Online Learning Management In Covid-19pandemic: Case In Vietnam

Ms.Thu-Hien Nguyen[1]

Ms.Phuong-Nhung Nguyen[2]

Dr.Thanh-BinhNguyen[3*]

[1,3]Thai Nguyen University of Education, Vietnam
[2]Institute of Information Technology, Vietnam Academy of Science and Technology

Online Learning Management In Covid-19pandemic: Case In Vietnam

Ms.Thu-Hien Nguyen[1], Ms.Phuong-Nhung Nguyen[2], Dr.Thanh-BinhNguyen[3*]

[1,3]Thai Nguyen University of Education, Vietnam

[2]Institute of Information Technology, Vietnam Academy of Science and Technology

*Corresponding Author

Email: hienntt.math@tnue.edu.vn[1], nguyennhung.ict@gmail.com[2], binhnt@tnue.edu.vn[3]

ABSTRACT

The world is dealing with the COVID-19 epidemic, which has created enormous impacts on education, especially on learning management, requiring the adjustment and implementation of an online learning system effectively.The process of digital transformation has been promoted rapidly to adapt to new conditions in Education.Nowadays the online system has facilitated students of all levels to study at anytime and anywhere owing to the development of technologies.However, the existence and limits ofonline teaching and learning have been mentioned such as the complicated implementation or limited communication of active teaching methods compared to an actual classroom. Therefore, innovative teaching strategies and models are now required to be more diverse to encourage learners to focus on the lesson.In this study, we proposed an optimal paradigm of online learning management: the combination of several supported programs to effectivelymanage the teaching process. The approach has been appliedtothe Basic Informatics course for students majoring in Primary Education at the Thai Nguyen University of Education, Vietnam, and suggesteda flexible approach to stimulate learners' enthusiasm, express opinions, and actively participate in activities for enhancing their achievements. In addition, the investigation and discussion from lecturers and students about the digital transformation challenges in learning management also were presented and proposed the necessary information for the educational process.

Keywords: Online learning, COVID-19, tools, management

1. INTRODUCTION

In the context of the Covid-19 pandemic, most educational institutions around the world have switched from traditional learning to online teaching (Kim, 2021). This facilitates learners to study anywhere, anytime through pre-recorded video or online teaching videos(Andel, S. A., de Vreede, T., Spector, P. E., Padmanabhan, B., Singh, V. K., & De Vreede, 2020). Bilyalovaet al. have revealedthat strong digital transformation created many new learning opportunities, and removed the limitations of space and time(Bilyalova, A. A., Salimova, D. A., & Zelenina, 2019). Information technology has been creating great changes in education, making it easier to connect and communicate via the Internet, and promoting multi-dimensional cooperation between students and teachers in a positive direction (Mielikäinen, 2022). According to Laufer et al., grasping technologies in learning management helps teachers design a variety of learning content and assessment forms. Furthermore, it helps students have a positive learning attitude, and actively improves their digital skills at the same time(Laufer, M., Leiser, A., Deacon, B., Perrin de Brichambaut, P., Fecher, B., Kobsda, C., & Hesse, 2021).

Recently, Ismail et al.have argued that teachers need to actively study toimprove their qualifications, master information technology, and flexibly adapt to new teaching conditions. They also should be equipped with management skills in a digital environment to easily communicate with the newstudent generation - generation Z and Alpha - who tend to use technology-based learning methods (Ismail, N. A., Abd Wahid, N., Yusoff, A. S. M., Wahab, N. A., Abd Rahim, B. H., Abd Majid, N., ... & Zakaria, 2020).

In the scene of Asian and Southeast Asiacountries, it can be seen that each region and country use different approaches to respond to Covid-19.Education has changed dramatically with the rise in particular of online learning, lectures delivered remotely on digital platforms.(Sia, J. K. M., & Adamu, 2020). Many challenges have been shown.Some limitations of online learning have been named as technology requirements (computer or mobile device), internet access, and information support. Indeed, the affected learners of primary schools, high schools, and universities are mainly in mountainous areas where living and learning conditions are still difficult(Dubey, P., & Pandey, 2020). Teachers are still confused and encounter many obstacles when they lack technology skills and online teaching tools, leading to difficulty when implementing positive methods to encourage learners actively interact in the classroom (Vu, C. T., Hoang, A. D., Than, V. Q., Nguyen, M. T., Dinh, V. H., Le, Q. A. T., ... & Nguyen, 2020). Another limitation that may be mentioned is the low motivation

of learners (Istenič, 2021). They are not able to keep up with the lecture, resulting in a lack of knowledge, or not being willing to share with lecturers when they have problems in learning. Moreover, learners might also feel bored and not willing to participate in the class, which might lead to difficulty in applying knowledge in practice (Niemi, H. M., & Kousa, 2020), (Yuzulia, 2021).

Despite many difficulties, universities have actively proposed solutions to apply solutions, technologies, and techniques in teaching, Google Classroom (Okmawati, 2020), Zoom (Gunawan, G., Kristiawan, M., Risdianto, E., & Monicha, 2021a),…It can be seen that, with the advancement of computer and network technology, many softwarehave been introduced to support learning methods that enable and fully interact with learners. However, research on applying technologies used in the online teaching process systematically, with full steps including teaching, management, and evaluation is limited.Based on the learning purposes, the supported programs for online training programs have been categorized into teaching software, classroom management software, evaluation software, practical software, and the other necessary software…In this study, we proposed an approach to exploit different software and tools when teaching and managing online classrooms. The various software including Zoom Meeting, Google Classroom, Wheelnames, Mainboard, Pollev, and Padlet has been flexibly used in implementing the pedagogical ideas. This research has been carried out at the Thai Nguyen University of Education with the first-year student of the Primary in Education Faculty under the Basic Informatics course. The findings illustrated the outstanding effects of combined methods in online teaching, especially during the pandemic situation, while students performed high outcomes and positive feedback.

