

Enhancing online education: A model for establishing an effective learning space with Google Workspace tools

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ABSTRACT: *Due to the impact of the COVID-19 pandemic, online education has emerged as a popular teaching method, supported by advancements in technology and communication. The development of computer technology and the widespread availability of internet connections have facilitated the transition from traditional classrooms to online platforms. However, both educational institutions and learners have encountered numerous challenges in the process of online education. Schools struggle to determine suitable technological setups, and collaboration among administrators, teachers, and students has proven ineffective. Therefore, it is crucial to conduct research to identify an appropriate model for educational institutions. This study involves the participation of 12 instructors and 360 students from a university of pedagogy in Hanoi, with the objective of proposing a suitable online teaching tool and defining the roles of the participants. The research results suggest a model of an online learning space that utilizes Google Workspace tools, enabling the learning and working community to engage in online activities within a large, centrally managed environment. This teaching model offers easier access, a user-friendly experience, effectiveness, and simplicity in management and instruction for online education.*

KEYWORDS: online teaching, online learning, e-learn space, Google Workspace, learning management, university.

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1. Introduction

The COVID-19 pandemic has necessitated the shift to digital platforms for communication between educators, experts, and learners (Frith, 2021). In the USA, the number of remote jobs doubled in 2020, primarily in the technology, finance, and law sectors (Bloomberg News, 2021). The implementation of online courses in colleges and universities is increasingly prevalent (Anemona, 2020).

For most higher education institutions and organizations worldwide, the COVID-19 pandemic has accelerated the integration of digitalization and digital ways of working into organizational life and service delivery, including new approaches to learning and working (Webb et al., 2021). To support distance learning, institutions have invested in digital tools and equipment (Moorhouse, 2020; Sutiah et al., 2020). Despite these investments, teacher training and development in technology

integration and pedagogical implementation may lag behind (Yurtseven et al., 2020). Technology integration is a complex and multidimensional process involving various dynamics, such as technological tools, teachers, students, school management, and education programs (Teo, 2009). Different technology integration models have been proposed based on the adopted learning theory (Ma et al., 2005; Shiue, 2007; Velazquez, 2007). The constant changes in the technology integration process make it challenging to define (Pascal & Huay, 2007).

The aim of this research is to investigate the reality of online teaching at a university, survey students' perceptions during online learning, and explore the challenges faced by lecturers when teaching online. Based on this, the research proposes a technology-driven solution to develop an application suitable for universities, reducing the difficulties in the teaching process while maintaining user-friendliness for lecturers

and students. Our research is based on a learning model that emphasizes sustainable and rigorous interaction, utilizing the tools available on Google Workspace to build an online learning space model. Blended learning models proposed by Google Workplace have proven useful in the university field (Martín-Herrera et al., 2021). Google Workspace for Education is a version of Google Workspace specifically tailored to the needs of educational institutions, including all the same applications along with additional tools and features designed to enhance the learning experience (Malikah et al., 2022). Google Workspace for Education Fundamental is a free training program created by Google to help educators and administrators effectively use Google Workspace for Education, covering the basics and more advanced features to create engaging and interactive learning experiences for students (Malikah et al., 2022). This model was built and tested at the capital's university, and the results of the test demonstrate its effectiveness and potential application to many universities and other educational institutions.

2. Literature review

There are five advantages of using webinar tools to facilitate communication between two sites: (1) Webinar tools are affordable (De Gara, 2006). Users can participate in a webinar session with a computer, video/audio capture devices, and broadband network connections. (2) Webinar tools enable synchronous communication. Instructors can communicate with the learners in a synchronous format to provide immediate feedback to learners. (3) Webinar tools facilitate real-time multimedia demonstrations. Instructors can share the application on the presenter's site with all participants. (4) Webinar tools facilitate multi-level interaction. Instructors can lecture, interact with the audience, facilitate participant-group collaboration in a real-time format (Wang & Hsu, 2008), and designate certain participants to be in charge of the sessions. (5) Webinar tools provide an environment in which participants can archive seminar content for personal review or for people who missed the real-time session.

