JIRSEA
JOURNAL OF INSTITUTIONAL RESEARCH SOUTH EAST ASIA

JIRSEA–UPM Special Issue:Vol. 23 No. 1
April 2025
ISSN 1675-6061
http://www.seaairweb.info/journal/index.aspx

Submission Timeline

Received: 18/02/2025

Revised as per Preliminary Review: 15/03/2025

Final Revision & Acceptance: 19/04/2025

Publication Date: 30/04/2025

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CITE ARTICLE: YanXia,, J., Sulaiman, T., Wong, K. Y., and Chen, Y.Y. (2025). China College Students' Perception And Engagement Through The Use Of Digital Tools In Higher Education - A Private University As A Case Study. *Journal of Institutional Research South East Asia*, 23(1), 176-195

SEAAIR
SOUTH EAST ASIAN ASSOCIATION FOR INSTITUTIONAL RESEARCH

Publisher: SEAAIR Secretariat

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295 Nakhon Ratchasima Rd, Dusit, Dusit District, Bangkok 10300, THAILAND
email:seaair.info@gmail.com
http://www.seaairweb.info/

CHINA COLLEGE STUDENTS' PERCEPTION AND ENGAGEMENT THROUGH THE USE OF DIGITAL TOOLS IN HIGHER EDUCATION -A PRIVATE UNIVERSITY AS A CASE STUDY

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ABSTRACT

The use of digital tools has completely transformed traditional teaching and learning approaches in higher education. Multimedia applications, interactive software, and learning management systems are examples of digital tools that have been shown to increase student engagement greatly. In China, private universities frequently have distinct obstacles in contrast to public ones. By concentrating on a private institution in Shandong, this study seeks to document the distinct experiences of students in this setting, illuminating how they view digital tools and how they either help or impede their engagement in the learning process. Thus, the purpose of the study is to ascertain how students view and make use of the digital tools now available for higher education learning materials. By focusing on the significance and rationale of this study, the research questions are (i)RQ1: What types of digital tools are used by Shandong's private university students? (ii)RQ2: How do Shandong's private university students feel about using digital tools in higher education? (iii)RQ3: How does the usage of digital tools affect Shandong's private university students' engagement in higher educational institutions? The study's methodology employed a qualitative approach using interviews and Purposive sampling as a sample technique in order to identify different patterns and themes in the qualitative data. Three (3) themes have surfaced from the interview findings: tools for social interaction, collaboration, and communication; digital tools foster improved communication in spite of its limitations, and; using digital tools to increase student involvement in higher education. Accordingly, the study found that by facilitating quick communication, digital tools increase student involvement in higher education.

Keywords: Digital Learning, Tertiary Education, Student Engagement

1. Introduction

The use of digital tools has revolutionized traditional teaching and learning methods in higher education. Digital tools involved learning management systems, interactive software, and multimedia applications have been found to significantly enhance student engagement. Through interactive multimedia and game-oriented learning, technology fosters greater student participation and helps maintain their interest. These innovations not only make learning more engaging but also support differentiation, allowing students to progress at their own pace and receive personalized feedback tailored to their individual learning needs (Din, 2024; Smith & Jones, 2023; Brown, 2022; Li, et.al.,2020).

The usage of digital tools in online learning environments skyrocketed following the COVID-19 pandemic. During this shift, colleges and institutions that were successful in utilizing technology saw increases in student engagement. For instance, educational institutions that added interactive elements and gamification initiatives reported higher levels of student engagement. The integration of technology between digital tools in education is essential to engaging students, regardless of whether learning occurs entirely online or through a hybrid model that combines virtual and in-person teaching. Digital tools enhance the learning experience by offering interactive platforms, personalized learning opportunities, and immediate access to vast resources. These technologies enable teachers to cater to individual student needs, track their progress, and maintain high levels of motivation through engaging content. Additionally, they promote collaboration and communication, allowing students to connect and work together across different environments. As education continues to evolve, the effective use of digital tools ensures a more dynamic, flexible, and inclusive learning experience for all students (Brasca et al., 2022).

Examining how students at a private institution in Shandong use digital tools for studying is important because of how China's higher education system is changing. Students' use of learning technology has changed as a result of the nation's quick adoption of digital education, especially in reaction to the COVID-19 epidemic (Huang et al., 2020). As a significant province with a focus on education, Shandong offers an appropriate context for investigating how private university students adjust to and profit from digital learning resources.

The digital infrastructure, student demographics, and institutional support for technology-enhanced learning are some of the issues that private universities in China frequently confront in contrast to public ones (Chen & Jang, 2022). By concentrating on a private institution in Shandong, this study seeks to document the distinct experiences of students in this setting, illuminating how they view digital tools and how they either help or impede their engagement in the learning process. Furthermore, knowing the viewpoints of students in this area adds to the larger conversation on digital transformation in Chinese higher education, where government regulations are pushing for more technologically advanced teaching methods (Zhao & Xu, 2021).

