



## A Narrative Inquiry into an EFL Teacher: How is the ICT Used to Optimize Project-based Learning?

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### Abstract

Internet and technology innovation has traditionally been employed in education as a learning and teaching tool. Research and publications also have been examined and found to be associated with significant outcomes. In today's age, technology and the internet have its own place in education, forcing students to employ 21st-century technology skills. Meanwhile, the other research reports that project-based learning (PjBL) is open-ended, allowing students to incorporate even more technology. This narrative inquiry research reports the stories based on the teacher's experience in integrating technology and the internet in PjBL. The stories were collected through written (i.e., narrative frame) and oral narratives (i.e., face-to-face semi-structured interviews) and conducted using Bahasa Indonesia to explore the stories in detail. The open-ended questions adequately facilitated our exploration of the teacher's stories. We found that learning activities in "Local Wisdom" PjBL incorporate technology and the internet under two themes: technology and the internet are used to access knowledge and information and to create media products. The stories told could remind teachers that the use of technology and the internet in PjBL is not only limited to a mediator for delivering the material; this could galvanize the teachers into involving students to be more active in using technology and the internet.

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## INTRODUCTION

Starting in 2001, or the best-known 21st century, people faced unprecedented technological advancement; everything in every sector (i.e., social, economic, and even education) needs and involves technology. Arguably, in this digital age, people no longer have any opportunity to evade the influence of technology and the internet. Prensky (2010) pointed out that the transformations that happened in the digital era are inevitable. The information and the digital age have brought people to new ways of life, where people are challenged to have the ability to operate, use technology, and choose information wisely—technology innovations are constantly emerging, and the volume of information is doubling every hour or even every second.

Two decades ago, Prensky (2001) coined the term “digital natives” to describe the kids or students who grew up in the technological age. Although we do not completely endorse the idea, especially because we do not see today’s kids as the best in terms of their digital literacies, we see that the term gives the teachers the responsibility to let the students use technology. Additionally, technological advancement and innovations in education influenced the expectation for teachers to facilitate learning that could develop students’ 21st century skills, especially technology skills. Digital technology is becoming a fundamental part of student’s education (Prensky, 2010). In short, technology and education always stick together. Increasing the frequency of technology use among students enhance their readiness to live in a technology-driven future (Stanley, 2022).

Research and publications undertook and examined varied innovations of technology in education. It has to be found associated with positive outcomes (Driscoll, 2010; McKnight et al., 2016) for the students. The success of technology used in the classroom is not determined by how advanced the application is, but rather by the extent to which it facilitates teaching and learning (McKnight et al., 2016). The other research found that to make students familiar with technology, it is better to encourage

peer-to-peer sharing and learning (Such, 2019). It indicates that as the 21st-century teacher who has experienced rapid technological advancement in current days, extra attention needs to be paid to integrating technology in the classroom—principles, preparations, etc. Teachers’ professional development needs to be targeted to improve teachers’ values in terms of enhancing technology-related skills (Bowman et al., 2020).

Meanwhile, in the area of research teaching and learning English, technology and internet integration yield significant outcomes (Rintaningrum, 2023; Zhang et al., 2021; Zhang et al., 2023). In the previous studies, the technology innovations are measured and examined in isolated language skills such as writing (Foulger et al., 2007; Marzuki et al., 2023; Such, 2019), speaking (Rintaningrum, 2016; Ya-Ting et al., 2020), vocabulary (Zhang et al., 2023), reading (Khazaie, S., 2023; Qiaou et al., 2023; Zachoval, 2013). Previous studies also not only examined and saw the effect of technology used in the student’s learning outcomes but also much of the studies focus on the teacher. For example, Abraham et al. (2022) revealed how Information and Communications Technology (ICT) training for teachers significantly affects teachers’ pedagogical knowledge and English language proficiency. On the contrary, Gracia et al. (2022) saw that the definition of technology in the classroom has not kept pace with the rapid technological advancement in society. It was implied that we (teachers and researchers) must keep the technology used in teaching and learning activities and adjust it to keep up with technological innovation in education. In response, Hidalgo and Abril (2022) examined how crucial digital literacy is for 21st century teachers. “Today’s world is inevitably digital, and educators must be prepared to face these new challenges” (Hidalgo & Abril, 2022, p. 8).

