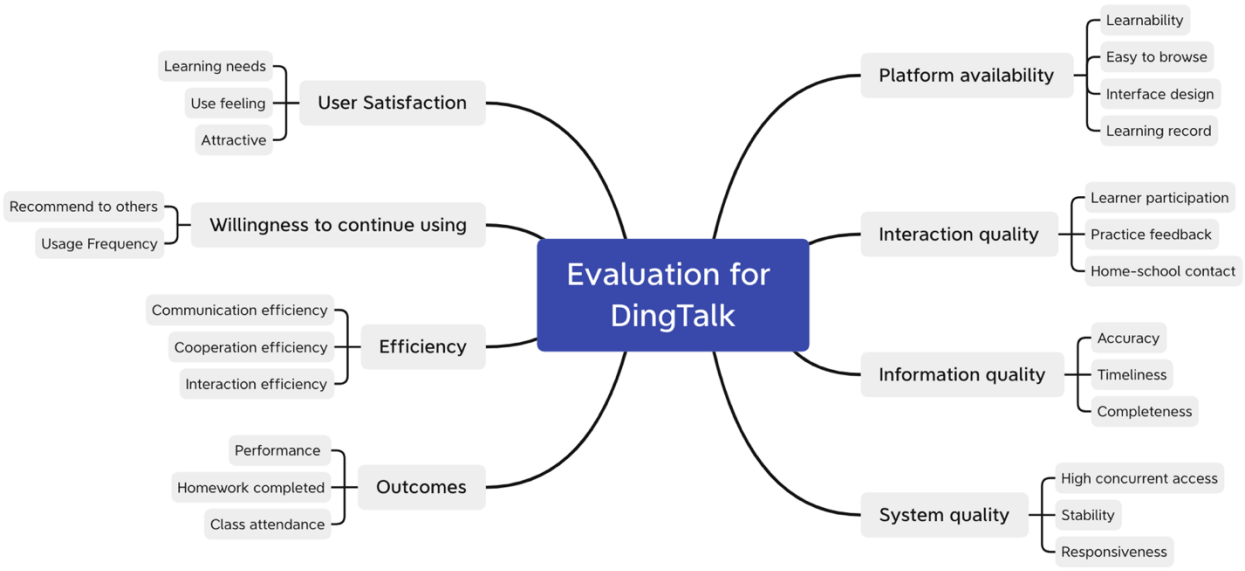
This research followed the guiding principles of respect and responsibility, incorporating ethical considerations throughout the entire case study. The first-hand data are all comments obtained from public web pages using crawlers. In this way, the personal information of student reviewers was not available or disclosed, and these groups can be protected. The second-hand data used in the article are publicly available or authorized by the original author to maintain the integrity and ethical standards.

Findings

Initial Analysis

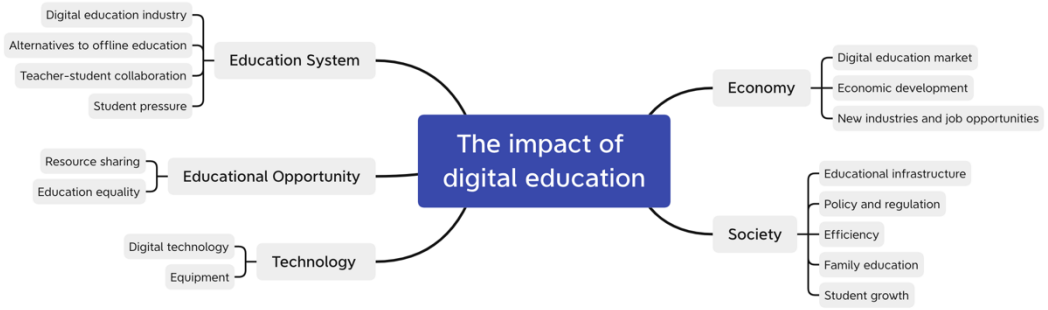
According to the eight evaluation elements of the digital education platform obtained from literature, in sorting out the first-hand data, the research found noteworthy points, which were used as sub-sections for continued analysis and were shown in the figure below.

