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Managing Online Learning Tools in Chinese Higher Education: Strategic Impacts During and After COVID-19

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Abstract

This research addressing the significant challenges and transformations in educational practices brought about by the COVID-19 pandemic. The rapid shift to online learning highlighted the need for effective management of digital tools, as institutions struggled to maintain engagement and educational quality. The primary objective of this study is to evaluate the effectiveness of various online learning tools, understand the experiences of educators and students, and propose strategies for future implementation. Utilizing a qualitative methodology, the research involved in-depth interviews and focus groups with faculty and students across multiple Chinese higher education institutions. Participants evaluated platforms such as Zoom, Moodle, WeChat, and Tencent Meeting, focusing on usability, engagement, and overall effectiveness in achieving learning outcomes. The findings reveal distinct preferences for specific tools, with Zoom and WeChat emerging as particularly effective in fostering engagement and interaction. However, challenges related to accessibility and the varying effectiveness of different platforms were also identified. The study concludes with actionable recommendations for integrating hybrid learning models, enhancing technological infrastructure, and ensuring ongoing support and training for educators. These insights aim to guide institutions in creating a more effective and inclusive online learning environment in the post-pandemic landscape.

Keywords: Online Learning Tools, Chinese Higher Education, COVID-19, China

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1. Introduction

Online learning in China has evolved significantly over the past two decades, driven by rapid advancements in information and communication technology (ICT) and a growing demand for flexible education solutions. The Chinese government has actively promoted online education as part of its broader educational reforms, aiming to enhance access to quality education across diverse geographical and socio-economic landscapes. The Ministry of Education (MOE) has implemented various initiatives to integrate online learning into the traditional education system, particularly in higher education institutions. This integration has been facilitated by the

proliferation of digital platforms and tools that support online teaching and learning, making education more accessible to students in urban and rural areas alike (Luan, Wang et al. 2020). The COVID-19 pandemic served as a catalyst for the widespread adoption of online learning in China. In early 2020, as schools and universities were forced to close to curb the spread of the virus, educational institutions rapidly transitioned to online platforms to ensure continuity of education. This unprecedented shift highlighted both the potential and challenges of online learning, as millions of students engaged in remote education for the first time. Reports indicated that over 220 million students participated in online learning during the pandemic, marking one of the largest educational experiments globally (Zhang, Zhuang et al. 2020). However, this transition also exposed significant disparities in access to technology and digital literacy, raising concerns about the effectiveness and equity of online education (Li, Jin et al. 2021). The significance of this study lies in its exploration of the strategic management of online learning tools in Chinese higher education during and after the COVID-19 pandemic. The pandemic has fundamentally altered the educational landscape, prompting educators and institutions to rethink traditional pedagogical approaches and embrace digital learning environments. Understanding how these changes impact teaching and learning practices is crucial for developing effective strategies that enhance educational outcomes. During the pandemic, many educators faced challenges such as inadequate training in online teaching methodologies, limited access to technological resources, and difficulties in engaging students remotely. These challenges necessitated a reevaluation of existing online learning tools and the development of new strategies to support both educators and students (Luan, Wang et al. 2020). As institutions adapt to a post-pandemic reality, it is essential to assess the long-term implications of these changes on educational practices and policies. This study aims to provide insights into how online learning tools can be effectively managed to foster a more inclusive and equitable educational environment in the future. The study aims to explore the experiences and perceptions of both educators and students concerning online learning tools during the pandemic. It will analyze the strategies that higher education institutions adopted to effectively manage online learning and identify best practices and recommendations for enhancing online learning in the post-COVID-19 educational landscape. By addressing these objectives, the research seeks to provide valuable insights into the management of online learning tools in Chinese higher education, ultimately supporting the development of more effective and equitable educational practices.

2. Literature Review

online learning tools have become integral to higher education, especially in the wake of the COVID-19 pandemic. As institutions continue to adapt to this new landscape, understanding the types of tools available and the trends shaping their use will be crucial for enhancing educational outcomes. The ongoing research in this area will provide valuable insights into best practices and strategies for effective online learning.

A. Definition and Types of Online Learning Tools

Online learning tools are digital platforms and resources that facilitate educational activities through the internet, enabling both synchronous and asynchronous learning experiences. These tools enhance the teaching and learning process by providing interactive, flexible, and accessible educational environments. The types of online learning tools commonly used in higher education include, Learning Management Systems (LMS), video conferencing tools, Collaborative Tools, platforms, and Content Creation Tools. LMS platforms such as Moodle, Blackboard, and Canvas allow educators to create, manage, and deliver course content. They facilitate communication between students and instructors, track student progress, and provide a centralized location for resources and assessments. Video conferencing tools Applications like Zoom, Microsoft Teams, and Google Meet enable real-time virtual classrooms, allowing for synchronous learning experiences where students can interact with instructors and peers in real time.