The term "virtual classroom" was first used

by universities and was initially defined as a combination of face-to-face teaching and online lectures. Thanks to the rapid development of broadband Internet, tools that support two-way audio conversations, still and dynamic images, as well as various interactive media, have created a new form of learning – virtual classrooms. The proper software and pedagogical techniques are necessary to obtain maximum effectiveness in the asynchronous virtual classroom (Turoff & Hiltz, 1995). A virtual classroom is normally too big a task to be carried out alone without the explicit support of the institution (Paquette, 2002). Effective interaction with and support for students in virtual school environments requires a unique set of skills and experiences (Davis et al., 2007); the students can clarify their doubts at any time from any place (Maanvizhi et al., 2020).

Virtual classrooms should encompass three distinct groups of essential features. Firstly, there should be visual information display features such as a whiteboard, screen sharing (in either one window or full-screen mode), and the ability to create slideshows with videos and images alongside other applications. Secondly, participant interaction should be promoted through features like the option to raise hands, express feelings, collaborate on writing, and enable individual screen sharing. Lastly, effective communication features between participants are crucial, including chat rooms, audio capabilities, the ability to split into groups, messaging windows, and the option to upload learning materials and conduct short surveys. When developing virtual classrooms, it is common for technology applications to strive to replicate and emulate the traditional classroom model (Hill et al., 2013). These virtual environments necessitate close and sustained interactions among participants, between participants and the content, between instructors and students, and among the students themselves. Virtual classrooms provide the means for schools to create, store, and utilize educational resources. Additionally, schools and teachers have the ability to edit and save lectures in online libraries. Moreover, students can conveniently revisit previous lectures from any location and at any time.

The first obvious similarity between face-to-face and virtual classrooms is that both teachers and students attend classes at the same time. Accordingly, in face-to-face classes, they meet at a certain location, while in virtual classrooms, they meet each other in cyberspace which is not limited by space. Research shows that, in a virtual classroom environment, the teacher’s ability to control is much less, and students can easily redirect their attention to other contents while sitting in front of a computer screen (Meyer, 2019). The biggest difference between face-to-face and virtual classrooms is the interactivity between teachers and students. Virtual classroom participants are unable to communicate with attitudes, eye contact, smiles, direct looks, or body language, and the lack of face-to-face interaction is the most significant limitation, which also easily leads to a decrease in the effectiveness, especially the interest or enthusiasm of lecturers.

Reasons to use virtual classrooms: In Table 1 below, we list the reasons that are the strengths of virtual classrooms, which are divided into two groups in terms of flexibility, expense, and time.

Corporations have widely adopted the webinar tool because it can reduce travel expenses and travel time (Lieser et al., 2018), yet, the webinar tool is relatively new for online learning and needs to be tested for pedagogical merits. Anderson Lynn suggested practical webinar-session guidelines for instructors, but educators and trainers need to emphasize research and examine the selection of appropriate webinar-related pedagogies (Anderson et al., 2006). Over

the years, many curricula have used webinar tools to develop virtual classrooms. These virtual classrooms are delivered via the Internet by an in-person platform or web-based conferencing system such as Elluminate, Adobe Connect, and WebEx, as well as free and open-source platforms such as Big Blue Button or free online platforms like Skype.

Online learning has become a popular teaching method at universities in Vietnam in recent years. This is especially important in the context of the COVID-19 pandemic, when most schools had to close to ensure the health and safety of students and lecturers (Pham et al., 2021). Many universities have invested in online learning systems and trained lecturers to transition courses to an online model. Tools such as Zoom, Google Meet, Microsoft Teams, and Moodle are widely used to support online learning and create a quality online learning environment (Le et al., 2021). Online learning not only brings convenience to students when they can study remotely but also helps universities save time and costs. In addition, online learning also helps students and lecturers access more diverse learning materials, thereby improving the quality of teaching and learning. However, online learning also poses some challenges, such as ensuring interaction between lecturers and students, collaboration among students, and Internet connectivity. To overcome these challenges, universities are finding ways to create the best online learning environment for students and lecturers (Pham & Pham, 2021).

