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Growing Digital Mindset and Upgrading Digital Skillset through designing Mobile Application Language Learning based on Glocalization in Society 5.0

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Article Info	Abstract
*Corresponding author: (M. Maisa) Corresponding Author email maisa313.ugj@gmail.com	Recently, Digital literacy has been the raising topic among educators as a move on the transformation education within society 5.0 in the Industry Revolution 4.0. Mobile Application Language Learning is one of the product innovation as a result of intergration between technology and language learning. This paper aims to dig out how the educators could transform the digital mindset and improving the digital skillsets. In addition, it also explores the types of teaching materials that are developed based on the immersion of global concept and local wisdom, glocalization. The participants are coming from in service English Teachers Community and Preservice English Teachers, in Indonesia, Turkey, and Kazakhstan. The research was conducted for 12 weeks period using a cyclical action, including planning, action, observation, and reflection. Data were collected through pre- and post- assessment, classroom observations, and student focus groups. Findings indicate that marked changes level the teachers' digital mindset and improve the digital skillset simultaneously from level two to level five. In other sides, it also underscores the importance of iterative, reflective teaching practices in navigating teachers to enhance the digital literacy ability and experiencing in creating a mobile application language learning developer which materials are based on glocalization. In conclusion, this study highlights the role of action research in driving teachers to develop the critical thinking and upgrading the digital skillset toward the sophisticated educational innovation

INTRODUCTION

Nowadays, in an increasingly interconnected world, the concept of Society 5.0 emerges as a transformative vision that integrates advanced technology with human centric values. This paradigm shift emphasizes an importance is digital literacy as a foundational competence for educators including digital mindset and digital skillset, equipping them to navigate the complexities of a digitally driven society. As educational institution strives to prepare students for future challenges, it becomes imperative to empower teacher candidates with the necessary skills and knowledge to foster digital literacy effectively (Aguilera 2022; Maisa and Linda 2024; Reddy, Chaudhary, and Hussein 2023)

The notion of glocalization—combining global and local perspectives—serves as vital framework for enhancing teachers' digital literacy competence. By contextualizing digital skills within local cultural, social, and economic realities, educators can create more relevant and impactful learning experiences. This article explores innovative strategies and practices that facilitate the development of digital literacy in teachers, emphasizing the significant of adapting global digital competencies to local contexts (Guo 2014; Reddy et al. 2023; Van Roekel 2014; Schwieter 2011)

Digital Mindset and Digital Skillset

Digital literacy encompasses a range of skills necessary for effective participation in a digital society. According to Eshet-Alkalai (2004) digital literacy includes information, communication, and technological

competencies that enable individuals to interact meaningfully with digital content. In educational sphere, teachers' digital literacy is crucial for integrating technology into their pedagogy and enhancing students learning experiences (Barak 2017; Coakley, Garvey, and O'Neill 2017; Khalid 2019; Maisa, Nenden Sri Lengkanawati 2019; Mega 2020; Suherdi 2018; Zarei and Hussin 2014). The demand for continuous professional development in digital competencies is well-documented, as teachers often face challenges in adapting to rapidly changing technologies (Ahmad et al. 2016; Chai et al. 2017; Ertmer 2010; Maisa and Linda 2024). Digital literacy has two major components, including digital mindset which covers openness to change (OC), curiosity(C), critical thinking (CT), collaborative approach (CA). Meanwhile, the components of digital skillsets include technical skill (TS), Information Management (IM), Data Literacy (DL), Cyber Awareness (CA), and (Problem solving).

Glocalization and Its Implications for Education

Glocalization, a blended concept of global and local perspectives, has gained prominence in educational discourse, particularly in the context of digital literacy. Ritzer (2003) describes glocalization as the adaptation of global ideas to local contexts, fostering a more relevant and culturally sensitive approach to education. This concept is particularly pertinent in diverse setting where teachers must navigate localized needs while leveraging global digital resources (Robertson, 1995). The previous research has shown that glocalization can enhance teachers' engagement with digital tools by aligning them with local cultural contexts. Thereby improving their effectiveness in promoting digital literacy among students (Mayer, 2018)

Society 5.0 and Education Transformation

Society 5.0 represents a vision of human-center society that integrated advanced technologies such as AI, IoT, and big data to address societal challenges (Shimizu, 2019). In this context, digital literacy becomes essential for educators to prepare future teachers and students for a future where digital skills are paramount and digital mindset has no misinterpretation. The shift toward Society necessitates a revolution of educational strategies, focusing on collaborative learning environments and innovative teaching practices (Kukulska-Hulme,2020). Teachers must not only be digitally literate but also adept at fostering digital literacy in their students to thrive in this new societal framework.