Figure 4. Evaluation indicators for Digital Education Platforms (Based on Yang & Zhang, 2020, Chen et al., 2020, Dhawan, 2020)



Research on the impact of digital education platforms and research on news content can start from a brand-new framework, including the education system, educational opportunity, technology, economy, and society. After further analysis of the content, more detailed sub-sections have been discovered, exploring the relationship between digital education and sustainable prosperity.

Figure 5. The impact indicators of Digital Education from News



Through NVivo's analysis of the sentimental bias of the text, it can be seen that the positive text in the review accounted for 63%, and the positive content in the news accounted for 74%. It can be seen that users and news media have a positive attitude towards the role of DingTalk-based digital education platforms in the epidemic. Furthermore, for the frequency analysis of each theme in the text, it can be seen in Table 1, most user review comments were related to user satisfaction (20.51%), efficiency (18.91%) and platform availability (18.01%), while less focused on outcomes or willingness to continue using.

Table 2. The number and percentage of nodes related to each topic

Evaluation Themes for Digital Education Platform Reviews		
Theme	**Number of related comments**	**Percentage**
User Satisfaction	64	20.51%
Willingness to continue using	19	06.08%
Efficiency	59	18.91%
Outcomes	8	02.56%
Platform Availability	59	18.01%
Interaction Quality	25	08.01%
Information Quality	30	09.61%
System Quality	48	15.38%
Themes for the Impacts of Digital Education News		
Theme	**Number of related nodes**	**Percentage**
Education System	93	36.75%
Educational Opportunity	24	09.48%
Technology	27	10.67%
Economy	24	09.48%
Society	85	33.59%

Themes that are frequently mentioned in the comments and news will be cross-correlated. Then through observation and analysis, the following five conclusions and their related themes will be drawn in Table 2.

Table 3. Cross-related Themes and Main Findings

Main Findings	**Themes of comments**	**Themes of news**
Sustainable alternatives to the education system	Platform Availability Interaction Quality Efficiency	Digital education industry Alternatives to offline education Teacher-student collaboration
Promote education equality	Information Quality Efficiency Platform Availability	Resource Sharing Education opportunity
Related technology development	System Quality Information Quality	Digital technology Equipment

	Platform Availability	
Economic development	Willingness to continue using	Digital education market Economic development New industries and job opportunities
Social influence	Outcomes Interaction Quality	Educational infrastructure Policy and regulation Family education Student growth

Main Findings

Main Findings 1: Sustainable alternatives to the education system and to mitigate the impacts of COVID-19 on students

- *Remedy for affected offline education and student lifestyle*

More than 56 comments showed that DingTalk could effectively provide online courses, including "clear course live broadcast", "questioning and interaction like in school "," convenient homework submission and correction ", and "features are very user-friendly ". At the same time, the DingTalk live classroom provides an online whiteboard, online sign-in, interactive message area, and playback functions, which restores the courses and interactions in school to the greatest extent, covering various learning scenarios. The report of China Youth Research Center shows the five aspects that Chinese high school students care about most about online learning are: high-quality courses (69.1%), counseling (58.1%), can be concentrated effects (55.7%), with individual learning content (55.2%) and provide a rich curriculum (54.6%). In terms of high-quality courses that students are most concerned about, this includes the level of teachers and the effectiveness of the platform's usability.

For the impact of the mitigate epidemic on students' lifestyles, in addition, to live courses, online education platforms such as DingTalk have also tried their best to restore campus life. DingTalk released summer security check-in, campus payment, student ID, and cloud school opening functions. A total of 11 users thought that DingTalk's page design was straightforward, and they thought that they could "clearly know how to operate", "the functions are easy to find and beautiful". A total of 5 news organizations believe that DingTalk can effectively help teachers reduce complicated tasks and reduce the burden on teachers and students through digital technology.

Digital education includes new infrastructure such as information networks, platform systems, digital resources, intelligent campuses, and new development concepts for high-quality education. Among the 20 news articles, more than 80% of the news recognized DingTalk's online education function during the epidemic, saying that it "provides convenience and new possibilities for online education, greatly alleviating the plight of students unable to learn under the epidemic."