The use of webinar platforms for virtual classrooms has gained popularity, with Google Workspace emerging as a prominent tool for

Table 1. Reasons for using virtual classrooms

Practicality	Teaching ability
Low cost	There is real-time interaction between faculty and students
Quick Deployment	Flexible in terms of time
Approach more learners	Easily build lesson plans
Saving time	Convenient to use computers and software in teaching
Easy to complete the course	Easy for connection and cooperation between participants
	Minimize the impact on society.

remote work collaboration. Its features cater to both epidemic and normal social conditions, making it suitable for education and training purposes (Salih, 2021). Google Workspace comprises various tools like Google Classroom, Google Drive, and Google Sites. Google Classroom, a free web application, simplifies teaching tasks by allowing students to join a class using a provided code and submit assignments online through a dedicated folder in their Drive. Teachers can monitor the learning process, grade assignments, provide comments, and rank student performance. Google Drive, a file storage and synchronization service, enables cloud storage, file sharing, and collaborative editing of documents, spreadsheets, and presentations. Google Site, an online application, facilitates the creation of websites by consolidating various types of information, such as videos, calendars, attachments, and documents, in one place. These resources can be shared for viewing or editing by specific groups, the entire organization, or the public. Several studies have highlighted the advantages and opportunities offered by Google Workspace for Education. For instance, Irani (2022) focuses on teachers' utilization of Google Workspace for Education in the teaching and learning context, emphasizing the significance of ICT development and the implementation of Google Workspace to enhance education. Hafid and Barnoto (2022) concentrate on digital classroom management using Google Workspace for Education, covering planning, organizing, implementing, monitoring, and evaluating (Hafid & Barnoto, 2022). Their study underscores the importance of proper planning and management for the effective use of Google Workspace in the classroom. Additionally, Khair et al. (2022) demonstrate the successful application of Google Workspace for Education in ensuring uninterrupted teaching and learning during the COVID-19 pandemic (Khair et al., 2022). Moreover, Thuan (2022) reveals that Google Workspace for Education extends beyond general education and finds relevance in specific subjects and disciplines (Thuan, 2022). Perceptions and utilization of Google Workspace

for Education have also been explored by students and faculty. Serrano et al. (2021) investigate students' perceptions regarding the educational use of Google Workspace in communication and digital communication programs (Serrano et al., 2021). Lanzon (2022) conducts a survey to assess the frequency of usage and challenges faced by faculty members when utilizing Google Workspace Educational Tools.

This study aims to investigate pedagogical issues underlying the use of the webinar tool in online learning and training. Four research questions guide this study: (1) What are the perceptions that student-trainers have regarding their use of webinar tools for the development and implementation of an instructional session? (2) What tools are used to effectively deploy teaching on the web? (3) What is the role of the parties involved, including managers, lecturers, and students, in the process of teaching to achieve efficiency? (4) What field of study is appropriate for using the webinar tool? Overall, the use of webinar platforms for virtual classrooms has become increasingly popular, and Google Workspace is a set of tools that provides the right features for training, teaching, and collaboration. It contains many ideal features for collaborative teamwork, smart connectivity, and large storage, making it suitable for use in both epidemic and normal social conditions. This study aims to investigate pedagogical issues underlying the use of the webinar tool in online learning and training. Despite this, the use of Google Space's toolkit is only limited to using each application individually. This study proposes the utilization of the AppSheet application (within the Google Workspace ecosystem) to integrate individual applications, facilitating easier usage for teachers and students.

3. Methodology

This is qualitative research in which four chief techniques are observation, open-ended survey recommendations, and solution evaluation. Marshall identifies situations that suit qualitative research, including in-depth research on complex processes and research on innovative systems (Marshall, 1985). Qualitative research is also

ideal for understanding how participants perceive their roles or tasks in an organization. We adopted qualitative research because we want to analyze not only student trainers' life experiences and perceptions of adopting new technology but also their use of new technology. Besides, qualitative research helps us maximize our understanding of each student trainer's background, expertise, technology skills, and training experiences, which will help us understand the student trainers' perceptions of the new training technology.

We conducted this study with teachers and students of pedagogy at a university in Hanoi. The main reason is that Hanoi is the capital of Vietnam, which has good infrastructure conditions and a high educational level. The students participating in the survey are all majoring in pedagogy and are about to become teachers at high schools in Hanoi. The participating instructors are all highly qualified and have extensive online teaching experience.