In relation to the discussion of how vital technology integration is in education, project-based learning (PjBL) was introduced as an open-ended approach that could give students more opportunities to incorporate technology (Stanley, 2021). PjBL is not a new approach to education. Since the 18th century, this method, which uses

real-world situations as a means of teaching, has recently been adopted in the educational field (i.e., with the different term “the project method”) as a means of improving educational outcomes (Wurdinger, 2016). Since then, PjBL has been considered for varied disciplines to give a new experience and meaningful learning for them to locate in lifelong learning. The theory of constructivism, upon which this strategy is based, advocates for students to take an active role in their learning activity rather than merely passively listen to the teacher’s presentation. Therefore, PjBL has widely been recognized as an effective approach to accomplishing vital goals. In PjBL, learners can control what they learn, how they learn, and how they express their learning. Because they transmit in purposeful ways, their project matches its function (e.g., inventing, entertaining, persuading, motivating, or inspiring) (Bender, 2012; Krauss & Boss, 2013; Steenhuis & Rowland, 2018).

Many research and publications in every discipline have tried integrating technology into PjBL (Chanlin, 2008; Foulger et al., 2007; Gubacs, 2004). Chanlin (2008) states that technology was critically helpful in supporting students’ work in PBL and reporting their work. Similarly, teachers felt that integrating technology in PjBL could enhance students’ technology skills and use technology to help them in the learning process (Foulger, 2007).

In the Indonesian curriculum, PjBL was recently adopted in the “Emancipated Curriculum” and became a mandatory learning activity that has to be followed by the students. Nevertheless, despite the adoption of the Emancipated Curriculum, there has been a dearth of scholarly research on the topic of PjBL. Therefore, this research focuses on the stories-based experience—exploring the stories of an English language teacher after integrating technology in the PjBL—to maintain the idea of technology integration in the PjBL. By using a narrative inquiry, this research invites the readers to rethink and reevaluate their views and experiences of PjBL-integrated technology.

## **An Overview of PjBL**

PjBL is extensively researched in education as a teaching method that provides a challenging learning activity and requires a high level of thinking. PjBL equips the students with the skills necessary for today’s digital age: critical-thinking, collaboration, communication and creativity (Almazroui, 2023). From across disciplines, PjBL is considered as the teaching method that could give a new experience and meaningful learning for them to locate in lifelong learning (Yamada, 2021; Varro & Gorp, 2021)

Larmer et al., (2015) highlights that PjBL is focused on how learning can engage the students to deal with the skills in the twenty-first century:

“...is a powerful teaching method that helps students meet standards of today’s world situation that demand a student as a problem solver, responsible, work well with others, can work independently, critical thinker, confident, manages time and work effectively, and communicates well with a variety of people” (p. 1).

The theory of constructivism, upon which this method is based, advocates for students to take an active role in their learning activity rather than merely passively listen to the teacher’s presentation. Therefore, PjBL has widely been recognized as an effective approach to accomplishing vital goals. In PjBL, learners can control what they learn, how they learn, and how they express their learning. Because they transmit in purposeful ways, their project matches its function (e.g., inventing, entertaining, persuading, motivating, or inspiring) (Bender, 2012; Krauss & Boss, 2013; Steenhuis & Rowland, 2018).

## **PjBL and 21<sup>st</sup> Century Skills**

After defining PjBL and exploring what we should do (as a teacher) in response to the 21st century learning, it is critically seen that PjBL is a very related and appropriate method for 21st century learning because it encompasses varied skills necessary for 21st learning. Being involved in PjBL means the students can do more than memorize knowledge and instead apply necessary skills (e.g., deep learning, critical

thinking, communication, collaboration, and creativity) (Stanley, 2021) and build the ability to solve the problem. Teamwork is the key competence in the 21st century workplace, and it will be hard if people do not have collaborative and communicative skills.

Meanwhile, in PjBL, collaboration is emphasized because PjBL is conducted in collaborative work. However, without any technology intervention in PjBL, supporting learning that cultivates 21st century skills seem less efficient. 21st century students are savvy with and enthusiastic about a wide range of technological resources. Nowadays, a massive amount of information from the internet broadens their knowledge and sources of their project. However, it needs critical thinking to choose or decide which information that appropriate for the project. Allowing the students to use and involve technology in undertaking PjBL will give the students an experience that offers a real-life situation where we live in the era of technology.

