

Understanding students' perceptions of the challenges of teaching in the fourth industrial revolution in a private university in Yogyakarta

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Abstract. Alongside with the development of technology of 4.0 Industrial Revolution, the new teaching approaches also have changed to be more effective because of the technology integration. Students and teachers need to be keen on the use of technology in their teaching and learning process. Understanding digital competence in the classroom is crucial for supporting language instruction within the context of this industrial revolution. Qualitative research design was used in this study and employ semi-structured interviews to obtain insight from the participants. The research highlights significant challenges in teaching language, such as high course fees for skill updates, unequal distribution of human resources, limited technological resources in the classroom, and unprepared teaching abilities. The empirical evidence from this study underscores the importance of integrating technological competence into teacher education, preparing educators for the pervasive use of technology in both personal and professional realms in this era of advanced technology.

Keywords: 4th Industrial Revolution (4IR), technology innovations, teaching-learning, English education.

Introduction

The field of education is transitioning to new and effective teaching methods. This is an observation of the swift progress in the contemporary era of the fourth industrial revolution, which resulted in the rapid emergence of technology. The main pillars of society are communication and information technology (ICT), education, and scientific innovation and technology [4]. Rapid technological developments have emerged as a significant influence in the field of education, leading to significant changes in the actions taken by instructors during teaching activities. Information and communication technology and knowledge will also influence the teaching process. Muslem et. al said, "Technology has become an integral part of life and learning patterns in the 21st century" [4]. According to Malik, technology will become an essential part of life. However, teaching competency in the industrial era 4.0 impacts the instructor's teaching process. Instructors in the Fourth Industrial Revolution must possess digital competencies to enhance the teaching process in the classroom. Digital competency is crucial to have proficiency in information and communication technology (ICT). Aminullah et al. (2019) stated, "Information and

Communication Technology (henceforth, ICT) has become increasingly popular in the field of education, including in the English classroom" (p. 147) [2].

In the fourth industrial revolution era, implementing teaching methods presents challenges. According to Aminullah et al. (2019) more school facilities are needed to allow teachers to use technology in teaching [2]. In the context of teacher education, the challenge is that student teachers need to enhance their digital teaching skills. The significance of enhancing skills in the fourth industrial revolution highlights the influence of student teachers' autonomy. According to Kumar et al. [3] there is a growing need for expanding networks, honing individual capabilities, building professionalism, and gaining valuable insights into Industry 4.0. However, student teachers need help in enhancing their digital competencies. In order to be prepared for the challenges presented by the fourth industrial revolution, it is essential to promote training in digital technology. This is due to the rapid growth of technology [8]. Ganal et al. [14] note that student teachers face difficulties and challenges such as inadequate evaluation tools, inappropriate teaching materials, weak teaching skills, and classroom management. Implementing information and communication technology can be challenging due to the burden of schoolwork and the large number of students, which in turn can reduce teacher motivation [4].

According to Prabawati et al. [5], using technology in the classroom can be ineffective, inefficient, and not timesaving (p. 175) due to the teacher's lack of technological competence. Therefore, it is vital to monitor and evaluate the application of technology to enable student teachers to deliver high-quality learning in the fourth industrial revolution era. Ahmadi [7] stated that one of the challenges in the Fourth Industrial Revolution era was the skills and knowledge to integrate teaching skills, technology, and multimedia teaching that the student's teachers needed to possess. This study reveals the students' perceptions regarding the challenges of teaching in the fourth industrial revolution era, particularly the integration of technology into language instruction.

Literature Review

In preparing future educators to incorporate the tools and methods of the Fourth Industrial Revolution (4IR) era into their teaching practices, the studies reviewed here highlight various challenges and needs. A study by Moila, Mji, and Mnisi [15] investigated the challenges faced by teacher educators in South African universities when they introduced 4IR tools to train student teachers. The study revealed that teacher educators needed more professional development (PD) in using 4IR tools in their classes and conducting the assessment in the classroom. Therefore, the researchers recommended implementing higher standards for professional development and providing appropriate funding for necessary 4IR resources.

Van Wyk and Waghid [13] conducted additional research that complemented previous studies by examining the readiness of student teachers in South Africa to integrate Information and Communication Technology (ICT) into their teaching practices. This research utilized a case study approach involving 22 higher-education student teachers. The findings were implemented as the basis for discussions on the challenges faced by student teachers, the curriculum provided to teacher educators, and its implications for educational policy and practice in South Africa. In line with previous research, Van Wyk [12] found in his dissertation that prospective teachers needed further preparation to teach effectively in 4IR learning spaces, even though they already knew about 4IR basics and ICT tools. We can use the results of this research to develop better educational curricula that will equip teachers to tackle the learning challenges of the 4IR era.