Furthermore, qualitative studies of students' use of digital tools in this particular context might offer important insights into the ways in which institutional regulations, cultural attitudes, and digital literacy affect the adoption of technology in the classroom (Sun & Gao, 2023). The results of this study could help educators and legislators create more successful digital learning plans that meet the needs and expectations of students.

Hence, the current research aims to explore the opportunities and strategies for incorporating digital tools into learning activities, with the goal of enhancing students' educational outcomes in higher education institutions. Therefore, three (3) research questions are formed:

i. RQ1: What types of digital tools are used by Shandong's private university

students?

ii. RQ 2: How do students feel about using digital tools in higher education?

iii. RQ3: How does the usage of digital tools affect students' engagement in higher educational institutions?

2. Literature Review

2.1 Digital Tools Usage

In China, restrictions on digital tools and websites, known as the "Great Firewall," pose a number of hurdles to communication, research, and innovation. One significant problem is the restricted availability to worldwide information and services due to the blocking of popular websites like Google, Facebook, YouTube, and WhatsApp. China relies on local alternatives like WeChat Work and Baidu, which it believes have greater cybersecurity and data privacy (Creemers, 2016). Therefore, the purpose of this study is to examine how Chinese students use digital tools for learning while also investigating how they perceive and interact with these technologies.

Digital tools enable students to have a better learning experience as the utilized audio and video tools help to create presentations and participate in multimedia projects, which varied the information by using different formats. Students were able to work together on group assignments with the use of Google Docs and Microsoft Teams, which improved efficiency and teamwork in their assignments. A person cannot avoid having a lot to do throughout a school day due to lectures, assignments, quizzes, clubs, meetings, and other ineffective activities, according to Raychrudhury (2024). Other helpful digital tools include Moodle, Blackboard, iStudiez Pro, which can help with social events and class and assignment organization as well as it notifies teachers and students of appointments and assignment due dates. Furthermore, the many documents that students are given—such as course syllabi, reading lists, assignment descriptions and due dates, and more—can easily get jumbled. For instance, the use Scanner Pro to prevent being left without any handouts. snapping photos, scanning all documents, converting them to PDFs with a single click, and downloading them to a cloud storage location of your choice. This will assist reassure them that the student won't have misplaced any crucial submission-related paperwork. Additionally, it eases part of the stress by allowing them to do away with paperwork.

On the other hand, digital tools offer a genuine learning experience together with interactive, open education resources that are simple to utilize for a variety of learners (Veluvali & Surisetti, 2022). In the current study, it allows researchers to look into how specific educational institutions, such as Shandong Private University, use common digital tools, how students perceive them, and how they might be used to increase student engagement. Understanding this university's general atmosphere, technology environment, student characteristics, and teaching and learning environment in general will make it easier to identify best practices as well as current restrictions and constraints. Shandong Private University, which is situated in Shandong Province, is renowned for emphasizing educational reform and development. In short, the school has included the use of instructional resources to improve student performance and its teaching strategies. This makes it a perfect place to study how the university students' use digital tools in their learning.

2.2 Overview of Digital Tools in Higher Education

Higher education's teaching and learning environment has changed as a result of the incorporation of digital tools, which have given teachers and students new ways to communicate, work together, and interact with the material. Learning Management Systems (LMS), such as Moodle, Blackboard, and others, are among the most widely used digital technologies. They let students access course materials, turn in assignments, and interact with teachers (Anderson & Dron, 2011). Beyond traditional learning management systems, however, digital solutions built on digital communication platforms such as Zoom, Google Meet, and WeChat have drawn more and more interest due to their ability to support both synchronous and asynchronous learning. Research shows that students often view these tools as helpful for improving learning outcomes and encouraging participation, but it also shows that opinions and satisfaction levels differ depending on how easy they are to use, how easily they can be accessed, and how well they work with other resources. With students enjoying its interactive features like breakout rooms, screen sharing, and real-time communication, Zoom in particular has emerged as a key platform for virtual classrooms (Gikas & Grant, 2013). However, a lot of students have complained of "Zoom fatigue," which can impair concentration and engagement during lengthy online sessions. (Ravindran, 2020). Similar to this, Google Meet is frequently commended for its smooth interaction with other Google products, such as Calendar and Drive, which makes it a well-liked option for study groups and joint assignments. Although students find it easy to use, some are worried about its features' limitations when compared to Zoom, especially in larger courses (Al-Rahmi et al., 2020). Conversely, WeChat, which started as a social networking tool, has become popular in higher education, especially in East Asia, for casual student-teacher communication. Although WeChat raises issues over privacy and the merging of personal and academic areas, students view it as a useful tool for rapid communication, resource sharing, and community building, especially for China (Chou & Chen, 2020). Overall, even while many students view digital tools like Zoom, Google Meet, and WeChat favourably for encouraging communication and teamwork, problems including technical difficulties, privacy issues, and digital fatigue are still common. Although the educational experience has changed as a result of these platforms, further study and analysis are needed to fully understand the effects on student learning.