However, as a substitute for campus education, education platforms such as DingTalk also have significant problems: insufficient information fluency and responsiveness. 26% of the comments mentioned that they had encountered phenomena such as freezes, black screens, and information lag. 19% of users think that when there is too much information, they will appear chaotic and unable to find adequate information accurately. Under the outbreak of the epidemic, the digital education platform cannot perfectly cope with the situation of a large number of users online at the same time, and it is still necessary to improve the hardware performance.

- *The efficiency of cooperation and learning*

On the one hand, the flat management system promotes the transmission of instructions, and the rapid transmission and storage of data also promote the efficiency of student cooperation. Among the comments on efficiency, 22 comments mentioned "cooperative efficiency", and 41 comments mentioned "learning efficiency". Users generally believe that DingTalk's file storage and online file editing have enhanced the efficiency of cooperation, especially among college students. Moreover, elementary and middle school students usually think that DingTalk's homework submission area and feedback area reduce time consumption and can be submitted and reviewed at any time. Teachers' feedback can also be received as soon as possible. These improvements in efficiency benefit from the convenience of file storage, transportation, and the speed of information transmission.

On the other hand, the various kinds of information on the Internet bring diversified sensory stimulation. Facing the screen for a long time, students are trapped in a state of information trek, and learning is discrete and random. At least 25 users said that when the camera and microphone are turned off, it is not easy to focus on the classroom, and even do other unrelated things such as playing mobile phones. The situation of asking someone to take the class is also common among college students, while elementary students need parental supervision. Digital education lacks face-to-face teaching, lacks supervision of users to a certain extent, and is also a challenge to students.

The cooperation between teachers and students is also worth noting. People's Daily put forward the concept of "teacher-student community". In traditional education, teachers play the role of professors, but in online education, they also need to learn new forms of

knowledge dissemination. Therefore, to adapt to changes, how to communicate with students and appropriately change online teaching methods according to the situation is the part that teachers need to learn. In this process, many users expressed that they felt that the teaching method has changed, which has promoted the enthusiasm for learning, and they are more willing to communicate with teachers. This kind of cooperation makes it more efficient to complete learning together.

- *Social and communication*

In response to the needs of student users, DingTalk has added unique functions such as classmate groups, exclusive student medals, and student topic circles, which distinguish the learning and social scenes. The live course corresponds to offline teaching, and the student topic circle is equivalent to after-school communication. The home-school contact area also provides a communication scene between parents and teachers. Many students said that the interest circle set up by DingTalk allows them to relax after studying, and the group chat and social section make communication faster.

Digital education cannot simulate physical movements and emotional judgments in offline social interactions, but it can promote communication efficiency through some functions. A total of 38 comments mentioned "communication efficiency", which mentioned that rich emoticons could promote emotional expression, and DingTalk's unique "have read" function can know whether the other party can respond. At the same time, the readability and retention of information make long-term communication more traceable. For example, in the correction function of the work area, many users will make multiple revisions and inquiries, and they can also get feedback from the teacher the first time. It significantly improves the completion of the homework and the efficiency of interaction.

- *Student development*

As mentioned earlier, learning may become discrete and random due to the lack of face-to-face guidance and supervision in digital education. However, in this case, it is also an opportunity to exercise students' independent learning ability. From a realistic point of view, digital education allows students to learn about problems and use Internet resources to solve problems. Although 4% of the comments mentioned that it is not possible to understand the teacher's content through the digital education platform, half of them is self-learning through the Internet or other online materials. It is a subversion of traditional education methods, thereby exercising students' self-management and self-learning abilities, and at the same time, promoting self-discipline.

It needs to be pointed out that the foundation of this ability is to guide students' digital technology literacy. Davis and Eynon believe that digital upskilling is the pipeline to prosperity in the next generation (Davis & Eynon, 2018). DingTalk is considered

"convenient", "easy to use", and "easy to use" by 25% of the reviews. For students to learn to use the Internet and various software in their daily study, they can quickly form digital skills and literacy.