The previous studies emphasize the difference between current teacher preparation and future needs for preparing prospective educators to teach in the era of the Fourth Industrial Revolution (4IR). The research suggests that improved professional development for teacher educators, curriculum development aligned with the 4IR, and adequate resource allocation to

support the integration of 4IR tools and methods into teaching practice are crucial. By better preparing future teachers, teacher education will be better equipped to tackle the challenges and opportunities presented by the 4IR era.

Methods

We used qualitative research methods to investigate our research questions. Specifically, we conducted semi-structured interviews with two prospective teachers with prior teaching experience. Participants were selected through purposeful sampling, focusing on those with relevant knowledge and experience related to the research topic. Data was collected through interviews conducted via Zoom and in-person meetings to gain an in-depth understanding of their experiences and perspectives. Ten guided questions were designed to explore the participants' views on teaching practices in the context of the Fourth Industrial Revolution (4IR). Additionally, we obtained informed consent from the participants to accurately record and transcribe the interviews for data analysis.

We used thematic analysis to analyze the interview data. This method helped us identify recurring themes, patterns, and meaningful insights within the participants' responses. Thematic coding enabled us to gain a deeper understanding of the complexities surrounding teaching practices in the era of the Fourth Industrial Revolution. To enhance the trustworthiness of our findings, we employed triangulation. We validated the consistency and reliability of our results by cross-referencing data from the interviews, member checking, and expert reviews.

Findings and Discussion

Tyas and Pratiwi are pseudonyms used for the participants in the study. Through interviews, we have identified the challenges student teachers face in the era of Industrial Revolution 4.0. We will present the result of the study using the themes we gained from the data analysis. The first challenge is the uneven distribution of human resources, making it difficult to implement learning technology. The findings are supported by Fahmiyah et al. [9], who stated, "Differences in age range and education level cause gaps in the ability to use technology" (p. 2).

The second factor is the impact of age on technological proficiency. Elderly teachers often lack the necessary skills to use technology effectively. Their reduced motivation to integrate technology into classroom learning is attributed to their declining desire to acquire new knowledge and skills. This aligns with the findings of Meirani et al. [16], who noted, "These baby boomers tend not to have high motivation in completing tasks" (p. 72).

The third challenge is that applying learning technology to students in larger classes presents challenges that hinder the efficient and optimal use of technology. While larger classes need help teaching using technology effectively, smaller classes can provide better results for students. According to Bovill [6] "Therefore, smaller classes may be more conducive to enacting deeper forms of interaction, negotiation, and power-sharing that are necessary for co-creation" (p. 1032).

The fourth challenge in teaching is the high cost of preparing students for quality teaching in the classroom. The participants suggested that pre-service teachers can independently learn through the Internet or collaborate with colleagues with expertise in learning technology. By doing so, they can create an interactive and comfortable learning environment. Another suggestion is to assist fellow students who are eager to improve teaching quality by leading discussions and introducing innovative learning ideas. According to Afrianto (2018), "Today's teachers are expected to introduce novelty and innovation in their teaching" (p. 8) [1].

The participants highlighted that technology-based learning can simplify both learning and assessments. Student teachers must be skilled in using technology to enhance efficiency and keep current. Additionally, student teachers should be able to carefully select learning technology to ensure it effectively captures students' interest. Choosing a suitable learning medium through technology leads to comprehensive results. Fitriyah et al. (2020) agreed on the idea that engaging media should be in line with learning objectives and materials, aligned with student characteristics, and be user-friendly [10].

Utilizing technology in the classroom can create a more effective learning environment and motivate students to learn. Student teachers can use Canva, PowerPoint, and Kahoot software programs to enhance their teaching skills. Student teachers must recognize the potential of technology as a learning tool in the classroom, especially in the context of the fourth industrial revolution. According to Tomczyk et al. (2022), software in the education sector is a strategic factor in this era [11].

Conclusion

In summary, student teachers faced several challenges in the era of the Industrial Revolution 4.0. The first challenge is the limited human resources, which makes it difficult to implement learning technology effectively. The second challenge is the low motivation among senior teachers to stay updated with current developments and integrate new technology into the learning process. The third challenge is the limited funds available for learning technology infrastructure and training. Finally, the large number of students in a single class poses a challenge in effectively implementing learning technology. The recommendation for overcoming these challenges is for prospective teachers to make three primary efforts. Firstly, they should engage in independent learning, where student teachers enhance their knowledge and skills in learning technology. Secondly, they should collaborate with fellow teacher candidates or experienced teachers who use learning technology. Finally, they should be able to leverage the use of suitable learning technology that meets their needs and abilities and is based on the learning material to be taught. By understanding the technology's potential in learning and using it appropriately, student teachers can play an active role in preparing the next generation to face the challenges and opportunities in the Industrial Revolution 4.0 era.

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