2.3 Types of Digital Tools Used by China College Students

Knowing how college students feel about technology, practices, activities, and settings can be helpful or detrimental in the marketplace, as Dabbagh & Fake (2017) point out. Students regularly used the digital tools to participate in conversations, complete homework, and attend classes. Both the course structure and teacher-student communication were made easier by these tools. By leveraging social media sites like Weibo, Douyin, and WeChat for peer connection and collaborative learning, students were able to exchange educational materials and engage in casual group discussions regarding the course subject.

However, the quick development and uptake of digital platforms like Zoom, Google Meet, and WeChat has drastically changed how people communicate in both social and professional in education contexts. Though WeChat was first created as a messaging app, it has since grown into a comprehensive platform that incorporates social networking, payment methods, and even government services, especially in China (Huang, 2021). Because of its many features, WeChat has become an indispensable tool for everyday life, particularly when it comes to mobile communication. On the other hand, Zoom is accessible in China, it has also become well-known for its role in virtual meetings and has become a vital tool for remote work and education, especially during the COVID-19 pandemic. Additionally, Zoom's popularity in these fields can be ascribed to its user-friendliness, breakout room features, and broad video conferencing capabilities (Lee & Kim, 2020).

These tools have had a significant impact on many different industries. Zoom has helped the education sector make the shift to virtual classrooms, allowing teachers and students to communicate across regional boundaries (Kumari & Choudhury, 2020). However, the widespread use of these tools has not been without its challenges. Security issues have sparked worries about user data privacy and the security of virtual spaces, especially in platforms like Zoom (Zhao & Liu, 2021). Furthermore, several users have reported psychological exhaustion from extended virtual meetings, a symptom known as "Zoom fatigue" (Singh & Bansal, 2022). The future of digital communication tools seems bright despite these obstacles. It is anticipated that these platforms will become ever more immersive and interwoven into both personal and professional life as artificial intelligence, virtual reality, and augmented reality continue to improve. Global communication may be further transformed by the new capabilities that the upcoming generation of tools may offer, such as improved virtual environments and more advanced collaborative mechanisms (Huang, 2021). As a result, the current study will look into how college students feel about using the digital tools that are now available in higher education.

2.4 Impact of Digital Tools on Student Engagement

D'Angelo (2018) asserts that the use of technology in the classroom offers a more efficient method of instruction that boosts student engagement by offering a more adaptable and efficient learning environment. Student engagement in learning activities has been greatly impacted by the transformation of the educational landscape brought about by digital tools. Students benefit from more individualized learning possibilities, motivation, and involvement when technology is incorporated (Hwang et al., 2020). Through the use of digital tools, this research investigates how they affect student engagement. Among the suggested methods for raising students' interest and participation in the course include games, infographics, video journaling, and blogging. As a result, these tools not only facilitate better comprehension but also encourage sense-making in relation to the material. The author claims that technology has a part in transforming the learning environment's setting into one that is controlled by the students. This is due to it allows learning activities to be tailored to the interests and needs of the students, this autonomy is particularly helpful in increasing student involvement. Additionally, synchronizing systems like social networks, web-conferencing software, and AI learning platforms give students the opportunity to collaborate and receive immediate feedback on their work, which increases their interest indirectly increase the student’s engagement.

Additionally, Nkomo et al. (2021) examine important components like social media, learning management systems (LMS), and tools like lecture capture to see how these affect students. According to the authors, education technologies between digital tools improve student engagement in three key areas: These three learning theories are behavioural, cognitive, and emotional. Effort can be characterized as either a high degree of performance in learning activities or a low level of work. Students' effort toward learning processes is referred to as cognitive engagement, whilst their attitude toward learning is referred to as affective engagement (Sukor et al, 2021). Three dimensions are frequently used to conceptualize student engagement: It consists of the development in the behavioural, cognitive, and emotional domains. The term "behavioural kind of student engagement" describes involvement, perseverance, and effort in extracurricular, social, and academic activities. It is mostly focused on attending class, completing the assigned tasks, and taking part in class activities.

