Evaluation of Information Technology Utilization in Early Childhood Education Institutions Learning

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Abstract. This research aims to describe the technological media used by early childhood educators in Manggarai, along with the factors that influence the use of ICT in learning. The methodology used is qualitative research. Data was collected through interviews, observation and documentation at several early childhood education institutions in Manggarai. The study revealed that of the 10 institutions investigated, only 6 incorporated ICT into their teaching methods. The main option is to use laptops to display educational content, although their use is not planned consistently in the daily teaching schedule. However, the use of technology has succeeded in creating an interesting learning environment for children. However, limited access to technology, educators' skills in operating technology, and infrastructure constraints are the main obstacles in optimizing the use of ICT in early childhood learning. Therefore, there is a need for better support from early childhood education institutions and improvement of educators' skills in integrating ICT into teaching practice. This research highlights the importance of a planned approach, adequate support and adaptation to meet children's needs and development in order to maximize the use of ICT in learning.

Keywords: Information Technology; Learning; Early Childhood Education

1 Introduction

Given the rapid and soaring development of Information Technology (IT), educational development programs in Indonesia are striving to adapt. The design of educational development programs is aimed at creating integrated, directed, and technology-based education that is anticipated to have multiplier and nurturing effects on nearly all aspects of educational development. Thus, IT functions to narrow the gap in mastering cutting-edge technology, especially in the educational sphere. Consequently, numerous educational institutions have successfully developed information and communication technology to support their learning processes.

The presence of information and communication systems has become an inseparable component of educational activities, where IT plays multiple roles: as a skill and competence, educational infrastructure, a source of teaching materials, an educational tool and facility, as well as a support for educational management and decision-making.

Furthermore, the existence of IT in the educational realm offers at least two advantages: it acts as a catalyst for the educational community, including teachers, to be more appreciative and proactive in maximizing educational potential, and it provides ample opportunities for students to utilize the limitless potential from available resources.

Learning is a term closely intertwined with and inseparable from the educational process. Learning is an activity conducted to create an atmosphere or provide services so that

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students' learning is adapted to relevant conditions. Hence, it's important to understand how students acquire knowledge through their learning activities. For early childhood, learning occurs primarily through play, which optimally stimulates their development. Considering the relevant condition where children are in a technology-rich environment, learning activities should be adaptable. This adaptation directs learning activities that utilize IT as a learning medium or support tool for a smooth learning process. The use of IT in learning, especially in early childhood education, needs to consider the age level and stages of children's learning to ensure proper implementation that stimulates all aspects of child development.

An example of utilizing IT in early childhood education, such as in Early Childhood Education is that teachers can use the internet to search for learning resources related to the current themes or subthemes being taught. Teachers can also use social media or online platforms to share information, experiences, and ideas with other teachers. Additionally, teachers can use IT to enhance digital literacy in young children. Digital literacy involves the ability to access, understand, use, and create information using digital technology. Teachers can teach young children how to operate digital devices like computers or tablets, how to safely and responsibly search for information on the internet, how to process information into creative products like images or stories, and how to communicate with others through digital media.

In practice, the use of IT in early childhood education is not always ideal. Several factors can affect the effectiveness of IT usage, including teachers' abilities in using technology. Not all teachers in the PAUD environment have sufficient skills or knowledge to integrate IT into their teaching activities. Moreover, remote areas with limited internet access or IT infrastructure pose obstacles in optimizing technology usage. Limited IT facilities in PAUD schools also seriously hinder the implementation of technology-based learning, leading to disparities in IT utilization between urban and rural areas. In certain areas, teachers may have limited knowledge regarding technology usage, impacting their ability to create innovative and responsive learning environments for early childhood needs. This is as described by Andy Hardiyana [1] it explains that there are several factors causing the minimal use of IT in early childhood education (PAUD), including the low quality of PAUD teachers, lack of variability in teaching methods, and insufficient use of technology in early childhood education

Utilizing interactive and high-quality media in distance learning is key to supporting enjoyable learning experiences and better learning outcomes. Research conducted by Haryani and Sari [2] The research demonstrated that the use of instructional video media at TK Al Kautsar effectively guided and stimulated the cognitive development aspects of 4-5-year-old children during distance learning. The instructional videos aided teachers in delivering the material more effectively and helped children understand the learning content.

The focus of this study is to explore the types of technological media utilized by early childhood educators in Manggarai for early-age learning, as well as the factors influencing the high and low utilization of Information Technology (IT) in the learning process.

2 Method and Materials

The research conducted is a qualitative study focusing on a profound understanding of the use of information technology in the context of Early Childhood Education (PAUD) learning. This study was conducted in October 2023, with several PAUD institutions in Manggarai chosen as

the research locations to gather representative information and data regarding the utilization of information technology in the context of learning. The research subjects are PAUD teachers directly involved in the teaching process, while the object of the study is the use of information technology in the context of learning in PAUD institutions.
Information was collected through three main methods: interviews, observations, and documentation. Interviews were conducted with teaching staff to comprehend the utilization of technology in teaching. The interview questions in this study revolved around the types of technology used by PAUD teachers in their respective institutions. Observations were made to assess children's responses to the use of technology in the classroom. Documentation was used to gather evidence of technology use in the learning process, such as video recordings and lesson plans prepared by teachers.
Data analysis was conducted through a validation analysis using triangulation of data, where interview results were juxtaposed with documentation to review teachers' lesson plans and identify steps or elements indicating the use of technology.