2. LITERATURE REVIEW

2.1. Online teaching software

The online teaching softwareallowslecturers and learners to communicate in a real-time learning process. Some popular software were widely used during the COVID-19 pandemic such as Zoom Meeting (Gunawan, G., Kristiawan, M., Risdianto, E., & Monicha, 2021b), Google Meet(Nasution, A. R., & Nandiyanto, 2021), and Microsoft Team (Fadilah, F., & Baidawi, 2021).Each software has different strengths and limitations, such as the maximum number of members per class, various functions, and cost.From the instructor's point of view, Google Meet might be the most appropriate software owing to its compatibility with other software to manage Google Classroom, especially withthe class having few participants.However, it requires screen sharing in the whole learning process, so learners can not observe the display screen, leading to difficulty in class management. On the other hand, Microsoft Team might support large class sizesof up to 300 participants.However, some functions are not available on the free version.Similarly, Zoom Meeting limits the participant and use time (40 minutes). However, Zoom Meeting uses a low Band-witch, so does not require high-speed internet, hence the video and voice loss during learning is minimized. The consideration of software selection depends on different conditions, such as budget, number of learners, learner preparation, and responsiveness of hardware and software.

2.2. Classroom management software

Numerous classroom management software has been introduced and supported teachers to control the resources or content, such as images, videos, files, and links. The most widely used software might be named Google Classroom (Ali, M. K., & Maksum, 2020) while it contains tools that support potent functions. In addition, educational institutions can also develop organizational learning platforms using Learning Management Systems (LMS) and Moodle(Rice, 2015), which are the most popular and widely implemented in schools and educational institutions in response to the COVID-19 pandemic.

2.3. Software to create assessment tests

The software used to create tests and evaluate learners before, during, and after learning is very diverse. They not only facilitate different teaching purposes but also assist learners in using flexible devices, such as laptops, smartphones, and tablets, to complete the tests regardless of device type and operating system.Some software widely used for evaluating the effectiveness of learners including Kahoot (Martín-Sómer, M., Moreira, J., & Casado, 2021), Quizizz(Nasution, A. R., & Nandiyanto, 2021)and Google Form (Vasantha Raju, N., & Harinarayana, 2016), Liveworksheet(Indriani, S., Nuryadi, N., & Marhaeni, 2021),… However, each software has different strengths and limitations, therefore, the software selection should be based on the situation and object suitability.

2.4. Practical Software

Microsoft Office package has been used as the practical software in this course. Students were guided through installing and using the Microsoft Office software suite from 2016 or higher throughout the course. In addition, students were also encouraged to experience the great features and utilities of the Office 365 suite. This software was often pre-installed on the school's computer lab. However, due to the Covid-19 epidemic students had to install them on their computers.
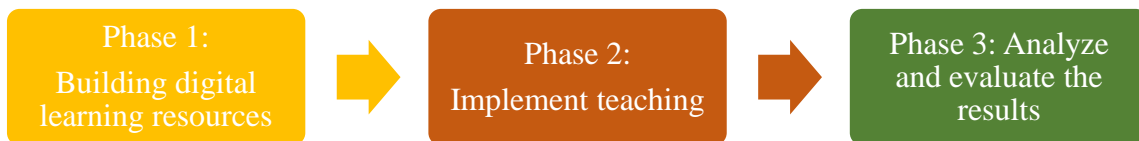
2.5. Utility software

In addition to the mentioned software, some utility softwarecould be applied to enable learners' attention and facilitate teachers from prompting, brainstorming ideas, checking attendance, scoring points, grouping learners automatically, calling individuals by name at random, doing time activities, asking questions during the lesson, feedback... etc, includingthe Wheelofnames (Rosales, M., & Torres, 2021), Classdojo(Chiarelli, M., Szabo, S., & Williams, 2015), Padlet(Zainuddin, N. M. M., Azmi, N. F. M., Yusoff, R. C. M., Shariff, S. A., & Hassan, 2020),IdeaBoardz(Deckert, C., Mohya, A., & Suntharalingam, 2021), Mentimeter(Mayhew, E., Davies, M., Millmore, A., Thompson, L., & Pena, 2020).

3. MATERIALS AND METHODS

3.1. Research Methodology

The research method includes the following phases:

Phase 1: Building digital learning resources → Phase 2: Implement teaching → Phase 3: Analyze and evaluate the results

• Phase 1: Building digital learning resources

Lecturers selected Zoom software for online teaching and usedthe Breakout Rooms feature for discussion of lesson issues. Google Classroom was used for classroom management, lesson-related materials, links, and individual and group assignments. YouTube platformwas also used to upload class videos to review lessons. They selected Kahoot, and Quizizz software to create games to start lessons, generate excitement for students before each task or consolidate knowledge to evaluate learners' processes. In addition, the quiz section also allowed teachers to give feedback to learners, such as displaying a test summary or the answer. Lecturersalso provided the Ideaboardz software link to freely ask related questions during the whole learning process which will be supported by the lecturer. Additionally, Google Forms was implemented synchronously to design the assessment for students. The Menti software wasaimed to collect student feedback after each course and helped teachers have a better understanding of students' wishes and suitability in their teaching methods.

