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AN ANALYSIS OF DIGITAL LITERACY LEVEL IN TECHNICAL ASPECTS AMONG *FRESH GRADUATES* OF EARLY CHILDHOOD EDUCATORS

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Abstract

This research aims to analyze the level of digital literacy among fresh graduates of early childhood educators, with a special focus on technical aspects. Through a survey, this research illustrates the readiness of fresh graduates to face technology needs in the early childhood education environment. The research results show that the majority of fresh graduates still need to develop digital literacy skills, especially in technical contexts. Despite having a basic formal education, several respondents face difficulties in integrating technology into early childhood learning activities. The implications of the results of this research show the importance of expanding learning approaches that provide support for digital literacy, in line with the efforts of education administrators and higher education institutions to ensure that new graduates in the early childhood education have sufficient skills to overcome the challenges of digital world of education.

Keywords: Digital literacy, Technical Aspects, Fresh Graduate

Abstrak

Penelitian ini bertujuan untuk menganalisis tingkat literasi digital pada fresh graduate tenaga pendidik anak usia dini, dengan fokus khusus pada aspek teknis. Melalui survei, penelitian ini menggambarkan gambaran kesiapan fresh graduate dalam menghadapi tuntutan teknologi di lingkungan pendidikan anak usia dini. Hasil penelitian menunjukkan bahwa sebagian besar fresh graduate masih perlu pengembangan keterampilan literasi digital, terutama dalam konteks teknis. Meskipun memiliki dasar pendidikan formal, sejumlah responden menghadapi kesulitan dalam mengintegrasikan teknologi ke dalam kegiatan pembelajaran anak usia dini. Implikasi dari hasil penelitian ini menunjukkan pentingnya memperluas pendekatan pembelajaran yang memberikan dukungan pada literasi digital, seiring dengan upaya penyelenggara pendidikan dan institusi pendidikan tinggi dalam memastikan lulusan baru di bidang pendidikan anak usia dini memiliki keterampilan yang cukup untuk mengatasi tantangan dunia pendidikan yang semakin digital.

Kata Kunci: *Literasi digital, Aspek Teknis, Fresh Graduate*

Introduction

Early childhood education (ECE) plays a very vital role in forming the foundation of child development from an early age. In this early stage, children begin to develop a variety of cognitive, emotional, and social abilities that will affect their educational journey in the future. Therefore, education at the preschool level is a key factor in ensuring a solid foundation to face future challenges for children. In the era of information and communication technology that grow rapidly, early childhood education can no longer rely on conventional methods alone. It needs to adapt to technological advances that have a great impact on the world of education.

Technological advances have affected almost every aspect of life, including in the world of education. Information and communication technology (ICT) has changed the way humans work, interact, and learn. In the context of education, technology opens up opportunities for more creative, interesting, and effective learning innovations. Therefore, the integration of digital literacy in early childhood education is a necessity that cannot be ignored. Digital literacy, which includes the ability to use technological devices, understand digital information, and access resources online, is an important element in supporting the teaching and learning process in the modern era.

Zubaidah (2020) emphasized that digital literacy is no longer only considered an additional skill for early childhood educators, but has become a must. Digital literacy is a prerequisite for educators to be able to adapt to the ever-changing dynamics of the learning environment. Not only to facilitate children in using technology but also to provide examples of how technology can be used wisely and productively. In this context, early childhood educators are expected to have adequate digital literacy skills to be able to present learning experiences according to the needs and challenges of the digital era (Zubaidah 2020).

Amid global changes triggered by the technological revolution, the role of early childhood educators is increasingly crucial. In this case, fresh graduates of early childhood educators have a great responsibility to bring fresh ideas and new enthusiasm into the learning process. They are a young generation born in the digital era and have closer knowledge of the latest technology. Therefore, their ability to utilize technology is an advantage that must be optimized in early childhood learning strategies. As conveyed by Amelia (2023), fresh graduates in the field of early childhood education have great potential to integrate technology into the learning process. However, this potential needs to be analyzed in more depth, especially in terms of their digital literacy. (Amelia 2023).

In the world of modern education, digital literacy is a prerequisite for the success of an innovative and effective learning process. An understanding of technology includes not only the technical ability to use hardware and software but also how technology can be used creatively to support child-centered learning. (Sri Mulatsih et al. 2023) Stated that a technical understanding of the use of technology, such as interactive learning applications and other digital devices, is very relevant in the

context of early childhood education. Therefore, digital literacy in fresh graduates of early childhood educators is an important factor to analyze so that they can optimally utilize technology in supporting the learning process (Sri Mulatsih et al. 2023).

The analysis of the level of digital literacy in fresh graduates of early childhood educators aims to evaluate the extent to which they can utilize, understand, and apply technology in the context of early childhood learning. Technical ability to operate digital devices is only one aspect of digital literacy. Furthermore, digital literacy also includes an understanding of how to integrate technology into learning strategies that support children's holistic development. Thus, this analysis not only aims to identify technical skills that need to be improved but also to explore the innovative and creative potential of fresh graduates in facing technological challenges in the world of education.

As early childhood educators who have just graduated, fresh graduates have a unique position. They come up with the latest knowledge they gained during formal education, and they have easier access to technology compared to previous generations of educators. However, even though they are more familiar with technology, not all fresh graduates have the same level of digital literacy. Therefore, it is important to analyze their digital literacy level to identify areas that need improvement. By understanding their digital literacy strengths and weaknesses, development and training programs can be designed in a more specific and effective way.

Well-designed digital literacy training can help fresh graduates improve their technical skills and ability to use technology effectively in the context of early childhood learning. In an increasingly digital world, the ability to master technology and integrate it into learning strategies is no longer an option, but a necessity. Therefore, digital literacy training must be an integral part of the professional development of early childhood educators, both those who have just graduated and those who are already experienced.

