# *Preference of Early Childhood Teachers in Using Instructional Media: A Systematic Survey*

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*Abstract*— **Instructional media is a fundamental need for teachers, especially those who teach early childhood, in transmitting messages as taught material. Early childhood teachers have certain preferences when developing (by design) or utilizing instructional media, especially in the realm of digitalization. These preferences are tailored to the learning needs of early childhood. This study aims to find the preferences of early childhood teachers in utilizing or developing instructional media. This quantitative research uses a systematic survey (percentage) approach involving 30 early childhood teachers as respondents. The results showed that there was a dominant preference of early childhood teachers in optimizing instructional media. These preferences include LCD Projectors, traditional whiteboards, wall magazines, Microsoft Word, self-drawing, smartphone cameras, voice recordings, WhatsApp Call, public television, YouTube live broadcasts, Zoom, Capcut, Google, WhatsApp, Google Form and Google Classroom. This means that early childhood teachers' understanding of instructional media is good, but needs to be strengthened in their digitization capabilities. Thus, this research can be used as an alternative reference in empowering early childhood teachers in the future.**

***Keywords: Early Childhood Teacher, Instructional Media, Education***

## I. INTRODUCTION

The education of pre-school children at the age of 2 to 3 years is character building, where education here is emphasized on images, sounds and movements combined with interesting shapes and colors. At this age, children begin to know the objects around them (Zahrotun, Hendriana, & Saputra, 2015). For this reason, the right stimulus is needed, so that early childhood development is maximized. Early childhood development includes several aspects, namely cognitive, motor, physical, social and language development (V. H. Saputra, Pasha, & Afriska, 2020). Early childhood educators have been described as caregivers, babysitters, specialists, advocates, teachers and foundation builders. Early years educators had an important and complex role that required a tacit dimension from "knowing" to, "experiencing to acting" (Goodfellow, 2001) and embodied knowledge. Thus, the roles and responsibilities of educators of the early years are so wide and diverse, that it is difficult to determine the desired qualities, knowledge and important attributes (Harwood, Klopper, Osanyin, & Vanderlee, 2013).

Early childhood learning is never separated from the need for learning media as one of the urgent components. Especially when relevant with the development of Information and Communication Technology (ICT). According to Lee (2019), early childhood teachers need to understand ICT literacy which includes understanding educational policies related to the use of ICT, understanding the objectives and assessment of ICT curriculum and the use of ICT in education, including the use of instructional methods, the application of digital technology, the development of an ICT learning environment and management for the development of teacher professionalism related to ICT

instructional media. In line with the TPACK competence declared by Koehler & Mishra in 2009. Therefore, it is necessary to introduce various resources in the form of digital tools that can support early childhood teachers in improving their knowledge, skills, and understanding of effective technology integration practices (Keengwe & Onchwari, 2009).

Instructional media is any form of physical and non-physical intermediary that is used as a component of delivery strategies to channel messages that can be done through recording, storing, preserving or retrieving information aimed to achieving instructional goals (Thaariq, 2022). The main concepts or procedures to be followed are broken down into phases as determined by various models. Selected or more models can be woven together in actualizing the product in question (Yusuf, Olanrewaju, & Soetan, 2015). Supporting learning materials for early childhood can be through educational content such as various games, storytelling, playing, and other activities that are done correctly (Prilosadoso, Kurniawan, Pandanwangi, & Yunianto, 2021).

Studies related to the use of instructional media for early childhood have been conducted with various forms of utilization. One thing that is certain is the urgency regarding learning objectives. For example, in Chen & Chan (2019) study regarding the use of augmented reality (AR) based flashcards can significantly improve children's vocabulary learning and that there is no significant difference in effectiveness between AR and traditional flashcard methods. The teachers indicated that the children enjoyed the AR learning activities. Another study from Novaliendry, Saltriadi, Mahyuddin, Sriwahyuni, & Ardi (2022) also showed that early childhood students can easily recognise the given words as they learn by using animated videos as they can display not only written words but also images.

