TEL Integration Into the Post-Pandemic Classrooms in the Eyes of Students and Lecturers

Sri Yunita[1], Riadi Darwis[2], Rina Riniawati[3], Susilawati[4*]
[1]Management Study Program, STIE Yasa Anggana, Indonesia
[2]Tourism Department, Politeknik Pariwisata NHI Bandung, Indonesia
[3]Information System of Kota Sukabumi Study Program, Universitas Bina Sarana Informatika, Indonesia
[4]English Literature Study Program, Universitas Bina Sarana Informatika, Indonesia
[1]sriyunita@yasanaggana.ac.id, [2]riadidarwis@gmail.com, [3]rina.rri@bsi.ac.id, [4]susilawati.sxw@bsi.ac.id

INFO ARTIKEL	ABSTRAK
	Abstrak: Integrasi aplikasi technology-enhanced learning (TEL) di era pascapandemi mendapat perhatian yang intensif. Sebagai pengguna TEL di perguruan tinggi (HEI), perspektif mahasiswa dan dosen terhadap penggunaan TEL penting untuk diselidiki. Penelitian kali ini bertujuan untuk mengetahui bagaimana sikap mahasiswa dan dosen terhadap TEL di era pascapandemi. Metode deskriptif kualitatif digunakan untuk mencari jawaban atas sudut pandang tersebut. Wawancara mendalam dilakukan terhadap 12 orang mahasiswa dan 1 orang dosen program studi manajemen salah satu perguruan tinggi swasta di Garut, Jawa Barat, Indonesia. Sebanyak 12 pertanyaan diajukan kepada dosen, sementara 5 pertanyaan diajukan kepada mahasiswa. Data hasil wawancara dianalisis dengan menggunakan analisis tematik. Para mahasiswa secara dominan menyatakan pandangan positif mereka terhadap penerapan TEL meskipun mereka masih memperhitungkan umpan balik negatif mengenai masalah teknis, sikap belajar, dan interaktivitas. Dosen juga menyampaikan pandangan positifnya terhadap penggunaan TEL di kelasnya, namun ia menyoroti kendala teknis, kurangnya pelatihan mahasiswa untuk menggunakan aplikasi TEL, dan dukungan universitas terhadap penggunaan TEL dalam proses pembelajaran. Studi saat ini menyimpulkan bahwa secara umum TEL dipandang bermanfaat baik oleh mahasiswa maupun dosen dengan menggarisbawahi beberapa permasalahan penting yang harus ditangani, dan merekomendasikan partisipasi dari manajemen universitas untuk mendukung penggunaan teknologi di lingkungan mereka dengan menyediakan fasilitas yang memadai dan pelatihan pengembangan bagi dosen dan mahasiswa.
	Abstract: Integrating technology-enhanced learning (TEL) applications in the post-pandemic era has received intensive concern. As the users of TEL in higher education institutions (HEIs), students' and lecturers' perspectives on using TEL are significant to investigate. The current study intends to explore students' and lecturers' views of TEL in the post-pandemic era. A qualitative descriptive method was employed to seek the answers of the viewpoints. In-depth interviews were administered to 12 students and 1 lecturer from a management study program of a private university in Garut, West Java, Indonesia. A total of 12 questions were posed to the lecturer, while 5 questions were directed to the students. The data from the interviews were analyzed using thematic analysis. The students dominantly expressed their positive viewpoints of TEL applications although they still reckoned negative feedback regarding technical issues, learning attitude, and interactivity. The lecturer conveyed her positive view of using TEL in her classroom, yet, she highlighted technical issues, students' lack of training to use TEL applications, and university support on the use of TEL in the learning process. The current study concludes that generally TEL is viewed as beneficial both by the students and the lecturer by underscoring some crucial issues to handle, and recommends participation from university management to support technological use in their environment by providing adequate facilities and development training for lecturers and students.

