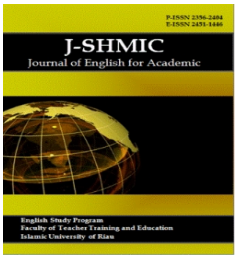

J-SHMIC : Journal of English for Academic

*ISSN : 2641-1446 (Online) ISSN :*2356-2404 (Print)
Homepage: ***https://journal.uir.ac.id/index.php/jshmic***
Vol 10, No 1, February 2023

The Implementation of Digital Technology in Online Project-Based Learning during Pandemic: EFL Students' Perspectives

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ABSTRACT

Integrating technology and digital media into project-based learning (PBL) is the best strategy for addressing the challenges of the English classroom in the digital age as well as providing an online learning alternative during the Covid-19 pandemic. This is a case study that investigates the utilization of technology in PBL and the benefits and drawbacks experienced by students. To conduct the case study, open-ended questionnaires were distributed to 118 students to get a wide range of perspectives on the implementation. The findings indicated that a numerous digital technology and tools were used to succeed in PBL learning ranging from LMS, video conferencing platforms, virtual whiteboard apps, chat and messaging, messaging and collaboration apps, Web 2.0, word processing, presentation software, graphic design or drawing tools, and photo editors. They concurred that the technology-mediated PBL was beneficial because it facilitated remote learning, offered online discussion/collaboration and feedback, was accessible and flexible, encourage creativity and allowed students to explore new knowledge as well as knowledge to produce a digital product, and also enhanced technological literacy. However, there were still significant obstacles existed especially the issues of internet connectivity and technology operation. In addition, they also had difficulties in articulating ideas using the technology and managing their time to complete the project.

KEYWORDS
Technology; Digital Media; Project-Based Learning; Perspectives

ABSTRAK

Mengintegrasikan teknologi dan media digital ke dalam project-based learning (PBL) merupakan strategi terbaik untuk menjawab tantangan kelas bahasa Inggris di era digital sekaligus menawarkan alternatif pembelajaran online di mas`a pandemi Covid-19. Tujuan dari penelitian ini adalah untuk menginvestigasi pemanfaatan teknologi dalam PBL dan kelebihan serta keterbatasan yang dihadapi oleh mahasiswa. Kuesioner terbuka diberikan kepada 118 siswa untuk memperoleh tanggapan yang beragam mengenai topik ini. Hasil penelitian menunjukkan bahwa teknologi dan alat digital yang digunakan dalam pembelajaran PBL sangat beragam mulai dari LMS, platform konferensi video, aplikasi papan tulis virtual, obrolan dan perpesanan, aplikasi kolaborasi, Web 2.0, pengolah kata, perangkat lunak presentasi, software atau tool desain grafis serta editor foto. Mahasiswa sepakat bahwa PBL yang dimediasi teknologi sangat bermanfaat karena membuat pembelajaran jarak jauh menjadi lebih mudah, menawarkan diskusi/kolaborasi online dan umpan balik, dapat mudah diakses dan fleksibel, mendorong kreativitas dan memungkinkan siswa untuk mengeksplorasi pengetahuan baru serta

KATA KUNCI
teknologi; media digital; project-based learning; perspektif

pengetahuan untuk memciptakan produk digital, dan juga meningkatkan literasi teknologi. Namun, beberapa kendala masih ada terutama masalah koneksi internet dan pengoperasian teknologi. Selain itu, mereka juga kesulitan dalam mengartikulasikan ide melalui teknologi dan manajemen waktu.

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INTRODUCTION

Project-based learning (PBL) is an important methodology since it is an innovation in learning that offers important 21st Century skills (Bani-Hamad & Abdullah, 2019; Bell, 2010; Mcmahan-Krepop, 2020; Shelly et al., 2010; Stanley, 2021). PBL is a student-centered approach that gives more opportunities for students to engage and develop their knowledge in the learning process as they gain knowledge by actively participating in personally meaningful and real-world projects (BIE, 2019) which are carried out through individual or group activities over time to produce a genuine product, presentation, or performance (Moursund, 2016; Thomas, 2000). According to Hamilton (2018) PBL encourages groups of students in investigating and resolving complicated challenges. Through PBL, students drive their learning through inquiry, as well as work collaboratively to research and create projects that reflect their knowledge, and students also learn autonomously since they are the ones who are responsible to plan and organize the project they design (Bell, 2010; Yuliani & Lengkanawati, 2017). National Research Council (as cited in Krauss & Boss, 2013) stated that supporting students throughout their educational journeys is necessary to guide them toward producing high-quality project work. The important role of teachers is to monitor, facilitate and give feedback to students during the process.