Media is needed to facilitate children in the learning process, especially based on digitalisation. Digital media plays an important role in learning, because it can create interaction between children and the material to be studied. The use of media can increase children's learning motivation, so that children's attention to learning materials increases. The use of media will help educators and children in the instructional process (Sari & Suryana, 2019). This study focused on the percentage of teachers' preferences in using instructional media to early childhood. Mainly related to the use of hardware and software in it (Fajarianto, Setiawan, Mursidi, Sundiman, & Sari, 2018).

## II. METHODS

This research uses a quantitative approach with systematic survey techniques. This type of research allows various methods to recruit participants, collect data, and utilize various instrumentation methods (Ponto, 2015). The sample collection technique in this study was simple random sampling. A total of 30 early childhood teachers were randomly selected because they were considered to represent a population that was considered homogeneous. The instrument that has been validated by experts is then distributed to respondents using a questionnaire with items that are numerically rated. Choosing 30 early childhood teachers as respondents is in accordance with the statement from Kerlinger & Lee (2000) regarding quantitative research. Percentages tend to be easy to calculate and easy for most people to understand. As such, the re-emergence of percentage grades stems primarily from the increased use of technology and the favouring of computer technicians, rather than from educators' desire for alternative grading scales or from research into better grading practices (Guskey, 2013). Percentage indicates the ratio of the population.

The items assessed as surveys are teachers' preferences in developing and using learning media based on the classification of their forms. Ibrahim (1997) in Thaariq (2022) mentioned that the classification of instructional media consists of (1) projection media, (2) two-dimensional media without projection, (3) three-dimensional media without projection, (4) audio, (5) television or video (audiovisual) and (6) computers. All forms of such classification are relevant to the digitization has evolved.

## III. RESULTS AND DISCUSSION

The Educational technology is a science in solving educational problems through a series of activities to facilitate learning and improve performance by utilizing resources appropriately (Januszewski & Molenda, 2013). One of its forms is the development and utilization of instructional media (Thaariq, Ramadhani, et al., 2020). In choosing instructional media, Abidin (2017) revealed that there are principles who need to be considered, namely (1) there is clarity of the purpose and aim of media selection, (2) there is media familiarity, (3) there are a number of instructional media that can be selected or compared and (4) there are a number of criteria or norms used in the selection process. Thus, this study resulted in a percentage of early childhood teacher preferences during developing and using digital-based learning media. It is because digital literacy is an important component for teachers in 21st century instruction to support student-centered learning (Kuswandi et al., 2021).

Projection media is a medium that can be used with the help of a projector. This medium is a visual medium. It is said to be a visual medium because it can visualize an object in a tangible form (D. Saputra, 2021). As for the use of projection media, data was obtained that the use of overhead projectors was 6.7 percent, LCD Projectors 60 percent, Film Strips 6.7 percent, Slides 16.7 percent and the remaining 10 percent had never used. Thus the preference for the use of LCD Projectors has the highest percentage compared to other projection media.

Two-dimensional media without projection is an intermediate form that displays messages with teaching materials that have dimensions of length and width whose use does not require the help of projection tools (Thaariq, 2022). By Thaariq (2022), the media is divided into (1) whiteboard, (2) pasteboard (widget), (3) module, (4) graphics and (5) photo. As for the use of whiteboards, each preference was obtained such as Open Board as much as 10 percent, Microsoft Powerpoint (drawing) as much as 13.3 percent, Microsoft Whiteboard as much as 3.3 percent, Whiteboard as much as 3.3 percent and the remaining 70 percent using conventional whiteboards. When it comes to pasteboards, 70 percent use wall magazines, 16.7 percent use Sticky Notes, 6.7 percent Google Keep, 3.3 percent Padlet and the remaining 3.3 percent have never used. When it comes to modules, 90 percent use Microsoft Word, 3.3 percent use Flipsnack and the remaining 6.7 percent have never used. Regarding graphic media, 33.3 percent used Canva, 10 percent used Paint, 6.7 percent Corel Draw, 3.3 percent answered they used Canva combined, Corel Draw, drew their own, 43.3 percent answered they tend to draw it themselves without the help of an app and the remaining 3.3 percent have never used. Meanwhile, regarding the use of photo media, as many as 90 percent tend to use cameras from their respective mobile devices (smartphones), 6.7 percent tend to use Adobe Photoshop and the remaining 3.3 percent use PicsArt. Thus the preference of using conventional whiteboards, wall magazines, Microsoft Word, draws their own with a makeshift and camera from the respective smartphones.

