Ambivalences of Technological Literacy and Cognitive Growth: A Learning Classroom Dynamic in the Disruptive Era

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Abstract
This research aims to reveal the ambivalence of using technology in the learning process. The research methodology employed is qualitative. The research approach employed in this study is a case study. The data utilised in this study comprises statements extracted from a Forum Group Discussion (FGD). The data source consists of the FGD transcripts. Two ELT lecturers, one concentrates in *English Writing* and another in *Translation*, were put in sharing ideas session during the Focus Group Discussion (FGD). The data collection technique employed in this research is focus group deliberations. The data gathering method utilised in this study is the Single Focus Group (FGD). The analytical approach employed in this work is thematic analysis. From the FGDs conducted, two axes of answers were found. The first is related to how the utilisation of technology, such as AI (Artificial Intelligence), is a must. There are two points related to the necessity of technology integration in learning: 1) Improving Access and Learning Opportunities and 2) Increasing Student Motivation and Engagement. The second, on the other hand, the utilisation of technology in the learning process also reflects a very ironic phenomenon. There are two main reasons why the utilisation of technology in learning is very dilemmatic at the moment: 1) Balanced Potential Benefits and Risks, and 2) Educational Paradigm Shift. The details of these findings can be traced from the elaboration of key points from the excerpts of discussions with lecturers when sharing teaching experiences in this disruptive era.

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Abstrak
Penelitian ini bertujuan untuk mengungkap ambivalensi penggunaan teknologi dalam proses pembelajaran. Metodologi penelitian yang digunakan adalah kualitatif. Pendekatan penelitian yang digunakan dalam penelitian ini adalah studi kasus. Data yang digunakan dalam penelitian ini terdiri dari pernyataan-pernyataan yang diambil dari Forum Group Discussion (FGD). Sumber data terdiri dari transkrip FGD. Dua orang dosen ELT, yang satu berkonsentrasi pada Penulisan Bahasa Inggris dan satu lagi konsentrasi pada Terjemahan, diikutsertakan dalam sesi berbagi ide dalam Focus Group Discussion (FGD). Teknik pengumpulan data yang digunakan dalam penelitian ini adalah musyawarah kelompok terfokus. Metode pengumpulan data yang digunakan dalam penelitian ini adalah Single Focus Group (FGD). Pendekatan analitis yang digunakan dalam penelitian ini adalah analisis tematik. Dari FGD yang dilakukan, ditemukan dua sumbu jawaban. Yang pertama terkait bagaimana pemanfaatan teknologi seperti AI (Artificial Intelligence) adalah sebuah keharusan. Ada dua poin terkait perlunya integrasi teknologi dalam pembelajaran: 1) Meningkatkan Akses dan Kesempatan Belajar dan 2) Meningkatkan Motivasi dan Keterlibatan Siswa. Kedua, pemanfaatan teknologi dalam proses pembelajaran juga mencerminkan fenomena yang sangat ironis. Ada dua alasan utama mengapa pemanfaatan teknologi dalam pembelajaran saat ini sangat dilematis: 1) Potensi Manfaat dan Resiko yang Seimbang, dan 2) Pergeseran Paradigma Pendidikan. Detil temuan tersebut dapat ditelusuri dari penjabaran poin-poin penting dari petikan diskusi bersama dosen saat berbagi pengalaman mengajar di era disruptif ini.

I. INTRODUCTION

Technological literacy in the English Language Teaching (ELT) classroom is becoming increasingly important in the digital age as technology has revolutionised the way we communicate, the way we teach and learn languages. The benefits of technology in language learning, the role of technology in encouraging learner activities, and the potential for technology to transform existing language teaching methods are considerable. For one, technology in language learning can provide teaching resources and bring different, innovative and creative learning experiences to

the learners' world. Through the use of technology, many authentic materials can be provided to learners, and of course, technology motivates them to explore media and facilitates learning that enhances students' learning experience, as well as providing them with a more interesting and interactive learning environment. Of course, there are so many benefits of technology that cannot be detailed in this section, because there is a bigger monster in the presence of technology in the midst of the advancement of civilisation (Ahmad, 2012; Mohammed, 2022; Mohammed, 2020; Sert & Boynueğri, 2016; Chauhan, 2021).