In the Covid-19 pandemic context, the significance of PBL has grown even more clear (Stanley, 2021). In early 2020, Covid-19 began to expand over the globe and had an impact on many sectors including our educational system. Tam & El-Azar (2020) mentioned that given the digital divide, new changes in educational paradigms can worsen inequality gaps rather than bring about much-needed innovation. Indonesian Minister of Education and Culture (2020) suggested that teachers and educators should apply PBL during this Covid-19 pandemic, for example by designing a group-project assignment. In addition, the shifting of face-to-face or blended learning had to be changed into online teaching-learning activities by all educational institutions in an attempt to avoid the coronavirus breakout (Oktarini, 2021). In response to that situation, integrating technology into the teaching and learning process, especially during online learning instructions was a must.

The employment of technology and digital media in the 21st Century era is not a new topic as they are pervasive and now permeate every aspect of people's lives, even in the teaching and learning process. Huang et al. (2019) explained that information technology has emerged as a key educational instrument that not only offers a plethora of information resources but

also can increase human potential and the social context in which learning may take place. They define educational technology as a wide range of learning modalities, tools, and strategies that address the inquiry, communication, construction and problem solving, and knowledge representation. Teachers must consider the increasing usage and innovation of technology and media to create a classroom environment that helps students to be more engaged in the learning process and most important to reach the instructional goals. Today's students, known as "digital learners", are heavily exposed to and rely on the internet, technology, and social media since they grew up in the digital age (Schrum et al., 2016).

Teachers must consider the expanding use and creativity of technology and media to build a learning environment that enables students to be more active in the learning process. Several ways can be utilized to deploy technology in the classroom, according to (Hamilton, 2018) including instructional uses, software and websites, non-computer tools, teacher-directed projects, Web 2.0 tools, technology centers, teacher collaborations, and project-based learning.

Moursund (2016) highlighted that information and technology-enhanced PBL is a tool for education, as it is an aid to accomplishing the mission and goals of education as PBL allows the student to conduct research projects, and requires high-order thinking skills to transform their acquired information into knowledge and use the knowledge and skill to create a product, presentation, or performance. According to Boss & Krauss (2007) the combination of project-based and technology shows encouraging signs, such as 1) projects are the main focus of the curriculum, they do not come after a "real" unit as an extra or an add-on; 2) students participate in real-world tasks and put their actual disciplinary skills into reality; 3) students collaborate to find solutions to topics that matter to the; 4) technology is used as a tool for discovery, collaboration, and communication, sending students to locations they otherwise might not visit and assisting instructors in meeting essential learning objectives in novel ways; and 5) teachers work together to create and implement projects that transverse geographical boundaries and even change time zones. We have to take into consideration five key qualities that Jonassen et al. (2003) identified as significant meaningful learning principles which are characterized as being proactive, constructive, purposeful, original, and cooperative.

The integration of technology in Project-based Learning in EFL context is not a novel concept. Studies on this integration such as social media, video, or other applications were successful to improve certain language performances, such as speaking, writing, and reading (Areti, 2018; Harisma et al., 2019; Hung et al., 2004; Poonpon, 2017; Qisthi & Arifani, 2020). While in the context of distance learning during Covid-19, PBL was conducted online by benefitting technology which has both benefits and limitations. Yuliansyah & Ayu (2021) explained that the implementation of PBL with the assistance of digital technologies for learning instruction and communication as well as learning resources greatly influenced students' motivation to learn and improve their research and teamwork skills. Students used a variety of information sources to access and research for this project. They also learned how to manage a team, communicate their ideas, collaborate, and finally create their products. Through the collaboration, they added that students' problem-solving and critical thinking were also developed. In the same breath, Poonpon (2021) found that integrating a self-generated online project improved the students' motivation, problem-solving, and teamwork skills. Additionally, it enhanced their digital and teaching abilities. However, there were certain issues faced by students such as unexpected alterations to the original plan, limitations in multimedia knowledge and abilities, challenges with team communication, poor time

management, and a lack of creativity. Likewise, online PBL aids in the development of students' 4Cs: creativity and innovation skills, communication skills, critical thinking skills, and collaboration skills (Haniah et al., 2021). In this study, the technical concerns caused by the low internet connection and the students' time management to complete the project were the two main issues that arose during the implementation of the online project-based environment. Hamilton (2018) claimed that the use of technology through project-based learning develops students' technological skills through a high level of student autonomy and student control of technology as students need both fundamental skills and digital age expertise during the learning process. They can manage and direct their learning through these skills while being supervised and mentored by an experienced teacher.