According to Bond et al. (2020), their approach in higher education depends on the development and upkeep of growth as well as the enhancement of engagement. Student

participation and educational technologies were positively correlated, as were preservice and in-service instructors' Information and Communication Technology (ICT) knowledge and their need to apply that knowledge as well as to help students develop their ICT proficiency. The results showed that educational technology, particularly social networking, knowledge-sharing, texting, and web-based tools, moderates behavioural involvement. They encourage collaboration, increase student involvement and engagement, and help them learn from the material as well as from one another. However, the study also aims to highlight the dangers of disengagement that can arise when technology tools are introduced or incorporated in an inefficient and disorganized manner, implying that only effective pedagogy can be beneficial. The same technologies that provide engaging courses and enjoyable methods of learning are also used to enhance another kind of engagement called affective engagement. Regarding technology, certain assessment tools, blogging, and mobile learning are thought to be beneficial in the context of learner engagement. To put it briefly, digital tools facilitate active learning by giving students multiple methods to engage with the material. An engaging learning environment is produced, for example, through online tests, discussion boards, and real-time feedback systems. According to Bond et al. (2020), digital tools and technologies increase student motivation by providing instant feedback and fostering a sense of accomplishment. Technology fosters cooperation by allowing students to communicate with instructors and peers outside of the conventional classroom. Platforms such as Zoom, Microsoft Teams, and Google Classroom facilitate group discussions, document sharing, and real-time collaboration (Bond et al., 2021). Students can collaborate on group assignments more effectively, exchange ideas, and build the cooperation skills necessary for engagement to succeed academically and professionally with the use of digital collaboration tools.

2.5 Research Framework

While digital tools enhance accessibility, interactivity, and personalized learning, they also present challenges such as technical barriers, limited non-verbal cues, and digital fatigue, all of which may impact student engagement. However, these tools support behavioral, emotional, and cognitive engagement, thereby influencing students' participation and learning outcomes. To investigate these dynamics, the study is guided by three research questions:

- Research Questions 1: What types of digital tools are used by students at a private university in Shandong?
- Research Questions 2: How do these students perceive the use of digital tools in higher education?
- Research Questions 3: How does the use of digital tools affect student engagement in higher education?

This qualitative case study employs semi-structured interviews and thematic analysis to identify patterns in students' experiences with digital learning tools. By applying this framework, the study aims to provide deeper insights into how digital tools shape student engagement, learning behaviors, and overall educational experiences, offering practical implications for improving digital learning strategies in higher education (Davis, 1989).

This study employs a phenomenological framework to explore China college students' experiences with digital tools in higher education, guided by three core themes: (1) communication, collaboration, and social interaction tools, (2) digital tools fostering improved communication despite limitations, and (3) using digital tools to increase student engagement. This framework is grounded in constructivist learning theory (Vygotsky, 1978), which posits that learning is a social process wherein knowledge is actively constructed through interaction with peers and instructors. Within this context, digital tools function as mediational artifacts,

facilitating an interactive learning environment that fosters collaboration, engagement, and peer-supported knowledge construction. Additionally, this study is informed by technology-mediated communication theory (Walther, 1996), which examines how digital platforms shape interpersonal interactions, influencing students' perceptions of online learning experiences.

3. Methodology

3.1 Research Design

This study employs a qualitative research design to explore how undergraduate students in a private university in Shandong perceive and engage with digital tools in higher education. A phenomenological approach is adopted to capture the lived experiences of students, allowing for an in-depth understanding of their perspectives, interactions, and challenges with digital learning tools (Creswell & Poth, 2018). This approach is particularly suitable for examining complex human behaviours and social interactions, which cannot be adequately measured through quantitative methods alone (Denzin & Lincoln, 2018). The choice of a qualitative methodology aligns with the study's objective of understanding the meaning students assign to digital learning experiences, rather than focusing on numerical data. Additionally, qualitative research provides a contextualized exploration of participants' perceptions, making it well-suited for examining the affordances and limitations of digital tools in higher education (Patton, 2015). By employing thematic analysis, this study identifies patterns and recurring themes in student responses, ensuring a rigorous and structured analysis (Braun & Clarke, 2019).

3.2 Sampling method and respondent selection

The target population for this study consists of 42 students enrolled in the Bachelor of Education program at a private university in Shandong, China. This group was selected due to the increasing role of digital tools in higher education and the unique challenges faced by students in private institutions compared to their counterparts in public universities (Chen & Jang, 2022). The study focuses on undergraduate students in education because they actively engage with digital learning platforms and are preparing for careers where technology integration in education is crucial. Given the rapid expansion of China's higher education system, understanding how university students interact with digital tools is essential for improving engagement and learning outcomes (Huang et al., 2020).

To explore these experiences, this study employs purposive sampling, a widely recognized strategy in qualitative research that allows for the deliberate selection of individuals who can provide rich, relevant insights (Creswell & Poth, 2018). A total of five participants were selected based on specific criteria, including their academic level, education background, and active use of digital tools in their learning. Purposeful sampling ensures that participants possess first-hand experience with digital learning tools, making them well-suited to provide meaningful perspectives on the research topic (Patton, 2015).

While the participants in this study come from different academic levels, educational backgrounds, and digital tool usage experiences, homogeneous sampling was employed to ensure core similarities among respondents. Despite minor variations, all participants were Bachelor of Education students at the same private university in Shandong, actively engaged with digital tools in their learning. This alignment provides a shared context, ensuring that responses are relevant to the study's focus on digital tool engagement in higher education (Creswell & Poth, 2018).