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A. INTRODUCTION

The infusion of technology-enhanced learning (TEL) into classrooms plays significant roles for students, instructors, and higher education institutions (HEIs) management. For students, TEL has assisted them with the feeling of being contented with learning (Dubey & Sahu, 2021). TEL has also been reported to affect students' learning interest and trust in online learning (Mondragon-Estrada et al., 2023). For lecturers, integrating TEL accommodates student's understanding (Al-Labadi &

Sant, 2021). Lecturers might also get assistance from TEL to promote their students' learning outcomes by considering the aspect of interactivity of the TEL and its effective implementation (David & Weinstein, 2023). For HEIs management, TEL infusion has aided them with learning delivery, effective management of students and lecturers, and efficient curricula organization. Therefore, study programs are observed to count on many courses involving TEL (Han & Geng, 2023). Although the infusion sometimes leads to disruption (Shen & Ho, 2020), TEL's

existence has made the learning process and outcomes greater.

TEL, which is perceived as various types of e-learning and refers to learning with technology (HEA, 2019, as cited by Dunn & Kennedy, 2019), has aided education by offering remote learning, especially when the pandemic hit the world. During the pandemic, the use of TEL in HEIs significantly increases due to the need to provide facilities for emergency remote teaching (ERT). Up to the present, considering the benefits offered by TEL, the trend of using TEL keeps increasing in the post-pandemic era, for example, the wide use of video communication technology, such as Zoom or Google Meet or social media in classroom learning. The most current is the emergence of AI which is not only considered to advance but also to disrupt learning (Moorhouse et al., 2023).

However, although TEL infusion provides vast advantages, its usage sometimes has not met the successful and effective implementation. Various obstacles emerge during the implementation that prevent TEL from being an effective tool for instruction. Technical problems and insufficient facilities are probably the most common issues found. These problems are not only found in developing countries like Indonesia (Mali et al., 2023) but also in other regions such as the United States of America (Alamri, 2021). Teacher and student conditions are other hindrances that impede TEL implementation. The study by Aljanazrah et al. (2022) found that students felt they had no preparation for digital courses in which TEL tools are used intensively. Some research accentuated the teacher's competence (Okoye et al., 2023), lack of experience (Johnson et al., 2016), and adaptability (Sum & Oancea, 2022) to use TEL also remains a big challenge to overcome. Moreover, insufficient infrastructure (Mali et al., 2023), financial issues (Maatuk et al., 2022), and institutional support (Johnson et al., 2016) become critical points that intrude on the effective practices of TEL integration in university life.

Those listed issues might bring various viewpoints of teachers and students when utilizing TEL in learning. Positive and negative thoughts will emerge under such circumstances. As users of TEL, their views are regarded as significant (Van Wart et al., 2020) as a starting point to evaluate course implementation and determine further strategies or policies to be implemented for the successful integration of TEL in university courses (Malik et al., 2023).

Many studies have researched the university students' and lecturers' viewpoints on using TEL either in Indonesian or abroad context. In the Indonesian context, student' positive viewpoints toward TEL were discovered due to their lecturer's readiness for using TEL (Situmorang et al., 2020). University students in Jakarta further reflect their acceptance of TEL concerning their positive learning experience (Hidayat et al., 2022). Students in North Cyprus shared mixed opinions about TEL; they saw it as beneficial but sometimes led to flatness (Ironsi, 2022). Students in Irish universities show their dominant acceptance of TEL (Durand et al., 2023) although they underline the issue of social isolation as the effect of using TEL. The teachers are also observed to have various perspectives on using TEL. In the Indonesian case, lecturers perceive the use of technology to teach significantly considering the aspect of student motivation, more contextual learning, and rich learning resources (Nahartini et al., 2018). Optimism in utilizing TEL has also been discovered, but Indonesian lecturers also emphasize the predicament of digital facilities on campus (Elihami, 2021). Mexican instructors reckon positively that TEL is beneficial to sustaining student learning passion (Mondragon-Estrada et al., 2023). Another study conducted on Nigerian lecturers unearthed their positive attitude toward TEL integration concerning the acceptance of easy use (Falade et al., 2020).