Regarding to the studies on the combination of technology and PBL conducted in the previous studies, however, little is documented about how the technology and digital media are utilized to support the PBL, as tools for online learning instruction, information discovery, collaboration and communication, and project presentation, particularly in distance learning environments. It is also considered important to figure out the assistance as well as the drawbacks that the EFL students experienced through the practice. Consequently, there is a need to investigate the students' perceptions towards the utilization of technology in a fully online course with Project-Based Learning to succeed in their project work.

For that reason, this study aimed 1) to explore the various technologies utilized by EFL students to succeed in their Project-Based Learning, and 2) to find out the difficulties and advantages faced by students to carry the learning process. These findings will add insights to teachers on the kinds of technology which are applicable to be integrated into the context of online English course using Project-Based Learning instructions and give an understanding of its implementation.

METHOD

This research used a descriptive approach to state a condition or phenomenon to ascertain attitudes toward or opinions on circumstances or practices (Sudaryono, 2018) by presenting a case study (Creswell, 2014) for the implementation of technology and digital media integration in project-based learning in the EFL classroom during distance learning. The participants of this study were 118 students from 4 classes of second-year students of Air Transport Management Department who enrolled in English course in the academic year of 2021/2022.

To collect data, the researcher used observations and questionnaires were used. The observation was done to capture the online teaching and learning process including the utilization of tools or apps. The researcher also employed a semi-structured questionnaire with open-ended questions to gather respondents' truthful and open responses (Cohen et al., 2018). The questionnaires were distributed online via Google Form to the participants. In the first section, the questions were addressed to find out any technology and digital media used by students as tools in learning instructions, communication with both teachers and other students, information inquiry, project development, and product presentation by adapting BIE (2019), Huang et al. (2019), Sulistyaningrum (2019) and Areti (2018). The second section of the questionnaire was to figure out the benefits and challenges encountered by the students during the implementation of technology-mediated online PBL.

The data gathered from both data collection techniques were then analyzed quantitatively. The analysis included a five-phased cycle: compiling, disassembling, reassembling,

interpreting data, and concluding (Yin, 2011). After the data had been compiled, the researcher carefully read and code the data. The researcher simplified the information to identify the essential aspects by creating a shorter list, segmenting sentences or paragraphs into categories, and labelled the categories. The condensed data were then reassembled and presented in thematic tables and multiple participant perspectives. The researcher interpreted and discussed the findings before conclusions were reached.

In the PBL activities, students were asked to create an English digital poster. The incorporation of technology in this learning method covered the whole stages of PBL. At the initial stage, the teacher and students brainstormed on a big theme which resulted in a list of topics on which the teaming-up would be based. Later the teacher launched the project and communicated some instructions on how to succeed in the work. Then, they planned the project by discussing the product they wanted to create, then distributing job responsibilities. Each student also conducted an initial inquiry or researched materials relating to the topic. Next, they worked together to develop the project by writing an outline and making a draft of the content of the poster. To get more feedback and to improve the content quality, each group made a live presentation to the class. They also developed the template or designed the digital poster. At the scheduled time, each group reported their final product on a platform as well as to gain feedback from the exhibition. The last stage was the assessment.

FINDING AND DISCUSSION

Technology Utilization in the Project-Based Learning Activities

To figure out what kinds of technology were used by both lecturer and students during the activities, observation, and questionnaires were used. The results of the utilization of technology in project-based learning are displayed in Table 1.