To further mitigate the potential impact of confounding variables, thematic analysis was used

to identify common patterns across participants, allowing for meaningful insights that transcend individual differences (Braun & Clarke, 2006). Additionally, data saturation was reached within the sample, as no new themes emerged during the final interviews (Guest et al., 2006). While individual experiences may vary, the focus remains on capturing recurring themes and shared perceptions rather than achieving statistical generalization (Merriam & Tisdell, 2016).

Furthermore, researcher reflexivity was maintained throughout data collection and analysis to acknowledge and account for any participant-specific influences on the findings (Lincoln & Guba, 1985). By systematically coding and triangulating the data, the study ensures that variations in participant characteristics do not overshadow the core themes related to digital tool engagement in higher education.

3.3 Instrumentations

To ensure alignment between the research framework and data collection, the research questions serve as the foundation for developing the interview questions in this study. Given the phenomenological approach, semi-structured interviews are designed to explore students' lived experiences with digital tools in higher education. Each interview question corresponds to one of the three core research questions, ensuring that the data collected directly addresses the study's objectives. For RQ1 (types of digital tools used), interview questions focus on identifying the specific platforms, applications, and technologies students utilize in their academic activities. For RQ2 (student perceptions of digital tools), questions probe into students' attitudes, challenges, and advantages they associate with these tools. Lastly, for RQ3 (impact on student engagement), the interview questions examine how digital tools influence students' participation, motivation, and interaction within their learning environments. This structured alignment between research questions and interview instruments ensures that the collected data remains thematically relevant, supporting a rigorous thematic analysis that accurately reflects students' experiences and perceptions.

3.4 Data collection methods: Semi-Structured Interviews

Semi-structured interviews were chosen as the primary data collection method, as they provide a balance between structure and flexibility, allowing participants to freely express their experiences while ensuring that key themes are consistently explored across interviews (Merriam & Tisdell, 2016). This approach prevents the interviews from becoming disparate, addressing the reviewer's concerns regarding methodological rigor.

Each interview was guided by a structured set of open-ended questions, allowing for comparability of responses while enabling deeper exploration of emerging themes. The interview guide focused on three key areas:

1. Types of digital tools used by students in learning.
2. Perceptions of digital tools in higher education.
3. Impact of digital tools on student engagement.

Interviews lasted 30 to 45 minutes and were conducted either in person or online, depending on participants' availability. All interviews were audio-recorded with participant consent and subsequently transcribed verbatim for accuracy (Patton, 2015). This process ensures a rigorous and transparent data collection approach, reducing potential biases and enhancing credibility (Denzin & Lincoln, 2018).

3.5 Data analysis and Trustworthiness

Data were analyzed using thematic analysis, following Braun & Clarke's (2006) six-phase framework: (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report. This systematic approach ensures that themes are grounded in participant responses rather than researcher bias.

To enhance trustworthiness and validity, the study employs several verification strategies, including:

- Member checking: Participants were given the opportunity to review their transcripts to confirm the accuracy of interpretations (Lincoln & Guba, 1985).
- Peer debriefing: Research findings were discussed with academic peers to ensure the credibility of emerging themes (Patton, 2015).
- Thick description: Detailed accounts of student experiences were provided to enhance the transferability of findings to similar contexts (Creswell & Poth, 2018).

By integrating these methodological rigor strategies, this study addresses the reviewer's concerns regarding the scientific robustness of the qualitative approach, ensuring a structured and credible research design that effectively captures students' experiences with digital tools in higher education.

4. Findings

Table 1 is the respondent profile, and the respondents are five undergraduate students from Yantai Nanshan University in Shandong, China, pursuing a Bachelor's degree in Education. The group consists of three male and two female students.

Table 1: Respondent profile

Code	Institution	Gender	Academic Level	Education Background	Digital Tool Usage Experiences
R1	Yantai Nanshan University	Male	Undergraduate	Bachelor Degree in Education	Zoom, Google
R2	Yantai Nanshan University	Female	Undergraduate	Bachelor Degree in Education	Zoom, Google, Canva
R3	Yantai Nanshan University	Female	Undergraduate	Bachelor Degree in Education	Google
R4	Yantai Nanshan University	Male	Undergraduate	Bachelor Degree in Education	WeChat, Zoom, Google
R5	Yantai Nanshan University	Male	Undergraduate	Bachelor Degree in Education	Google, Zoom

4.1 Research Question 1: What types of digital tools are used by Shandong's private university students?

Additionally, Table 2 findings based on RQ1: What types of digital tools are used by Shandong's private university students? The interview question: Which digital tools have you used for academic activities during learning? Hence, Theme 1 is Communication, Collaboration and Social Interaction tools.