### **ICT and PjBL**

ICT has become a fundamental aspect that needs to be paid more attention to in the classroom. Stanley (2021) addressed that “The more often students use technology, the better prepared they will be to live in the world where technology is dominant” (p. 92). Because ICT is constantly advancing, it is important to stay up to date with ICT. Not only that, ICT has also transformed the workplace—unprecedentedly. In bridging the gap, education has a potential role in teaching the ICT skills necessary for today’s modern age. In line with that, “PjBL is fairly open-ended; students could take it even further by incorporating even more technology” (Stanley, 2021, p. 37). In PjBL, the integration of ICT is often used as a cognitive tool. Foulger and Silva (2007) shared the teacher’s perception of involving ICT in the writing class: ICT allowed authentic communication among peers, ICT expanded communities across geographic boundaries, and ICT increased motivation. Additionally, the involvement of the internet and information access in PjBL helped students

acquire basic research habits that will serve them well later in their lives (Dooly & Sadler, 2016).

## **METHODS**

This research used a qualitative approach to unravel the teacher’s experiences in terms of technology used in PjBL. The following descriptions below explain it in more detail.

### **Narrative inquiry**

The recent research adopted a narrative inquiry methodology. Narrative inquiry is generally known as stories or narratives used for the research data. However, drawing upon Barkhuizen et al., (2014), narrative inquiry is categorized into two forms: narrative analysis and analysis of narratives. In narrative analysis, narrative data (e.g., written and oral stories) are used to be analyzed; meanwhile, in the analysis of narrative, non-narrative data is produced and articulated as stories.

In line with the purpose of the research, “exploring the teacher’s experience in incorporating technology and the internet in PjBL,” we employed narrative analysis in this research. Cladinin (as cited in Barkhuizen et al., 2014) explain that “narrative inquiry is a way of understanding experience.” Narrative inquiry invites the readers to rethink and reevaluate their experience, especially in teaching. Narrative inquiry seems an appropriate method to place the teacher in an optimal space to elucidate how technology and the internet have been implemented in PjBL to help the students enhance their technology skills.

### **Collecting stories**

There are two types of data collection in narrative inquiry: oral and written narratives (Barkhuizen et al., 2014). This research employed written (narrative frame) and oral narratives (semi-structured interviews). The semi-structured interview serves open-ended questions, where follow-up questions are allowed once the researcher needs further exploration, explanation and clarification. We refer to Trilling and Fadel’s (2010) and Stanley (2021) framework to design

the interview questions. Since the participant's mother tongue is Bahasa Indonesia, and she felt comfortable telling the stories and experiences in Bahasa Indonesia, we interviewed the teacher in this language. The interview was also conducted face-to-face and recorded. In the end, we transcribed the conversation. This narrative research creates a deeper relationship between the researcher and participant; therefore, this qualitative research considers ethical considerations—to protect the teacher's identity, researchers did not reveal the participant's name and assign a pseudonym (Clara).

### Analyzing stories

The data were analyzed thematically. The thematic analysis would reveal patterns and themes relevant to the issues aroused. We adapt the thematic analysis stages of Braun and Clarke (2022). According to Braun and Clarke (2022), there are five stages in conducting thematic analysis. This research used four stages of thematic analysis. However, it does not mean we ignore the one stage of Braun and Clarke (2022); we merge it into other stages instead. The stages are described below:

First, it starts with data familiarization. We read carefully the data transcription of the interview. Additionally, to familiarize with the data, we transformed the data into segments and numbered those segments.

Second, coding and generating initial themes. In this stage, we read the segments and identify the codes potentially relevant to the research purpose and topic. Before deciding on the codes, we went to the relevant literature review. To separate the data easily based on the themes, we designed a table that consists of themes, quotation.

Third, developing, reviewing, defining, and naming the themes. In this stage, we re-checked and read the segments by going to the entire segments to ensure the accuracy of the themes: Are there any themes left? Not only that, we also checked the themes: Does each theme tell a convincing story about important patterns across the dataset in relation to the research questions? Braun & Clarke (2022) highlighted

that “themes may be collapsed together; one or more may be split into new themes; candidate themes may be retained; some or all may be discarded” (p. 90).