Main Findings 2: Promote education equality

- *Equal Educational Opportunity*

The highly flat cyberspace has given education more efficient and broader possibilities of equality. DingTalk first met the needs of students for online classes and gave full play to the advantages of Alibaba's digital technology. It is free and open to universities, middle and primary schools, and covers vast rural areas. A student said: "In the past, only the schools in the city centre had some excellent teachers. The teacher turnover rate in my rural schools was very high, and the level was different. Now I also often watch some famous teachers' classes records and broadcast lessons. They are outstanding." And a total of 12 news articles mentioned the feature of "educational inclusiveness". They believe that applying inclusiveness to the education field can spread the radiation range of online high-quality educational resources more widely. So that more children in poor and remote areas can get the opportunity to receive a high-quality education. Digital education can break the time and space constraints, provide high-quality teaching content to rural children, and improve the overall teaching level of rural schools, which is conducive to the balanced development of urban and rural education.

Another key to promoting the equality of educational opportunities is the storage and sharing of resources. The essential function of digital education is to connect and share, which is conducive to promoting educational equity. During the epidemic, schools used platforms such as DingTalk to conduct remote teaching. Since teachers in their hometowns in rural areas can teach students in the cities, high-quality teacher resources can also be provided to the students in rural areas. The further application of the public service platform of educational resources in daily teaching is of milestone significance for the construction of education in rural and impoverished areas. After the epidemic becomes routine, the sharing of educational resources will exist for a long time in different forms. The news media pays close attention to "Synergy". When resources, teaching materials, data and channels explore synergy in multiple dimensions, communication costs will be significantly reduced, and the education level of schools will be improved.

- *Student interest extension*

In addition to regular live courses, homework submission, and teacher-student interaction, digital education also provides different types of high-quality courses, digital technology guidance, an environment where students can concentrate, and unique learning content. Among all users who are satisfied with the courses provided by DingTalk, 28.5% of students have used DingTalk to watch interest courses, including programming, musical instruments,

design. Under the epidemic, digital education not only undertakes the task of restoring campus curricula, but it has also become a platform for expanding student interests and promoting comprehensive development.

In addition to interest courses, paid courses have also become popular. In the commentary, a college student said that he spent a total of 5,000 yuan for paid courses during the epidemic. Exam preparation, question-making skills, and interview strategies are all courses he has spent to acquire. During the epidemic, many young people have a strong sense of crisis, and "knowledge thirst anxiety" is also one of the characteristics of contemporary young people mentioned by the media. The research done by Penguin Intelligence pointed out that in the era of excessive information emergence and overload of information reception, difficulty in quickly obtaining valuable information has become a new pain point. The digital education platform is officially the carrier platform for this new way of consumption.

Main Findings 3: Related technology development

- *Digital Education Related Technology*

Facing teachers and students' increasingly diverse teaching needs, new technologies such as big data, artificial intelligence, 5G, and blockchain are developing rapidly. The sudden epidemic has also prompted the continuous update and iteration of digital education platforms to adapt to the digital transformation of education. Faced with a wide range of digital teaching needs and an increasing number of users, the original online education-related technologies face significant challenges. There is also much room for improvement. For example, DingTalk launched a student-specific version of digital education tools. A total of 48 reviews mentioned the quality of the system. Nineteen users thought the system was smooth, 16 thought it was stable, and 13 thought it was responsive.

Moreover, personalized learning customization is also a practice of recommendation algorithms. DingTalk will use algorithm technology to dynamically push personalized online learning content to teenagers, solving the homogenization of some online resources. Personalized learning materials, combined with the flexible learning environment provided by big data for students, students can learn independently and obtain a more suitable learning method based on platform technology. The needs of students for personalized learning have also promoted the development of related digital education technology. Many media believe this is a process of mutual benefit and mutual growth.