Three-dimensional media without projection is a group of media without projection presented in three-dimensional visuals without the need for the help of projection (Thaariq, 2022). This media is in the form of an object that resembles the original object to represent its original form, both presented in life and non-life (Badriah, 2018). In a sense, the message conveyed in this media can be seen or felt as a whole. As for the use of media without three-dimensional projection, data was obtained that 33.3 percent used conventional (physical) media, 20 percent used 3D Paint, 3.3 percent used Blender and the remaining 43.3 percent had never used. Thus, early childhood teachers still predominantly have never used three-dimensional media.

Audio media is a medium with material that contains messages in auditive form (vocal cords or sound discs), which can provide encouragement of students' thoughts, feelings, attention, and willingness for the learning process to occur (Sudjana & Rivai, 1997). The use of audio media can help students in listening learning (Wahyuniar, Uspayanti, Sari, & Natalia, 2021). Regarding the development of audio media, data was obtained that as many as 60 percent used standalone sound recordings, 20 percent used radio in smartphones, 7 percent used audacity and the remaining 13 percent had never

used. Regarding the use of audio teleconferencing, as many as 77 percent use the WhatsApp calling feature, 6 percent use the Instagram call feature and 17 percent have never used. Regarding the development of audio podcasts, 33.3 percent used audio editing applications as usual, 6.7 percent used Anchor FM and 60 percent had never used it. This means that predominantly, early childhood teachers tend to use independent voice recordings and utilize WhatsApp's calling feature to optimize audio media, but have never tried to develop audio-based podcasts.

The next form is audio-video (commonly known as audiovisual) in the form of television and video broadcasts. Television is a source of information and entertainment, and for many it is an integral part of everyday life (Webb, 2014). Television is in dire need of broadcasting. So the data on the acquisition of television broadcasts (open) commonly used in learning is 36.7 percent using television in general, 30 percent answering that they usually use television from the web and 33.3 percent have never used it. As for live broadcasts, as many as 50 percent often use live broadcasts from YouTube, 20 percent often use live broadcasts from Instagram and 30 percent have never used them. This means that early childhood teachers predominantly use television in general and access live broadcasts from YouTube. As for video, it can record and reproduce perfectly the systems developed in the film industry and broadcasting institutions to depict reality and to create meaningful combinations of sound and image (Armes, 2006). In the development of learning videos, 36.7 percent used Capcut, 30 percent used Kinemaster, 6.7 percent used Wondershare Filmora, 3.3 percent used Screencastify, 3.3 percent used Inshot, 3.3 percent used Instagram and 16.7 percent had never used. Regarding screencasts, 43.3 percent use Screencast-O-matic, 6.7 percent use Screencastify and the remaining 50 percent have never used. As for video teleconferencing, 70 percent use Zoom, 20 percent use Google Meet, 3.3 percent use Microsoft Teams, 3.3 percent use Skype and the remaining 3.3 percent have never used. This means that predominantly, teachers optimize videos using Capcut and Zoom, but never optimized screencasts.

The last classification is computer media. Computer-based learning environments are usually characterized by multiple representations of information that can be controlled by the learner and can help to define tasks, set goals, impose strategies, and adapt metacognition (Zheng, 2016). Much of the work has been done on the effectiveness of computer-based learning approaches versus traditional methods, and little has been done on the comparative effects of computer-based learning versus its methodology (Taveira-Gomes, Ferreira, Taveira-Gomes, Severo, & Ferreira, 2016). In this study, it divided computer media into (1) search engines, (2) social media, (3) applications, (4) web-based learning, (5) game-based learning, (6) quizzes, and (7) computer teleconferencing. When it comes to using search engines, 100 percent use Google. For social media, 80 percent use WhatsApp, 13.3 percent use Instagram, 3.3 percent use Facebook and 3.3 percent have never used. In developing applications, 46.7 percent used Microsoft Powerpoint, 3.3 percent used Glide and the remaining 50 percent had never used. In creating the web, 36.7 percent use Google Docs, 10 percent use WordPress, 3.3 percent use Moodle, 3.3 percent use HTML programming and the remaining 46.7 percent have never used it. In making games, 6.7 percent use Wordwall, 3.3 percent use Proprofs Game and the remaining 90 percent have never used. In creating quizzes, 40 percent used Google Forms, 13.3 percent used Quizizz, 3.3 percent used Kahoot, 3.3 percent used Microsoft Forms and the remaining 40 percent had never used. Meanwhile, in using computer teleconferencing, 63.3 percent use Google Classroom, 10 percent use Microsoft Teams and the remaining 26.7 percent have never used. Thus, data was obtained that predominantly early childhood teachers use computer media in the form of Google, WhatsApp, Google Form and Google Classroom. But they have never developed applications, web, games and quizzes to support learning.