In addition, the analysis of digital literacy in fresh graduates of early childhood educators also has important implications in the formulation of education policies in the era of the digital revolution. The results of this analysis can provide valuable input for policymakers in designing educational curricula that are relevant to the needs and challenges of the times. Educational policies that support digital literacy will not only help improve the quality of learning but will also provide strong provisions for children to compete in the technological era.

Early childhood education is the main foundation for shaping the next generation to be competitive in the technological era. Children who grow up in a learning environment that supports the wise and creative use of technology will have better abilities in facing future challenges. Therefore, fresh graduates of early childhood educators have a very important role in ensuring that digital literacy is an integral part of the learning process from an early age. Thus, children will grow up with adequate digital literacy skills, which not only help them in the learning process but also their

daily lives in the digital era.

In facing global challenges and the demands of the digital era, fresh graduates of early childhood educators need to be equipped with strong digital literacy skills. With the right analysis of their digital literacy level, efforts to improve technical and innovative skills can be carried out in a more targeted manner. Ultimately, the main goal of this analysis is to ensure that early childhood education can continue to evolve and adapt to the changes that occur in the world so that children can grow up to be individuals who are ready to face the digital age with all its challenges.

This analysis aims to identify technical skills that need improvement, but also to explore the innovative and creative potential of fresh graduates in facing the demands of technology in the learning process, the analysis of the level of digital literacy in fresh graduates is important to explore the strengths and weaknesses that can shape the direction of digital literacy development among early childhood educators. By understanding the level of digital literacy of fresh graduates, we can design more specific and effective training and development programs. In addition, this analysis can provide valuable input in the formulation of education policies that can respond to the era of the digital revolution, so that early childhood education can be the main foundation in shaping the next generation that is competitive in this technological era.

Along with the rapid development of information and communication technology, digital literacy has become one of the most important skills in various fields, including education. Early childhood education (ECE), which plays an important role in the early development of children, is not spared from the influence of this technological development (Dijck, 2019; Facer, 2018). Today's digital literacy includes not only basic skills using technological devices but also a deeper technical understanding, including mastery of tools and applications relevant to the context of education (McDougall et al., 2018).

Fresh graduates of early childhood educators are faced with the challenge of immediately adapting to the increasingly complex needs for digital literacy in the field. As newly graduated educators, they are required to be able to integrate digital technology into the learning process, both for teaching and classroom management purposes (Burnett & Merchant, 2020). However, studies show that digital literacy among fresh graduate educators is often not optimal, especially in technical aspects that include the use of hardware, educational applications, and other digital platforms (Heath et al., 2020; Mishra & Koehler, 2006).

The importance of mastering digital literacy in the technical aspect for ECE educators is further strengthened by changes in interaction and learning patterns in the classroom. In the context of early childhood education, teachers are expected not only to introduce children to technology, but also to use it pedagogically to support child development (Sung, Chang, & Liu, 2016). The use of digital tools, such as educational software and multimedia applications, requires solid technical competence on the part of educators (Dong, 2018).

Various studies show that the lack of technical digital literacy can be an obstacle for teachers in providing meaningful learning experiences through digital media (Erstad, 2015). In addition, digital literacy is also related to the professional competence of educators in using the Learning Management System (LMS), such as Google Classroom or other similar platforms, which are now widely used in ECE institution (Valtonen et al., 2017).

For this reason, this study will focus on analyzing the level of digital literacy in technical aspects among fresh graduates of early childhood education personnel. This study aims to identify the extent of their mastery of digital literacy, the obstacles faced, and how this affects the quality of learning provided to students (Ranieri et al., 2019).

In particular, this study seeks to answer several basic questions, such as: 1) What is the level of mastery of technical digital literacy for fresh graduates of early childhood education educators? 2) What factors affect their digital literacy? 3) How are these technical skills applied in daily learning practices? (Koehler & Mishra, 2009; Aesaert et al., 2017).

The gap between the expectations of the education world for technical digital literacy and the reality of mastery possessed by fresh graduates of PAUD educators is one of the main motivations for conducting this research. In addition, the results of this research are expected to contribute to the development of a teacher education curriculum that is more responsive to the needs of digital literacy in the digital era (Ching, Hsu, & Baldwin, 2018).

Method

This study uses a descriptive analysis research design with a quantitative approach. This approach was chosen because it can provide a comprehensive and measurable picture of the phenomenon focusing on the research, namely the digital literacy level in early childhood educators who have just graduated (*fresh graduates*). The quantitative approach aims to objectively measure digital literacy skills, especially in technical aspects, in a predetermined group of respondents. In this case, a descriptive approach was chosen because this study seeks to describe the existing situation without intervention or manipulation of the variables studied.

The subjects in this study are schoolars who just completed undergraduate education (*fresh graduate*) and work as early childhood educators. The focus on fresh graduates was chosen because they are considered to bring a new perspective to the world of education, especially in terms of the application of digital technology in learning. This group is also expected to have a better level of digital literacy because they have just graduated from formal education which is likely to have integrated technology in their curriculum. This study specifically selects graduates from the Early Childhood Education Teacher Study department (PG-PAUD), assuming this study focus on early childhood education and childhood development.

A total of 30 *fresh graduates* were selected as respondents in this study. These

respondents were randomly selected from the population of graduates of the PG-PAUD department who have worked as early childhood educators. Random selection was conducted to avoid bias in participant selection and ensure that the results of the study could be generalized to a wider population. Random sampling also provided an equal opportunity for every individual in the population to engage in the study, making the results more representative.

