European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available online at: www.oapub.org/edu

DOI: 10.46827/ejes.v12i12.6450 Volume 12 | Issue 12 | 2025

TEACHERS' PERCEPTION ON TECHNOLOGY INTEGRATION AND ITS AVAILABILITY IN PRESCHOOL LEARNING ENVIRONMENT

Ailyn T. Gilay[1i],
Aizabeth S. Anga[2]
[1]Lataban Elementary School,
Liloan, Cebu,
Philippines
[2]Liloan Central Elementary School,
Liloan, Cebu,
Philippines

Abstract:
This study assessed teachers' perceptions of the integration of technology into the learning process and its availability in the preschool learning environment at a public elementary school in the province of Cebu, Philippines, for the school year 2025–2026, using a descriptive correlational research design. 54 teachers completed the adopted questionnaire, which served as the primary data collection tool. The study employed descriptive and inferential statistics, including the weighted mean, standard deviation, and Pearson's r, for data analysis. Results revealed that the respondents had very positive perceptions of technology integration in terms of their beliefs, and also positive perceptions of their knowledge and attitudes towards technology integration. On the other hand, the respondents claimed that technology resources are sometimes available in the learning process. Moreover, there was a weakly significant correlation between the respondents' perception of technology integration and the availability of technology resources in the preschool learning environment. Hence, school administrators need to ensure sufficient technology resources for teachers' utilization in the teaching-learning process.

Keywords: perception on technology integration, availability of technology resources, preschool learning environment

1. Introduction

In the 21st-century learning landscape, technology plays an increasingly vital role in shaping educational practices across all levels, including early childhood education. The

[i] Correspondence: email gilayailyn5@gmail.com

integration of Information and Communication Technology (ICT) in preschool settings is no longer a novelty but a necessary strategy to enhance engagement, foster foundational digital literacy, and support diverse learning needs (Otom *et al.*, 2025). However, the success of this integration heavily depends on the perceptions and readiness of preschool teachers, who serve as the primary facilitators of learning experiences for young children. Understanding teachers' perceptions toward technology is crucial because their attitudes significantly influence whether and how digital tools are used in the classroom (Almusharraf & Khahro, 2024). Positive perceptions often lead to greater willingness to explore, adapt, and innovate with technology, whereas skepticism or anxiety may result in underutilization of available resources. Moreover, perceptions are closely tied to beliefs about developmentally appropriate practices in early childhood education, especially when balancing screen time with play-based learning.

Furthermore, in countries like Finland, Australia, and Singapore, which are often regarded as leaders in early childhood education, teachers report relatively positive experiences due to strong institutional backing, well-developed digital curricula, and ongoing professional support (Chan *et al.*, 2024). Conversely, in many developing nations or under-resourced contexts, teachers may struggle with outdated devices, unreliable internet connectivity, or a lack of training tailored to early childhood education, leading to inconsistent or superficial use of technology (Abdullah & Rahman, 2024). In the Philippine context, preschool teachers play a pivotal role in shaping young learners' foundational skills, and their ability to use digital tools meaningfully impacts children's cognitive, social, and emotional development (Calderon & Tumibay, 2024). Cebu Province offers a unique setting for exploring this topic, with a mix of urban and rural areas, varying levels of infrastructure, and diverse socioeconomic conditions. These factors directly influence the availability of digital tools, internet connectivity, and teacher training programs. Preschool teachers, in particular, often face limited access to developmentally appropriate digital resources, a lack of targeted professional development, and inconsistent institutional support (Bonghanoy & Reyes, 2024).

Existing studies often focus on broader or urban settings, but the unique challenges and dynamics of rural schools, such as the public elementary schools in Cebu, remain underexplored. This gap presents an opportunity to understand how localized factors, such as teachers' perceptions, readiness, and availability of technology toward the learning process, might give a significant relationship in a technology-driven preschool environment.

Thus, this study is significant as it seeks to document and analyze the first-hand experiences of preschool teachers in using technology as a pedagogical tool. By exploring teachers' perceptions of technology integration, educational leaders, policymakers, and curriculum developers can better design strategies that are responsive, inclusive, and developmentally appropriate. Ultimately, this research supports the goal of fostering equitable and meaningful technology integration in early learning environments, explicitly chosen for a public elementary school in Cebu Province for the school year 2025–2026.