The aforementioned studies have reviewed various viewpoints and underpinning factors beyond the views by applying quantitative, qualitative, and mixed methods approaches. The current research will concentrate on similar areas to investigate students' and lecturers' views on TEL integration, using interviews as a more exploratory analysis method. Specifically, the research subjects are in a different region in Indonesia namely Garut City. This city has the potential to be portrayed in an academic context, but research on the university's digitization initiatives has not gained much attention. The findings of this study are intended to be a basis reference for policymakers to develop a digitalized learning environment. By considering the students' and lecturers' viewpoints, university management in the area can further determine the actions to take for successfully adopting TEL and advancing their HEIs' learning quality. To address the research objective, the researchers formulate the following question: how do lecturers and students view TEL infusion in the post-pandemic classrooms?.

B. RESEARCH METHODS

The present study proposes to deeply investigate the views of students and lecturers on TEL integration. To seek the answers, a qualitative descriptive method was employed. Referring to the idea proposed by Braun and Clarke (2006), this design enables researchers to fully explore or portray a phenomenon comprehensively.

The instrument used to collect the data is in-depth interviews. 12 students from the third year were questioned about their viewpoints. One lecturer teaching in their course was also interviewed. The students were selected based on criteria that fit the current research. The first criterion is the third-year students, who have been experiencing online learning since the pandemic. The second criterion is that they were chosen due to their frequent interaction with TEL in their classes. The lecturer was chosen as the research subject due to her extensive

experience in using TEL, specifically since the pandemic wave, indicating that she has much insight into TEL implementation. The students were posed with 5 questions, while the lecturer was given 12 questions. The aspects of the questions are described in Table 1 and Table 2.

Table 1. Lecturer interview blueprint and questions

Blueprint	Question
TEL infusion	1-5
Assistance provided by TEL	6-7
Difficulties when using TEL	8-10
Students' responses	11-12

Table 2. Student interview blueprint and questions

Blueprint	Question
Habits of using technology	1-2
TEL apps used in class	3
The feeling about learning online and using TEL	4
Burdens in using TEL	5

The researchers conducted the following procedures when collecting data. First, having formulated the interview questions, the researchers administered the interview with 12 students. They were interviewed in groups. The interview was carried out online via Zoom Meeting application. One researcher became the interviewer, while the rest were carefully listening to the interview, making sure that the interview was run as planned and taking notes. After the students' interview finished, a direct interview with the lecturer was conducted by one researcher. She was given 12 questions. The two interviews were delivered in semi-structured interviews.

Following Braun and Clarke (2006), thematic analysis was adapted to analyze the collected data. Initially, the researchers checked the completeness of the student and lecturer interviews and continued with data transcription. Then codes were generated to put all data in a big picture, whether the students and lecturer have positive, negative, or even mixed viewpoints of TEL. To scrutinize the data, themes were chosen based on the blueprints of the interviews. Here the researchers opted to use tables for easier data presentation. The constructed themes were then reanalyzed, just in case the researchers found irrelevant or too broad data; so, the chance to add or reduce the themes is possible here. The next phase is putting the themes into generalization, in which the researchers put the student's and lecturer's answers into more abstract concepts. The last step to conduct is locating exemplars, which was carried out by interpreting and justifying the data of the two parties' viewpoints to the currently existing literature or relevant research, to indicate the harmony or contrast. To triangulate the data, data source triangulation (Patton, 2014) was applied. The

results of the two sources were compared. The results signify the conformity of the data gained from the two sources.

C. RESULTS AND DISCUSSION
1. Lecturer's views of TEL
a. TEL infusion

Concerning TEL implementation, the lecturer was given 5 questions. The questions and answers are presented in Table 3.

Table 3. TEL infusion

Question	Answer
How do you use technology when teaching?	For assessment, i.e. quiz, for example using Kahoot!
How is your experience teaching with TEL?	Very helpful, especially when I need tools to give a quiz
Do you give directions to your students on how to use the tool?	Of course, this is their first encounter with the tool.
How do you help students who find difficulties when using TEL?	Guiding them directly and with patience.
How do you make sure that all students can use TEL?	I make them habituated to using the technology I have introduced to them.