Table 1. Variety of technology utilization in the project-based learning

No.	Usages	Applications or Tools
1.	Instructional Organization of learning	LMS (e-learning, Google Classroom), Video Conferencing (Google Meet), Padlet, Virtual board (OneNote), Microsoft PowerPoint
2.	Communication	
	a. With peers	WhatsApp, Instagram, Google Meet, Zoom, Google Docs, Line, Hangouts, Telegram, Facebook, Gmail
	b. With teacher	Google Meet, Google Chat, Google Docs, Google Classroom, Gmail
3.	Learning Resources/Inquiry	LMS (e-learning, Google Classroom), Web browsers (Chrome, Mozilla Firefox, Safari, Edge), AdobeReader, WPS Office, Youtube, Google Scholar, ipusnas, Scribd, Instagram
4.	Developing Projects	
	a. Drafting Content	Word Processing (Ms.Word, WPS Office for Word), Google Docs, Notepad, Notes (built-in HP),
	b. Content Knowledge Presentation	Presentation Software and tools (Microsoft PowerPoint, Office 365 for PPT, WPS Office for PPT, Google Slide)

	c. Designing Poster	Canva, Corel Draw, Adobe Photoshop, Adobe Lightroom, Paint, PictArt, Epik
5.	Product Presentation	Google Classroom

In this study, the teacher used the learning management system (LMS) such as e-learning and Google Classroom for general classroom instruction. Google Classroom was utilized to provide any information posted related to class activities and to facilitate students' discussion or feedback, especially during the asynchronous meeting. While for synchronous meetings, Google Meet was employed for regular video conferencing. A virtual whiteboard, such as OneNote, was helpful and more effective to share or explain complex concepts to students during video conferences. Web-based discussion tools such as Padlet were also used for example to accommodate students' responses and engagement during discussions. Microsoft PowerPoint was utilized by the teacher to present the materials. This was in accordance with Bell (2010), besides transferring instructions to students by demonstrating creative uses of numerous tools and applications, it was also essential to put their appropriate uses into consideration.

Student and teacher made benefits from Google Suite as with a single Google mail account under the registered educational domain both were connected and maximized the features, particularly for communication and supporting students' collaboration and productivity, which will be explained later. The communication between students and the teacher was maintained via Google Meet during the regular face-to-face virtual meeting and messaging apps. such as Google Chat or Mail. In addition, using Google Docs, a productivity tool the instructor selected to facilitate writing collaboration, students and the teacher may add comments or provide written feedback to one other. The communication between students mostly occurred via social media. The majority of students today, or we call "millennials" are heavily exposed to and affected by social media. They are accustomed to utilizing social media platforms, for example, WhatsApp, Instagram, Line, etc., to communicate with their friends on the daily basis unexceptionally to work on the group project. Some video conferencing apps were also helpful for them to create real-time and face-to-face communications within the group.

Some information and communication technology tools or applications aided students in accessing learning resources and supporting inquiry activities. These technologies play as library resources or digital libraries (Huang et al., 2019) to provide information and knowledge related to the topic throughout the process. The teacher utilized Learning Management Systems (LMS) such as E-learning and Google Classroom to upload learning resources such as an e-book or an e-module, as well as resources in the form of links. As for accessing the electronic materials, students utilized software such as Acrobat Reader or WPS Office from their computers or smartphones. Web browsers such as Google Chrome were the most popular search engine among students. Furthermore, YouTube also helped provide audio-visual resources. A small number of students also answered that they accessed Google Scholar, ipusnas, Scribd, and Instagram.

To develop the project works Google Docs was used as the primary tool to provide a platform for students that enables them to work collaboratively in groups on a single text and allows many writers on a single document. Even though students attended remote learning from three different time zone in Indonesia, through this collaborative platform they were not required to be physically present during group work. As stated by Boss & Krauss (2007) that

such a productivity application was very useful as it enabled work-sharing without worrying about geographic boundaries and time zones.

Students could share directly their work from Google Docs or share the document on Google Drive then later edited the work or continued the collaboration on Google Docs. Through this document sharing, the teacher could monitor their workflow and give feedback on their progress. Furthermore, offline word processing was utilized by students such as Microsoft Word, WPS Office for Word, Notepad, and Notes (built-in HP).

Group conferences were also held to share the content knowledge with the class. To present their understanding several kinds of presentation software and tools were used such as Microsoft PowerPoint, Office 365 for PPT, WPS Office for PPT, and Google Slide.

To present their knowledge in a digital poster product as the final product, students employed graphic design tools such as Canva and drawing software such as Corel Draw. Other photo editors such as Adobe Photoshop, Lightroom, and PictArt, Epik, were also helpful. Some also used basic Paint which can be found on all Windows computers and Power Paint to create the poster.