- *Access to technology and broadband coverage*

The differences in the level of economic development have encountered difficulties in promoting online teaching in some places. There is a digital divide between urban and rural areas. There is a significant gap in the equipment that students have, their digital skills, and

the infrastructure of network signals. According to the latest report released by the China Internet Network Information Centre, as of March 2020, non-netizens in China are 496 million, non-netizens in rural areas account for 59.8%. Restricted by factors such as lack of Internet access equipment, uncovered networks, and burden of bandwidth traffic costs, some students in remote rural areas cannot usually conduct online learning, especially video learning.

Online education can promote the fairness of educational opportunities due to its convenience and universality. Its requirements for equipment and broadband have caused unfairness to a certain extent. One commenter claimed to be living in Inner Mongolia, and his family members are herdsmen living in the grasslands. They searched for the Internet for online classes. Without a computer at home, a student in Hubei province can only borrow from the teacher in the village. A user living in a mountainous area set up a tent on the top of the mountain with a better signal to take online lessons. These examples show that digital education cannot stop at the software used for the live broadcast. It is necessary to strengthen infrastructure, empower technology, and share high-quality educational resources to avoid creating a new digital divide and promote educational equity. At present, the government and some online education platforms are helping remote areas to build signal facilities and donating computers and other equipment.

Main Findings 4: Economic development

- *Education market and economic development*

According to the E-commerce Research Centre of the Net Economics Society report, the scale of China's online education market will reach 423 billion yuan in 2020, and the number of users is expected to reach 331 million (E-commerce Research Centre, 2020). The future development of digital education is the news media's focus, and many news articles have reported optimism about the future market. Due to the long-term lack of a large number of parents and students in the use of digital education platforms, the future development of the relevant market is considered to reach the level of 100 billion.

- *New industries and employment opportunities*

Under the influence of the epidemic, many people are in a career state, and related industries such as digital education platforms are developing rapidly, creating a demand for human resources. At the same time, many employment-related online courses have appeared, providing students who are waiting for employment with broader learning opportunities for job hunting skills. The impact of digital technology on demand is worthy of attention. Every step of its development promotes changes in lifestyles. In this epidemic, many people experienced the online lifestyle deeply for the first time. Some users said that they learn online dancing, fitness, cooking, makeup, and other courses on DingTalk. These emerging

consumption potentials are expected to generate new demands for new models, new formats, new industries, and new products in the future.

Main Findings 5: Social influence

- *Family education*

Digital education enables families to play an active role and explore effective models of home-school cooperation. When parents participate in teaching, the family scene and the school scene begin to connect, and the part and positioning of parents in daily education practice will gradually become clear. In this unique stage of socialization of young people, families can give full play to their educational advantages such as companionship, guidance, and nurturing to promote students' mental health. A total of 22 comments mentioned that using the digital education platform is the participation of the family. Some users mentioned that his father became the computer technical instructor, his mother became the uploader of the filming, and his grandfather was the learning supervisor. When the focus of campus learning shifts to the home, problems such as lack of autonomy caused by digital education are exposed, and family education becomes a way to make up for it.

Nevertheless, not all students have a good family education experience in the epidemic. Half of the users believe that the cumbersome tasks of using a digital education platform make the whole family have to participate in it instead of relying on students to complete tasks such as shooting, uploading, and checking in on time. According to a questionnaire survey conducted by the Shanghai Survey Team of the National Bureau of Statistics of China, among the parents of students who participated in online courses, 30% felt negative, 28.2% felt the urge to beat and scold, 22.1% felt dissatisfied, and 7.3% of parents are bored. A total of 5 pieces of news have focused on family education in the epidemic. They believe that digital education has made parents aware of the importance of family education. It also reflects that the combination of family and digital platforms can jointly explore an effective model of home-school cooperation.

- *Social mobility*

Education will promote the continuous development of people and promote the continuous progress of society. When higher education is generally accepted among the population, it will increase the employment rate, reduce the number of poor people, and ultimately promote high-speed social mobility, making politics, society, and economy more efficient. The Hamilton Project shows that education can play a key role in improving social mobility (Greenstone, Looney, Patashnik & Yu). Low-cost interventions can encourage more low-income students to attend, continue to attend and increase the economic diversity of top universities. Digital education is one of such low-cost interventions. While increasing the fairness of educational opportunities, more students enter higher education institutions to

promote social mobility, and ultimately create social and economic value in high-level positions.