3 Results and Discussion

Out of the 10 investigated PAUD institutions (TK Negeri Tentang, KB Watu Cambir Todo, KB Dirgahayu Narang, SPS Golo Pau, PAUD Bangka Ruang, KB Tunas Harapan CIA, PAUD Bunda Maria Manong, KB St Gabriel, KB St Carlo Acutis Welu, and KB Munting Jaya), 6 of them incorporate Information Technology (IT) into their teaching methods, while the remaining 4 do not use IT at all. Among the six institutions utilizing IT, most employ laptops to display relevant educational videos aligned with the learning material. Laptops are utilized to present educational content suitable for the developmental stage of PAUD children, such as short videos, interactive applications, educational games, or presentations that enrich the learning experience. This data was obtained from interviews with teachers regarding the types of technology they have used to support learning.

The use of laptops in children's learning activities at several PAUD institutions is not consistently included in their daily lesson plans. Nevertheless, observations indicate that children exhibit high interest in the use of this technology. Teachers integrating laptops into their teaching practices have successfully created a more engaging learning environment, enriched learning experiences, and enhanced children's participation levels.

Beyond laptops, there are various other types of technology that teachers can use in PAUD learning, such as television. Television can serve as a learning medium in the teaching and learning process. Teachers can prepare television devices as learning tools for children in PAUD educational processes. Additionally, teachers can create learning modules for children to study through the school television. Modules developed by teachers can be broadcasted through the school television transmission [3].

Research conducted by Krobo [4], and others, it proves that the use of information and communication technology in early childhood education (PAUD) has several benefits, such as facilitating teachers in delivering learning materials to children, increasing efficiency in time and cost in teaching, and improving the quality of learning and children's learning outcomes. Sulistyaningtyas [5] and Jatmikowati [6] it also explains the positive effects of using technology in early childhood education, including self-confidence, curiosity, creativity, motivation, and interest in learning. In developing children's cognitive abilities, for instance problem-solving and critical thinking, through games, it supports language development in children by providing access to digital resources, such as e-books and language learning apps. Additionally, children

can acquire exposure to digital literacy skills, which are increasingly important in the current digital era [7]

However, there are several factors contributing to why the use of technology in early childhood education (PAUD) remains minimal, including: lack of access to technology and difficulties in operating digital devices [8], as well as limited internet data and signal disruptions [9]. From the results of the conducted research, these factors are the reasons behind the limited use of technology in learning apart from the financial limitations of the institution. To address several issues mentioned above, educators in Early Childhood Education (ECE) need to consider various aspects when integrating technology into children's learning. Firstly, they need to have adequate technological knowledge to create engaging and enjoyable learning activities. Secondly, educators should consider the concept of Developmentally Appropriate Practice (DAP) when designing technology-integrated learning activities that align with children's developmental stages [10], to ensure that activities align with the skills, knowledge, disposition, and feelings of children, educators should consider a few essential aspects. Firstly, they should ensure that activities correspond to the skills, knowledge, disposition, and feelings of the children. Secondly, educators must model the use of technological devices, encourage collaboration and resource-sharing among students, and incorporate Information and Communication Technology (ICT) into lesson planning. These strategies can enhance the effectiveness of technology integration in early childhood education classrooms. Additionally, for early childhood education institutions, they should focus on providing support and resources for teachers using educational technology. This support includes providing technological facilities and their support systems, as well as offering opportunities for teachers to attend training related to technology utilization in teaching and learning

4 Conclusion

In the evaluation research on the utilization of Information Technology (IT) in Early Childhood Education (ECE) institutions, it was found that out of the 10 ECE institutions studied, only 6 of them incorporated Information Technology (IT) into their teaching processes. These institutions utilized laptops to showcase relevant videos corresponding to the learning materials for the children. However, the use of laptops was often unplanned in the daily lesson plans, yet it managed to capture the interest of the children and enrich their learning experiences.

Nevertheless, several factors serve as primary obstacles to the utilization of technology in ECE. These factors include limited access to technology, challenges in operating digital devices, as well as limited resources and support from ECE institutions. These limitations contribute to the minimal integration of technology in the teaching processes of some ECE institutions studied.

To address these challenges, the research suggests several essential considerations. Educators in ECE institutions should possess adequate technological knowledge to create engaging and effective learning activities. It is crucial to consider developmentally appropriate practices when designing technology-integrated learning activities for children.

Furthermore, ECE institutions need to provide better support to teachers in utilizing educational technology. This support could include the provision of adequate technological resources, guidance in device operation, and opportunities for teachers to undergo training related to technology use in teaching.

In conclusion, the integration of Information Technology in ECE holds significant potential for enhancing the quality of early childhood education. However, a more structured approach,

adequate resource support, and adaptation to the needs and developmental stages of children are necessary to optimize the benefits of using technology in education to the fullest extent.

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