Student survey: We conducted a survey on students who are studying teacher training majors who have spent more than 1 year studying online

by using webinar tools. The survey is presented in Appendix A of this study, which covers the content of collecting information on the quality, effectiveness as well as personal desires of students about online learning.

Interview and discuss with teachers: We exchanged opinions and discussed with 12 lecturers who are directly teaching online for students. The content of the discussion is about the difficulties in the online teaching process, as well as the results and wishes of the lecturers (Appendix B). The following Table 2 lists the characteristics of the participants, who are all lecturers randomly selected by us. They have basic information technology capabilities, professional competence and training experience. Their identities were encrypted to ensure privacy.

4. Results

4.1. Evaluation of online teaching

We conducted a survey among students studying pedagogy at a university in Hanoi. The results, collected from 360 survey questionnaires, demonstrate that after nearly 2 years of online learning, students have become highly familiar with this form of teaching. The assessments provided by the students lend credibility and validity to the survey, offering valuable insights.

Regarding the ability to acquire knowledge through online learning (as shown in Table 3), a significant 69.4% of students assessed their acquisition in the range of 50-80%. This is noteworthy since achieving the same rate through direct teaching is not guaranteed. Additionally, 24.2% of students reported acquiring knowledge at a level surpassing 80%, indicating a strong effectiveness in transmitting knowledge to students.

Table 2. Participant characteristics

Learner	Gender	Technology skills	Training experience (years)	Expertise
L1	F	Good	12	Literature
L2	F	Good	25	Kindergarten education
L3	M	Excellent	20	Math
L4	F	Average	11	Manager
L5	F	Weak	8	Psychology
L6	F	Average	7	Psychology
L7	M	Weak	8	Biology
L8	F	Average	5	Art
L9	F	Weak	25	Management
L10	F	Average	20	Physics
L11	F	Good	18	Physics
L12	F	Good	12	Kindergarten education

Table 3. The percentage of acquired knowledge compared to face-to-face learning

	N	Percentage (%)
Less than 50%	23	6,4
From 50%-80%	250	69,4
Over 80%	87	24,2

In terms of the ability to acquire knowledge (Table 4), the findings indicate that a majority of students (56.9%) perceive the extent of absorption to vary depending on each subject. In practice, subjects that are primarily theoretical or rely on various tools, equipment, software, etc., are deemed more suitable for online teaching, whereas specialized subjects that require interaction and hands-on practice tend to be less effective in the virtual environment.

Table 4. Ability to acquire knowledge compared to face-to-face learning

	N	Percentage (%)
Better absorption than face-to-face learning	48	13,3
Varied outcomes depending on each subject (accepting better or worse)	205	56,9
Acquisition quality depends on the instructor (good or poor)	107	39,8

Table 5 highlights several strengths of online teaching that contribute to student participation in the learning process. During online instruction, lecturers leverage various tools, equipment, and software to create engaging lectures that effectively transmit knowledge (36%). This approach can be challenging to achieve in face-to-face teaching due to physical constraints. Additionally, the convenience of studying from home without the need to commute to a centralized school is another appealing factor for students (33.3%).

Table 5. The advantages of learning online

	N	Percentage (%)
Using many modern tools and means	100	36,0
Good communication methods by teachers	60	16,7
Studying at home, not at school	120	33,3
No pressure to study	50	14,0

Online teaching also poses several challenges for students, with the most significant difficulty being related to equipment and internet connectivity (Table 6). This is partly due to the high number of students studying online simultaneously, which affects the speed of the internet connection. Moreover, the devices such as laptops and computers used by students are sometimes shared among multiple family members, further complicating the situation. Additionally, the increased workload assigned by lecturers adds to the pressure on students. However, these challenges can also contribute to fostering personal learning, promoting self-direction, and cultivating a positive mindset, aligning with the general psychology and aspirations of lecturers who encourage students to engage actively in the online learning environment.