- *Private issues*

Supervision is an essential part of digital education, including supervising the status of students in class, supervising the submission of homework, and strengthening contact after class. However, this kind of supervision sometimes creates privacy issues. A total of 24 users believed that DingTalk violated their privacy, including those teachers can force the camera to be turned on in the classroom, cannot turn off notifications of important messages, and parents can view some private chats of students. The original intention of these designs was to promote communication and information circulation between teachers, students, and parents. However, under the supervision of this high pressure, many elementary school students gave DingTalk a low score of 1 star on the AppStore in February 2020 to express their inner dissatisfaction. One aspect of the flexibility of digital education is that students can freely arrange the time and form a personalized learning plan. However, a large amount of information and high-intensity supervision counter this original intention and become invisible bondage. How to strike a balance between flexible application and rigorous information is a challenge that DingTalk needs to face urgently.

Discussion

The research findings explained the role of DingTalk in the epidemic from many aspects and answered the first research question: How can digital education platforms mitigate the impacts of Covid-19 on students in China? Firstly, DingTalk provides a convenient online live course platform that allows flexible conduct of class, homework submission, and teacher-student interaction. Secondly, to simulate offline campus life and reduce students' depressed mood, related social activities and circles provide students with channels to receive new messages and communicate with each other. Third, the flexibility and convenience of digital education promote cooperation and communication between students, and on the one hand, it improves efficiency. Fourth, big data and cloud storage functions make all kinds of interesting courses and learning materials available, giving students the opportunity to choose courses freely and a personalized learning plan. Finally, the vast network space and learning scalability provided by digital education force students to exercise self-discipline and self-determination of learning plans, which is also beneficial to improving students' independent learning ability. However, it is worth noting that the prerequisite for digital education to reduce the impact of Covid-19 is the powerful functions of technology. However, the hardware load is caused by too many people using the system, which is not smooth. It also urgently needs to be alleviated and upgraded. When DingTalk plays its role, it does not simply move offline education to online, but starts from users' needs and meets the needs of

learning, social interaction, and interest. At the same time, it takes advantage of online learning based on technology, and makes high efficiency and flexibility the main driving force for restoring students' study and life.

Regarding the function of DingTalk and its impact on students, this research is consistent with Xiao's research results. It is believed that the online learning functions provided by DingTalk with comprehensive functions and simple methods of use can restore students' regular learning to a large extent and reduce the impact of the epidemic (Xiao, 2020). From the perspective of digital education for students' personal development, this research believes it can give students rich resources to promote flexible learning and self-control. Alam's research also has similar results and believes that online learning enhances students' autonomous learning ability. An essential part of digital education is a stable network technology, which is agreed by this research and other researchers such as Chen and Derar, because a good network is the foundation of all learning behaviours and the beginning of a good experience (Chen et al., 2020, Derar, 2020).

However, this research also yielded some results that are different from other literature. Arora and Srinivasan believe that digital education's most significant challenges are lack of training and awareness and network issues (Arora & R. Srinivasan, 2020). However, the results of this case study on DingTalk show that infringement of personal privacy is a point that Chinese students attach great importance to, which has not been mentioned in other studies. It may be due to the different national conditions and the time of research. Chinese apps usually have relatively large powers to explore personal information to implement intelligent content recommendation mechanisms, but they will cause resistance. This research focuses on China during the epidemic. When a large population just started to use online education platforms, the whole day of learning is different from the occasional viewing of courses in the past, and long-term supervision can make people feel out of bounds.

In addition, regarding the factors affecting DingTalk, this article and Yang and Zhang have slightly different views. They believe that the most critical factors are users' perception of the usefulness and quality of courses, the quality of platform and website services, and the degree of expectation. In contrast, the results of this study believe that efficiency, platform availability, and the system's quality are what students are most concerned about. The reason may be different platforms for obtaining data. Yang & Zhang's data comes from questionnaire surveys, while this research uses App Store reviews as the primary data, which is more biased towards the evaluation of the product itself.