• Phase 2: Implement teaching

We conducted the classroom management and digital learning approach for 85 students participating in the Basic Informatics course at the University of Education, Thai Nguyen University, Thai Nguyen, Vietnam.
The active learning method was applied by actively participating in academic classes and practical activities to firmly grasp the knowledge content described in the module outline. In addition, they were asked to use the software to perform assigned or desired tasks for further work. The details of learning management methods and models can be presented as follows:

- Warm-up - Before learning, the teacher created a quiz for each lesson, averaging ten questions using Kahoot/Quizizz. The test included multiple-choice questions like a game for the whole class. At the end of the game, the instructor can find the most correct and fastest person. This step aimed to create initial excitement for learners to start a new lesson.
- Learning management for the theoretical part was divided into three models: online instructors, students learning based on watching videos, and students self-study, recording the presentation video. The final model emphasized that the instructor will deliver each week's content and require students to present the knowledge.
- Computerized Learning Management employed video-based learning and was initially created before each class by uploading to YouTube. The teacher followed the online classroom to observe the practice process. In the online classroom, learners can share the screen with the teacher and other classmates, therefore teachersmight directly support students.
- Assessing learners according to the process applied many models including Q&A, randomly taking learners by Wheelofnames software. Group Discussion used Group Maker from Classdojo.com to divide learners automatically. Think Pair Share was also used to ask questions for learners to exchange ideas. Individual or group assessment in each lesson will depend on the lesson's content.
- Assessment after the lesson: After the theory part, learners were assessed by a test to see their understanding of the given knowledge. Through this, learners received feedback indicating their learning process, thereby illustrating their learning strategies for the next chapters. At the same time, teachers might prepare additional classes for individual learners or the entire class.

• Phase 3: Analyze and evaluate the results
After the teaching approach, we surveyed 85 first-year students from the Primary Education Faculty, who participated in the Basic Informatics module to understand students' thinking. Additionally, we interviewed3 lecturers who were implementing learning management applications and digital applications in the teaching process.

1.2. Methods of sampling and analysis
We usedSlovin's formula to determine the number of samples:

$$n = \frac{N}{(1 + N.e^2)}$$

Where n is the number of collected samples; N is the total number of students in the class and e is the allowable error with relative precision (we choose the error value e = 0.05 (5%)). According to the collected results, there was a total of 79 out of 85 completed the survey, illustrating the reasonable investigation for research purposes.The student's opinionsabout experiencing digital tools in the classroom were quantitatively analyzed using IBM SPSS Statistics 24 software.

We simultaneously interviewed 3 lecturers who were teaching Basic Informatics classes. Teacher interview questions emphasized the application of digital transformation in teaching and its application in classroom management. The lecturers' discussions were very useful to design their future teaching process and active learning motivation for learners.

1.3. Prepare the questionnaire
Student

Q1: Features of Zoom	Q1A	Simple to use
	Q1B	Effective
	Q1C	Convenient group discussion
	Q1D	Easily connect to multiple devices with the app installed
Q2: Features of Google Classroom	Q2A	Regular updates of assignments, research papers, and discussion questions
	Q2B	Control assignment submission and completion time
	Q2C	Easily store all lessons
	Q2D	Effective classroom management tool
Q3: Features of Kahoot	Q3A	Interesting
	Q3B	Exciting and exciting class
	Q3C	Easy to play
	Q3D	Increase competition with correct answers and fastest response times
Q4: Features of Ideaboardz	Q4A	Simple to use
	Q4B	Convenient for collecting information
	Q4C	Feel free to share your opinion
	Q4D	Easily search stickers by keyword
Q5: Features of Google Form	Q5A	Easy to use
	Q5B	More comfortable checking on paper
	Q5C	Know the results immediately after submit
	Q5D	Get feedback for true/false answers
Q6: In your opinion, what are the advantages of using digital tools in the classroom?	Freely answer	
Q7: In your opinion, what are the disadvantages of using digital tools in the classroom?	Freely answer	
Q8: What suggestions do you have to make the application of digital tools in classroom management more effective?	Freely answer	

Questions Q1-Q5 aimed to survey students about their level of agreement with the features of Zoom in online learning, Google Classroom on classroom management, Kahoot for organizing games in the classroom,

Ideaboardz forthe discussion, and Google Forms for the test. The above questions were designed on a 5-point Likert scale to quantitatively evaluate the results. The questions wereassigned as follows: Strongly disagree = 1, Disagree = 2, Neither agree nor disagree = 3, Agree = 4, Strongly agree = 5.

Q6, Q7, and Q8 were open-ended questions that aimed to draw out the advantages and disadvantages of online learning management tools and the aspects that need to be improved. The results will be analyzed qualitatively.

Lecture

Open-ended questions were asked to collect feedback from lecturers on the proposed process of applying to online learning management, including 8 questions as follows:

O1	How do you evaluate the role of using tools to build digital learning materials for teaching?
O2	What advantages and disadvantages do teachers face when using digital tools to create digital learning resources for teaching?
O3	Do teachers need to prepare digital learning resources for teaching? Why?
O4	What are the advantages and disadvantages of teaching online through the digital platform Zoom?
O5	What are the advantages and disadvantages of collecting student feedback and discussion through Idearboadz?
O6	What are the advantages and disadvantages of holding Kahoot/Quizziz games in the classroom?
O7	What are the advantages and disadvantages of assessing student learning outcomes through Google Forms?
O8	What are the advantages and disadvantages of classroom management through Google Classroom's digital platform?