The literature emphasizes the importance of professional development programs that equip teachers with the skills necessary for navigating digital landscapes. Effective professional development should be continuous, collaborative, and contextually relevant, allowing teachers to share experiences and strategies (Desimone, 2009). Programs that incorporate glocalized approaches can enhance teachers' abilities to adapt global digital literacy frameworks to local educational contexts, thereby fostering a more inclusive and effective learning environment (Culp, Honey, & Mandinach, 2005).

Therefore, a comprehensive professional development programs that cope the important of digital literacy and glocalization meet current trends and challenges in education, this study highlights how educators promote digital fluency among students by navigating the intricacies of digital tools and resources, teachers can better prepare learners for active participation in Society 5.0. This article aims to provide insights and practical approaches that empower teachers to embrace their roles as educators of digital literacy, fostering an adaptable and future-ready generation.
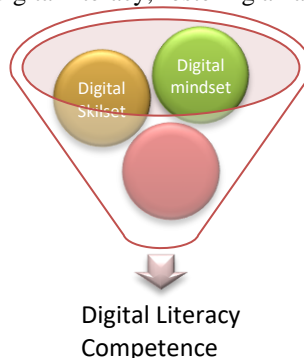

Figure 1. Digital Literacy Competence(Adapted from Bawden, 2020)

METHOD

This action research aims to explore how glocalization can enhance teachers' digital literacy competencies within the context of Society 5.0. The study will involve a systematic approach to identify challenges, implement interventions, and assess the effectiveness of these strategies in improving digital literacy among educators. By systematically analyzing the impact of targeted professional development, this study will contribute valuable insights

into effective strategies for teacher training in the digital age. The formulation of the problems is: (1) how can glocalization be effectively integrated into professional development programs to enhance teachers' digital literacy? (2) what challenges do teachers face in developing digital literacy within their local contexts? (3) How do teachers perceive the impact of glocalization on their digital literacy competencies and teaching practices? The cyclical process has carried out into four phases including planning, acting, observing, and reflecting (Cresswell, John W.; Poth, 2016b, 2016a; Culp, 2022; Hamied, 2017; Hurley & Henry, 2015; Kelly et al., 2021; Sailors et al., 2018).

The first phase is planning. In this phase, participants were selected from English teachers and their background education program. Then, conducting survey and focus group discussion to identify the current levels of digital literacy among teachers with their specific needs, and local challenges related to technology integration. Next, develop a workshop that incorporates glocalized content related to technology integration and reflects local culture and societal needs. The second phase is acting. Implementation by rolling out the professional development program over a designated period of four months incorporates various methodologies, such as workshops of digital tools, resources tailored to local context, peer-learning groups where teachers can share experiences and strategies, and integration of local case studies and examples into digital literacy training. The third phase is observing. Data collection by utilizing various ways to gather data on the impact of the intervention and conduct interviews and focus group discussions with participants to gather in-depth insights into their experiences and perceptions of the training. Next, administer pre and post-intervention surveys to measure the changes in teachers' self-reported digital literacy skills and confidence levels. Last but not least, classroom observation to assess the integration of digital tools and strategies learned during the training. The last phase is reflecting. In this phase, data analysis and reflection are including identify patterns, success, and areas for improvement. Use thematic analysis for qualitative data and statistical methods for quantitative data and facilitate reflective discussion to evaluate the effectiveness of the intervention, gather feedback, and discuss future applications of glocalization in digital literacy training.

RESULT AND DISCUSSION

The result will be presented from a couple of different points of view. The first is quantitative data and product which are taken from the survey of digital literacy assessment and the second is qualitative data which are taken from focus group discussion and the notes from observation.