After finishing the project, they were instructed to publish their digital poster in .jpg or .jpeg image format on Google Classroom. The posters were on display for a week to receive comments and feedback from friends before being finally graded by the teacher.

Benefits and Challenges of Online PBL with Technology Incorporation

During the whole stages of online PBL with technology incorporation, students encountered several benefits and drawbacks related to the utilization of the provided and chosen applications, tools, or media to carry out the learning activities and also complete the project assignments. The students' responses to the open-ended questionnaires revealed certain emergent themes encompassing the benefits and challenges, as presented in Table 2 below.

Table 2: Students' responses to benefits and challenges of technology in online PBL

Benefits	Challenges
1. Facilitate remote learning	1. Poor internet connection
2. Provide discussion/ collaboration room	2. High demand for internet quota
3. Provide feedback	3. Unfamiliar with the tool features
4. Accessible and flexible	4. Limited/paid features
5. Promote creativity	5. Idea Creation
6. Explore new knowledge	6. Time Management
7. Provide knowledge to create a digital product	
8. Enhance technological literacy	

Benefits of PBL with Technology

Students benefited greatly from the PBL's technological integration. Technologies made project-based instruction in remote learning possible.

"Our distant learning and project work can be facilitated in effective and efficient ways (with the use of technology)." (Q2S2)

"(I) can follow the learning process easily and effectively from home." (Q2S88)

"(We) can work on the projects together at a distance." (Q2S51).

The utilization supported and maximized the learning process, connecting both teacher and students to carry the lessons both in real-time or asynchronously.

Communication among students and students with the teacher was maintained using digital tools or social media or messaging apps, where they held both oral and written conversations.

"(Digital technologies) facilitate communication with the teacher and friends at ease." (Q2S37)

"The benefit of using these tools is that they do not limit space and time so that we can communicate and have discussions without direct face-to-face." (Q2S57).

Students were also encouraged to collaborate and give feedback to the group members via Google Docs. Through these collaborative apps, it was easier for students to receive and ask for feedback and discuss their progress with the teacher too.

"The teacher can provide us comments or corrections on our progress more easily." (Q2S23).

For instance, the teacher wrote comments or suggestions for ideas and improvement for either grammatical features or topic understanding on each group's work when the students shared their project content proposals, such as the outline or draft. The primary method for giving oral feedback was Google Meet, particularly when the group shared the knowledge they had learned about a particular topic with the class. Direct feedback was mostly given at the end, both teacher and students outside the group presenters had the same opportunities to ask for confirmation as well as to offer constructive feedback and criticism.

Digital technology made learning resources accessible as they could easily access and study materials offered on LMS (Sari & Putri, 2022). Internet access provides a massive online collection of resources. They also could access it at their flexible time.

"(It is) easier to find information and wider coverage through the internet." (Q2S5)

"I can access information easily and quickly." (Q2S38)

"(It is) much more practical and easier to explore the material". (Q2S58)

The majority of students responded that they became more creative as they could use digital tools and apps to explore and communicate their ideas in completing project work, similar to the previous studies (Bell, 2010; Haniah et al., 2021; Santhi et al., 2019; Sukerti & Susana, 2019). The digital English project craves students' creativity in providing informative and well-designed products.

"We can enhance our creativity." (Q2S15)

"(I was) taught to be creative to do the projects." (Q2S81)

In addition to encouraging creativity, the use of technology equipped them with the expertise to produce digital English posters or digital products, as well as the knowledge to learn the technology itself which was new for them.

"(I) can take advantage of various applications, and can also develop knowledge about online poster editing applications, thereby adding to our skills and abilities in today's digital world." (Q2S1)

"We now have access to and try technologies that we have never used and operated before." (Q2S20)

"This project-based work made it easier for me to edit the poster as the tool (Canva) provides many kinds of motifs and designs." (Q2S117)

Finally, they expand their technology literacy and learn new information. Students build technological skills (Hamilton, 2018)

"I can use the advantages of technology to widen my horizons, learn more about current technological advancements, and accelerate my ability to get the information and knowledge I need to finish projects." (Q2S38)

"(I) gain more knowledge and insight by using new applications, learn new things." (Q2S90)

Challenges of PBL with Technology

During the project-based learning using technology, students encountered some challenges. As the learning process was conducted via an online environment, the internet was very important for both the teacher and students to keep connected. The main issue students encountered was that they had unstable internet connections and were unable to access the internet even. This is due to the vast range of geographical issues that lead to infrastructure limitations and inadequate internet access, especially for students in rural and distant places (Septianingsih & Erliza, 2021; UNICEF, 2020)

"It is challenging to access the applications or website because of the poor network." (Q1S44)

"I live in a remote village and have hardly any internet access, in addition when blackouts happen, we completely lose the connection." (Q1S75).