When asked how she utilized technology in her class, the lecturer confirmed that she used technology for giving quizzes to students. One of the applications used is Kahoot. She mentioned that she got great assistance from using technology in her class, particularly for quiz delivery. It is evident that the lecturer shows her acceptance of the TEL application in her classes. Although the lecturer only uses one TEL application, her effort in implementing TEL is regarded as momentous.

She admitted to giving directions to her students on how to use the tool as she mentioned it was the first time her students used TEL in class. When the students faced difficulties, direct and patient guidance was applied to the students as new users. The lecturer also highlighted that she convinced the students to use the tool by regularly infusing the tool into the classroom session.

From the explanation, two points are identified. First, for the lecturer, TEL has assisted her with easier assessment delivery. Providing digital assessment for students in the current era is an unavoidable thing, particularly for digital native students. The significance of digital assessment in the current modern era has been stressed by Jurāne-Brēmane (2023), by noting that post-pandemic insight and knowledge are integrated. Infusing technology into classroom assessment

has also been viewed to improve efficiency (Chen, 2023). TEL applications like Kahoot are also well-accepted by students (Iman et al., 2021). On this basis, it is typical that the lecturer feels empowered by TEL.

The next point to underline is how she provides help for the students as new users of TEL: direct and patient guidance and habituation to TEL use. The findings correspond to what was found by (Carstens et al., 2021) about the necessity to guide students in technology use. Habituation to TEL use is critical because frequent exposure to TEL might enhance the possibility of success for students, for example after they graduate, i.e. at the workplace (Singh, 2021).

b. Assistance provided by TEL

The lecturer received 2 questions regarding the assistance provided by TEL. Her answers are displayed in Table 4.

Table 4. Assistance provided by TEL

Question	Answer
Do you feel assisted by teaching using TEL?	I feel assisted. It will help students in the learning process.
How do you know that the tool you use is effective?	Students' easy process when answering quizzes.

Regarding the assistance provided by TEL, the lecturer mentioned that TEL has assisted her and her students during the learning. As she usually used the TEL as an evaluation tool (for quizzes), she confirmed that the tool is effective for the students to answer the quizzes she gave them. This is in harmony with the study reported by (Fuller et al., 2022), that technology commonly used for assessment or technology-enhanced assessment (TEA) might focus on optimizing delivery. In this case, an easy process when doing quizzes is predicted to enhance the students' engagement with the assessment. Particularly, technological advancement is indeed potential for the learning assessment revolution (Chiu & Mok, 2020).

c. Difficulties when using TEL

Considering the difficulties when using TEL applications, the lecturer was given 3 questions. The answers are recorded in Table 5.

Table 5. Difficulties when using TEL

Question	Answer
What is the weakness of using TEL when teaching?	The steps when introducing the tools to my students
What problems do you encounter when using TEL?	Access to go back to the applications if we suddenly exit the application
Do you think your campus management (internal) stakeholders support the use of technology?	They are less concerned about the technology used on campus (the lecturer learns the technology development from her social media.

The lecturer admitted some obstacles when infusing TEL into her classrooms. First, she highlighted the difficulties of introducing TEL applications to the students. Her students might be familiar with many current applications but not for TEL, as they only used it for academic purposes on campus. Considering this, training for students to use TEL should be considered for its successful infusion (Carstens et al., 2021). Second, she underlined technical difficulties when accessing the applications. It is not that surprising as the disconnection issues (Pathiranage & Karunaratne, 2023) will typically emerge either in the pre-, during, or post-pandemic era. This problem is frustrating for both lecturers and students; therefore, HEIs support is necessary. Third, she felt that the campus showed less support for the use of TEL. She did not get any relevant training for TEL; she learned autodidact from her social media. Having no support from the institution is eventually not a good sign for the lecturer's competence development. Whereas borrowing the idea of Blikstad-Balas and Klette (2020), it is critical to build instructor pedagogical motivation for TEL infusion. Regarding the support for modernized learning, the university is supposed to infuse the use of TEL into its curriculum. Developing a technology-based curriculum is an urgency for them to equip the lecturers and students facing the current era. In practice, relevant and professional training for technology use can be applied. More importantly, the image built by HEIs in using technology is also critical in influencing students' choice of using technology (Dubey & Sahu, 2022).

d. Students' responses

The last aspect asked of the lecturer is her students' responses. She was given 2 questions as follows. Her responses are displayed in the following Table 6.