Collaborative Tools such as Google Workspace and Microsoft 365 support group work and collaboration among students by providing shared documents, spreadsheets, and presentations, fostering teamwork and communication. Assessment Tools like Kahoot!, Quizlet, and Socrative offer interactive quizzes and assessments that help gauge student understanding and engagement, making learning more dynamic and participatory. Content Creation tools such as Canva and Prezi assists educators in creating visually engaging presentations and learning materials, enhancing the overall learning experience. These tools have become essential in higher education, particularly as institutions increasingly adopt blended and fully online learning models to meet diverse student needs (Dhawan 2020).

B. Global Trends in Online Learning

The COVID-19 pandemic has significantly accelerated the adoption of online learning tools across the globe. According to (UNESCO 2020) , over 1.5 billion students were affected by school closures, prompting a rapid shift to online education. This transition has highlighted several key trends in online learning such as Increased Investment in Technology, Focus on Student-Centered Learning, Hybrid Learning Models, and Global Collaboration and Resource Sharing. Institutions are investing more in digital infrastructure and training for faculty and students to enhance online learning experiences. This investment is crucial for ensuring that both educators and learners are equipped to navigate the digital landscape effectively (Silva, Lino-Neto et al. 2022). Focus on Student-Centered Learning is a growing emphasis on creating interactive and engaging learning environments that prioritize student participation and collaboration. This shift reflects a broader pedagogical trend towards active learning, where students take a more central role in their educational experiences (Dhawan 2020, Silva, Lino-Neto et al. 2022). Many institutions are adopting hybrid models that combine online and face-to-face instruction, providing flexibility and accessibility for students. This approach allows for a more personalized learning experience, accommodating different learning styles and preferences (Sathe, Krishwasamy et al. 2023).Moreover, the pandemic has fostered a spirit of collaboration among educational institutions worldwide, leading to the sharing of resources, best practices, and innovative teaching strategies.

This trend is expected to continue as institutions recognize the benefits of global partnerships in enhancing educational quality (Sathe, Krishwasamy et al. 2023).

Research on online learning tools in higher education has expanded significantly in recent years, particularly in response to the challenges posed by the COVID-19 pandemic. A bibliometric analysis of research trends in online learning revealed a significant increase in publications focusing on e-learning, student engagement, and teaching methodologies during this period (Sathe, Krishwasamy et al. 2023). Several studies have highlighted the effectiveness of online learning tools in enhancing educational outcomes. For instance, a study Sareen and Mandal (Sareen and Mandal 2024) found that while online learning offers flexibility, it also presents challenges such as digital divide issues and the need for effective pedagogical strategies. The authors emphasized the importance of addressing these challenges to ensure equitable access to quality education. Moreover, research conducted by Sathe et al. (Sathe, Krishwasamy et al. 2023) examined the impact of online learning on student engagement and satisfaction. Their findings indicated that students who participated in interactive online learning environments reported higher levels of engagement and satisfaction compared to those in traditional settings. This underscores the potential of online learning tools to create more engaging and effective educational experiences.

C. Transition to Online Learning

The COVID-19 pandemic has significantly transformed the educational landscape, necessitating a rapid transition to online learning. This shift has presented numerous challenges for both educational institutions and students, reshaping how education is delivered and experienced. In response to the pandemic, educational institutions worldwide were compelled to close physical campuses and transition to online learning. This shift was abrupt and often unplanned, leading to a variety of responses across different educational contexts. Many institutions adopted online platforms to facilitate remote instruction, which became essential for maintaining educational continuity during lockdowns (Dhawan 2020). The transition involved not only the use of Learning Management Systems (LMS) but also various digital tools to support teaching and learning processes. Research indicates that while some students adapted quickly to online learning environments, others faced significant challenges. Factors such as prior experience with technology, access to reliable internet, and the availability of necessary devices played crucial roles in determining how well students could engage with online education (Silva, Lino-Neto et al. 2022). For instance, students from lower socioeconomic backgrounds often struggled with access to technology, exacerbating existing educational inequalities (Gray and DiLoreto 2016).