Digital Literacy Assessment and The Digital Modul with Glocalization Integration

The current result shows how the teachers integrate the concept of glocalization by leading them to take a digital survey within a digital mindset and digital skillset. The components of a digital mindset include openness to change (OC), curiosity(C), critical thinking (CT), and collaborative approach (CA). Meanwhile, the components of a digital skillset include technical skills (TS), Information Management (IM), Data Literacy (DL), Cyber Awareness (CA), and (Problem-solving).
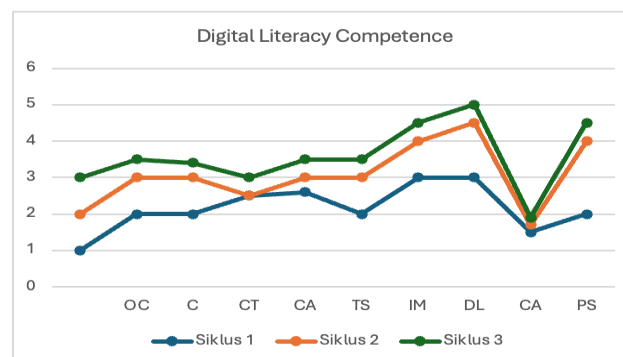

Figure 2. The Assessment of Digital Literacy Competence Cycle 1,2

Cycle 1(Blue Lines)

Openness to change (OC) starts relatively low, showing that participants are initially less open to adapting to change in the digital environment. The score of Curiosity (C) starts low as well, but it increases steadily, showing that participants were developing a greater interest in exploring digital tools and environments as they progressed. Meanwhile, the score of Critical Thinking (CT) shows a consistent increase indicating that participants developed stronger analytical and evaluative skills as they engaged with digital content and tasks. However, the rise is not as steep compared to other competencies, meaning that fostering critical thinking might require more focused interventions. Initially, collaboration skill seems to fluctuate, showing a dip in cycle 1, indicating some difficulty in working together digitally. The recovery in cycle 2 and a more significant rise in cycle 3 suggest that participants gradually became more comfortable collaborating digitally. Next, A gradual improvement is evident, indicating that

technical proficiency, such as operating digital tools or software, improved with practice and exposure. There's a plateau during cycle 2 but cycle 3 shows a clearer upward trend. Information Management (IM) shows a steady increase which suggests participants learned to better organize, retrieve, and manage information in digital content over the three cycles.

Cycle 2 (Red Line)

By cycle 2, participants show improved openness, indicating an increasing willingness to adapt to new digital practices or technology. This change aligns with growing comfort in digital spaces. Curiosity © improvement here suggests that participants became more curious about exploring digital platforms or technologies, which is a positive shift toward engagement with new information and tools. Critical thinking (CT) describes a moderate rise in Cycle 2 and shows that participants' ability to apply logic and reasoning to digital challenges improved. However, this competency is slower to develop compared to others, showing it may require targeted strategies for deeper engagement. Collaboration Approach (CA) shows improvement in collaboration skills, reflecting growing confidence and ability to work in digital teams or groups. However, this skill set continues to fluctuate slightly meaning that while teamwork improves, it is not without challenges. Technical proficiency begins to show more noticeable improvement in cycle 2, indicating that participants are becoming more comfortable handling digital tools and technologies. Information management shows strong, steady growth, implying that participants were learning how to efficiently store, organize, and retrieve information in digital formats. On the other hand, Digital literacy, the core competency of this analysis, continues to improve in cycle 2, showing that participants were becoming more adept at navigating the digital world, utilizing tools, and applying digital skills in practical contexts.

Cycle 3 (Green Line)

By Cycle 3, participants are significantly more open to change, showing a high level of adaptability. This reflects greater flexibility and confidence in dealing with new digital tools, platforms, or workflows. A continued increase suggests that participants are now highly motivated to explore new digital tools and environments. The curiosity fostered by previous cycles seems to have become a driving force for learning. While this competency continues to improve, the increase remains gradual. This could suggest that while participants are developing critical thinking skills, they may still need more structured opportunities to practice and refine these abilities in digital contexts (CT). Cycle 3 shows stronger growth in collaborative abilities, implying that participants are now more comfortable working in teams, sharing ideas, and co-creating in digital spaces. This skill saw more fluctuation earlier but appears to stabilize with experience (CA). The sharp improvement here reflects growing confidence in using digital tools and handling technical challenges. Cycle 3 suggests that participants are now highly proficient in basic technical skills. By cycle 3, participants demonstrate strong information management skills, effectively organizing and retrieving digital information. This is a crucial skill that participants appear to have mastered by the final cycle.