To measure the level of digital literacy, especially in the technical aspect, the instrument used in this study is a self-assessment questionnaire developed based on *the Youth Digital Skills Indicator.* (Literacy 2022). This questionnaire was designed to explore information about the technical skills of digital literacy of the respondents, such as the use of hardware and software, skills in operating various applications relevant to early childhood learning, as well as an understanding of how technology can be used in the context of learning. The Youth Digital Skills Indicator is a measuring tool designed to assess the digital skills of the younger generation, and in this study, it is adjusted to measure the technical ability of early childhood educators.

The questionnaire used consisted of 10 questions that focused on the technical aspects of digital literacy. Each question is designed to explore different aspects of digital skills, including the use of technology to communicate, searching for information, managing digital content, and skills in solving technical problems that may arise when using the technology. Respondents were asked to rate themselves based on these questions.

The data obtained from the questionnaire were then processed and analyzed using descriptive statistical methods. Descriptive statistics are used to simplify and present data in a form that is easier to understand, such as averages and standard deviations. In this study, the average calculation was carried out to determine general digital literacy level in fresh graduates who are early childhood educators, especially in the technical aspect. Standard deviation is used to measure how much variation or spread of data is from the mean. The smaller the standard deviation, the more homogeneous the results obtained and conversely, the greater the standard deviation, the more varied the level of digital literacy in the group studied.

The results of this analysis provide a comprehensive overview of the digital literacy skills of early childhood educators who have just graduated. Using this method, research can determine whether their level of digital literacy is sufficient to support their duties as educators in the digital age, or whether further training is needed to improve their technical skills.

The approach used in this study, namely descriptive analysis with a quantitative approach, allows researchers to objectively measure and describe the level of digital literacy of fresh graduates of early childhood educators. The use of self-assessment questionnaires based on the Likert scale provides results that can be processed statistically so that it can produce an accurate picture of the respondents' digital literacy level and technical skills. Through the analysis of descriptive statistical data, this study

provides important insights into the potential and limitations of digital literacy of fresh graduates as an early childhood educators, which the result can be the basis for designing further development programs.

Results and Discussion

1. **Electronic use**

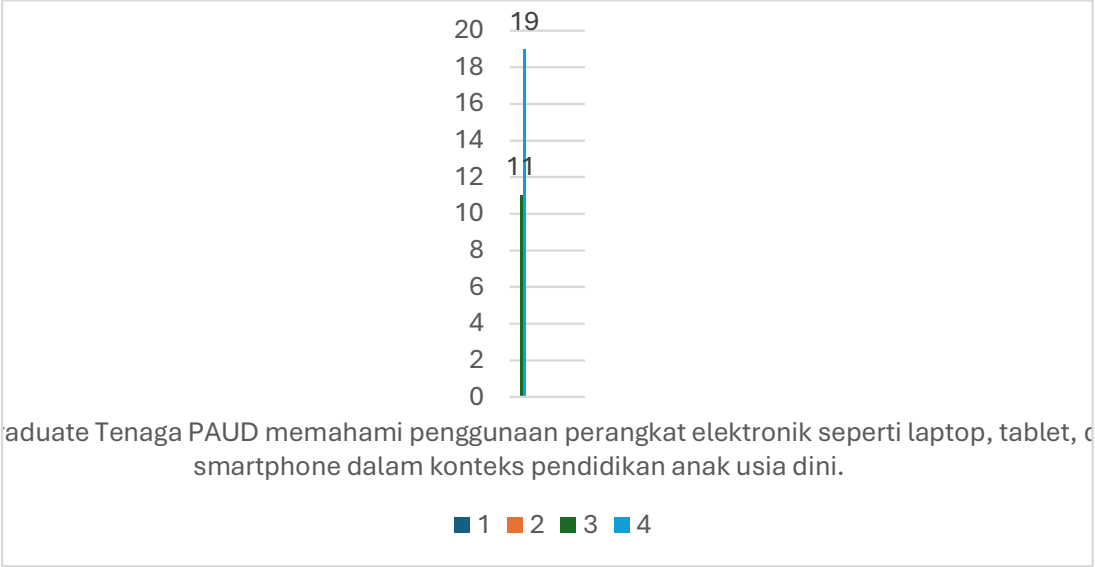

Figure 1. Electronic use

The results of the understanding of fresh graduates of early childhood education teacher department (PG-PAUD) related to the use of electronic devices, such as laptops, tablets, and smartphones, in the context of early childhood education, illustrate a fairly diverse picture. Most had excellent abilities as many as 19 of those showed a basic understanding of the functions of each device, although some still needed improvement in identifying the differences between them as many as 11 respondents showed a good understanding of the functions of each device. Most fresh graduates demonstrate basic skills in operating educational applications and using basic features on electronic devices. Nonetheless, a small percentage of them experience technical difficulties, which indicates the need for further training to ensure that all graduates have uniform technical skills.

When discussing awareness of the challenges and benefits, most respondents are aware of several potential challenges, such as the risk of overuse or lack of supervision. On the other hand, they also see benefits, including increased child engagement, access to educational resources, and technological skills development. (Febrianti et al. 2023). Further discussions can be directed to knowledge development, integration of educational concepts, and improvement of technical skills through additional training.