2. Purpose of the Study

This study assessed teachers' perceptions of technology integration in the learning process and its availability in the preschool learning environment, particularly at a public elementary school in Cebu, Philippines, during the school year 2025–2026. Specifically, it sought to answer the following objectives:

- To assess the teachers' perception of technology integration in the learning process in the preschool learning environment in terms of their beliefs, knowledge, and attitudes,
- To determine the extent of availability of technology resources in the preschool learning environment,
- To test the relationship between the teachers' perception of technology integration and the availability of technology resources in the preschool learning environment.

3. Materials and Methods

The research used a descriptive-correlational design to test the relationship between teachers' perceptions of technology integration and the availability of technology resources in the preschool learning environment. The study respondents were the 54 kindergartens and third-grade teachers of the identified public elementary school. These teachers were observed to be utilizing technology in their classes, which qualified them to answer the adopted questionnaire from Alotaibi (2023) assessing their perception of technology integration and its availability in their school. There were six items for every three domains of perceptions, such as beliefs, knowledge, and attitudes, while six items were for the availability of the technology resources. The respondents were asked to rate their opinions, feelings, and observations about integrating technology in the classroom using a five-point Likert scale: 5-Strongly Agree, 4-Agree, 3-Undecided, 2-Disagree, and 1-Strongly Disagree. An informed consent was secured before the respondents were allowed to participate in the data-gathering process. Moreover, the respondents were informed of their right to withdraw at any time when they no longer feel comfortable with the process. This study's statistical analysis included both descriptive and quantitative methods. The study employed statistical tools such as the weighted mean, standard deviation, and Pearson's r for data treatment and analysis. The data gathered was handled and stored correctly in compliance with the Data Privacy Act.

4. Results and Discussion

This section presents the results from the data gathered from respondents regarding their perceptions of technology integration and the availability of technology resources in the preschool learning environment. This also includes testing the hypothesis.

4.1 Perceptions of Respondents on Technology Integration

This sub-section presents the perceptions of respondents on technology integration on the learning process in the preschool learning environment in terms of beliefs, knowledge, and attitudes.

Table 1 presents respondents' perceptions of the integration of technology into the learning process in the preschool learning environment, in terms of beliefs. Statement 1 and 6 "Using technology in the classroom enhances student engagement; Digital educational aids focused to help children learn and engage more effectively with their materials." are the highest response with a mean of 4.31, indicating that the respondents have a very positive perception about utilizing technology for enhancing learners' engagement. This perception suggests that educators view digital tools not merely as supplementary elements but as purposeful instruments that enhance children's comprehension, motivation, and active participation in learning activities. Believing in the instructional power of digital aids reinforces a more open and positive attitude toward adopting innovative teaching practices that align with young learners' developmental needs. It also implies that teachers recognize the unique ability of technology to present content in interactive, multisensory ways that are particularly effective in capturing preschoolers' attention and supporting diverse learning styles. Believing that technology boosts engagement indicates a recognition of its interactive and stimulating nature, which is particularly valuable in early childhood settings where play-based and visual learning are essential. Such a belief motivates teachers to confidently explore and adopt technological resources, knowing that these tools can complement traditional methods and promote active participation.

Table 1: Respondents' Perceptions on the Integration of Technology (Beliefs)

S/N	Indicators	WM	SD	Verbal Description
1	Using technology in the classroom enhances student engagement.	4.31	0.80	Very Positive
2	Technology provides valuable individualized learning opportunities for children.	4.20	0.81	Positive
3	Technology promotes collaboration and communication among children in the classroom.	4.15	0.90	Positive
4	Technology supports and supplements traditional teaching methods, such as lectures and textbooks.	4.28	0.74	Very Positive
5	Using technology in the classroom presents challenges that must be addressed.	4.19	0.78	Positive
6	Digital educational aids are focused on helping children learn and engage more effectively with their materials.	4.31	0.75	Very Positive
	Aggregate Mean	**4.24**		**Very Positive**
	Aggregate Standard Deviation		**0.79**	

Legend: 4.21-5.00-Very Positive; 3.41-4.20-Positive; 2.61-3.40-Neutral; 1.81-2.60-Negative; 1.00-1.80-Very Negative.