One of the most significant negative effects of technology on students is over-dependence on it. Students can spend more time using technology because of its vast network, unlimited information (Nugroho & Dirgahayu, 2020), as well as entertainment that distracts their focus. These can all lead to addictive effects and of course, affect their physical and mental health (Raza et al., 2020). With technology, students lose communication skills and struggle with reading. This can lead to difficulties in reading and understanding information, which can negatively impact academic performance (Gaspard et al., 2016; Lindroth et al., 2015). Social skills are also degraded which may affect students' ability to communicate effectively with others. In addition, students may be prone to cheating due to high dependence on information technology, which may lead to academic dishonesty and lack of critical thinking skills. All of these issues are the intersections that make up the headlines in this study (DeLoatch, 2015).

This is not about how technology provides a more modern or advanced style in the teaching-learning process in the classroom, but it has touched a crucial tangent line to discuss that technological advances actually weaken the strength and potential of students. We can see how Wikipedia has become a source of knowledge, applications on smartphones such as iPhones, and all, making students and university students weak in thinking and processing the messages they receive (Ahn, 2022; Alfehaid, 2014; Gaspard et al., 2016). Technological literacy creates many innovations and facilitates access to learning and paradoxically, with all its consequences, it creates an equally big problem: knowledge degradation.

The degradation of knowledge that occurs in learners, whether students or college students, occurs because they, technically, tend to focus on the creativity of digital technology itself, such as making PowerPoint displays as attractive as possible, making content as aesthetic as possible, and also learning on video or image displays. This tendency is certainly very good, but the essence of all those presentations to the public space is the substance, content, or material to be conveyed. Here, this research found this problem to be a disturbing dynamic in the classroom because students are digitally and technologically literate, but knowledgeably or cognitively, they are degraded. We can imagine an elegant outfit but a disproportionate body.

Therefore, the purpose of this study is to expose the problem of the literacy paradox between technology and cognition, explore the root of the problem, and distribute the potential to overcome the problem. The subjects in this research are students and lecturers who are the perpetrators of education and those who are the direct subjects in the case to be revealed in this research.

II. METHOD

The research methodology employed is qualitative. The research approach employed in this study is a case study, as it centres on a specific instance including the narrative experiences of two lecturers teaching students from English education departments. The reason of deciding to *knit* this approach is caused by the researchers' aim; it is to comprehensively gather data from the lecturers in order to gain a thorough understanding of the English teaching case. The data utilised in this study comprises statements extracted from a Forum Group Discussion (FGD). FGD is a research method that aims to gather comprehensive insights beyond binary responses, with a particular focus on eliciting participants' perspectives, experiences, and thoughts in a detailed manner. The data source consists of the FGD transcripts. Two lecturers, one concentrates in *English Writing* and another in *Translation*, were put in sharing ideas session during the Focus Group Discussion (FGD). They are from the English Language Education department of a university located in Surabaya. Within the scope of this research, the names of the lecturers are initially assigned fictitious-abstract names: *Pisces* and *Virgo*. There exist two main inquiries (Q1-Q3) that have been formulated using reactive and responsive questions (Q1a-Q3a) in accordance with the responses provided by the respondents: 1) How can technology help bridge the gap between the skills taught in schools and the 21st century skills

needed in the world of work? 2) In general, technology significantly improves learner learning *outcomes*, but does the use of technology have negative side in learning process? And 3) Does technology increase student motivation and engagement in the learning process or vice versa?

The data collection technique employed in this research is focus group deliberations. The data gathering method utilised in this study is the Single Focus Group (FGD), which offers an exploratory environment to augment the data provided for analysis. The process of conducting FGDs consists of three distinct stages: pre-activity, activity, and post-activity. During the preliminary phase of the activity, the following preparations were made: 1) Establishing the goals, 2) Formulating a set of inquiries to guide the conversation, 3) Enlisting people who are pertinent to the subject matter, 4) Arranging and arranging the day, time, and venue, as well as reaching consensus, obtaining consent, and deciding on the recording method. The process of data collection encompasses the subsequent stages: 1) Development of the interview instrument (questions); 2) Verification of the instrument through collaboration with scholars in the corresponding academic domain, guaranteeing the pertinence of the obtained data to both the theoretical framework and the research problem. 3) Engaging in communication with participants to establish the interview timetable, 4) Executing the interview process, 5) Transcribing the outcomes of the interview, and 6) Categorising the data to eliminate any superfluous or inconsequential material.

Furthermore, the analytical approach employed in this work is thematic analysis. The utilisation of this approach is justified due to its ability to accommodate the classification of issues identified throughout the data mining procedure, hence enabling the customisation of data exploration to align with the classed findings. Data analysis comprises the subsequent stages: (1) acquainting oneself with the data; (2) converting the data into numerical form and masking topic names; (3) constructing themes; (4) validating themes; (5) defining themes at the beginning of each exploration segment; and (6) doing the study.