If all the data are put together, a summary of the data on the use of instructional media is obtained as follows.

*Table 1 Teachers' preference for using digital media predominantly*

| Projection Media | Two-dimensional media without projection | Three-dimensional media without projection | Audio | Television and Video (Audiovisual) | Computer |
|---|---|---|---|---|---|
| LCD Projector (60%) | Traditional Whiteboard (70%) | Conventional Media (33,3%) | Sound Recording (60%) | Regular television (Analog/Digital) (36,7%) | Google (100%) |
| - | Wall Magazine (70%) | - | WhatsApp Call (76,7%) | Youtube Live (50%) | WhatsApp (80%) |
| - | Microsoft Word (90%) | - | - | Zoom (70%) | Google Form (40%) |
| - | Self-drawing (43,3%) | - | - | Capcut (36,7%) | Google Classroom (63,3%) |
| - | Smartphone Camera (90%) | - | - | - | - |

The results of the survey table above show the dominant ratio of teachers' use of instructional media. Regarding projection media, the dominant use of LCD Projector in the instruction process. As the dedication conducted by Rizza, Emzain, Monasari, & Puspitasari (2022) shows the instruction process using LCD projector media can make students happier, this is shown by the enthusiasm of students in participating in lessons, and there is also an increase in learning activities. In addition, research by Sobiruddin, Dwirahayu, & Kustiawati (2019) also showed that the instruction process using interactive projector-based ICT media was very enjoyable, this was shown by the enthusiasm of students in participating in the lesson, and there was also an increase in learning activities.

Then, related to two-dimensional media without projection, the dominant use of blackboards, wall magazines (widgets), Microsoft word (module), self-drawing (graphic media) and device cameras (photo media). Whiteboards, wall magazines and self-drawing are part of traditional instructional media, as they are clearly teacher-centred and cannot be personalised. The use of traditional media should be abandoned, given the more dynamic learning constructs (Angiello, 2010). In addition, the use of Microsoft Word in developing modules and smartphone cameras in developing photo media is very common (Essel, Tachie-Menson, & Ahiaklo-Kuz, 2017; Fawareh & Jusoh, 2017). Thus, teachers are still conventional in the construction of two-dimensional media without projection.

Unfortunately, the dominant one has not used three-dimensional media without projection. But if you look at the top are conventional media such as dioramas, mock ups, loose parts and so on. Thus teachers are still conventional in the construction of three-dimensional media without projections.

Furthermore, regarding the use of audio media, teachers predominantly use self-recorded voice recordings and WhatsApp calls. In many older studies, standalone voice recordings have successfully influenced both attention and good learning behaviour for learners (Blick & Test, 1987; Lloyd, Bateman, Landrum, & Hallahan, 1989). Similarly, the focus of WhatsApp calls has been used in everyday life.

As for the use of audiovisual media, teachers predominantly use regular television, YouTube live, Zoom and Capcut. Similarly, regular television cannot be personalised as not all children now have it since the drastic decline during the COVID-19 pandemic (Katadata, 2022a), although TV usage is still number one. This is in contrast to the use of Live streaming (YouTube), Zoom and Capcut. These three applications are becoming a trend in the community, especially students. This is also reinforced by the fact that live streaming enables teachers to interact with students by sending red envelopes, emojis and memes in text-based chat rooms. In addition, teachers can use chat rooms to give quizzes and assignments live and view system notifications (X. Chen, Chen, Wang, & Huang, 2021). Meanwhile, regarding Zoom, the study by Serhan (2020) shows that the use of this application is able to provide flexibility to students. Then for video editing using Capcut is also an effective and easy media (Rohmah, Kusumaningrum, & Dewi, 2022).