D. Challenges Faced by Institutions

Institutions encountered several challenges during the transition to online learning. A primary concern was the lack of preparedness among faculty for delivering online education. Many educators had limited experience with online teaching methodologies, which affected the quality of instruction and student engagement (Dhawan 2020). Faculty reported increased workloads as they adapted their curricula and learned to use new technologies, leading to stress and burnout.

Moreover, the rapid shift raised concerns about academic integrity. Traditional assessment methods were often inadequate in online formats, prompting institutions to explore alternative evaluation strategies. However, ensuring fairness and reliability in assessments remained a significant challenge (Sareen and Mandal 2024) . Additionally, the need for robust technical support systems became evident, as both students and faculty required assistance navigating new platforms and tools.

E. Challenges Faced by Students

Students faced a myriad of challenges during the transition to online learning. One of the most significant issues was the lack of social interaction, which is crucial for motivation and engagement in educational settings. Many students reported feelings of isolation and disconnection from peers and instructors, which negatively impacted their learning experiences. The absence of face-to-face interactions made it difficult for students to form study groups or seek help, leading to increased anxiety and stress (Dhawan 2020). Furthermore, the shift to online learning required students to develop new skills, such as self-discipline and time management, to succeed in a less structured environment. Those who struggled with these skills often found it challenging to keep up with coursework, resulting in lower academic performance (Gray and DiLoreto 2016). Additionally, practical subjects that require hands-on experience faced significant barriers, as online formats could not adequately replicate the learning experiences provided in traditional classrooms (Silva, Lino-Neto et al. 2022).

F. Strategic Management of Online Learning Tools

The strategic management of online learning tools has become increasingly important in higher education, especially in the context of rapid technological advancements and the shift towards digital learning environments. This literature review explores the theoretical frameworks for managing educational technology and the significance of strategic planning in higher education. The management of educational technology is guided by various theoretical frameworks that help institutions navigate the complexities of integrating technology into teaching and learning. One prominent framework is the Technological Pedagogical Content Knowledge (TPACK) mode, which emphasizes the interplay between technology, pedagogy, and content knowledge. This model encourages educators to develop a comprehensive understanding of how these three components interact to enhance learning outcomes (Mishra and Koehler 2006). Another relevant framework is the SAMR model (Romrell, Kidder and Wood 2014) (Substitution, Augmentation, Modification, Redefinition), which provides a lens through which educators can evaluate the integration of technology in their teaching practices. The SAMR model categorizes technology use into four levels, helping educators assess how technology can transform learning experiences rather than merely substituting traditional methods. Additionally, Bolman and Deal's four-frame model (structural, human resources, political, and symbolic) can be applied to educational technology management, Figure 1. This framework allows leaders to analyze organizational dynamics and address the multifaceted challenges associated with implementing technology in

educational settings (Bolman and Deal 2017). By employing these frameworks, institutions can create a more cohesive strategy for integrating online learning tools effectively.

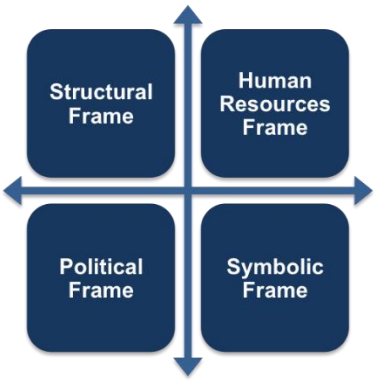

Figure 1: The Four Frame Model (MORENO 2018)

G. Importance of Strategic Planning in Higher Education

Strategic planning is crucial for higher education institutions as they adapt to the evolving landscape of online learning. Effective strategic planning involves setting clear goals, allocating resources, and establishing metrics for success (Russell, Smith and Larsen 2020). It enables institutions to align their technological initiatives with their overall mission and vision, ensuring that investments in online learning tools are purposeful and impactful (Taylor 2021). Research indicates that institutions with robust strategic planning processes are better positioned to respond to challenges and capitalize on opportunities presented by technological advancements (Ghemawat 2017). For instance, strategic planning can facilitate the identification of key performance indicators (KPIs) that measure the effectiveness of online learning initiatives, allowing institutions to make data-driven decisions (Gaftandzhieva, Hussain et al. 2023). Moreover, strategic planning fosters collaboration among stakeholders, including faculty, administrators, and students (da SILVA, Dias et al. 2022). Engaging these groups in the planning process ensures that diverse perspectives are considered, leading to more comprehensive and effective strategies for implementing online learning tools. This collaborative approach not only enhances buy-in from stakeholders but also promotes a culture of continuous improvement within the institution (McLean 2017).