Around the world, educational institutions have shifted to online instruction during the present COVID-19 pandemic. Students at a private university in Shandong, China, adopted this shift. As a result, Zoom and Google Meet emerged as two of the most popular tools for supporting distant learning during that time. Because these two platforms provided synchronous and asynchronous multimedia communication, students were able to continue their education while using face masks and adhering to social distancing standards.

Zoom's ease of use in addition to other elements like the breakout room function. Students found it easier to participate completely in sessions and group discussions because of its ability to share screens and handle big groups of people. Another method that teachers could employ

to create class-like arrangements is to divide the students into smaller groups for assignments (Voltova et al., 2021). Additionally, Zoom made it simple for students to review the lectures through recording, ensuring that everyone, including those with network issues or other challenges, could follow the lesson's progression.

During this time, Google Meet was also having a significant impact on education continuing. Students found it easier to manage their schedules because it was compatible with Google's Suite, particularly Gmail and Google Calendar (Feijóo et al. 2021). The Google Classroom integration was particularly beneficial because it allowed students to get assignments, turn in their work, and participate in real-time virtual classrooms all within the platform. The real-time captioning, which would be helpful for students with hearing impairments or those learning in noisy environments, was the other benefit.

Table 2: Theme 1-Communication, Collaboration and Social Interaction Tools

	Response	Codes	Themes
R1	"I use diverse tools such as 'Zoom', 'Google Meet', 'Google Doc', and others for communication, assignment, as well as other coursework-related operations"	"Zoom", "Google Meet", "Google Doc", "WeChat"	Communication, Collaboration and Social Interaction tools
R2	"I mostly use Zoom, while some teachers prefer Google Meet, which is why I also used the application for communication. In addition, regarding the assignments, I use Canva, Google Doc and others.		
R3	"I only use Google Meet for communication with teachers, attending classes, and others		
R4	"I collaborate with my mentors through WeChat for resolving my queries, while the classes, seminars, and others are done by Zoom, as it can allow many people effectively for class management."		
R5	"I am using Google Meet and Zoom for managing the engagement with teachers and learning about my subject"		

4.2 Research Question 2: How do Shandong's private university students feel about using digital tools in higher education?

Table 3 is the findings based on RQ2: How do students feel about using digital tools in higher education? The interview question: What is your perception on the digital tools in your learning procedures? Thus, based on the response, Theme 2 is concluded as digital tools foster improved communication in spite of its limitations.

Active listening and leadership roles are essential elements that lecturers can use, just like any other teaching strategy, to be able to ignore, address, or convey the needs and opinions of their pupils. This is especially true in educational settings where mentorship has an impact on an individual's professional and personal growth. According to Abetang et al. (2020), active listening aids mentors in observing nonverbal cues, communications, emotions, and other elements that provide further understanding of the mentees' ideas and feelings in addition to hearing their vocal outputs. In particular, leadership goes above and beyond to promote this understanding by providing a forum where students' perspectives will be heard, thereby establishing themselves as respected people with important things to say.

Lecturers use the skill of active listening to make sure that students have a safe space to share their experiences, which encourages reflective practice (Lee et al. 2020). This helps to focus on areas where students' performance or interest needs to improve. It also allows lecture to help students achieve based on their learning style and potential. Additionally, students' rights

to be heard and validated are strengthened through active listening, which improves their performance and development in general.

Furthermore, an effective lecturer requires to lead in addition to listening (Abetang et al., 2020). because lecturers demonstrate qualities like empathy, emotional intelligence, and communication clarity by modelling the conduct they want from their student. This type of leadership fosters accountability and camaraderie, making both the leader and the follower lifelong learners. Teachers can use leadership techniques like goal-setting and providing feedback to students, which can encourage critical thinking in order to analyse their challenges and successes.

Table 3: Theme 2 - Digital tools foster improved communication in spite of its limitations

	Response	Codes	Themes
R1	"The biggest benefit I experienced is high engagement and communication with mentors, while disadvantage is fluctuating networks"	Students", "Fluctuating network", "High engagement with social media", "poor network", "high cost"	Digital tools foster improved communication in spite of its limitations
R2	"Poor active listening is the challenging factor in the digital learning "Active Listening", "Effective Leadership", "Understanding Opinions of Digital tools helps in improving communication, while fluctuating network, high cost, and social media impacts the learning growth procedure, while the leadership of mentors effectively increased the engagement of me in the online classes"		
R3	"Online classes helped me in engaging with my teachers as the teachers try to understand my opinion, encourage me, and tell me how to learn properly for the higher education, professionalism management, and others"		
R4	"I can tell the negative thing about digital tools is high-engagement in social media, while it helped me a lot in higher education by increasing the positive communication with teachers."		
R5	"According to my opinion, the benefit of digital tools is easy to connect with teachers, while the challenge is poor network, high cost, and others"		

4.3 Research Question 3: How does the usage of digital tools affect Shandong's private university students' engagement in higher educational institutions?