When this research understands the impact and significance of DingTalk during the epidemic from a macro perspective, it can adequately interpret the second research question: What practices do digital education platforms use to contribute to sustainable prosperity in China? From the perspective of educational opportunities, digital education, due to its low threshold,

widespread resources, and easy accessibility, allows students of different regions and levels to have the same opportunity to learn online courses, rather than being limited by local educational resources. At the same time, it can promote educational equity. From a related technical point of view, with the emergence of a large number of digital education needs, companies need to quickly iteratively update products to adapt to complex application scenarios and usage loads. These have promoted platform hardware, big data, and artificial intelligence. And other technological developments. From the perspective of economic development, on the one hand, digital education platforms have enormous economic potential and attract large amounts of investment.

On the other hand, online education is also an emerging industry, providing many new employment opportunities. From the perspective of social impact, digital education also promotes family education and promotes social mobility. However, it is worth noting that the platform's supervision of students can sometimes cause violations of personal privacy and cause users to feel rebellious. It can be seen that in the epidemic, digital education platforms use digital technology to play their role, promote sustainable prosperity in many aspects, and make education fairness, related technologies, and social mobility develop together.

This research collides with other researches on the argument of education equity. Derar believes that the demand for equipment and broadband in digital education leads to fairness and access issues (Derar, 2020), while Liu and Zhao believe that the popularization of digital education has expanded the digital gap and led to inequality. This research also mentioned the issue of technology and broadband. However, under the premise that the government and entrepreneurs donate equipment and optimize broadband networks, digital education eliminates time and space constraints. It makes high-quality education easy to obtain to the greatest extent. Promote equality of educational opportunities. Whether digital education or offline education, there is a certain degree of obstacles leading to inequality. The obstacle to digital education lies in the digital gap, and the gap in offline education lies in the gap in economic development and the gap in educational resources. Critically look at the results of digital education, explore its impact from different angles, give play to its strengths, and choose the most accessible gap to make efforts to promote equality and support sustainable prosperity in a realistic sense.

For the theoretical implications, this research is different from other research articles. The first is the evaluation criteria for the digital education platform. It starts from the platform itself and the users' experience and conducts a case study from rational and perceptual aspects. The selection of primary data is also a composite type, and comments that represent personal thoughts are selected. With news content representing the media's views, the role and influence of DingTalk can be explored from a micro and macro perspective. The research methods and data acquisition of this study are comprehensive and complex. It is worth noting that the content related to sustainable prosperity has rarely combined digital education with

sustainable prosperity in previous studies. From here, we can know some of the effects of digital education in promoting sustainable prosperity. The classification methods derived from deductive methods include educational opportunities, related technologies, economic development, and social impact. It can also provide a preliminary direction for future research.

For the empirical implications, this research is significant for the future development of digital education in China and the response to emergencies. Among the research results, the privacy issues and network issues that most affect the user experience are ethical and technical problems that urgently need to be improved by DingTalk in the future. How to make use of the universality of digital education to promote education fairness and education for all in the true sense is also the focus of supporting the sustainable prosperity of education and society. Combining the digital education platform with available equipment and broadband can the epidemic's impact be minimized, and digital education can be implemented. It is worth noting that the emphasis on family education caused by digital education has not been focused on in the past. The combination of family and campus education and the balance of personal self-learning and family supervision are vital points that need attention when conducting combined online and offline education.

The findings of this research have to be seen in the light of the following limitations. The primary limitation of the generalization of these results is the lack of universality. The boundary conditions of this study, including the early stage of the epidemic, coastal areas of China and students, are aimed at the role of digital education in the black swan incident of the Covid-19 epidemic, and cannot represent other periods. Moreover, the use of the deductive method will allow the result to develop and deduct within the established concept and framework, and the scope of the deduction is not broad. It cannot represent the universal law. Secondly, personal bias may occur because the researcher is also a Chinese student who has used DingTalk during the epidemic. Despite these limitations, this study focuses on the quality of a single case study rather than the generality and validity. In terms of data acquisition, the period when researchers use DingTalk is avoided, student reviews and news content are obtained reasonably, digital education is comprehensively analyzed, and the influence of personal factors is minimized.