2. Choosing and integrating learning apps that are appropriate for early childhood

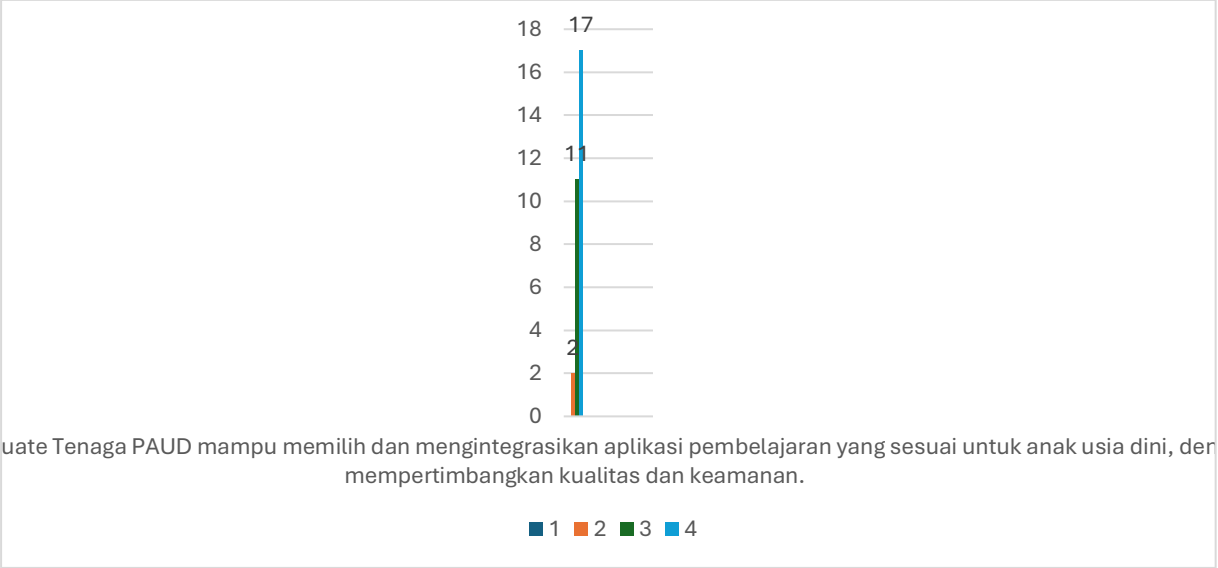

Figure 2. Choosing and integrating apps

The results of the ability of fresh graduates of PG-PAUD in selecting and integrating learning applications for early childhood illustrate several findings that show the results of the respondents, namely a total of 17 respondents answered that they had very good abilities, while 11 respondents had good abilities and as many as 2 respondents answered quite Most of them had shown good abilities in choosing applications that suit their needs and level of development early childhood. The importance of considering the quality of learning content and features that support an effective teaching process (Lana Fauziah, Junarti 2023). Most respondents also showed good awareness of security factors, such as children's privacy and data security.

3. Ability to conduct online searches for learning resources

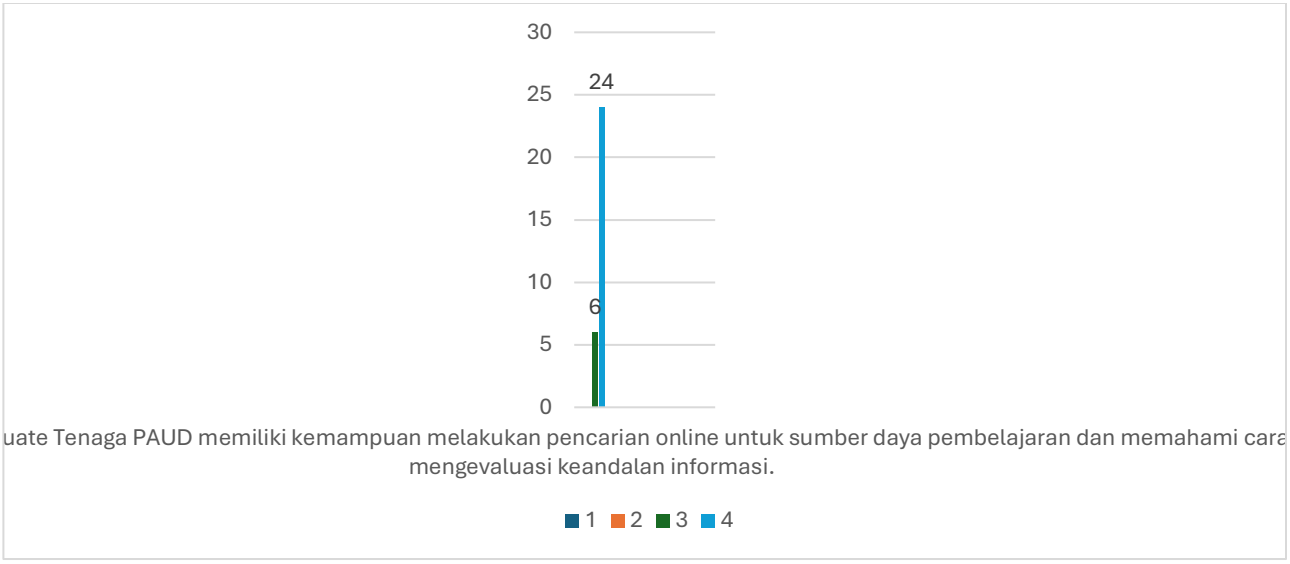

Figure 3. Conduct an online search for learning resources

The results of the ability of fresh graduates of PG-PAUD to conduct online searches for learning resources and their ability to evaluate the reliability of information showed that the majority of respondents had shown the ability to use search engines and choose relevant learning resources for early childhood, as many as 24 respondents chose very good answers and as many as 6 respondents chose good answers. They understand the importance of information reliability in the context of education, and most have been able to identify reliable and relevant resources. This will help fresh graduates develop better analytical skills when they are faced with various online learning resources. Strengthening their understanding of the risks of untrustworthy information and how to overcome misinterpretation will contribute positively to their ability as early childhood education facilitators.