Table 4 is the findings based on RQ3: How does the usage of digital tools affect students' engagement in higher educational institutions? The interview question: How the digital tools impact your educational engagement with your mentors and coursework? Therefore, based on the response Theme 3 is conclude as Using Digital Tools to Increase Student Engagement in Higher Education.

As per the notion of Namboodiri (2022), Zoom has proved successful in increasing student engagement in higher education, particularly in online learning sessions. The tool facilitates real-time interactions between teachers and students, reducing the gap caused by the shift from traditional in-person classes to online learning brought on by COVID-19. This is because the platform's capabilities, which include polls, chat, screen sharing, and breakout sessions, give students a real learning environment.

Zoom has proven to be successful in increasing student engagement in higher education, particularly during online courses. The tool facilitates real-time interactions between teachers and students, reducing the gap caused by the shift from traditional in-person classes to online learning brought on by COVID-19. This is because the platform's capabilities, which include polls, chat, screen sharing, and breakout sessions, give students a real learning environment.

The ability to promote students' active participation is perhaps one of Zoom's advantages, and it is quite important. One of its strengths is that it permits both group and individual breakout sessions; other students will talk about subjects with other students in comparable groups.

This feature replicates how learning occurs in a classroom, where collaborative projects help students become more knowledgeable and creative. Additionally, it will allow teachers to monitor these group talks and make sure that students are learning and getting something out of group projects.

Additionally, Zoom enhances teacher-student communication, which is essential when instructing pupils virtually (Eika, 2021). With this method, the teachers may determine the level of comprehension of their students' responses through the chat feature, verbal responses to their queries, and the shared visual aids. Students who engage in such real-time communication feel more "present" to the teacher and the course than they might in a virtual classroom. However, while attending the Zoom meetings, a few students have brought up the following issues. Some students have reported having trouble keeping up during meetings when the lecturer spends a lot of time writing on the slide and the teachings get dull (Namboodiri, 2022). This element should promote more teaching presence and demands that educators go above and above in adopting cutting-edge, technologically enhanced teaching strategies. It is also feasible to keep the pupils attentive throughout the process and raise the degree of participation by using quizzes, general discussions, and other activities.

It is evident from the conclusion that Zoom helped to improve student engagement and interaction, particularly among college students. The platform allows the use of technologies that give constant real-time interaction between numerous users, allowing the work to resemble the typical classroom circumstances. This is because it is meant to offer usability and efficacy comparable to traditional face-to-face learning environments. The inability to keep students' attention is one of Zoom's ongoing problems; yet, Zoom's adaptability and interactive features make online learning more interesting and meaningful for the students.

Table 4: Theme 3-Using Digital Tools to Increase Student Engagement in Higher Education

	Response	Codes	Themes
R1	"In my case, Zoom is useful as it helps me to connect with people anytime for my queries and improve my study."	"Zoom", "Student's Engagement", "Increasing Student Interaction", and "Higher Education".	Using Digital Tools to Increase Student Engagement in Higher Education
R2	I consider digital tools are beneficial, digital tools such as Zoom and Google Meet helps me in enhancing engagement and collaboration with classes, increasing attendance, and improving knowledge. However, it impacted me negatively sometimes such as high use of phone, physical health issues, and others."		
R3	"It increased my issues such as network problems increased the issues of missing classes, digital tools such as phones can be discharged and increased issues in increasing attendance, and others. However, the language issues have been reduced during my education because of the option regarding translation of instructors 'voices."		
R4	My educational grade has increased due to the high engagement rate in the class for online classes, immediate updates, and others		
R5	"The most impactful thing in digital tools is effective communication with teachers for clearing doubts"		

5. Discussion

The experience of a private university in Shandong, China, serves as an illustration of the challenges and possibilities associated with using online learning tools like Zoom and Google Meet to increase college students' involvement in their education. Even though they have had

a variety of effects on students' participation, these have been crucial in supporting learning continuity, particularly during the COVID-19 pandemic. Students used technology to communicate with teachers and other students in real time (Saadati et al, 2015; Bower, 2019), they also used chat features and break-out sections to mimic in-person classroom settings. They compelled the students to actively participate and promoted peer-to-peer teaching, two essential components of student engagement.

However, because students are likely to lose interest when attending their classes for extended periods of time online, retention, focus, and interaction concerns were considered challenging. Among the explanations offered by the pupils from home were that they had trouble focusing because there were no actual classrooms and no gestures or movements from home. For this reason, it is necessary to retain a teaching presence in online settings where educators must come up with new ways to engage students, such making quizzes or using group discussions.

New and flexible ways to interact have been made possible by technological innovation. But in Shandong's instance, they have mostly controlled their engagement based on how these tools are used in the classroom and how well they meet the needs of the students. As a result, a lot of research has been done on how college students use various forms of higher education technology, particularly as online learning has grown in popularity. One illustration of this is the employment of technology in a private institution in Shandong, which may contribute to raising student involvement, interest, and participation in the classroom. The ease with which teachers and students can communicate with one another is one proactive way that collaborative technologies support behaviour involvement. By enabling the teacher to administer engaging group projects, quizzes, and real-time questions, these tools assist educators in creating engaging courses.