3. Research Methodology

A. Research Design

The research uses the Phenomenological approach, this approach allows for an in-depth exploration of the lived experiences of educators and students using online learning tools during and after the COVID-19 pandemic. It aims to understand how these experiences shape their perceptions and strategies. For the sampling process, purposive sampling is employed to select participants who are directly involved in online learning within Chinese higher education. This selection includes university faculty members from various disciplines, educational

administrators, and students at both undergraduate and graduate levels. Additionally, to capture a wide range of experiences, it is essential to ensure diverse representation from various institutions, including both urban and rural settings as well as public and private universities. This approach helps provide a comprehensive understanding of the impacts and strategies related to online learning tools in different contexts. The data collection involves several methods, starting with in-depth interviews, where semi-structured interviews are conducted with participants to explore their experiences, challenges, and strategies related to online learning tools. An interview guide is developed, featuring flexible, open-ended questions that focus on key areas, including participants' experiences with online learning during COVID-19, changes in teaching and learning strategies, perceptions of the effectiveness of various online tools, and future implications and adaptations for online learning post-pandemic. In addition to interviews, focus group discussions will be organized with both students and educators to facilitate interactive dialogue about shared experiences and strategies. Finally, relevant institutional documents are analyzed, including policy changes, training materials, and communications from university administrations concerning online learning, to provide further context and depth to the research findings.

B. Data Analysis

The data analysis employs thematic analysis to identify, analyze, and report themes, within the collected data. The process begins with familiarization, where researchers will read through transcripts and notes to gain a comprehensive understanding of the content. Next, the data is coded by highlighting significant phrases or sections that stand out. Based on this coded data, themes are developed, followed by a thorough review of these themes to ensure they accurately reflect the underlying data. Finally, each theme is defined and named to effectively convey the essence of the findings, providing a clear framework for interpreting the experiences and strategies related to online learning tools in Chinese higher education.

C. Results and discussion

The research conducted revealed several key themes across participant interviews, focus groups, and document analysis. The primary themes identified include: adaptation to online learning, challenges faced, effectiveness of tools , and future strategies for online learning. The research findings underscore the transformative impact of the COVID-19 pandemic on online learning in Chinese higher education. By addressing the challenges identified and leveraging the strengths of existing tools, institutions can enhance the educational experience for both students and educators.

Adaptation to Online Learning

Participants reported a significant shift in both teaching and learning methodologies as higher education institutions transitioned to online platforms, Table 1.

Table 1: Participants Adaptation to Online Learning

Key Aspect	Description	Participant Quotes
Change in Teaching Style	Increased use of multimedia and interactive tools.	"I had to incorporate more videos and quizzes."
Student Engagement	Varied responses; some students thrived, others struggled.	"I feel more engaged in live sessions."

The findings indicate a successful adaptation to online learning tools, suggesting that institutions should continue to encourage innovative teaching practices. The incorporation of multimedia and interactive tools can enhance engagement, which is crucial for student retention and success.

Challenges Faced

Despite the successful adaptation, several challenges were highlighted, Table 2.

Table 2: Technical challenges

Challenge	Description	Participant Quotes
Technical Issues	Internet connectivity and platform reliability concerns.	"Our internet would drop during important lectures."
Training Needs	Faculty expressed a need for more training on online tools.	"I wish I had more training before we switched."

The reported technical issues highlight the need for reliable infrastructure and support systems. Institutions must invest in robust IT services and provide resources to assist both students and faculty in overcoming these challenges.

Effectiveness of Tools

Participants in the study evaluated a range of online learning tools to assess their effectiveness in facilitating teaching and learning during and after the COVID-19 pandemic. This evaluation was based on several criteria: usability, engagement, user satisfaction, and impact on learning outcomes. The findings reveal distinct preferences and perceptions regarding various tools, highlighting both strengths and limitations. The effectiveness of the tools was assessed through qualitative interviews and focus groups, where participants reflected on their experiences. The primary criteria for evaluation included usability, defined as the ease of navigation and accessibility for both students and faculty; engagement, which refers to the ability to maintain student interest and encourage participation; user satisfaction, encompassing overall satisfaction levels reported by faculty and students; and the impact on learning outcomes, which measures the

perceived effectiveness in enhancing understanding and knowledge retention. Participants evaluated several popular online learning platforms, including Zoom, Moodle, WeChat, Tencent Meeting, and Google Classroom, each of which provided unique functionalities and experiences, Table 3.