Table 6. Students' responses to TEL use

Question	Answer
Do your students show enthusiasm when learning with TEL?	They show their enthusiasm
What do your students think about using TEL?	They see it as something exciting

Despite all the difficulties she faced, the lecturer felt her students' enthusiasm when using TEL applications. She also noticed their acceptance of using TEL. Although the lecturer found difficulties when first introducing the TEL to them, the students still signaled their excitement. The fact indicates a good projection of the students' positive perception of using TEL. As reported by Dubey and Sahu (2021), students' positive thoughts about TEL will enhance their satisfaction with using such tools. Such a good and positive perception should be sustained by the campus management to promote a digital learning environment. Students' well-being, professional progress, and modern technology integration should be the priority (Sato et al., 2024) of campus management, to provide a more dynamic learning experience (Ratten, 2023).

2. Students' Views of TEL Infusion

a. Habits of using technology

To find out the habits of the students in using technology, they were given 2 questions. Their answers are shown in Table 7.

Table 7. Habits of using technology

Question	Answer
Are you accustomed to using digital technology such as computers, smartphones, or other electronic devices in various fields of daily activities?	S1-S12: Yes
What current applications you are using?	The current application used: AI

The interview finding points out that the students are accustomed to employing artificial intelligence (AI) in their daily lives and education. They believe this technology to be really valuable since it simplifies their duties and allows them to stay up with current advances. In general, the implementation of technology, particularly AI, has become a significant aspect of students' efficiency and progress in the middle of the industrial revolution. In conclusion, the results showed an effective complete implementation of digital technology, indicating that the students are knowledgeable and easily involved in technology.

The finding that the students have broad knowledge and adapt easily to technology is in line with previous research. Research on the way lectures are changing due to technology shows that abilities and skills in using technology are very important for the spread of learning (Mardiana, 2023). Another study on learning is the importance of communication, technology integration, and adaptability in the curriculum and teaching methods so that digital technology can be adopted effectively (Farsawang & Songkram, 2023; Zhou et al., 2023). In short, this report recommends that educators and educational institutions encourage the use of digital technology, and provide training and support so that digital tools can be used effectively.

b. TEL applications used in class

The students were also given questions about the TEL applications they use for campus. Their answers are presented in Table 8.

Table 8. TEL Applications used in Class

Question	Answer
What platform do you use for learning activities on campus?	Zoom Google Meet Google Classroom WhatsApp Canva CapCut YouTube Microsoft Office Twitter WPS CamScanner Link3 Google Spreadsheet

From the table of the interview above, the students admit to using many platforms for learning. There are popular ones such as Google Classroom, Zoom, and Google Meet which are often used to communicate and collaborate. They also use various other tools such as CapCut, Twitter, Canva, Microsoft Word, YouTube, and WPS according to their learning needs. This shows how they combine different technologies. The wide choice of platforms shows a thorough way of understanding technology. Everyone chooses different tools according to what they need and like. This all has to do with the diversity of technology used in their education. From the results of the interviews conducted, it was concluded that the use of TELL apps opens up many platform options for learning. This is in line with research conducted by Han and Geng (2023), the utilization of TEL apps suggests that students

are willing to explore different technologies to support their learning.

c. Feeling about online learning and using TEL

The students were given a question related to their feelings when online learning is implemented. The twelfth students shared their thoughts, displayed in Table 9.