Finally, regarding the use of computer media, teachers predominantly use Google, WhatsApp, Google Form and Google Classroom for instruction. This can be seen from the fact that Google users account for 64.4 per cent of the total Indonesian population (Katadata, 2019). Meanwhile, WhatsApp users also reach 112 million people in Indonesia (Katadata, 2022b). Thus the two media are very dominant in everyday life, including in instruction. In addition, the use of Google Form is suitable for student worksheets (Simanjuntak & Limbong, 2018). Then related to the use of Google Classroom, research by Batubara, Hamdani, & Paderan (2021) revealed that this media can increase early childhood learning motivation.

Although it has a good impression, when examined further using Bloom's taxonomy (1956) by adapting Carrington (2015) the following findings are obtained.

*Table 2 Level of use of instructional media from early childhood teachers*

| Media Used | Level | Details |
|---|---|---|
| LCD Projector | C1 | Low |
| Traditional Whiteboard | C1 | Low |
| Wall Magazine | C1 | Low |
| Microsoft Word | C1 – C2 | Low |
| Self-drawing | C1 | Low |
| Smartphone Camera | C1 | Low |
| Conventional Three-Dimensional Media | C1 | Low |
| Sound Recording | C1 – C2 | Low |
| WhatsApp Call | C1 – C2 | Low |
| Regular Television | C1 | Low |
| YouTube Live | C3 | Low |
| Zoom | C3 | Low |
| Capcut | C4 | High |
| Google | C1 | Low |
| WhatsApp | C5 | High |
| Google Form | C4 | High |
| Google Classroom | C5 | High |

Based on the survey results, it shows that teachers already know some customizations in the development of digital learning media, but dominantly still tend to be conventional (traditional) in their application (instructional patterns assisted by tools). This is in the category of lower-order thinking skills as in Bloom's taxonomy. The increasingly complex development of digitalisation has completely changed the mode of learning, including the orientation of instructional media from traditional to digital. Technology has played a major role. As reported by UNESCO (2012), it is imperative that early childhood educators productively integrate professional development related to the use of technology.

For this reason, there is a need for a joint study to empower teacher capabilities in developing and using digital instructional media variably. As Thaariq, Lindawati, & Puspita (2020) stated that teachers can be likened to travel guides, who based on their knowledge and experience are responsible for the “smooth journey” of students in the learning process. As a "travel guide", teachers can be said to be empowered if they have successfully managed learning well. One of them is by empowering digital technology that teachers can use as a digital learning medium. So that this application has an impact on teacher creativity which in the end students become more comfortable in learning (Thaariq, 2020). It is important to recognise that the process of becoming ICT competent for early childhood educators is a long-term transformation, requiring continuous support and monitoring. From the outset, efficient professional development programmes should focus on (a) developing educators' ICT literacy, and simultaneously harnessing their emerging literacy to (b) construct new ICT pedagogies that support children's learning and development (Gjelaj, Buza, Shatri, & Zabeli, 2020).

## IV. CONCLUSION AND RECOMMENDATION

This study concluded that it is related to the preference for the use of learning media for early childhood teachers. Those preferences include LCD Projectors at 60 percent, traditional whiteboards at 70 percent, wall magazines at 70 percent, Microsoft Word at 90 percent, drawing alone at 43.3 percent, smartphone cameras at 90 percent, sound recordings at 60 percent, WhatsApp call features at 76.7 percent, Regular television at 36.7 percent, live broadcasts from YouTube at 50 percent, Zoom at 70 percent, Capcut at 36.7 percent, Google at 100 percent, WhatsApp at 80 percent, Google Forms at 40 percent and Google Classroom at 63.3 percent. Based on this percentage, teachers are dominantly in the remembering category (C1) as Bloom's taxonomy in using and developing instructional media. This has shown that early childhood teachers have a good understanding of learning media, but need to improve in terms of their digitization capabilities. By looking at this data, it can be used as a reference for development and empowerment for early childhood teachers in optimizing learning media in the future.