Table 6. Difficulties of learning online

	N	Percentage (%)
Cannot concentrate for a long time	49	13,7
Difficult to interact and communicate with lecturers and classmates	41	11,4
Lack of equipment; poor internet connectivity	74	20,5
High study pressure with increased exercise assignments from teachers	53	14,8
Often distracted by other entertainment platforms	27	7,5
Difficulty logging into classes due to the use of multiple software and applications	33	9,1
Bad effects on health	36	9,9
Lack of study materials	47	13,1

Despite such difficulties, the majority of students still want to continue learning online (50%) or blended learning (38.6%), which shows that students have accepted online learning as an indispensable form today (Table 7).

Table 7. Preferred study format selection of students

	N	Percentage (%)
Online learning	180	50
Face-to-face learning	41	11,4
Blended learning (combination of online and in-person)	139	38,6

Teachers use teaching tools as a temporary solution, while teaching software primarily supports direct instruction through the internet without comprehensive support for online class management. Lecturers also encounter various challenges when teaching online, including limited information technology proficiency, extensive lecture preparation time, and difficulties in interacting with learners.

The survey results from 12 selected lecturers revealed several difficulties they faced while teaching online. Firstly, the absence of face-to-face communication with students diminishes teaching engagement. Lecturers are unable to utilize eye contact, gestures, or body language to effectively convey knowledge, resulting in reduced lecture effectiveness. Secondly, the exchange of information between lecturers and students is not as seamless as in physical classrooms. Thirdly, students easily become distracted during lectures as they have easy access to computers for other purposes while simultaneously attending virtual classes. Fourthly, device or internet connection issues frequently interrupt lectures, significantly impacting their effectiveness. Lastly, solely relying on webinars for virtual classes limits lecturers' ability to share documents, assign exercises, conduct surveys, facilitate short exercises, and engage in private discussions in class.

4.2. Effective tools for online teaching environments

Currently, there are several learning management systems utilized by schools for online teaching, including Moodle, Blackboard, Canvas, and Schoology. These platforms offer basic features such as course creation and management, test creation, student

communication, learning outcome management, and progress tracking. However, they still lack the comprehensive features provided by Google Workspace applications, particularly in terms of accessibility and user-friendliness. To address this, we propose the implementation of a virtual classroom model centered around the learner (Figure 1), utilizing Google Workspace tools. This approach enables the development of an E-learnSpace online learning environment, establishing a seamless connection among three key elements: learners, tools, and instructors (teachers, managers, technicians, assistants).

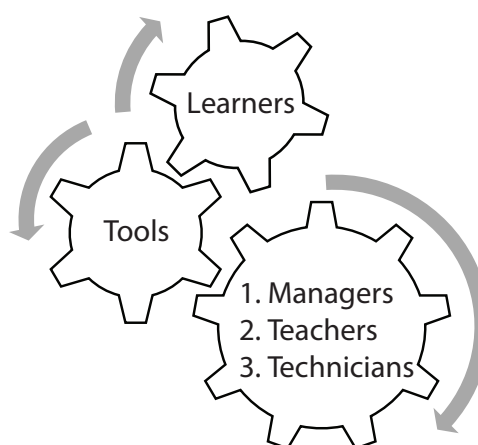


Figure 1. Elements of the online teaching system

Learners are the primary beneficiaries of the teaching process. It is essential for students to have the necessary equipment and proficiency in using technology devices such as computers, laptops, and smart devices. Additionally, they should exhibit self-discipline, independence, and proactivity in their learning journey. Instructors, including managers, teachers, and technicians, play a crucial role in online teaching. They should develop and implement well-structured online teaching plans, prepare suitable materials, learning resources, and engaging lectures. It is important for them to utilize tools that are compatible with the actual teaching conditions.

We are utilizing Google Workspace tools to construct an online learning space called E-LearnSpace, ensuring seamless connectivity among three key components: learners, tools, and instructors (teachers, managers, technicians, assistants, etc.). Learners should have the necessary equipment and technological skills

to fully engage with the learning process. They should be self-directed, independent, and proactive in their studies. Instructors, on the other hand, should create effective online teaching plans, curate appropriate learning materials, and leverage tools that align with their specific teaching contexts. We integrate Google Workspace tools to establish a comprehensive management system for operating E-Learnspace. AppSheet serves as a central platform for integrating other applications within the Google Workspace ecosystem (Figure 2). The selection of tools should be based on the unique conditions and requirements of each educational institution.