The findings clearly show a positive trend across all competencies, with significant improvements by cycle 3. The key takeaways are that participants; became more open to change and curious over time, gradually developed stronger critical thinking skills, improved collaboration and technical skills, particularly by cycle 3, and made significant gains in information management and digital literacy, which were core to the intervention. While all competencies improved, problem-solving and digital literacy saw the most pronounced growth, reflecting a successful focus on these areas.

The Design of Digital Modul based on Glocalization

Figure 2 depicts a series of digital modules designed to teach grammar, focusing on different aspects like the past tense and modals.

Figure 3. The product of integration between digital literacy competence and glocalization

The Local Integration

Figure 2 shows that the product of the digital module is designed with the local cultural context where the creators live. The digital module that is developed in this study is called Mobile Application Language Learning (MALL). The participants are working in groups to create the application from designing the home screen to the last screen. Most participants integrate the local culture into the global English content. Some who live in Cirebon City in West Java, Indonesia, put "Keraton Kasepuhan" as the landmark of the Palace in Cirebon. Meanwhile, the other puts the most famous landmark of Gapura in Bali. And the last design, they put the "mega mendung" Batik pattern as the symbol of Cirebonese fashion.

Global Educational Content

The content itself is global, focusing on English grammar, such as the past tense and modals. These are fundamental aspects of English language learning that apply universally, regardless of cultural context. The inclusion of a global educational framework such as CEFR (Common European Framework of Reference for Languages) in the menu reinforces the global aspect of the content, ensuring that the module adheres to internationally recognized language proficiency standards.

User Interface and Usability

The start buttons and menu options are written in English, signaling that the app is targeting learners who are interacting with English content directly. However, the interface remains simple and clear, catering to learners who might not be fully fluent yet. The balance between cultural elements and global language learning objectives is maintained, ensuring that the user can navigate the app without feeling overwhelmed by foreign elements.

The design simplicity allows for easy comprehension across different user groups, showing a universal approach to design that aligns with global digital standards while still offering a localized aesthetic touch.

Educational Relevance

By presenting global concepts (English grammar) within a local cultural framework, the digital module aligns with the glocalization strategy, where content is tailored to the needs and values of a specific locale while retaining its global applicability.

The images reflect a careful design choice that combines cultural identity with modern education. This kind of module might attract users not only for the content but also because of the cultural pride it instills, making learning a more enjoyable and locally relevant experience.

Target Users/Audiences

The target audience for these modules is likely Indonesian students or learners from similar cultural backgrounds who are studying English. The glocalized approach helps bridge the gap between local culture and global education by making English language learning feel less foreign or detached from the learners' own identity.

Motivational and Emotional Appeal

The inclusion of local cultural elements can enhance motivation and emotional connection to the learning material. Learners may feel a stronger sense of belonging and comfort when they see their own culture represented, even in a context where they are engaging with global content like English grammar.

This emotional appeal may also reduce the cognitive load associated with learning a foreign language, as learners engage with culturally familiar visuals that help ease the process.

The design of the digital modules leverages glocalization effectively by combining global educational content (English Grammar) with local cultural visuals and aesthetics. This approach makes the modules both relevant and engaging for local users while maintaining the educational rigor and global applicability needed to teach English grammar effectively. By fusing local and global elements, these digital modules enhance user engagement, motivation, and learning outcomes, offering an excellent example of glocalized educational technology.

The Challenges of Digital Mindset and Digital Skillset

This data was taken to answer the second and third research questions. It was taken in the focus group discussion (FGD) which is executed at the last moment of each cycle 1 to 3 as the observation and the reflection phase. Most participants describe the challenges are related to the digital skillset. Meanwhile, the impact has something to do with the digital mindset. The table below will present the challenges and the solution.

Table 1. The Challenges and the Impact

Items	Explanation
Challenges	Less curiosity
	Exclude critical thinking
	Collaboration approach
Impact	The enhanced technical skill in using thinkable software
	The enhanced skill in managing information

The enhanced skill of data literacy
The new skill of cyber awareness
The enhanced skill of problem solving

The challenges that the teachers have in implementing digital literacy integrated to create digital modules with the concept of glocalization generally are about how to maintain curiosity and critical thinking in trying something new in digital tools. Besides, they also find it difficult to collaborate, especially at the beginning cycle. However, since it takes three different cycles, the significant impact goes to some digital skills including technical skills, managing information, data literacy, and problem-solving.