Preschool teachers increasingly view digital educational aids, such as interactive apps, multimedia tools, and gamified platforms, as powerful enablers of children's engagement

and learning. In a mixed-methods study involving preschool teachers in the Philippines, educators conveyed that such tools effectively heightened learner motivation and attentiveness, especially when aligned with lesson objectives, even amid infrastructural constraints (Adaya *et al.*, 2024)

A descriptive correlational study conducted in the Calinan District of Davao City, Philippines, revealed that early childhood teachers' confident and consistent use of digital tools was significantly and positively correlated with heightened student engagement, especially in cognitive engagement, followed closely by emotional and social engagement (Carcosia *et al.*, 2025). This finding supports the perception that technology, when implemented effectively, captivates young learners and sustains their active participation.

In addition to the perceptions of respondents regarding the integration of technology into the learning process in the preschool learning environment, beliefs that technology supports and supplements traditional teaching methods, such as lectures and textbooks, have a mean of 4.27, indicating very positive perceptions regarding this matter. This indicates that teachers recognize the complementary role of digital tools in reinforcing and enriching established instructional practices. In the early childhood context, where storytelling, play, and hands-on activities are foundational, integrating technology such as interactive media, educational games, and digital storytelling can add layers of engagement and understanding. Believing in this supportive function of technology fosters a balanced teaching approach, encouraging educators to blend traditional methods with modern innovations to meet diverse learning needs.

Many preschool teachers perceive technology not as a replacement, but as a valuable supplement to traditional teaching tools such as textbooks and direct instruction. Constructivist-oriented educators, in particular, view technology as an enhancement that enriches educational content in areas like literacy and mathematics, boosting learners' engagement, self-regulation, and motivation (Tüfekci & Candan, 2023). Collectively, these insights reveal that preschool educators essentially believe that integrating technology augments conventional teaching approaches by offering richer, more interactive, and developmentally appropriate learning experiences, rather than displacing established pedagogical practices.

In general, the overall mean of the perceptions of respondents in the integration of technology toward the learning process in the pre-school learning environment in terms of beliefs, is 4.24 with a standard deviation of 0.79, indicating the generally very positive perceptions of the respondents on technology integration.

Table 2 presents the perceptions of respondents in the integration of technology toward the learning process in the pre-school learning environment in terms of knowledge. Indicator 6 states, "*I believe that an increased knowledge of technology would positively impact my teaching practices*." Has the highest mean of 4.15, suggesting the respondent's positive perception.

Table 2: Respondents' Perceptions on the Integration of Technology (Knowledge)

S/N	Indicators	WM	SD	Verbal Description
1	I feel confident in my ability to use technology effectively in the classroom.	3.87	0.85	Positive
2	I have received adequate training to effectively use technology in the classroom.	3.30	1.16	Neutral
3	I feel comfortable troubleshooting technology issues that arise in the classroom.	3.37	1.01	Neutral
4	I have a good understanding of how to integrate technology into my lesson plans.	3.81	0.93	Positive
5	I stay up to date with the latest technology trends and advancements to enhance my teaching practices.	3.56	0.98	Positive
6	I believe that an increased knowledge of technology would positively impact my teaching practices.	4.15	0.83	Positive
	Aggregate Mean	**3.68**		**Positive**
	Aggregate Standard Deviation		**0.96**	

Legend: 4.21-5.00-Very Positive; 3.41-4.20-Positive; 2.61-3.40-Neutral; 1.81-2.60-Negative; 1.00-1.80-Very Negative.

This implies that deepening their technological knowledge can enhance lesson delivery, classroom engagement, and learner support, and it fosters a proactive attitude toward integrating digital tools. In the context of early childhood education, this mindset encourages the exploration of age-appropriate applications and interactive media that can supplement developmental learning goals.

This belief aligns with findings from a study of kindergarten teachers in West Java, which revealed pronounced gaps in teachers' technological knowledge despite strong content and pedagogical understanding, underscoring the critical need to develop technological competence (Budiarti & Shintarahayu, 2024).