This problem frequently impeded the learning process during the synchronous meeting and also their project work. The accessibility to the internet determined whether or not learning could occur in the remote teaching scenario (Alifia, et.al. cited in Yani (2021)).

The inability to purchase an adequate internet allowance and or a high demand for internet quota for online learning is another issue brought on by the financial situation (Atmojo & Nugroho, 2020). Students should stay connected online with the teacher and other students during distance learning for example to communicate, access learning resources, collaborate, make digital products, and so on., while some tools and applications needed lots of internet quota.

As they utilized tools or applications while working on the project, some explained that they did not know how to operate such technology as they were not familiar with the features.

"There are still many new features that must be learned in the app that I use". (Q1S147)

This is in line with Fathali et al. (2020) and Santhi et al. (2019) who said that students lacked knowledge about the technology and the skills to use it.

Teachers have control over the usage of instructional tools (digital equipment) when they are utilized by them (Hamilton, 2018) but not when the tools are chosen and operated by the students themselves.

Students in this project used some drawing or design software or apps to create digital posters, unfortunately, some of them found a kind of limitation. They only used the available basic features and were unable to use the program's features to their full potential while working on the project because they needed to pay extra for some premium features.

Although, most of the students agreed that become more creative some of them revealed that they had difficulties using the technology to articulate and communicate their ideas.

"I had to adjust my inspiration or ideas on to the program I was using". (Q2S23)

Only a few students admitted that time management was a challenge for them. According to Sumarni (2013) the main factor of time management issues was a lack of time to complete the job. The issue in this study, which was a minor finding, was specifically how they matched their availability for real-time group discussion.

The findings show that the combination of project-based and technology that the project was the main focus of the curriculum where students participated actively doing tasks by benefiting technology as a tool for discovery, collaboration, and communication, as well as assisting learning instructions. It also encouraged students and teachers to collaborate to conceive and implement projects at distance and in separate time zones. In this study, students were given vast choices to select their tools and programs to carry out the PBL and to complete the project based on their needs and technological ability. The results suggest that digital technology can facilitate remote learning, collaboration and feedback, information accessibility, and new knowledge exploration as well as develop creativity, knowledge to produce digital products, and technological literacy which gave meaningful experiences for them. While following the project timeline, however, students had to deal with a variety of previously described obstacles, including those related to the internet connection, tool or system expertise, and also group communication in their journey to develop and create the project work.

CONCLUSION

The major goals of this study were to explore the various technologies utilized in project-based learning in an English course, as well as the difficulties and advantages faced by students who were taking the online course. The first finding revealed that diverse technology, tools, and applications were used in the teaching and learning with PBL by both the teacher and students. Technology and digital media play a significant role in 21st century education, especially during the total shifting to online learning mode during the Covid-19 pandemic. They integrated the technology to deliver teaching instructions, access learning resources and conduct inquiry, communicate with the teacher and among students, and also work on digital English posters as a group project. The technology utilization in this study covers Learning Management System (LMS), video conferencing platforms, virtual whiteboard apps, chat and messaging, messaging and collaboration apps, web-browsers, word processing, presentation software, graphic design, or drawing tools, and photo editors.

This technology-mediated PBL was perceived positively by students has significant benefits as it facilitated remote learning, provided online discussion/collaboration and feedback, was accessible and flexible, fostered creativity and allowed students to explore new knowledge as well as knowledge to create a digital product, and finally enhanced technological literacy. During the implementation, however, students encountered some problems such as unstable internet connections, particularly in rural areas. Although they were given the discretion to select the tools and apps. specially to communicate, access the available resources, and develop their works, their progress was still hampered by issues with tool or application features that also hindered their progress, such as being unable to use premium features or operate new programs or systems. Students struggled to express and convey their ideas and opinions using the technology and were also challenged with time management.