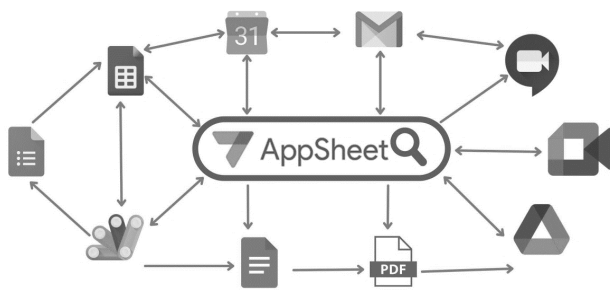


Figure 2. Appsheet in Google Workspace ecosystem

Building a general management website using Google Sites: The website features a simple and user-friendly interface, allowing learners and teachers to easily search for and access their respective classes. Users simply need to click on the icon or class name, and the system will direct them to the virtual classroom associated

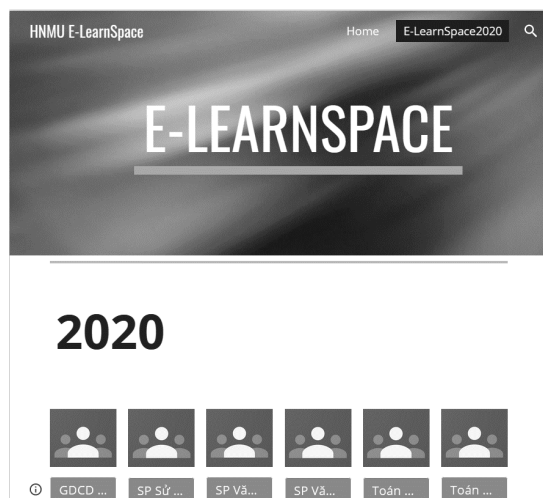


Figure 3. The link to virtual classrooms

with that class. Setting up virtual classrooms using the Classroom tool: The virtual classroom serves as the central component of the system, utilizing the School account to create classes (refer to Figure 3). Within these classes, there are different account types: Teacher account: This account includes administrators, technicians, testers (if applicable), and teachers responsible for teaching modules and topics within the class; Student accounts: These accounts are assigned to students authorized by their personal or school-issued email addresses. Depending on the circumstances, it is possible to delegate authority to teachers or students to configure basic class information, such as the timetable and personal details.

Teachers develop learning plans as well as forms and methods of teaching. Teachers can use face-to-face online teaching (using Google Meet built-in in class) or blended learning (b-learning). Use associated applications in the classroom to build lesson content, such as Driver, YouTube, tests, and exercises. The system allows teachers to manage student learning outcomes, test results as well as learning tasks such as projects and large assignments.

4.3. Role of the participants

By analyzing the tasks and functions of the components, on the basis of the student-centred model, the E-Learn Space model has established relationships in the model in the following Figure 4.

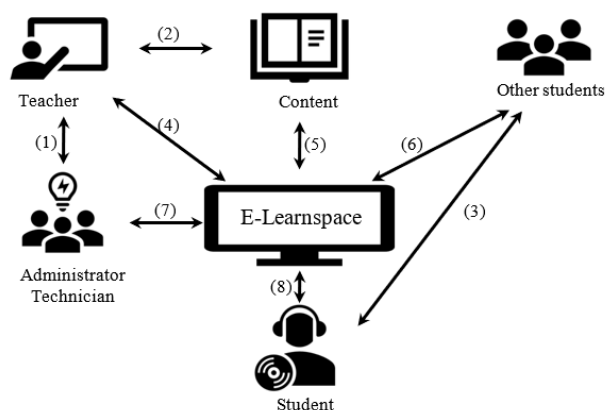


Figure 4. Relationships in the online learning space

The relationship (1) involves a two-way coordination between the key components of the model. In this relationship, managers collaborate with teachers to develop teaching plans, while technicians support administrators and teachers in effectively using the application. In relationship (2), the teacher gathers materials and resources to create lesson content. The learning materials should encompass various formats such as videos, images, sounds, and simulations, including recordings of previous teaching sessions by the teacher. The content of the lesson also influences the teacher, as they can make replacements, additions, and adjustments based on the results of previous lectures to ensure the most effective teaching.