III. RESULT AND DISCUSSION

A. Result

From the FGDs conducted, two axes of answers were found. The first is related to how the utilisation of technology, such as AI (Artificial Intelligence), is a must. There are two points related to the necessity of technology integration in learning: 1) Improving Access and Learning Opportunities and 2) Increasing Student Motivation and Engagement. The second, on the other hand, the utilisation of technology in the learning process also reflects a very ironic phenomenon. There are two main reasons why the utilisation of technology in learning is very dilemmatic at the moment: 1) Balanced Potential Benefits and Risks, and 2) Educational Paradigm Shift. The details of these findings can be traced from the elaboration of key points from the excerpts of discussions with lecturers when sharing teaching experiences in this disruptive era.

On the first question, about how technology helps to bridge the gap between the skills taught in schools and the 21st century skills needed in the world of work, the interviewees, Pisces and Virgo, clarified their answers. Pisces said, "Of course technology is very much needed and [its utilisation is] very helpful. Everything nowadays can be asked through *Google*, the internet makes distance no longer about kilometres, but internet signals and cellular data" (Pisces, Q1). Here, Virgo also expanded on the answer of how technology does exist in today's life and immersed in it, "... [In addition], I think, technology in learning provides access and opportunities, there are online learning systems, the use of gamification, videos, e-books, virtual reality, and ... interactive learning platforms, which can be accessed at any time. Students from peripheral areas can also access knowledge from the layer of their mobile phones" (Virgo, Q1). The researcher did not catch up the substance of the answer to the question posed, so the researcher re-asked, "... Sure, that's what they [students] can utilise for learning, but what about the competencies they will utilise in the future?" Pisces responded, "They have to undergo an integrated process with technology, by involving technology in their learning process, they can adapt to its use" (Pisces, Q1a). Pisces also added that, "Learning is not necessarily about understanding, but it is a process along with the learning method. Instead, utilising technology makes them dive directly into empirical and practical areas, they can explore their learning styles, such as visual, auditory,

or kinaesthetic" (Virgo, Q1a). The researcher asked them to give concrete examples of this explanation, "... Would you give concrete examples of 21st century competencies that students need from their *technology-integrated learning process*?" Pisces said, "Simple ... there is an app called Canva, a platform for designing, and one project can be operated together. Easy. Let's say, we want to talk about pollution. We [lecturer/teacher] provide a definition, put it there [on the project canvas] then students are asked to add other descriptions such as causes, impacts, factors, and so on, accompanied by images that can also be searched on Canva. See? They learn data exploration, critical thinking, and creativity" (Pisces, Q1b). Virgo added that, "Critical thinking? I remember when I taught using *StoryJumper*, a digital platform to create stories, telling stories visually. I gave the students bullet points about animals, then they created their own fables. It is … wow, amazing!" (Virgo, Q1b). From the discussion of the first question, it can be concluded that the utilisation of technology in learning is very important nowadays as it can increase access and learning opportunities for everyone and improve student motivation and engagement. However, it is a bold statement, it is imperative to bear in mind that technology serves as a mere instrument. The efficacy of technology in education hinges on its utilisation. Teachers must possess sufficient expertise and understanding to proficiently utilise technology in the process of education. Sufficient infrastructure and resources are needed to facilitate the integration of technology in educational settings.

On the second question, about a general fact that technology significantly improves learner learning *outcomes*, but the use of technology also has negative side in learning process, it assumes balanced potential benefits and risks, education paradigm shift, and availability of infrastructure and resources. The elaboration of the results of the second question can be seen from the fragmentation of the conversation during the FGD. In the second question, Pisces responded, "I think everything has two sides. It's the same with technology, its presence is to help, not to replace. For example, Google helps us find ideas or knowledge, not to be taken [copy-pasted]" (Pisces, Q2). Here, Pisces sees this technology as making things easier, whereas it is only with difficult things that we learn something. This assumption is also reinforced by Virgo's answer, "I feel, when I was a kid, I could climb the stairs to the 5th floor, but now at the same age, many children complain. Our bodies are designed to form from exercise, but when it is made easier or aided by tools, our bodies will not form or grow. It's the same with technology, when all information can be Googled, all answers can be found on websites, all forms of mischief can be supported by the internet and cyberspace" (Pisces, Q2).