Conclusion

At a broader level, this research was motivated by the observation that explores the impact of digital education in the epidemic and the role of promoting sustainable prosperity. Based on the hypothesis that digital education platforms such as DingTalk can alleviate the adverse effects of students during the epidemic, this research mainly proposes research questions

about how digital education platforms can support sustainable prosperity under Covid-19 in China and how DingTalk mitigate the impact of Covid-19 and its practice.

To assess the influence and significance of DingTalk, this research uses a qualitative analysis method based on the deduction method, using NVivo for content analysis. Based on related literature, eight factors for evaluating digital education platforms are determined: user satisfaction, willingness to continue using, efficiency, learning outcomes, platform availability, interaction quality, information quality, and system quality. Use this framework as the theme for DingTalk classification and analysis of the content of 150 comments. Moreover, 20 news related to digital education is also used as a piece of data, using five aspects of the education system, education opportunities, related technology, economic development, and society to explore further the role of DingTalk in supporting sustainable prosperity.

This research obtains the following results, which are stable in extensive, robust analysis. First of all, it can be seen that digital education platforms such as DingTalk played the role of mitigating the impact of Covid-19 on students in China during the epidemic. The online course lives broadcast platform provided by DingTalk, and the many functions of simulating campus life have restored the students' study life as much as possible, and made them feel convenient and valuable. The digital platform that digital education relies on has the functions of data storage and free sharing of educational resources to promote learning efficiency and enhance the learning experience. Because of the flexible platform and access to network resources, digital education can promote students' independent learning ability. However, maintaining the smoothness and high responsiveness of the digital education system, especially when many users use it simultaneously, is also a problem that education platforms such as DingTalk need to overcome. At the same time, the platform's prying of students' privacy also needs to be balanced to make it easy for users to accept.

This research also finds that DingTalk has a significantly positive effect on sustainable prosperity while the effect can be presented from five aspects: education system, educational opportunity, economic development, related technology and social influence. The digital education platform disseminates online resources for free. This flexibility and low threshold can promote the learning of a wider group of people, allow low-income students to learn, and promote educational equity. Students' extensive use of the DingTalk platform and high demand have also promoted the technological development of the platform. 5G, big data, artificial intelligence, broadband hardware and other technologies are updated rapidly. At the same time, the vast potential of the digital education platform has enabled this emerging industry to obtain a large amount of investment, while also generating many job opportunities, promoting economic development and social mobility.

The results of the research have both academic and practical significance. This research studied the relationship between the role of digital education in the epidemic and sustainable prosperity. It is a research gap that has not been covered in previous studies. At the same time, the combination of all aspects of first-hand data, the framework for evaluating digital education, and the importance of sustainable prosperity. All of the analyses have a particular academic significance. From a practical perspective, this research can inspire the developing Chinese digital education companies and industries on how to meet the needs of students and promote the sustainable prosperity of the overall society.

Although the sample already makes it possible to identify the effects of digital education on students in the epidemic, further insights can be gained once expand the sample and conducted the detailed regional comparative study. A single case study analyzed by the deductive method can gain an in-depth understanding of DingTalk, a digital education platform, but cannot represent all phenomena in the industry. In the future, a broader time and a more comprehensive range of regional research comparisons can be carried out, and more general research results can be obtained.

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Appendix 1

Evaluation Indicators for Digital Education Platforms	
The Primary Indicators	**The Secondary Indicators**
User satisfaction	Learning needs
	Use feeling
	Attractive
Willingness to continue using	Recommend to others
	Increase the frequency of use
	Usage frequency
Efficiency	Communication efficiency
	Cooperation efficiency
	Interaction efficiency
Learning outcomes	Performance improvement
	Homework completed
	Classroom acceptance
Platform availability	Learnability
	Easy to browse
	Interface design
	Learning record
Interaction quality	Learner participation
	Practice feedback
	Home-school contact
Information quality	Accuracy
	Timeliness
	Completeness
System quality	High concurrent access
	Stability
	Responsiveness