## REFERENCES

Abidin, Z. (2017). Penerapan pemilihan media pembelajaran. *Edcomtech Jurnal Kajian Teknologi Pendidikan*, *1*(1), 9–20.

Angiello, R. (2010). Study looks at online learning vs. Traditional instruction. *The Education Digest*, *76*(2), 56.

Armes, R. (2006). *On Video*. Routledge.

Badriah, A. (2018). *Pengaruh Penggunaan Media Tiga Dimensi Terhadap Hasil Belajar Kognitif Siswa Pada Materi Sistem Gerak Di Kelas Xi SMA Negeri 1 Pemulutan Ogan Ilir* (Diploma, UIN RADEN FATAH PALEMBANG). UIN RADEN FATAH PALEMBANG. Retrieved from http://perpustakaan.ac.id

Batubara, M. D., Hamdani, Z., & Paderan, M. P. (2021). Google Classroom: A Learning Media In Increasing Students’ Motivation. *Indonesian Journal of Learning Education and Counseling*, *3*(2), 164–169.

Blick, D. W., & Test, D. W. (1987). Effects of self-recording on high-school students’ on-task behavior. *Learning Disability Quarterly*, *10*(3), 203–213.

Bloom, B. S. (1956). *Taxonomy of educational objectives* (Vol. 2). New York: Longmans.

Carrington, A. (2015). The Padagogy wheel–it's not about the apps, it's about the pedagogy. *Recuperado El*, *9*(08), 2021.

Chen, R. W., & Chan, K. K. (2019). Using Augmented Reality Flashcards to Learn Vocabulary in Early Childhood Education. *Journal of Educational Computing Research*, *57*(7), 1812–1831. doi: 10.1177/0735633119854028

Chen, X., Chen, S., Wang, X., & Huang, Y. (2021). "I was afraid, but now I enjoy being a streamer!": Understanding the Challenges and Prospects of Using Live Streaming for Online Education. *Proceedings of the ACM on Human-Computer Interaction*, *4*(CSCW3), 237:1-237:32. doi: 10.1145/3432936

Essel, H. B., Tachie-Menson, A., & Ahiaklo-Kuz, N. A. Y. (2017). 21st Century Skill Set Deficiency in Ghanaian Basic Education: A Review of Basic Design and Technology, and Information and Communications Technology Syllabi. *Indian Journal of Applied Research*, *8*(3), 248–250.

Fajarianto, O., Setiawan, M. I., Mursidi, A., Sundiman, D., & Sari, D. A. P. (2018). The Development of Learning Materials for Introduction of Animals in Early Childhood Using Augmented Reality. In L. Uden, B. Hadzima, & I.-H. Ting (Eds.), *Knowledge Management in Organizations* (pp. 722–727). Cham: Springer International Publishing. doi: 10.1007/978-3-319-95204-8_60

Fawareh, H. M. A., & Jusoh, S. (2017). The use and effects of smartphones in higher education. *Ijim*, *11*, 103.

Gjelaj, M., Buza, K., Shatri, K., & Zabeli, N. (2020). Digital Technologies in Early Childhood: Attitudes and Practices of Parents and Teachers in Kosovo. *International Journal of Instruction*, *13*(1), 165–184.

Goodfellow, J. (2001). Wise Practice: The Need to Move beyond Best Practice in Early Childhood Education. *Australasian Journal of Early Childhood*, *26*(3), 1–6. doi: 10.1177/183693910102600302

Guskey, T. R. (2013). The case against percentage grades. *Educational Leadership*, *71*(1), 68.

Harwood, D., Klopper, A., Osanyin, A., & Vanderlee, M.-L. (2013). 'It's more than care': Early childhood educators' concepts of professionalism. *Early Years*, *33*(1), 4–17. doi: 10.1080/09575146.2012.667394

Ibrahim. (1997). Media pembelajaran: Arti, fungsi, landasan pengunaan, klasifikasi, pemilihan, karakteristik oht, opaque, filmstrip, slide, film, video, Tv, dan penulisan naskah slide. *Bahan Sajian Program Pendidikan Akta Mengajar III-IV. FIP-IKIP Malang*.