The relationship (3) exists between students, allowing them to exchange lessons, collaborate on group work, and complete specific learning tasks. This relationship is typically effective when employing collaborative teaching and project-based learning in the blended learning format. Relationships (1), (2), and (3) occur outside of the virtual classroom and often take place in advance to prepare for a productive virtual classroom session. On the other hand, relationships (4), (5), (6), (7), and (8) involve two-way interactions within the virtual classroom. In this context, the teacher guides the lesson, utilizing content and learning materials to impart knowledge to students. Students, in turn, receive learning information from the materials and the teacher, while also engaging in exchanges with both the teacher and fellow students to acquire knowledge. Furthermore, administrators and technicians interact with teachers and students through the virtual classroom, conducting tests, monitoring, and providing technical support. With its central position, students can interact with all other components of the model through the virtual classroom, enabling them to absorb the knowledge presented in the lesson.

4.4. Suitable subjects/ study fields for online teaching

A survey was conducted among students from the Faculty of Education at Hanoi Metropolitan University with the question, “*What subjects*

Table 8. Subjects suitable for online teaching

	N	Percentage (%)
Theoretical subjects	127	35,2
Specialized subjects (Advanced Mathematics, General Physics, ...)	63	17,6
Subjects on methods of teaching	76	21,0
Subjects with practice (Gymnastics, Defense ...)	25	6,9
Informatics, foreign languages	68	18,9

do you think are the most effective for online teaching?” The results are summarized in Table 8.

Not all courses can be implemented as effectively through online teaching. The survey results reveal that for purely theoretical subjects, which mainly rely on one-way knowledge delivery and have limited interactions, online teaching is considered the most appropriate (Table 8). Theoretical subjects are deemed the most effective for online teaching, with a rate of 35.2%. Online teaching offers several advantages for these subjects, such as access to online resources like videos, presentations, and written documents. Students can work at their own pace and engage with teachers through forums or live chats to ask questions. Furthermore, online teaching provides flexibility and accessibility for students with busy schedules or those living in remote areas. Subjects that involve various tools, software, and techniques, such as computing or foreign languages, are also considered suitable for online teaching. Online teaching allows teachers to leverage more supporting tools compared to face-to-face classrooms that might lack necessary facilities like computers or internet connections.

On the other hand, subjects that require extensive interaction among lecturers and students or between students themselves, such as specialized subjects, practical subjects, and physical activities, are less suitable for online teaching (6.9%). Many lecturers also find it challenging to impart professional and practical knowledge to students when teaching specialized

or professional subjects. In practice, not all subjects require direct student participation in the learning process through group discussions, skill practice, and career training.

5. Discussion

Lecturers encounter numerous challenges when teaching online. Firstly, there are limitations in the interaction between lecturers and students (Mubarokah & Sahra, 2021), which leads to a lack of motivation in teaching (Nifriza, 2022). Some other common difficulties faced by lecturers include a lack of technological skills, financial constraints, and unstable internet connectivity (Schipor & Duca, 2021). Similarly, the research conducted for this article involved interviews and discussions with 12 lecturers who have direct experience in teaching online, along with a survey administered to these lecturers. The discussions centered around the challenges encountered during the online teaching process, as well as the outcomes and aspirations of the lecturers. The survey results from a group of 12 lecturers at Hanoi Metropolitan University indicate several challenges they encounter when teaching online. These challenges included limitations in student communication, decreased engagement due to the absence of eye contact and body language, difficulties in information exchange between lecturers and students, and interruptions caused by device or internet connectivity issues. Students also face numerous challenges when learning online. Some common difficulties students often encounter include internet connectivity issues and changes in study schedules (Mansyur et al., 2022). Students may lack interaction with their peers and instructors (Mansyur et al., 2022), resulting in lower learning effectiveness (Song et al., 2004). The survey with 360 students also reveals various difficulties. 64.9% of students believe that they can absorb about 50-80% of the lecture content. 56.9% of students think that the ability to absorb knowledge depends on the subject, with purely theoretical subjects being most suitable for online learning. Limitations in the interaction between teachers and students, as well as the lack of synchronization when using online teaching

software, are also among the challenges in the online teaching process.