This part will present the two major sub-themes which represent the research questions. The first theme represents the answer to the first research question, how does the teacher integrate digital literacy with the glocalization concept? Meanwhile, the second theme represents the second and the third research questions, what are the challenges and the impacts of developing digital literacy competence to integrate the glocalization concept in Society 5.0?

Navigating Teachers' Digital Literacy Competence to Integrate Glocalization into Teaching Innovation

A look at the findings Figure 1. It stated clearly that the digital literacy assessment becomes the indicator for teachers to change their digital mindset and develop their digital skills frequently. Moreover, the three cycles are given to train the teachers to feel familiar with digital tools and problems as well as the solutions. This statement is in line with the perspective of the teacher as the navigator that the function operating navigation system where the digital tools have been provided in the form of software, social media, search engines, and even Artificial intelligence (AI), the setting goal becomes the most essential factors in the success of enhancing teachers' digital literacy competence (Anon n.d.; John Dewey n.d.; Songer et al. 2019; William and Marry 2023).

On the other hand, Figure 2 also represents the innovation of integrating the glocalization concept with the digital module in the form of Mobile Application language learning (MALL). In this case, the teachers' innovation represents their own local culture including Cirebonese Batik Fashion, Local Tourist attraction spot, and also the characterization in the English Materials inside the MALL. It indicates that the teachers are successfully integrating the concept of glocalization that has blended the local culture into the English global concept. Furthermore, the situated learning practice has been set to determine the content or materials that can trigger the process of excellent learning that could lead the learning desire -have a good curiosity and critical thinking- to learn more to achieve the target (Chu et al. 2016; Dewey 1938; John Dewey n.d.; Kim n.d.; Maisa n.d.; Malasari and Kurniawati 2020; Skills 2015).

The Impact and The Challenges in Enhancing Digital Literacy Competence in Society 5.0

Enhancing digital literacy competence in Society 5.0 presents several impacts and challenges, Society 5.0, which emphasizes a super-smart society where technology and innovation are integrated into daily life, requires individuals to possess a high level of digital literacy(Kong et al. 2013; Van Roekel 2014; Soland, Hamilton, and Stecher 2013). Table.1 presents key points regarding the impact and challenges the teachers have during the process.

The impacts of digital literacy competence in Society 5.0 have something to do with the teachers' digital skills including increased accessibility, enhanced technical skills, data literacy, managing information, communication, problem-solving, and lifelong learning. Most participants argue that the changing mindset and improving lifelong learning could be the most crucial for adapting to rapid technological changes. Besides, being adaptable and flexible to any new digital tools, they learn how to manage information and solve any problems by doing communication and collaboration during the teaching and learning process(Bi and Chen 2022; Culp 2022; Hassan and Mohsin 2015; Koehler, M.J., Mishra, Punya., and Cain 2013; Maisa and Linda 2024).

The Challenges are related to the issues on the teachers' digital mindset who are still struggling to develop their critical thinking and their curiosity in trying new digital tools. Keeping up with the fast pace of technological advancements can be overwhelming for some teachers. Besides, not all educational institutions provide quality digital literacy training, leading to inconsistencies in skill levels. Furthermore, some teachers resist adopting new technologies due to fear, lack of confidence, or unfamiliarity. By integrating digital literacy effectively into the glocalization concept and daily life, it indicates that it is relevant to various demographics and culture than can be challenging(Aguilera 2022; Bawden 2008; Harris 2012a, 2012b; Maisa and Linda 2024; Reddy et al. 2023; Rose 2011; Sya Laisa Amara, Shintia Rahayu Safitri, and Sulpani 2022).

CONCLUSION

From the current results and discussion, it can be concluded that navigating teachers to enhance digital literacy by integrating glocalization concept with Society 5.0 tend to be effectively if the teachers have set up the digital mindset appropriately and keep developing their digital skillset continuously. The teachers need to be flexible and adaptable to the sophisticated technology tools and software advancement. In additional there are tremendous

impacts to the increased lifelong learning quality. Furthermore, the glocalization integration could be more explored to promote the local culture into the global Society 5.0. Thus, the English education goal seem to be more flexible and adaptable for global citizen and spread widely and simultaneously in Society 5.0.

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