Januszewski, A., & Molenda, M. (2013). *Educational technology: A definition with commentary*. Routledge.

Katadata. (2019). Google Paling Banyak Kumpulkan Data Pengguna | Databoks. Retrieved December 24, 2022, from https://databoks.katadata.co.id/datapublish/2019/10/11/google-paling-banyak-kumpulkan-data-pengguna

Katadata. (2022a). Pengguna Internet Meningkat, Riset Nielsen Indonesia: TV Tetap Nomor Satu | Databoks. Retrieved December 24, 2022, from https://databoks.katadata.co.id/datapublish/2022/12/09/pengguna-internet-meningkat-riset-nielsen-indonesia-tv-tetap-nomor-satu

Katadata. (2022b). Pengguna WhatsApp Terus Bertambah, Ini Jumlahnya Sekarang | Databoks. Retrieved December 24, 2022, from https://databoks.katadata.co.id/datapublish/2022/09/07/pengguna-whatsapp-terus-bertambah-ini-jumlahnya-sekarang

Keengwe, J., & Onchwari, G. (2009). Technology and Early Childhood Education: A Technology Integration Professional Development Model for Practicing Teachers. *Early Childhood Education Journal*, *37*(3), 209. doi: 10.1007/s10643-009-0341-0

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research* (4th ed). Belmont, Calif.: Wadsworth.

Koehler, M., & Mishra, P. (2009). What is Technological Pedagogical Content Knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60–70.

Kuswandi, D., Thaariq, Z. Z. A., Kurniawan, C., Aulia, F., Wijanarko, D. A., Kustiawan, U., … Maknuunah, L. (2021). Literasi Pembelajaran Digital Dengan Integrasi Pendekatan TRINGO Ki Hadjar Dewantara Untuk Guru-Guru SMP Wahid Hasyim Malang. *Jurnal KARINOV*, *4*(3), 163–167. doi: 10.17977/um045v4i3p163-167

Lee, Y.-M. (2019). The Composition of Curriculum to Improve ICT Instructional Media Competency of Early Childhood Teacher. *Journal of the Korea Academia-Industrial cooperation Society*, *20*(12), 588–596. doi: 10.5762/KAIS.2019.20.12.588

Lloyd, J. W., Bateman, D. F., Landrum, T. J., & Hallahan, D. P. (1989). Self-recording of attention versus productivity. *Journal of Applied Behavior Analysis*, *22*(3), 315–323.

Novaliendry, D., Saltriadi, K. S., Mahyuddin, N., Sriwahyuni, T., & Ardi, N. (2022). Development of Interactive Media Based on Augmented Reality for Early Childhood Learning Around the Home. *IJIM*, *16*(24), 5.

Ponto, J. (2015). Understanding and Evaluating Survey Research. *Journal of the Advanced Practitioner in Oncology*, *6*(2), 168–171.

Prilosadoso, B. H., Kurniawan, R. A., Pandanwangi, B., & Yunianto, I. K. (2021). The Appeal of Cartoon Characters in Instructional Media Through Animation in Early Childhood Education in Surakarta. *International Journal of Social Sciences*, *4*(1), 35–38.

Rizza, M. A., Emzain, Z. F., Monasari, R., & Puspitasari, E. (2022). Peningkatan Kualitas Pembelajaran melalui Media Pembelajaran LCD Proyektor bagi Guru dan Siswa KB Bina Cendikia Desa Sidorejo Kecamatan Jabung Kabupaten Malang. *Prima Abdika: Jurnal Pengabdian Masyarakat*, *2*(3), 254–261.

Rohmah, D. A. A., Kusumaningrum, S. R., & Dewi, R. S. I. (2022). Development Of Learning Media Assisted By Capcut Theme 2 Subtema 1 Learning 6 In Class II Elementary School. *Justek: Jurnal Sains Dan Teknologi*, *5*(2), 164–173.