Regarding to the characteristics for 21st-century learning, students should ideally possess the knowledge and abilities to learn efficiently and live productively in a digitally-enhanced society. This research finding highlights, particularly from the perspective of students, the resources, tools, and applications available benefitted by the students to facilitate all the activities in online Project-based Learning. However, it was also revealed that some students still faced challenges in operating digital technology. Therefore, it is suggested that further research in this area need to delve deeper into the topic of students' technological skills. The advantages and obstacles emerged during this study can be informed as consideration for the future teaching and learning practices on the same theme. Furthermore, as a part of teacher professional development, teachers are suggested to familiarize with technology innovations and continually develop their technology and digital skills in order to support and provide more effective and better assistance to the students.

REFERENCES

Areti, K. (2018). Project Work and Information and Communication Technologies in the Teaching of English as a Foreign Language. *Journal of Linguistics and Literature*, *2*(1), 20–24. https:/doi:10.12691/jll-2-1-3

Atmojo, A. E. P., & Nugroho, A. (2020). EFL Classes Must Go Online! Teaching Activities and Challenges during COVID-19 Pandemic in Indonesia. *Register Journal*, *13*(1), 49–76. https://doi.org/10.18326/rgt.v13i1.49-76

Bani-Hamad, A. M., & Abdullah, A. H. (2019). The Effect of Project-Based Learning to Improve the 21st Century Skills among Emirati Secondary Students. *International Journal of Academic Research in Business & Social Sciences*, *9*(12), 560–573. https://doi.org/10.6007/IJARBSS/v9-i12/6749

Bell, S. (2010). Project-Based Learning for the 21st Century: Skills for the Future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(2), 39–43. https://doi.org/10.1080/00098650903505415

BIE. (2019). *Your Project Based Learning Journey A guide for teachers*.

Boss, S., & Krauss, J. (2007). *Reinventing Project-Based Learning Your Field Guide to Real-World Projects in the Digital Age* (First). International Society for Technology in Education.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* (Eight). Routledge.

Creswell, J. W. (2014). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches* (Fourth). SAGE.

Fathali, S., Marandi, S. S., & Okada, T. (2020). Beyond the language classroom: A case of Japanese EFL students' engagement with ICT. *Computer-Assisted Language Learning Electronic Journal*, *21*(2), 150–175.

Hamilton, B. (2018). *Integrating technology in the classroom: tools to meet the needs of every student* (Second). International Society for Technology in Education.

Haniah, A. U., Ngadiso, N., & Setyaningsih, E. (2021). Students' Perception on the Implementation of Online Project-Based Learning in Teaching 4Cs. *IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics)*, *6*(1), 123. https://doi.org/10.21093/ijeltal.v6i1.895

Harisma, I., Ilmiah, G., & Siliwangi, I. (2019). Improving Students' Writing Ability through Project Based-Learning Using Visual Media. *Professional Journal of English Education (PROJECT)*, *2*(3), 364–370.

Huang, R., Spector, J. M., & Yang, J. (2019). *Educational Technology Educational Technology: A Primer for the 21st Century* (R. Huang, Kinshuk, M. Jemni, N.-S. Chen, & J. M. Spector, Eds.). Springer. http://www.springer.com/series/11777

Hung, V. H. K., Keppell, M., & Jong, M. S. Y. (2004). Learners as producers: Using project based learning to enhance meaningful learning through digital video production. In R.

Artkinson, D. Jonas-Dwyer, & R. Philips (Eds.), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference*. http://www.ascilite.org.au/conferences/perth04/procs/hung.html

Jonassen, D. H., Howland, J. L., Moore, J. L., & Marra, R. M. (2003). *Learning to Solve Problems with Technology: A Constructivist Perspectives*. Merrill Prentice Hall.

Krauss, J., & Boss, S. (2013). *Thinking Through PROJECT-BASED LEARNING. Guiding Deep Inquiry*. Corwin.

Mcmahan-Krepop, J. M. (2020). *Social Media Technology Usage in Project-based Learning: A Case Study* [Dissertation]. Concordia University.

Moursund, D. (2016). *Project-Based Learning Using Information Technology*. http://i-a-e.org/downloads/free-ebooks-by-dave-moursund.html.

Oktarini, W. (2021). Students' Perception on the Online Learning: A Case Study of EFL Learners. *Edulingua: Jurnal Linguistics Terapan Dan Pendidikan Bahasa Inggris*, *8*(2), 65–71.

Poonpon, K. (2017). Enhancing English Skills through Project-Based Learning. In *The English Teacher: Vol. XL*.