4. RESULTS

4.1. Learning management system implementation results

An example of using the Zoom application wasshown in Figure 1(a).The practical class was divided into 4-5 groups (each group contains15 to 20 students) to ensure the allowed participant in Zoom class. These helped the lesson to be conducted continuously, smoothly, and fully perform the necessary functions when interacting in the virtual.Figure 1(b) showedthe active interaction between teachers and students when the lecturer used Quiz tools (Quizizz, Kahoot,etc) at the beginning to warm up and create excitement for students. Of course, Quiz was also applied at the end of the lesson to review and summarize the knowledge. Students learned the necessary skills to participate in online classes when using assistive devices. This also helped connect class members, creating a more vibrant and cohesive class atmosphere.
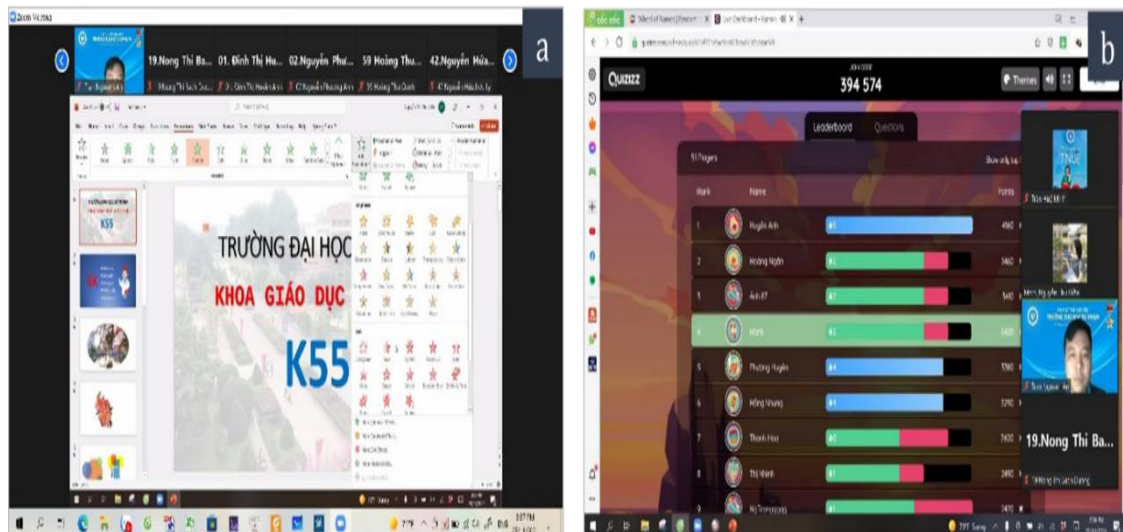

Figure 1: Instruction on using Zoom (a) and Quizizz software (b) in the classroom
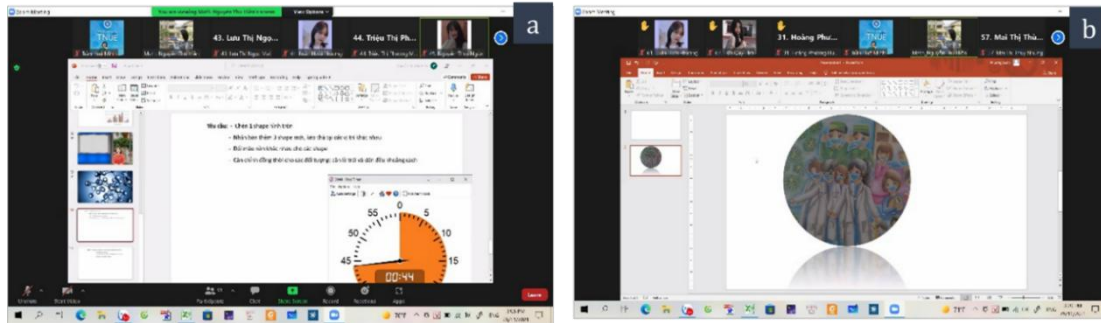
Figure 2: The Free Timer software used to count down the time (a) and students share practice (b)

In the teaching process, the teacher usually posed problems and used a countdown timer for students' activities (Figure 2a). After finishing the tasks, students were encouraged to perform their practice on software and share with teachers and classmates. The Wheelnames.com, Free Timer toolsfacilitated learners to focus on the lesson due to the requirements of tasks including preparing the answers,and discussing and expressing ideas individually or in groups. For example, one student shared practice screens after finishing the task and othersmight use the raise-hand function to support their classmate (Figure 2b).

Additionally, the lecturer might use the Wheelofnames software to randomlyask students to answer questions and actively participate in class activities (Figure 3).
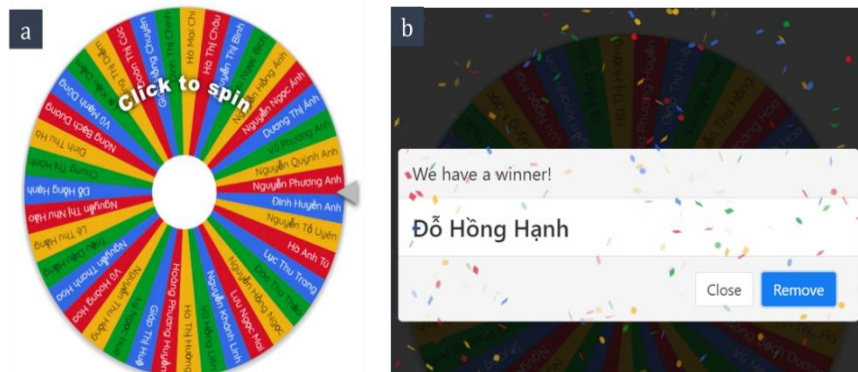