The researcher tried to address the main issue, as they are Writing and Translation lecturers, "Do you think students cheat on the assignments or questions you give?" Pisces responded, "Definitely, there are concerns related to that [student cheating]" (Pisces, Q2a). The researcher continued, "What cheating is the main concern?" Pisces replied, "I teach Writing, you know, what's my concern? I ask them to write, and they look for writing through Bard, Perplexity, Quillbot, or whatever. I don't forbid them to use AI, but I want to emphasise that AI is helpful, for example, it helps to provide ideas, the rest is that they have to develop their writing skills..." (Pisces, Q2b). Virgo added, "Besides Writing, my course, Translation. You can imagine how they learn to translate texts if they use Google Translator" (Virgo, Q2b), the researcher clarified, "... but we should be able to use the results of the translator as a discussion, an analysis, is the translation correct, is it appropriate, and so on?" Here Virgo said, "Indeed, but analysing the translation from AI is not the essence of learning to translate. Moreover, there are AIs that are more powerful than Google Translator, such as *DeepL* Translator. The middle way, we inevitably have to change the teaching paradigm, even the curriculum. This technology provides answers, so the substance of the curriculum is not to find answers, but to explore how answers exist" (Virgo, Q2c).

From the discussion that took place, it can be seen that there are benefits and risks that are equally large. This means that the risk or negative impact of utilising technology in learning is also great. Secondly, the involvement of technology changes the paradigm of teaching, learning, media

signalling, assignments, and even discussion materials.

In the third question, about the motivation generated by the involvement of technology in the learning process, or on the contrary, technology reduces students' motivation in learning. Pisces said, "I feel they focus on the completion, not the purpose of learning. I can say that this demotivates them in learning, but when it comes to innovating, it is a different cake" (Pisces, Q3). On the other hand, Virgo also said the same thing that technology in learning is felt to have a greater demotivating effect than a motivating effect, "I think [the utilisation of technology in English teaching] is more likely to demotivate. I'm afraid they underestimate, lack of effort, and take any problems or cases they have to solve lightly" (Virgo, Q3). These two statements conclude that technology reduces students' motivation to learn.

B. Discussion

There are two things discussed in this research that become the main issues reflected in the research title: Ambivalence in the use of technology in learning. Speaking of ambivalence, there are two faces displayed in the consequences of technology use, between the bad side and the good side.

On the positive aspect, the use of technology can (1) increase access and learning opportunities and (2) increase student motivation and engagement. On the aspect of increasing access and learning opportunities, technology enables distance learning, so that education can be accessed by everyone, wherever they are. Furthermore, technology facilitates the availability of many online educational materials, including videos, e-books, and interactive learning platforms, that may be conveniently accessed at one's convenience. Moreover, technology plays a crucial role in narrowing the educational disparity in remote regions by granting them access to high-quality educational resources. Technology can enhance student motivation and engagement by incorporating gamification, simulation, and virtual reality, which make learning more engaging and interactive. Furthermore, technology enables students to acquire knowledge in a manner that aligns with their preferred learning modality, be it visual, aural, or kinaesthetic. Moreover, technology offers a medium via which students can engage in collaborative efforts and socialise with their peers and educators, thereby enhancing their level of contact and involvement in the educational process. Essentially, the use of technology in education is essential in the present day as it might expand access and learning prospects for all individuals and amplify student motivation and involvement. It is crucial to bear in mind that technology is merely a tool. The efficacy of technology in education hinges on its utilisation. Conversely, teachers must possess the expertise and understanding to proficiently utilise technology in the process of education. It is imperative to acknowledge the significance of sufficient infrastructure and resources in facilitating the integration of technology in educational settings.

On the contrary, there exist two factors that contribute to the negative aspects associated with the utilisation of technology in educational settings: 1) The Equilibrium of Potential Benefits and Risks, and 2) A Shift in the Educational Paradigm. In terms of the possible balance between advantages and disadvantages, technology possesses the capacity to enhance accessibility, possibilities, and the calibre of education. Nevertheless, it can also worsen the disparity in access to digital resources, lead to reliance and interruption of learning, and endanger the privacy and security of student data. Essentially, educators and policymakers are confronted with the challenge of striking a harmonious equilibrium between the advantages and drawbacks of incorporating technology into the learning process. Furthermore, with regards to the alteration of the education paradigm, the integration of technology in the learning process has the potential to transform the conventional educational paradigm. The school system faces the issue of properly integrating this paradigm shift, which may raise questions regarding the role of teachers, learning methods, and education curricula.