Last, writing up. We tried to weave together the extracted data to report and create a coherent story.

## RESULTS AND DISCUSSIONS

Clara (a pseudonym) was an experienced English language teacher who had implemented PjBL and integrated technology into her PjBL. Her recent project was the “Local Wisdom” project—part of an Emancipated Curriculum program. When Clara was asked to explain how she maximized technology in PjBL, she mentioned that technology and the internet were utilized in “Local Wisdom” PjBL.

“I used technology to help me show an overview of what kind of PjBL will be conducted, for example used a power point and used technology to show the students some video documentary examples before we started the project.”

This segment of the narrative implied that the teacher operated and handled the use of technology. The activity seems less interactive between students and the technology itself. Today's situation sets the expectation for people to be more familiar with technology. Implicitly, “...let the students use technology and never use technology for them” (Prensky, 2010). Prensky (2010) emphasizes that the teacher's job is to guide the students to use technology for learning. However, Clara's stories do not just stop at that point.

Further, she shared the experience of how the students in PjBL maximize technology and the internet. Based on her narratives, we found that students' activity in PjBL of using technology and the internet are under two themes—technology and the internet are used to access information and to create the media product. Further explanation is presented below.

### Accessing the information

Living in this unprecedented era, with the rapid rise of information and communication technology, people must be able to use technology and the internet effectively. The technology revolution and globalization have profoundly impacted people's lives in the 21st century. Education needs to see technology's growing capacity for intervention in the world (Gounari, 2009). Teaching students and engaging them in real-world situations is mandatory for educators.

Based on Clara's stories, in "Local Wisdom" PjBL, the students employed the internet and technology to access the information. The students were given access to the internet and told to conduct research on the topic of interview questions by consulting various online resources: "Well at first, they generated the question independently in group, but then I allowed them to use internet access to search and find reference of the questions." Instead of obtaining the information by fieldwork, direct observation, the sources of information expanded to include secondary sources. Takahira et al. (2007) research result shows that the use of the internet had the most potent effect on students' information skills. They had to make sure the questions were pertinent to their project theme in light of the vast amount of material and sources available online.

Students' jobs are not merely taking the information passively but rather thinking critically and creatively (Stanley, 2021). Accessing the information means assigning the students' role as a researcher. Prensky (2010) mentioned that when technology and the internet are involved in learning activities, teachers have to assign roles for the students, whether they become researchers, technology expert, thinkers, world changers or even self-teachers.

The students access the internet to find the facts, information, and knowledge to support their data interview for the product.

"Because the data taken is only interview, so they need another information, knowledge and fact from the internet sources that appropriate and relevant to the historical sites we visited. I allow them

to use YouTube videos, relevant websites, books, etc."

Clara further elaborates on her idea of freedom to access any kind of sources.

"Yeah, it's opened for them, as long they did not misuse the internet used such as open the social media "Instagram", that is out of the context. For example, the sources are from YouTube that's Ok, as long it is relevant."

The freedom of information access offered by the teacher demands students to ensure the information is credible, accurate, and reliable (Trilling & Fadel, 2009). Living in today's age, the richness of information on the internet with numerous types encourages people to search, access, evaluate, and use information or sources critically and accurately (Trilling & Fadel, 2009).

### Creating media product

Surrounded by digital media and options, 21st-century students should know how to use media resources for studying and developing communication products (Trilling & Fadel, 2009). Clara's story revealed that the final product of "Local Wisdom" PjBL was a documentary video. Yang (2013) admitted that conducting video projects provides students with the opportunity to develop their media and video production skills and express their ideas through video. Besides that, multimodal compositions in video-making create students' self-structured and self-motivated knowledge construction process (Yang & Yeh, 2021).

Creating the final products obviously needs information and communication technology (ICT) tools. Clara described that:

"To record the video, they usually used a mobile phone camera, and to capture the activity they used a digital camera and to make a documentary video they need a technology or equipment; I allow them to use mobile phone and laptop to edit the video."

In this segment, Clara explained that multiple tools were genuinely open for the students to support their works in making documentary videos. Clara offered students choices. By dealing with this, her roles in the PjBL must also be carefully considered. Arguably, the teacher cannot leave them alone to

work on the project but instead act as a coach and guide (Stanley, 2021).

Further, Clara explained the detail activity of students in using technology and the internet.