4. Designing and using engaging and relevant digital learning materials to support early childhood learning

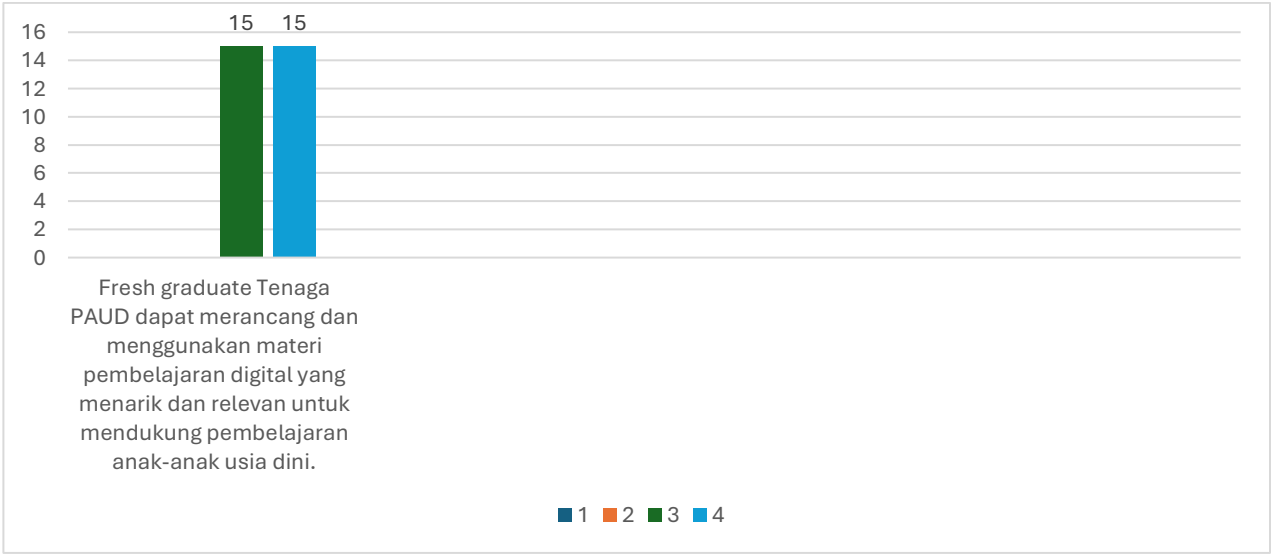

Figure 4. Designing and using digital learning materials

The results of the ability of fresh graduates of PG-PAUD to design and use digital learning materials showed satisfactory achievements. Most of the respondents have been able to create engaging and relevant digital learning materials for early childhood. A total of 15 respondents showed very good and 15 respondents showed good in designing and using interesting and relevant digital learning materials. They have understood the principles of effective learning design, such as the use of images, interactivity, and content tailored to the child's developmental level. Their ability to compose learning materials that are not only informative but also entertaining and motivating children signifies positive competence (Hidayat et al. 2022). In addition, efforts can be highlighted to ensure that digital learning materials comply with pedagogical and ethical standards, including children's safety and privacy. Thus, the results of this evaluation are a positive foundation to support the further development and improvement of the ability of PAUD fresh graduates to create meaningful and effective digital learning experiences for early childhood.

5. Implement online safety practices, including protecting privacy and teaching it to children.

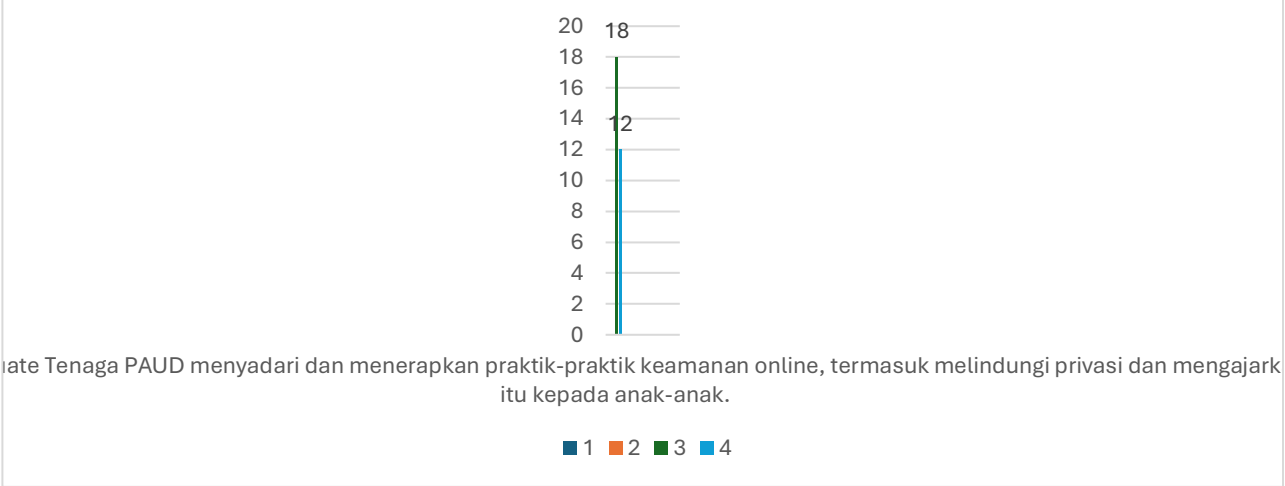

Figure 5. Implementing online security practices and protecting privacy

The results of the evaluation of the awareness and application of online security practices by fresh graduates of PG-PAUD staff showed positive achievements. The results of the respondents showed that as many as 12 respondents voted very well and as many as 18 voted good in realizing and implementing online security practices. Most respondents have shown a good understanding of the importance of online safety and privacy in the context of early childhood education. They can identify potential risks and have implemented precautions to protect children's personal information and data. Most participant are also aware of their role as educators in teaching children the principles of

healthy online safety. Thus, the results of this evaluation are not only a reflection of good awareness but also a basis for further development in supporting responsible online security practices in the PAUD environment.