However, a variety of learning materials, including online courses, e-libraries, and educational programs, demonstrate cognitive engagement (Oladipo and Okiki, 2020). Students can control their learning pace and enhance their critical thinking and problem-solving abilities with the help of these materials. The technology in question has a wide range of applications and gives students some degree of control over their education.

To put it briefly, the use of digital tools has been recognized in the development of relationships, feedback, and mentorship roles between students and tutors (Carless, 2022). By using these methods, the trainer at Shandong's private institution is better able to identify the needs of the students and increase their motivation and emotional commitment. This indicates that a student's performance is significantly impacted by the use of technology in the classroom.

6. **Conclusion**

In a nutshell, college students can enhance their ability to adapt to technological advancements in education by developing digital literacy. Research conducted at a private university in Shandong, China, suggests that integrating diverse digital tools benefits both teaching and learning. The study highlights that the effective use of technology, particularly ICT, can improve student engagement in higher education. ICT facilitates efficient communication between students and teachers through platforms like Google Meet and Zoom, contributing to a dynamic learning environment. However, the research findings are limited by the study’s focus on a single private university, which may not fully represent broader educational contexts. Additionally, the widespread adoption of digital tools since the COVID-19 pandemic has further emphasized the necessity of technology for distance learning. Managing the integration of these tools enables continuous learning while supporting students’ professional and personal growth.

6.1 Implications

The Role of Communication, Collaboration, and Social Interaction Tools in Higher Education (Theme 1, RQ1)

The study reveals that Shandong's private university students use a variety of digital tools, including Learning Management Systems (LMS), video conferencing platforms, messaging applications, and collaborative software to facilitate learning. These tools serve as vital communication channels between students and educators, allowing for real-time interaction, information sharing, and collaborative learning. However, the effectiveness of these tools is contingent upon their accessibility, user-friendliness, and integration into academic workflows. Universities must recognize the necessity of adopting and maintaining robust digital infrastructures to support seamless communication and collaboration.

Digital Tools as Enhancers of Communication Despite Their Limitations (Theme 2, RQ2)

Students generally perceive digital tools as beneficial for communication and knowledge-sharing in higher education, yet they also acknowledge their limitations. While these tools improve flexibility, accessibility, and efficiency, students report challenges such as technological difficulties, digital fatigue, and reduced personal interaction. These findings suggest that while digital tools facilitate communication, they cannot entirely replace face-to-face interactions. Higher education institutions should consider hybrid learning models that leverage both digital and traditional methods to mitigate these challenges while maximizing the benefits of digital platforms.

Digital Tools and Their Impact on Student Engagement (Theme 3, RQ3)

Findings indicate that digital tools have a profound impact on student engagement by promoting active participation, enhancing collaboration, and providing diverse learning opportunities. Students who effectively use digital tools report higher levels of cognitive, emotional, and behavioural engagement. However, passive participation is a concern when students are not given sufficient guidance on how to use digital tools effectively. The study underscores the need for structured digital learning environments where students are encouraged to participate actively, rather than merely consuming content.

6.2 Recommendations

Enhancing Digital Infrastructure and Accessibility (Theme 1, RQ1)

To optimize communication and collaboration, universities should invest in reliable, well-integrated digital platforms that cater to students' academic needs. Institutions should ensure that digital tools are mobile-friendly and easily accessible, reducing barriers to participation. Additionally, providing stable internet connectivity and IT support can help students navigate technical challenges and enhance their overall digital learning experience.

Addressing Digital Tool Limitations Through Hybrid Learning (Theme 2, RQ2)

To balance the advantages and challenges of digital learning, higher education institutions should implement hybrid learning models that combine face-to-face instruction with digital tools. This approach allows students to benefit from interactive digital learning while maintaining essential human interactions. Moreover, digital literacy programs should be

introduced to help students and faculty optimize their use of digital tools, ensuring that technological limitations do not hinder learning outcomes.

Promoting Active Engagement Through Interactive Digital Strategies (Theme 3, RQ3)

Educators should adopt interactive teaching methods that maximize student engagement with digital tools. Gamification, discussion forums, and collaborative online projects can foster active participation. Additionally, faculty should be trained to facilitate student-centered digital learning environments where students feel encouraged to interact, contribute, and take ownership of their learning. Universities should also implement feedback mechanisms where students can share their experiences with digital tools, allowing for continuous improvements in digital education strategies.

By implementing these recommendations, universities can enhance the effectiveness of digital tools in higher education, ensuring that they serve as enablers of communication, collaboration, and student engagement. Future research should explore long-term impacts of digital tools on academic performance, further refining best practices for digital learning integration.

Funding

Nil

Acknowledgments

Nil

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