Poonpon, K. (2021). Integrating Self-Generated Online Projects in an ELT Class at a Thai University during the COVID-19 Pandemic. *Asia Pacific Journal of Educators and Education*, *36*(2), 183–203. https://doi.org/10.21315/apjee2021.36.2.10

Qisthi, N., & Arifani, Y. (2020). The Application of Project based Learning via Instagram to Improve EFL Students' Speaking Skill. *Borneo International Conference on Education and Social Sciences (BICESS 2018)*, 201–209. https://doi.org/10.5220/0009018802010209

Santhi, D. D. Y., Suherdi, D., & Musthafa, B. (2019). ICT and Project-Based Learning in a Rural School: an EFL Context. *Advances in Social Science, Education and Humanities Research*, 29–35.

Sari, M. I., & Putri, A. A. (2022). Exploring Online Learning Tools Used by EFL Teachers during the COVID-19 Pandemic. *Journal of Foreign Language Teaching and Learning*, *7*(1), 61–76. https://doi.org/10.18196/ftl.v7i1.13407

Schrum, L., Niederhauser, D. S., & Strudler, N. (2016). Competencies, Challenges, and Changes: A US Perspective on Preparing Twenty-First Century Teachers and Leaders. In J. M. Spector, D. Ifenthaler, D. G. Sampson, & P. Isaías (Eds.), *Competencies in Teaching, Learning and Educational Leadership in the Digital Age*. Springer.

Septianingsih, P. A., & Erliza, S. (2021). Urban and Rural Area Graduate Students' Perceptions toward Synchronous English Learning amidst Covid-19 Pandemic. *Journal of English Language Teaching and Linguistics*, *6*(3). https://doi.org/10.21462/jeltl.v6i3.641

Shelly, G. B., Gunter, G. A., & Gunter, R. E. (2010). *Teachers Discovering Computers: Integrating Technology and Digital Media in the Classroom* (Sixth). Course Technology.

Stanley, T. (2021). *Project- Based Learning for Gifted Students; A Step-by-Step Guide to PBL and Inquiry in the Classroom* (Second Edition). Routledge.

Sudaryono. (2018). *Metode Penelitian*. Rajawali Press.

Sukerti, G. N. A., & Susana, K. Y. (2019). Fostering Students' Presentation Skill Using Infographic: The Implementation of Project-Based Learning in English for Specific Purposes. *IJIET (International Journal of Indonesian Education and Teaching)*, *3*(2), 227–239. https://doi.org/10.24071/ijiet.v3i2.1940

Sulistyaningrum, S. D. (2019). ICT-Based Learning in Public Speaking at English Language Education Study Programme. *Advances in Social Science, Education and Humanities Research*, 812–817.

Sumarni, W. (2013). The Strengths and Weaknesses of the Implementation of Project Based Learning: A Review. In *International Journal of Science and Research* (Vol. 4). www.ijsr.net

Tam, G., & El-Azar, D. (2020, March 13). 3 ways the coronavirus pandemic could reshape education. *World Economic Forum*. https://www.weforum.org/agenda/2020/03/3-ways-coronavirus-is-reshaping-education-and-what-changes-might-be-here-to-stay/

Thomas, J. W. (2000). *A Review of Research on Project-Based Learning*. http://www.autodesk.com/foundation

UNICEF. (2020). *Strengthening Digital Learning across Indonesia: A Study Brief*. https://blogs.worldbank.org/eastasiapacific/COVID-19-and-learning-inequities-indonesia-four-ways-bridge-gap

Yani, A. (2021). English Teachers' Perception on the Quality of Online Learning during Covid-19. *Journal of English Language Teaching and Linguistics*, *6*(2), 471. https://doi.org/10.21462/jeltl.v6i2.600

Yin, Robert. K. (2011). *Qualitative Research from Start to Finish.* New York: The Guilford Press.

Yuliani, Y., & Lengkanawati, N. S. (2017). Project-based learning in promoting learner autonomy in an EFL classroom. *Indonesian Journal of Applied Linguistics*, *7*(2), 285–293. https://doi.org/10.17509/ijal.v7i2.8131

Yuliansyah, A., & Ayu, M. (2021). The Implementation of Project-Based Assignment in Online Learning during Covid-19. *Journal of English Language Teaching and Learning (JELTL)*, *2*(1), 32–38. http://jim.teknokrat.ac.id/index.php/english-language-teaching/index