“Each group should bring a laptop or at least one laptop and mobile phone. The students had to operate a laptop to use, choose, and download the media creation tools to create a compelling documentary video. I saw them used cap cut application.”

From Clara’s quotation, the students possess the autonomy to select any editing tools they deem suitable for producing a documentary video—taking into consideration their own strengths and abilities. The abilities include knowing how to operate, navigate, and understand how materials are organized in a digital space (Casal & Bikowski, 2020). It also takes a high level of media literacy skill; since there is a wide range of video editor tools, the students had to search and select the appropriate video editor application to help them create the documentary video. (Casal & Bikowski, 2020).

Even though Clara gave her students the freedom to choose a video editor tool, Clara made sure the students chose appropriate and knew about the application.

“I ask them “what application do you use to edit the video?” and they answered “capcut,” then I asked “why do you use it?” they answered “because I know it and have used it” and also the application is available for laptop and mobile phone, so it can be edited from those stuff.”

By giving them personalized learning tools, Clara said: “I saw them enjoy editing the video, fewer difficulties, they just need more time to edit the documentary video.” She added: “They could operate the application and tried to take the initiative to try every single tool on the application.” Successful learning with technology and internet resources relies on the agentive deployment of a range of behaviors (Casal & Bikowski, 2020).

As a facilitator, Clara continually monitored them: “Sometimes I ask them “Are there any difficulties? If they felt difficulty, they ask me, “Ms. How to...? They directly asked me, and I will help and guide them right away to

maximize the time.” The phrase “I will help them” does not show the role of the teacher as a facilitator; it tends to indicate that Clara helped the students solve the problem. On the other hand, Stanley (2021) criticizes that in PjBL, the role of the teacher is to provide support, feedback, and guidance, not give them answers and solutions.

Clara’s story continues by finding that some unintended things happen in her classroom when technology and the internet are involved in teaching-learning activities: “Sometimes, I saw them open a social media “Instagram” while using a laptop to edit the video.” But then she immediately warns them: “Hey stay focus on your project, leave the irrelevant things.” Dealing with that, Prensky (2010) and Stanley (2021) emphasized that when considering technology and the internet in teaching and learning activities, the teacher plays an essential role in guiding and managing the classroom activity.

In the final PjBL, students share their projects with a public audience. Students use technology to showcase their work: “Both documentary video and scientific paper showcased and presented simultaneously in front of teacher, students.” She added: “The students prepared all the things, projector, screen projector, and till they showed it in front of public.” At the end of the interview, she argues how technology plays an important role in student’s learning: “In this 21st century, teaching and learning process should integrate technology and internet.” She also added: “It is indisputable that our reliance on technology and the internet, particularly as sources of information, is inevitable.” Education needs to see technology’s growing capacity for intervention in the world (Gounari, 2009).

In conclusion, this research does not merely share the participant’s stories in relation to the PjBL and ICT. This research is a co-creation between the researcher and the participant. In other words, the benefits are not only for the reader and the researcher but also for the participant—re-thinking and re-evaluating the teaching practice. Teaching language in the 21st century learning environment should leave the

focus only on teaching language structure (vocabulary, grammar, etc.). Engaging the students into more authentic learning that is close to their world is mandatory for today's age. This research potentially shows the overview that the learning language in modern PjBL is different from the traditional one—the teacher is the centered. The teachers could consider varied creative ways of teaching language.

## CONCLUSION

The rapid advancement of technological innovation gives extra attention to people to adjust to today's modern situation. Clara's stories underscore how she involved the students in using technology to produce the product of the PjBL—accessing information and creating media products (documentary videos). Integrating technology in educational practices does not merely engage students in learning but also equips them with fundamental skills for the digital age. Enabling interactive learning through technology encourages students to contribute to their learning actively. Moreover, allowing the students to access the rich information on the internet engages them in exploring knowledge from diverse perspectives, conducting in-depth research, and developing critical-thinking skills. Clara's stories provide an overview for the teachers to integrate technology in PjBL and invite the teachers to rethink, reevaluate, and consider their roles for the students when technology is integrated into the learning activity. To expand more and see from different perspectives, we suggest further research exploring some of the teachers' experiences of technology integration in PjBL and viewing the students' stories instead—using various narrative inquiry data.

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