6. Troubleshoot basic technical issues and maintain devices simply.

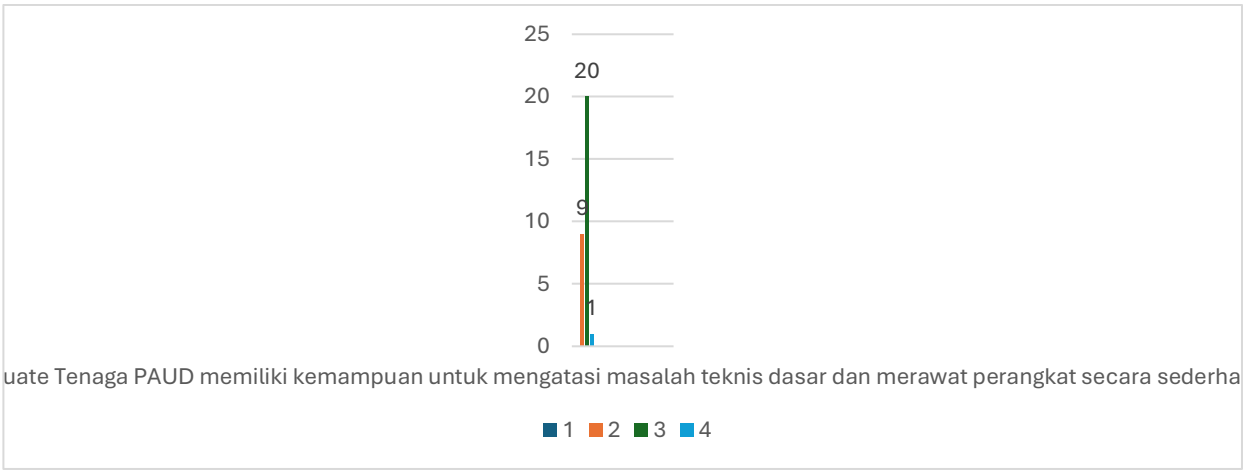

Figure 6. Troubleshoot basic technical issues and maintain the device

The results of the evaluation of the ability of fresh graduates of PAUD personnel in overcoming basic technical problems and maintaining devices simply. From the results of the respondents, it has been shown that 1 respondent chose very well, 20 respondents have good abilities and 9 respondents have sufficient ability in overcoming basic technical problems and maintaining the device simply. The ability to identify and address common issues that may occur with devices such as laptops, tablets, and smartphones. They can handle basic technical issues, such as internet connection issues, software installation, or simple hardware troubleshooting. Fresh graduates can be directed to take on more complex technological challenges by improving their understanding of the latest operating systems, hardware, and software. In this way, this evaluation is not only a current assessment but also a basis for continuous development in supporting the ability of fresh graduates of early childhood education personnel to effectively manage and

maintain technological devices in the early childhood education environment.

7. **Educative Social media and communicates ethically online, promoting collaboration and the exchange of ideas.**

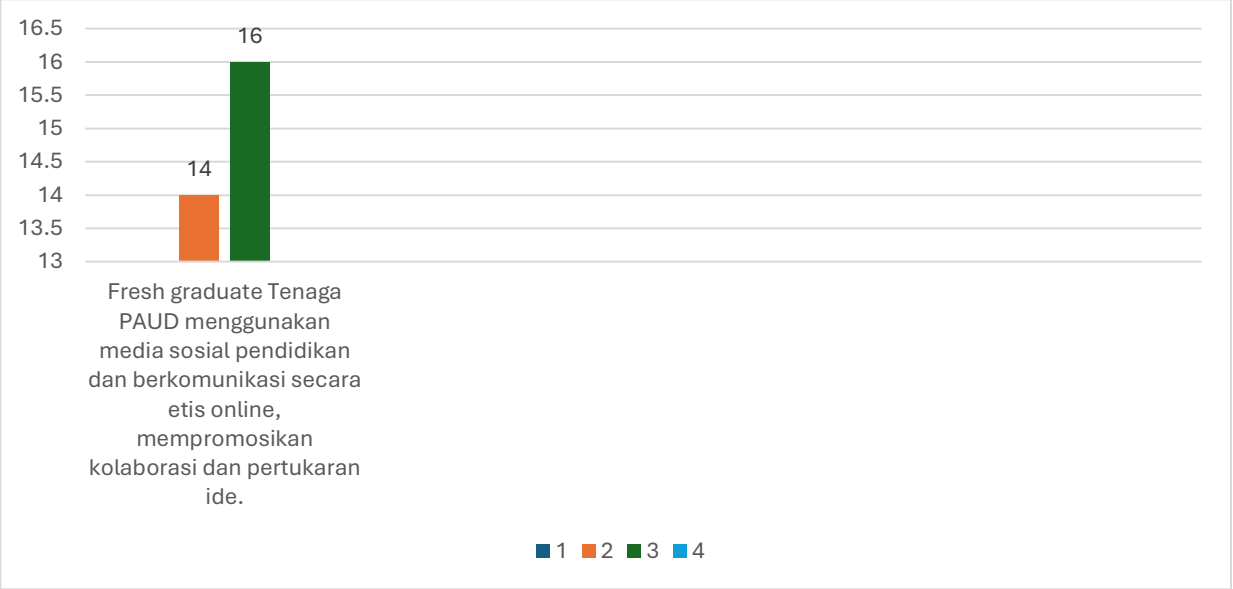

Figure 7. Educative social media, and communicating ethically online

The results of the use of social media and online communication skills by fresh graduates of PG-PAUD reflect the achievement with 1 respondent choosing very well, as many as 16 respondents having good abilities and 14 respondents having sufficient ability in using educative social media and communicating ethically. Respondents have demonstrated a solid understanding of the use of social media in an educational context and have implemented ethical communication practices online. They can leverage educational social media platforms to promote collaboration and exchange of ideas between fellow educators, even in a broader scope, perhaps including parents and the educational community. This evaluation not only provides an overview of current abilities but

also serves as a foundation for the development of the ability of fresh graduates of PG-PAUD to utilize social media positively and ethically in supporting early childhood education.