Table 9. Students' feelings about online learning and TEL use

Question	Answer
How do you feel when online learning policies are implemented?	S1: The learning time is effective, but I feel bad about technical issues, power outages, and less interactive classes.
	S2: I feel lazier, and the learning is less efficient.
	S3: I feel fatigued quickly, but more efficient time.
	S4: I got stressed and tired, many assignments to finish, but positively cost me less.
	S5: I feel awkward and less interactive, but I also feel, no rush to prepare, and cost-effective.
	S6: The connection is poor.
	S7: It is cost-effective, but I see a mannerless attitude when learning online, and limited time for learning preparation.
	S8: I think it is less interactive and makes me lazier.
	S9: The learning is simpler, but I cannot directly interact with my friends.
	S10: The learning is simpler, and needs less preparation. However, I frequently feel nervous during class.
	S11: I am used to it, virtual is more okay, and the learning material can be a screenshot.
	S12: Simpler and the learning can be recorded.

The findings above indicate that technology in online learning makes the students have different feelings. Some people are happy because they can save time, but others find it difficult because technical problems make the lesson less exciting. Some lack enthusiasm, but some are shocked and tired but know that they can be more efficient. Some are stressed due to work matters but also know there are financial benefits from online learning. Some are uncomfortable and bored with online classes, but some like the relaxed atmosphere and can save money. But some don't like it because of connection problems. So, students have varying feelings about online learning, some are good but there are also problems.

Particularly, if there are issues with internet connection, using TEL can be a bit complicated for students (Doo et al., 2023). Consequently, to make the online learning experience more exciting and productive, we must know the strategies that have been proven to be effective, such as building community, asking for help from existing online teachers, and combining training with assigned assignments (Schmid et al., 2023).

d. Burdens in using TEL

The final question given to the students is whether they feel burdened academically by the use of technology and their reasons. They provided the answers summarized in Table 10.

Table 10. Burdens in using TEL

Question	Answer
Do you feel that the use of technology adds to the academic workload? Why do you feel this way?	S1: It depends on how we respond to the demands of technology use.
	S2: Some are burdensome, some are not, and depending on the course instructor.
	S3: Yes, because of the facilities I think.
	S4: Not burdening, it helps gather information.
	S5: No, technology helps me, and my technological competence improves.
	S6: Not burdened.
	S7: Lack of facilitates.
	S8: It is burdensome for me, because of limited access.
	S9: Technology facilitates learning activities, but demands technology use skills.
	S10: Depending on the task, not all tasks are easy to complete with technology because you have to learn the application first.
	S11: It helps in completing assignments.
	S12: Technology simplifies the task.

From the results of this part, it can be seen that the students have different thoughts about technology at school. Some feel that technology is cool for doing assignments and finding information, but some are a bit confused, especially if access is limited or they are not very good at using it. Consequently, it is critical to listen to their opinions so that the learning atmosphere becomes more exciting (Timotheou et al., 2023).

University management and authorities or stakeholders are expected to provide more support so that the students can be more

proficient in using technology comfortably. Apart from that, the finding also shows that technology in educational settings can sometimes be confusing, especially regarding assignments. Therefore, it is necessary to consider ways to let technology assist in organizing students' academic assignments and help them be more relaxed about online learning (Slack & Priestley, 2023).

D. CONCLUSIONS AND RECOMMENDATIONS

In the current digital era, TEL infusion into HEIs cannot be neglected. Proper implementation and adequate support to create a digitalized environment will promote learning outcomes and advance quality education. In practice, students' and lecturers' voices as TEL users should also be considered in an effort to reflect the learning.

This study demonstrates that both students and lecturers share their positive thoughts regarding the use of TEL in the post-pandemic period, as well as recognize the crucial need to integrate TEL in the era. However, there are still problems to overcome, such as technical issues, inadequate training, learning attitude, interactivity, and university support. As a result, the university management should play an active role in providing the required facilities and training for lecturers and students. Future researchers might address the issue of best practices for dealing with technical problems, improving training programs, and creating a supportive learning environment that allows for optimal integration of TEL in HEIs.

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