To summarise, the incorporation of technology in education is a multifaceted and contentious matter. Technology has the capacity to enhance the calibre of education. Conversely, there are potential hazards that must be taken into account and resolved. Achieving a harmonious equilibrium between advantages and drawbacks, while also surmounting fundamental changes and

constraints in infrastructure, is crucial for successfully and responsibly harnessing technology in the realm of education. Conducting comprehensive study and assessment on the effects of technology integration in educational settings holds significant importance. Furthermore, it is imperative to foster effective communication and cooperation among many stakeholders, including governmental bodies, educational institutions, educators, parents, and students, in order to formulate suitable policies and strategies pertaining to the integration of technology in educational settings.

Information is readily available to individuals in the current era of digital technology. The rapid acquisition of knowledge is facilitated by the internet and many information technologies. This phenomenon appears to usher in an era characterised by boundless progress in knowledge, whereby there is an abundance of information sources. Nevertheless, beneath the allure of this convenient accessibility lies a captivating phenomenon referred to as the *Knowledge Paradox*. This dilemma elucidates the predicament whereby the availability of copious information does not consistently correlate with the ideal utilisation of knowledge within the general populace. This phenomenon elucidates the reasons behind the continued division and uneven distribution of knowledge among individuals and society groupings, despite the widespread availability of information in contemporary times.

An essential element of the Knowledge Paradox is the growing availability of information. The proliferation of search engines, social media platforms, and other internet sources has significantly facilitated the accessibility of information, enabling individuals to readily acquire knowledge. Nevertheless, it is important to acknowledge that although information is readily available, not all individuals possess equitable access to technology and the internet. The disparity in access frequently serves as a fundamental factor contributing to the Knowledge Paradox. Certain groups, particularly those residing in rural regions or developing nations, may encounter challenges in obtaining sufficient access to technical infrastructure. Consequently, their ability to delve into the vast reservoir of knowledge accessible via the internet is constrained. Access is not the only problem, but Knowledge Paradox is also affected by the way individuals filter and choose information. When confronted with a surplus of information, individuals have a tendency to selectively filter and choose information that aligns with their perspectives or convictions. This occurrence is commonly referred to as the *Filter Bubble*.

The phenomenon known as the filter bubble results in individuals being exclusively exposed to a limited range of perspectives, hence limiting their exposure to potentially contentious or divergent information. Consequently, a lack of extensive exposure can impact an individual's comprehensive comprehension and expertise. Information overload is a significant obstacle in the current era of abundant information. We frequently encounter a vast amount of information on a daily basis, which poses challenges for us to effectively absorb it. Excessive information might cause information fatigue or possibly lead to difficulties in comprehending different subjects. One further obstacle that arises is the deficiency in digital literacy. Digital literacy encompasses the aptitude to effectively categorise, analyse, and comprehend information sourced from the internet. Lacking these skills, individuals may encounter difficulties in identifying reliable sources of information or distinguishing between accurate and inaccurate information.

When considering guidance, it is imperative to employ technology in a judicious and equitable manner within the context of education. It is imperative to give precedence to the utilisation of technology in order to enhance accessibility and educational prospects for all individuals, while guaranteeing equitable access to technology and online learning materials for all pupils. Furthermore, it is imperative to offer thorough instruction to educators on the secure and conscientious utilisation of technology in the educational process. Furthermore, it is imperative to safeguard student privacy and data security through the implementation of robust legislation and procedures.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

The outcome and the observation solidified a conclusion that diverged into two distinct

directions. The initial aspect pertains to the imperative nature of incorporating technology, specifically Artificial Intelligence (AI). There exist two key aspects pertaining to the imperative nature of incorporating technology in the realm of education: 1) Enhancing accessibility and educational prospects, and 2) Augmenting student motivation and involvement. On the contrary, the incorporation of technology in the educational process also exemplifies a highly paradoxical occurrence. There exist two primary factors that contribute to the current challenge around the integration of technology in educational settings: 1) The Equilibrium of Potential Benefits and Risks, and 2) The Transformation of Educational Paradigms. The elucidation of important aspects from the excerpts of lectures provides a means to trace the specifics of these findings.

B. Suggestion

The world of education must embrace and adapt to the existence of technology, rather than negating or exploiting it, which causes difficulties. All human resources, from teachers to students, must be technologically and digitally literate, because technical advancement without growth in human resource awareness will result in challenges in the teaching and learning process. This is not about students or teachers at the center, but about aiding learning through technology, computerized systems, the digital world, social media, and everything else relevant to the advancement of modern society. Without technological literacy, technological development will become merely a cliche.

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