8. Evaluate the feasibility and suitability of digital content with early childhood development.

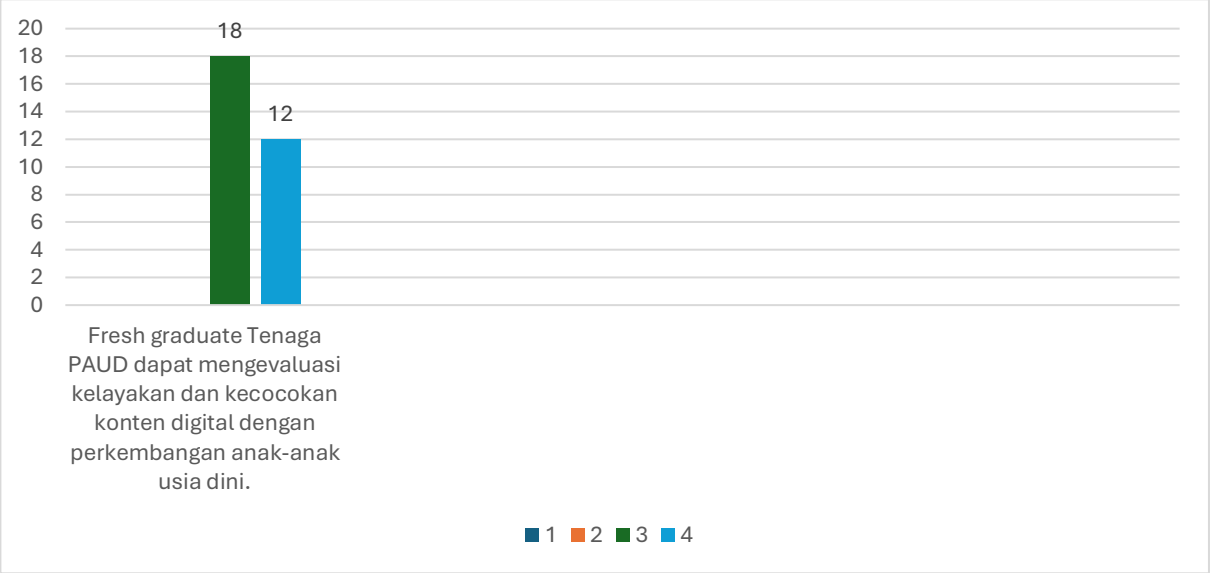

Figure 8. Evaluate the feasibility and suitability of digital content

The results of the ability of fresh graduates of PG-PAUD to evaluate the feasibility and suitability of digital content with early childhood development reflect positive achievements. With the results of 12 respondents choosing very well and 18 respondents choosing both in evaluating the feasibility and suitability of digital content, respondents have been able to conduct a careful assessment of digital content, considering factors such as relevance, level of difficulty, and sustainability with the developmental stage of early childhood. They can identify materials that are by the curriculum and learning methods that support the cognitive, motor, social, and emotional development of the children. In further discussion, the importance of deepening their understanding of the stages of early

childhood development and how digital content can be an effective tool in supporting their learning can be emphasized. Through this evaluation, further discussions can focus on developing more sophisticated evaluation strategies, including the use of assessment tools and frameworks that support in-depth analysis of digital content. By strengthening their evaluation capabilities, fresh graduates expected be more effective in selecting and integrating optimal digital content to enhance the learning experience of early childhood.