Saputra, D. (2021). Implementasi Media Proyeksi Dalam Learning Qur'an Hadits (LQH). *Dirasah : Jurnal Studi Ilmu Dan Manajemen Pendidikan Islam*, *4*(2), 118–133. doi: 10.29062/dirasah.v4i2.278

Saputra, V. H., Pasha, D., & Afriska, Y. (2020). *Design of English Learning Application for Children Early Childhood | Proceeding International Conference on Science and Engineering*. *3*, 661–665. Retrieved from http://sunankalijaga.org/prosiding/index.php/icse/article/view/582

Sari, N. E., & Suryana, D. (2019). Thematic Pop-Up Book as a Learning Media for Early Childhood Language Development. *Jurnal Pendidikan Usia Dini*, *13*(1), 43–57.

Serhan, D. (2020). Transitioning from Face-to-Face to Remote Learning: Students' Attitudes and Perceptions of Using Zoom during COVID-19 Pandemic. *International Journal of Technology in Education and Science*, *4*(4), 335–342.

Simanjuntak, B., & Limbong, T. (2018). Using Google form for student worksheet as learning media. *International Journal of Engineering & Technology*, *7*(3.4), 321–324.

Sobiruddin, D., Dwirahayu, G., & Kustiawati, D. (2019). Pengembangan Media ICT Berbasis Proyektor Interaktif Bagi Guru dan Siswa Raudhathul Athfal (RA). *Edcomtech: Jurnal Kajian Teknologi Pendidikan*, *4*(1), 8–18. doi: 10.17977/um039v4i12019p008

Sudjana, N., & Rivai, A. (1997). *Media pengajaran: Penggunaan dan Pembuatannya*. Bandung: Sinar Baru.

Taveira-Gomes, T., Ferreira, P., Taveira-Gomes, I., Severo, M., & Ferreira, M. A. (2016). What Are We Looking for in Computer-Based Learning Interventions in Medical Education? A Systematic Review. *Journal of Medical Internet Research*, *18*(8), e5461. doi: 10.2196/jmir.5461

Thaariq, Z. Z. A. (2020). The Use of Social Media as Learning Resources to Support the New Normal. *Teknodika*, *18*(2), 80–93.

Thaariq, Z. Z. A. (2022). *Media Pembelajaran Abad 21* (D. Kuswandi, Ed.). Banyumas: Pena Persada.

Thaariq, Z. Z. A., Lindawati, L., & Puspita, R. D. (2020). Profesionalitas Guru Sekolah Dasar dalam menghadapi Ragam Karakteristik Belajar. *EduBasic Journal: Jurnal Pendidikan Dasar*, *2*(1), 61–71. doi: 10.17509/ebj.v2i1.26523

Thaariq, Z. Z. A., Ramadhani, L. R., Kuswandi, D., Sinaga, M. N. A., Wijanarko, D. A., Hamudi, R. W. D., … Abednego, P. I. C. (2020). Pengelolaan Media Pembelajaran Digital bagi Peningkatan Kualitas Guru di SMP Wahid Hasyim. *E-Prosiding Hapemas*, *1*(1), 79–92.

UNESCO. (2012). *ICTs in Early Childhood Care and Education* [IITE Policy Brief]. Moscow: UNESCO Institute for Information Technologies in Education.

Wahyuniar, Uspayanti, R., Sari, H., & Natalia, S. P. (2021). Audio Media to Improve Listening Skill. *Musamus Journal of Language and Literature*, *3*(02), 44–50. doi: 10.35724/mujolali.v3i02.3498

Webb, S. (2014). Extensive Viewing: Language Learning Through Watching Television. In *Language Learning Beyond the Classroom*. Routledge.

Yusuf, M. O., Olanrewaju, O. S., & Soetan, A. K. (2015). Instructional Media Production for Early Childhood Education: A. B. C. Jig-Saw Puzzle, a Model. *Malaysian Online Journal of Educational Technology*, *3*(2), 7–12.

Zahrotun, L., Hendriana, Y., & Saputra, D. (2015). Learning Media Introduction of Yogyakarta Culture For Early Childhood 2-3 Years. *International Journal of Computer Techniques (IJCT)*, *2*, 1–5.

Zheng, L. (2016). The effectiveness of self-regulated learning scaffolds on academic performance in computer-based learning environments: A meta-analysis. *Asia Pacific Education Review*, *17*(2), 187–202. doi: 10.1007/s12564-016-9426-9