Figure 3: Students' names in Wheelofnames software (a) and randomly selected the student to answer questions (b)

Figure 4 indicated the students-lecturer's effective interaction using Ideaboards when students can easily enter their feedback and counter-questioning forthe lecturer during the learning process. This might encourage learners to regularly express their opinions and discuss the proposed topic.
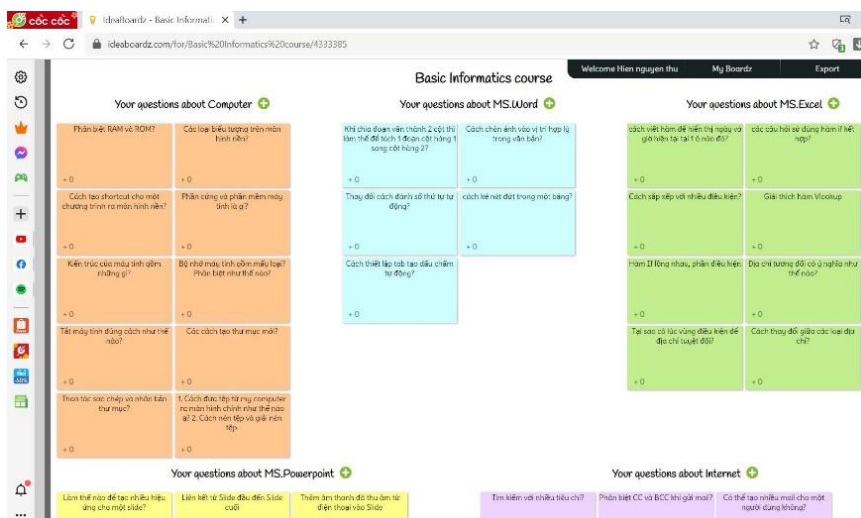

Figure 4: Students use the IdeaBoardz provided by the lecturer to ask questions to the lecturer during the learning process

Google Forms was created to deliver the assessment results for students, reviewing the article that they could not understand or answered incorrectly. Furthermore, teachers can usethese data for designing the next lesson. (Figure 5).
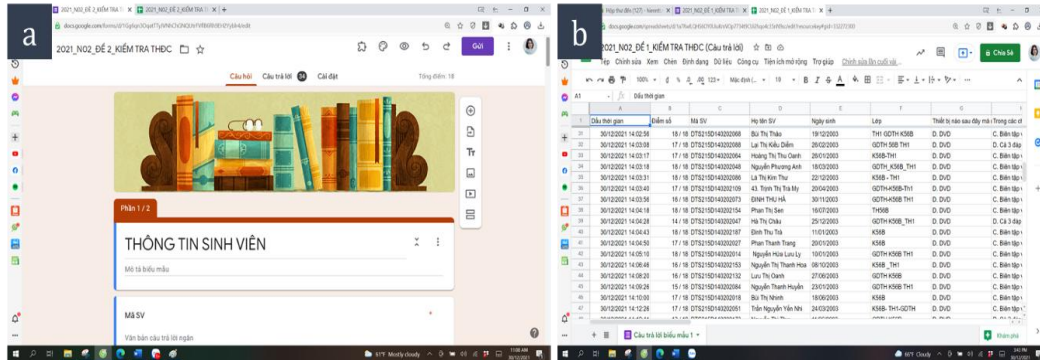

Figure 5: Using Google Form for assessment (a) and corresponding results when students completed the test (b)

The results of online learning using online and video-based learning methods in the theory and practice part of the General Informatics module have proved the effective interaction between learners and teachers. In case students had any problems or questions, they felt free to ask the lecturer directly and actively participate in online classroom activities. By using the cloud application, learners flexibly encounter in the practice regardless of devices or operating systems requirements. In addition, this online learning approach encouraged learners to participate in assigned activities, express their opinions and share their work through the online system (Figure 6).

(a)   The lecturer provides information and documents to students
(b)   The lecturer gives the test to the students
(c)   Students can watch video lectures after class
(d)   The group of students prepares their discussion before reporting to the class
(e)   The lecturer assigns homework periodically to students
(f)   The lecturer summarizes all knowledge of each chapter through mind maps
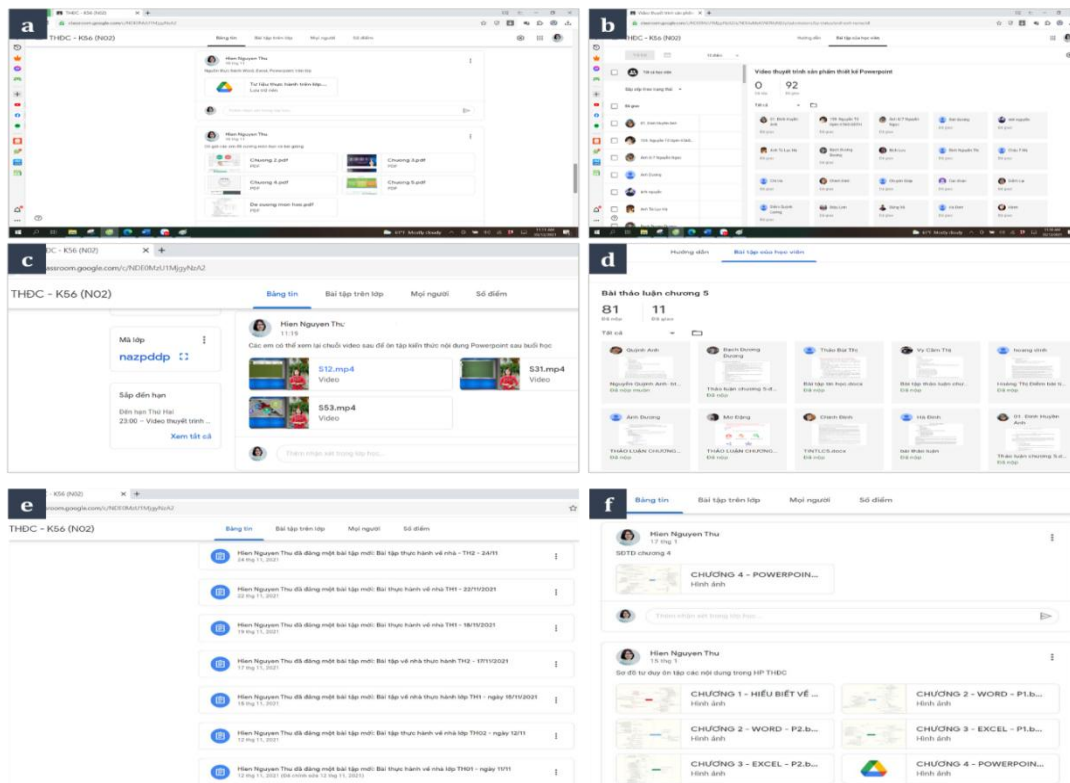