Table 3: Evaluation of the Effectiveness of Online Learning Tools

Tool	Usability (Rating 1-5)	Engagement (Rating 1-5)	User Satisfaction (%)	Impact on Learning Outcomes (%)
Zoom	4.5	4.7	85	75
Moodle	4.0	3.8	70	65
WeChat	4.3	4.5	80	70
Tencent Meeting	4.1	4.2	75	60
Google Classroom	4.2	4.1	78	68

Participants rated Zoom highest for its usability, noting its intuitive interface and ease of use. The platform facilitated interactive sessions through features like breakout rooms and polls, which were particularly effective in maintaining student engagement. Teachers reported a 75% effectiveness in achieving learning outcomes, attributing this success to the real-time interaction and immediate feedback capabilities that Zoom offers. In contrast, some educators found Moodle less user-friendly compared to other platforms, although it provided robust features for course management. Engagement levels were lower on Moodle due to its asynchronous nature, which led to less real-time interaction among students. Despite offering comprehensive resources, the perceived impact on learning outcomes was moderate, with a reported effectiveness of 65%. WeChat received high ratings for usability, especially among students who were already familiar with the app for social communication. It proved effective for quick communications and updates, significantly enhancing student engagement outside formal classes. Participants reported an improvement in learning outcomes by 70%, particularly for collaborative projects and group discussions facilitated through the platform. On the other hand, Tencent Meeting was generally rated positively in terms of usability, although some participants noted technical issues. While the platform provided adequate tools for engagement, it was not as robust as Zoom. The perceived impact on learning outcomes was lower, at 60%, due to its less interactive features compared to other tools.

These findings highlight the varied effectiveness of each online learning tool in promoting engagement and achieving educational outcomes, reflecting both strengths and limitations in their use within Chinese higher education.

Future Strategies for Online Learning

Looking ahead, participants suggested several strategies for improving online learning, Table 4:

Table 4: Future Strategies for Online Learning

Strategy	Description	Participant Quotes
Hybrid Learning Models	Combining online and face-to-face instruction.	"A mix of both seems to work best."
Ongoing Training	Continuous professional development for faculty.	"We need regular workshops on new tools."
Enhancing Technological Infrastructure	Institutions must invest in robust technological infrastructure	"Update and maintain online learning platforms"
Fostering Collaboration and Community	Building a sense of community among students and faculty	"Encourage collaborative projects that require teamwork"
Sustainability of Online Learning Tools	institutions need to adopt sustainable practices	" Allocate budget resources specifically for the ongoing development and maintenance"

Chinese higher education institutions needs to developing strategic approaches to enhance online learning's effectiveness, accessibility, and sustainability, particularly in light of challenges faced during the COVID-19 pandemic. Key strategies include adopting hybrid models that combine online and face-to-face instruction, which promotes flexibility and caters to diverse learning preferences. Institutions should invest in robust technological infrastructure by regularly updating platforms and providing dedicated technical support. A data-driven approach will help assess the effectiveness of online tools, utilizing learning analytics and feedback mechanisms from students and faculty. Additionally, fostering a sense of community through social media and collaborative projects is essential, as is ensuring equitable access by providing resources for students facing barriers. Finally, ongoing investment and partnerships with technology providers will be crucial for sustaining these online learning initiatives. These strategies collectively aim to create a more effective and inclusive online learning environment in Chinese higher education.

4. Conclusion

The research highlights the transformative effects of the pandemic on educational practices and the strategic management of online learning tools. The findings indicate that while various platforms such as Zoom, Moodle, WeChat, and others have been utilized, their effectiveness varies significantly based on usability, engagement, and the support provided to both educators and students. The study underscores the importance of adopting hybrid learning models that blend online and face-to-face instruction, allowing for greater flexibility and improved student engagement. Furthermore, investing in robust technological infrastructure and establishing dedicated technical support are critical for minimizing disruptions and enhancing the learning experience. A data-driven approach emerges as essential for continuously assessing and improving online learning tools, with analytics and feedback mechanisms providing valuable insights. Additionally, fostering collaboration and community among students and faculty can significantly enhance engagement and learning outcomes. Ensuring accessibility and inclusivity is vital, as institutions must address barriers that some students face in accessing online learning resources. Finally, the sustainability of online learning initiatives will depend on ongoing investments and strategic partnerships with technology providers. Future research could conduct comparative studies between Chinese higher education and other countries to understand different approaches to managing online learning tools. This could highlight best practices and innovative strategies that could be adapted in the Chinese context. areas to further enhance understanding and implementation of effective online learning strategies.

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