9. Support and direct the use of technology in early childhood, prioritizing safety and ethics.

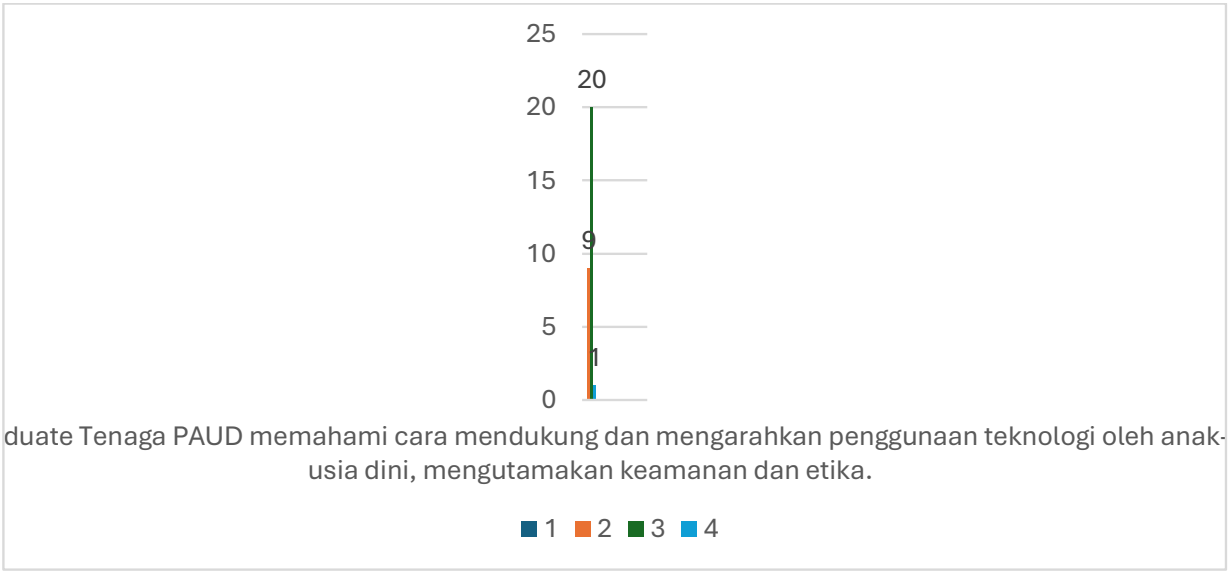

Figure 9. Support and direct early childhood use of technology

The results of the understanding of fresh graduates of PAUD personnel related to how to support and direct the use of technology by early childhood showed that 1 respondent had very good ability, 20 respondents had good ability and 9 respondents had sufficient ability to understand how to support and direct the use of technology. Respondents have demonstrated strong awareness and knowledge of the importance of their role in managing children's use of technology safely and ethically. They can prioritize safety and ethics in supporting early childhood in exploring the digital world. The results of this evaluation can lead to the development of additional training programs or workshops that help fresh graduates improve their skills in managing the use of technology in early childhood. By continuing to prioritize safety and ethics, they can play an important

role in shaping early childhood digital experiences to be more positive and support their overall development.

10. The use of technology to create interactive learning experiences that support the development of early childhood literacy skills.

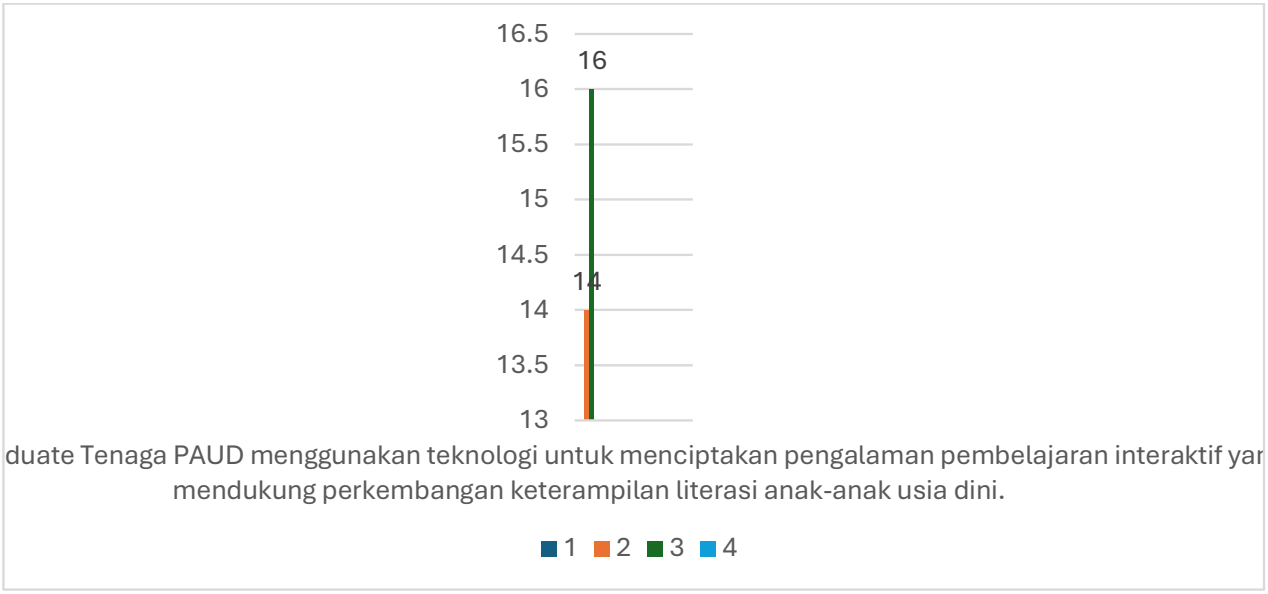

Figure 10. Supporting the Development of Early Childhood Literacy Skills

The results of the use of technology by fresh graduates of PG-PAUD in creating interactive learning experiences showed that 16 respondents had very good abilities and 14 respondents had good abilities in creating interactive learning experiences that supported the development of children's literacy skills. Most respondents have successfully integrated technology into early childhood learning environments to create interactive experiences that support the development of literacy skills. They can utilize various applications, software, and digital resources to design learning activities that are engaging and appropriate to children's developmental levels. Continuous improvement through training and research can be an integral part of the development of fresh graduate skills in creating interactive learning experiences that can stimulate the development of early

childhood literacy holistically.

Conclusions

The conclusion regarding the analysis of the level of digital literacy in fresh graduates of early childhood educators shows that there is a gap between the demands of increasingly advanced technology in the world of education and the practical readiness of new graduates. Although they have obtained adequate formal education, the technical skills required in integrating technology into the learning process are still less than optimal. This can be seen from the inability of some fresh graduates to effectively utilize technology to support early childhood development, such as the use of interactive tools, educational applications, and software relevant to the curriculum.

It is important to note that technological developments are not only teaching aids, but they are also influencing the way children learn and interact. Therefore, digital literacy is a core competency that must be possessed by educators. These skills involve not only basic technical abilities, such as using computers or applications but also an understanding of how technology can be pedagogically integrated to improve the effectiveness of learning. For example, teachers need to be able to adapt technology-based learning strategies, such as interactive learning methods, to suit the characteristics of early childhood development.

The findings of the study show that the majority of fresh graduates still need to develop digital literacy skills, especially in technical aspects. Despite having a formal education background, some of them may have difficulty integrating technology in the early childhood learning process. Therefore, education providers and higher education institutions need to strengthen learning approaches that prioritize digital literacy, to ensure that new graduates in the field of early childhood education have adequate skills to face the challenges of an increasingly digital education world.

Thus, education providers, especially higher education institutions that train prospective teachers, must adopt a more proactive approach to strengthening their curriculum with elements of digital literacy. Training and hands-on practice using technology should be an integral part of learning. This will ensure that new graduates are ready to innovate and provide a more modern and relevant learning experience for children in the digital age.

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