Figure 6: Lecturers using Google Classroom to manage classes

Especially, students can positivelyimplement some small projects proposed by the lecturer toexpress their abilities and be more active and proactive in activities. Figure 7 showed a Powerpoint design activity and thematic presentation (introduction to your hometown, feeling about a book, understanding of the traditional Tet holiday, etc)

Figure 7: Students working on projects and presenting their products

4.2. Results of assessment and survey of learners
Assessment of academic achievement in online and video-based learning methods has proved that most learners' achievement ranges from good to excellent level. Table 1 presented the examination quality of students' regular assessment tests.

Table 1: Student's regular assessment scores

Scores / Format	0.0-5.0	5.1-7.9	8.0-10
Multiple choice test via Google Form	5 (5.88%)	26 (30.59%)	54 (63.53%)
Practice test submitted to the class group via Google Classroom	1 (1.18%)	20 (23.53%)	64 (75.29%)
Product design and video presentation	0 (0.00%)	13 (15.29%)	72 (84.71%)

At the end of the course, weconducted the Menti survey to investigate learners' feelings about the online tools in the class. Students can freely share their opinions after the online course of the Basic Informatics module. Figure 8 illustrated students' comments and feedback, which might motivate teachers to be more creative in teaching methods and design appropriate adjustments to suit the higher requirements of"GenZ" students.

Figure 8: Student thinking about the course using Menti software (For example: "rấttốt" corresponds to "very good", "thúvị" corresponds to "interesting", "hiệuquả" corresponds to "effective"...)

At the same time, students also participated in a survey to evaluate the effectiveness of software which have been used in the teaching process. Rating scale from 0 to 5 includes (0: not useful, 1: somewhat helpful, 2: regular, 3: satisfied, 4: interesting, 5: very interesting)

Your evaluation of softwares effectiveness which have been used in the course?

Figure 9: Evaluation of the software used in this course

Figure 9 exhibited the evaluation of software used in the course. It can be seen that students still prefer to gather documents by themselves, and self-study on the Google Classroom classroom management system compared to the others. Online assessment and testing tools also have shown relative satisfaction for students. It was not easy to comprehensively assess students' practical skills and ensure fairness through these forms of testing and evaluation.

In order to have a more accurate quantitative assessment, the results of collecting students' opinionson the reliabilityin question groups Q1, Q2, Q3, Q4, and Q5were analyzedusing Cronbach's Alpha method using IBM SPSS 24 software and specifically expressed in table 2.

Table 2: The results of the analysis of student's opinions of the question group Q1-Q5

Reliability Statistics	
Cronbach's Alpha	N of Items
0.874	20

	Corrected Item-Total Correlation	Cronbach's Alpha
Q1A	0.523	0.855
Q1B	0.694	0.864
Q1C	0.448	0.872
Q1D	0.442	0.841
Q2A	0.575	0.866
Q2B	0.451	0.852
Q2C	0.541	0.868
Q2D	0.612	0.865
Q3A	0.594	0.867
Q3B	0.547	0.868
Q3C	0.496	0.869
Q3D	0.432	0.877
Q4A	0.542	0.868
Q4B	0.650	0.864
Q4C	0.550	0.867
Q4D	0.840	0.863
Q5A	0.625	0.865
Q5B	0.427	0.856
Q5C	0.460	0.871
Q5D	0.440	0.855

The Cronbach's Alpha coefficient of all questions was higher than 0.874 demonstrating thewell-investigated scale and confirming the evaluated questions. All observed variables were accepted and might be used in the next factor analysis.