The papers suggest that Google Workspace for Education is being used in education, but there are challenges to its integration. Technology integration is a complex and multidimensional process with several dynamics, and full integration cannot be achieved (Akcil et al., 2021). Faculty members were unfamiliar with some of the tools in Google Workspace and rarely used them in their classroom discussions (Lanzon, 2022). Teachers need to increase their insight and professionalism in the field of information and communication technology based on the learning process (Irani, 2022). Students value the interface and services provided by Google Workspace, especially Meet, Documents, Gmail, Classroom, and Presentations, but perceive that other applications, such as Keep, Jamboard, or Tasks, are not very useful (Martín-Herrera et al., 2021). Overall, Google Workspace for Education is being used in education, but there are challenges to its integration, and more training is needed for teachers to fully utilize its features. One of the main challenges faced by educational institutions and learners in the process of online education is the effective utilization of teaching tools. Using the Appsheet application as a tool to connect online teaching applications within the Google Workspace ecosystem addresses this challenge. Additionally, the roles of online teaching participants are clearly assigned, highlighting the importance of administrators and lecturers in improving online teaching. Administrators play a crucial role in providing the necessary resources and support for the implementation of online education. They need to ensure that the infrastructure and technical support are prepared to facilitate smooth online teaching and learning experiences. On the other hand, lecturers need to adapt to the methods and strategies of online teaching. They should be proficient in using Google Workspace tools and other relevant technologies to deliver engaging and interactive online lessons. Furthermore, lecturers should continuously seek opportunities for professional development and stay updated with the latest trends and best practices in online education.

Another challenge in online education is the feasibility in terms of the financial aspect of the necessary tools and technologies for effective teaching and learning. However, the study emphasizes that the webinar tool provided by Google Workspace is affordable and accessible to users. Participants can join webinar sessions with basic computer equipment, audio/video recording devices, and internet connectivity. This feasibility factor makes the implementation and deployment of the proposed model of an online learning space feasible for educational institutions, regardless of their financial resources. The findings of this study have significant implications for both educational institutions and learners in the realm of online education.

6. Conclusions

Today, the social environment places greater emphasis on digital adaptation and proficiency in using online collaboration tools and technology in the workplace. In such practical circumstances, educators need to provide learning opportunities and expand learning spaces for diverse learners. The integration of technology in education aims not only to enhance the quality of lessons but also to improve efficiency in providing open spaces and flexible learning opportunities for various types of learners. However, institutions encounter several challenges when implementing online courses. One of the main hurdles is the need to invest in digital tools and equipment to sustain distance learning. Another challenge is the necessity for teacher training and development in technology integration and pedagogical implementation, which may lag behind despite technological investments in schools. Additionally, there are difficulties related to communication between educators and learners, such as limitations in information exchange and maintaining student engagement during online lectures.

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Distance learning offers numerous advantages, including access to online resources such as videos, presentations, and written documents, flexibility and accessibility for students with busy schedules or living in remote areas, and the availability of diverse supporting tools compared to traditional face-to-face classrooms. However, it is crucial to ensure that students receive a high-quality education. To achieve this, institutions should invest in digital tools and equipment to sustain distance learning, provide teacher training and development in technology integration and pedagogical implementation, encourage student self-discipline and independence in the learning process, maintain communication between educators and learners through forums or live chats, and ensure students have access to appropriate materials. In our research, we believe that teachers and students should utilize integrated, accessible, and cost-effective tools instead of standalone applications. This approach promotes ease of use, efficiency, simplicity in management, and effective teaching. Furthermore, the tools should be mobile-friendly and suitable for sustainable education.

Google Workspace is a widely used online application suite that offers a range of valuable and well-suited tools for education at a minimal cost. Moreover, the system does not require users to possess advanced technological proficiency, making it a practical choice for establishing an “E-Learnspace” learning environment. The experience of Hanoi Metropolitan University demonstrates that this model is a favorable option for universities in Vietnam, not only during times of pandemics but also for future development. Additionally, the proposed model in this study can be applied to various educational institutions, including high schools and universities.

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