Table 3: Survey statistics of questions Q1-Q5 for students

Code		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Q1A	Frequency	3	4	8	57	7
	Percent	3.8	5.1	10.1	72.2	8.9
Q1B	Frequency	2	3	5	63	6
	Percent	2.5	3.8	6.3	79.7	7.6
Q1C	Frequency	1	3	8	61	6
	Percent	1.3	3.8	10.1	77.2	7.6
Q1D	Frequency	1	3	8	56	11
	Percent	1.3	3.8	10.1	70.9	13.9
Q2A	Frequency	4	4	8	53	10
	Percent	5.1	5.1	10.1	67.1	12.7
Q2B	Frequency	3	-	9	62	5
	Percent	3.8	-	11.4	78.5	6.3
Q2C	Frequency	3	6	7	51	12
	Percent	3.8	7.6	8.9	64.6	15.2
Q2D	Frequency	3	4	8	49	15
	Percent	3.8	5.1	10.1	62.0	19.0
Q3A	Frequency	2	-	7	58	12
	Percent	2.5	-	8.9	73.4	15.2
Q3B	Frequency	3	6	11	40	19
	Percent	3.8	7.6	13.9	50.6	24.1
Q3C	Frequency	1	3	13	44	18
	Percent	1.3	3.8	16.5	55.7	22.8
Q3D	Frequency	3	7	11	39	19
	Percent	3.8	8.9	13.9	49.4	24.1
Q4A	Frequency	4	6	14	35	20
	Percent	5.1	7.6	17.7	44.3	25.3
Q4B	Frequency	1	4	7	48	19
	Percent	1.3	5.1	8.9	60.8	24.1
Q4C	Frequency	2	5	4	51	17
	Percent	2.5	6.3	5.1	64.6	21.5
Q4D	Frequency	1	1	5	66	6
	Percent	1.3	1.3	6.3	83.5	7.6
Q5A	Frequency	2	3	9	46	19
	Percent	2.5	3.8	11.4	58.2	24.1
Q5B	Frequency	2	12	5	56	4
	Percent	2.5	15.2	6.3	70.9	5.1
Q5C	Frequency	2	3	5	55	14
	Percent	2.5	3.8	6.3	69.6	17.7
Q5D	Frequency	2	1	5	43	28
	Percent	2.5	1.3	6.3	54.4	35.4

Table 3 revealed that most participating students chose "Agree" compared to the remaining levels. The total number of "Agree" and "Strongly Agree" choices accounted for more than 50% with the features of digital tools such as Zoom, Kahoot, Ideaboardz, Google Classroom, and Google Forms. The "Strongly disagree" and "Disagree" choices were less than 10% of each content. However, Q5B selection exhibited 15.2% out of the total chose "Disagree", illustrating that some students still had difficulties and inadequacies when accessing digital tools in the learning process. Moreover, the reason might come from the conditions of equipment and IT skills.

With the open question, most learners expressed that teachers' use of video posting in classroom management allowedstudents to review and give questions as they were uncertain about a particular knowledge. Moreover, the software can support students quickly and easily work in groups. Regular discussions and exchanging ideas during the lesson kept their focus and attention during class. The tests enabled them to recognize the correct or incorrect answers to fill in the gaps in their knowledge. In addition, the screen can be shared with classmates or teachers when learners have problems and need support. Activities also made them more attentive to the lesson through utility software, such as a random wheel to help them focus on the class. Lecturers had many active learning methods to help students take the initiative in learning activities and implementing small projects.

Learners felt that they become more creative, proactive, and energetic when participating in classroom activities. Finally, most importantly, the learning results also proved that 90% selection belonged to a good level and higher (Q6).

However, a few students also complained about the poor quality of the network connection, so it was difficult to follow the lesson closely and use the support tools well. Some students often had to borrow computers to practice (Q7). They also required lecturers to support students with characteristics of mountainous areas and ethnic minorities (Q8).

4.3. Teacher survey results

According to the interview results, all participating lecturers revealed the extreme necessity of quality lectures constructed by using digital learning materials tools, and this is a process that is always necessary to perform (O1). The trainers fully agreed on the necessity to have digital learning resources for teaching and consider this essential way to adapt to the current situation - when the learning methods (online and offline) have been widely applied and in response to the prolonged Covid-19 epidemic situation (O3). In general, the mentioned tools such as Google Classroom, Google Forms, Zoom, Kahoot, etc. were assessed by lecturers as having completely understood, applicable to a wide range of learners, and easily deploy in online teaching. Google Form was considered an effective support tool for students to assess the learning process owing to its capabilities including quick assessment, easily set up and sharing, and quick response. The Google Classroom learning management tool has received the most positive feedback from instructors, which focused on several reasons such as easy connection, sharing, feedback, and flexible assignments for students (O4-O8). However, there werestill difficulties in organizing and managing online classes for students in mountainous and disadvantaged areas, who can not ensure the required facilities for learning. Some students were still having low motivation in adapting to new learning technology (O2). In general, lecturers should positively and frequently learn to be more creative, which facilitates the rational conditions to make class hours more interesting, attractive, exciting, and effective. Lecturers agreed that applying learning management software in teaching was an effective measure during the pandemic and keeping up with the trend of digital transformation worldwide.

5. CONCLUSION

How to manage an online course using supported software and tools has been an urgent question. Educational innovation today requires various skills and competencies of teachers to implement an interesting and effective class, subsequently encouraging the students' enthusiasm and determination for better results. This study proposes an online learning paradigm for the Basic Informatics course at Thai Nguyen University while combining different software and tools for online teaching, especially during the Covid-19 epidemic. The results of qualitative and quantitative feedback from student and lecture surveys after applying this learning model show a positive impact. Their discussions propose a cross-sectional view of research that complements further courses in online teaching.

REFERENCES

1. Ali, M. K., & Maksum, H. (2020). Utilization of E-Learning-Based ICT Learning Using the Google Classroom Application During the COVID-19 Pandemic. Journal of Education Research and Evaluation, 4(4), 373–379.
2. Andel, S. A., de Vreede, T., Spector, P. E., Padmanabhan, B., Singh, V. K., & De Vreede, G. J. (2020). Do social features help in video-centric online learning platforms? A social presence perspective. Computers in Human Behavior, 113, 106505.
3. Bilyalova, A. A., Salimova, D. A., & Zelenina, T. I. (2019). Digital transformation in education. In International Conference on Integrated Science, Springer, Cham., 265–276.
4. Chiarelli, M., Szabo, S., & Williams, S. (2015). Using ClassDojo to Help with Classroom Management during Guided Reading. Texas Journal of Literacy Education, 3(2), 81–88.
5. Deckert, C., Mohya, A., & Suntharalingam, S. (2021). Virtual whiteboards & digital post-its– incorporating internet-based tools for ideation into engineering courses. 49th Annual Conference, Berlin.
6. Dubey, P., & Pandey, D. (2020). Distance learning in higher education during pandemic: challenges and opportunities. The International Journal of Indian Psychology, 8(2), 43–46.
7. Fadilah, F., & Baidawi, A. (2021). Microsoft Team of Zoom as a media for teaching extensive reading during covid-19 pandemic. International Journal of Educational Resources, 1(6), 581–587.
8. Gunawan, G., Kristiawan, M., Risdianto, E., & Monicha, R. E. (2021a). Application of the zoom meeting application in online learning during the pandemic. Education Quarterly Reviews, 4(2).
9. Gunawan, G., Kristiawan, M., Risdianto, E., & Monicha, R. E. (2021b). Application of the Zoom Meeting application in online learning during the pandemic. Education Quarterly Reviews, 4(2).

10. Indriani, S., Nuryadi, N., & Marhaeni, N. H. (2021). Student's Worksheet Design Assisted with Liveworksheets to Improve Student's Concept Understanding Skills on Quadrilaterals and Triangles. Multidiscipline International Conference (Vol. 1, No. 1), 462–469.

11. Ismail, N. A., Abd Wahid, N., Yusoff, A. S. M., Wahab, N. A., Abd Rahim, B. H., Abd Majid, N., ... & Zakaria, R. (2020). The challenges of industrial revolution (IR) 4.0 towards the teacher's self-efficacy. In Journal of Physics: Conference Series, IOP Publishing, 1529.

12. Istenič, A. (2021). Online learning under COVID-19: re-examining the prominence of video-based and text-based feedback. Educational Technology Research and Development, 69(1), 117–121.

13. Kim, H. J. (2021). Digital Transformation of Education Brought by COVID-19 Pandemic. Journal of the Korea Society of Computer and Information, 26(6), 183–193.

14. Laufer, M., Leiser, A., Deacon, B., Perrin de Brichambaut, P., Fecher, B., Kobsda, C., & Hesse, F. (2021). Digital higher education: a divider or bridge builder? Leadership perspectives on edtech in a COVID-19 reality. International Journal of Educational Technology in Higher Education, 18(1), 1–17.

15. Martín-Sómer, M., Moreira, J., & Casado, C. (2021). Use of Kahoot! to keep students' motivation during online classes in the lockdown period caused by Covid 19. Education for Chemical Engineers, 154–159.

16. Mayhew, E., Davies, M., Millmore, A., Thompson, L., & Pena, A. (2020). The impact of audience response platform Mentimeter on the student and staff learning experience. Research in Learning Technology, 28.

17. Mielikäinen, M. (2022). Towards blended learning: Stakeholders' perspectives on a project-based integrated curriculum in ICT engineering education. Industry and Higher Education, 36(1), 74–85.

18. Nasution, A. R., & Nandiyanto, A. B. D. (2021). Utilization of the google meet and quiziz applications in the assistance and strengthening process of online learning during the COVID-19 pandemic. Indonesian Journal of Educational Research and Technology, 1(1), 31–34.

19. Niemi, H. M., & Kousa, P. (2020). A case study of students' and teachers' perceptions in a Finnish high school during the COVID pandemic. International Journal of Technology in Education and Science.

20. Okmawati, M. (2020). The use of Google Classroom during pandemic. Journal of English Language Teaching, 9(2), 438–443.

21. Rice, W. (2015). Moodle e-learning course development. Packt Publishing Ltd.

22. Rosales, M., & Torres, Y. M. (2021). Using a Wheel of Names During an Online Synchronous Class to Encourage Participation During COVID-19. Nurse Educator, 46(3), E49.

23. Sia, J. K. M., & Adamu, A. A. (2020). Facing the unknown: pandemic and higher education in Malaysia. Asian Education and Development Studies, 10(2), 263–275.

24. Vasantha Raju, N., & Harinarayana, N. S. (2016). Online survey tools: A case study of Google Forms. In National Conference on Scientific, Computational & Information Research Trends in Engineering, GSSS-IETW, Mysore.

25. Vu, C. T., Hoang, A. D., Than, V. Q., Nguyen, M. T., Dinh, V. H., Le, Q. A. T., ... & Nguyen, Y. C. (2020). Dataset of Vietnamese teachers' perspectives and perceived support during the COVID-19 pandemic. Data in Brief, 31, 105788.

26. Yuzulia, I. (2021). The challenges of online learning during pandemic: Students' voice. Wanastra: Jurnal Bahasa Dan Sastra, 13(1), 08–12.

27. Zainuddin, N. M. M., Azmi, N. F. M., Yusoff, R. C. M., Shariff, S. A., & Hassan, W. A. W. (2020). Enhancing classroom engagement through padlet as a learning tool: a case study. International Journal of Innovative Computing, 10(1).