In addition to the perceptions of respondents in the integration of technology toward the learning process in the pre-school learning environment in terms of knowledge, considering indicator 1 stating "*I feel confident in my ability to use technology effectively in the classroom*," is the second highest response, with a mean of 3.87, and a 0.85 standard deviation denotes positive perception of the respondents.

This suggests that teachers have the confidence to navigate digital tools and apply them meaningfully to support young learners' development. When educators feel equipped and knowledgeable, they are more likely to explore innovative approaches, experiment with various educational technologies, and tailor tech-based activities to meet diverse learning needs. This belief not only enhances teaching effectiveness but also promotes a more engaging and interactive classroom atmosphere.

A mixed-method study involving Turkish preschool teachers found that those with high self-efficacy used technology more purposefully, applying it to boost motivation, participation, and engagement in learning activities, while those with lower self-efficacy struggled both practically and motivationally (Aksan & Kutluca, 2021).

Generally, the overall mean of respondents' perceptions of technology integration in the pre-school learning environment, in terms of their knowledge, is 3.68 with a

standard deviation of 0.96, suggesting that respondents have positive perceptions of their knowledge of technology integration.

Table 3 presents respondents' perceptions of the integration of technology into the learning process in the preschool learning environment, in terms of attitudes. Interestingly, the respondents believe that using technology in the classroom can help prepare children for future careers, with the highest response, a mean of 4.31, and a standard deviation of 0.67, indicating very positive perceptions of technology integration in their attitudes.

Table 3: Respondents' Perceptions on the Integration of Technology (Attitudes)

S/N	Indicators	WM	SD	Verbal Description
1	I believe that using technology in the classroom can help to prepare children for a future career.	4.31	0.67	Very Positive
2	I feel confident in my ability to integrate technology into my teaching practices in a meaningful way.	3.89	0.86	Positive
3	I believe that technology can help to better engage children in the learning process.	4.17	0.64	Positive
4	I feel that using technology in the classroom is an important aspect of modern education.	4.22	0.69	Very Positive
5	I feel excited about incorporating new technology tools into my teaching practices.	4.11	0.77	Positive
6	I believe that using technology in the classroom can enhance student learning outcomes.	4.22	0.72	Very Positive
	Aggregate Mean	**4.15**		**Positive**
	Aggregate Standard Deviation		**0.72**	

Legend: 4.21-5.00-Very Positive; 3.41-4.20-Positive; 2.61-3.40-Neutral; 1.81-2.60-Negative; 1.00-1.80-Very Negative.

This perception implies that educators view early exposure to technology as more than just a learning aid; it is a crucial step in building the digital literacy, problem-solving, and adaptability skills needed for the future. It reflects a commitment to preparing young learners for a tech-driven world by using age-appropriate digital tools that foster meaningful learning and curiosity.

Many preschool educators believe that early exposure to technology can play a foundational role in preparing young learners for future career readiness. A study across eight countries indicates that a teacher's attitude is central in understanding their professional digital competence, suggesting that positive beliefs about technology's future value motivate its integration even at the preschool level (Dore & Dynia, 2020).

In addition, the respondents feel that using technology in the classroom is an important aspect of modern education, and they believe it can enhance student learning outcomes, with a mean of 4.22 indicating a very positive perception. This implies that such an attitude reflects a forward-thinking mindset, in which educators are not only open to integrating digital tools but also view them as essential for promoting engagement, understanding, and skill development. This belief fosters a more

enthusiastic and intentional use of technology in the preschool setting, leading to more interactive and effective teaching practices that align with 21st-century learning goals.

According to Hong *et al.* (2021), early childhood educators who perceive technology as beneficial for learning are more inclined to incorporate it into daily lessons, especially when it is seen as improving engagement and comprehension. Similarly, teachers with favorable attitudes toward educational technology tend to implement it more frequently and effectively, using tools such as interactive games and multimedia presentations to promote active learning (Aksan & Kutluca, 2021). Furthermore, research by Lu *et al.* (2022) emphasizes that a teacher's belief in the instructional value of technology directly correlates with higher levels of classroom integration, often outweighing the influence of available resources alone. These studies collectively affirm that strong, positive attitudes rooted in the belief that technology enriches educational experiences are a key driver in the successful integration of digital tools in preschool classrooms.

In summary, the overall mean of respondents' perceptions of the integration of technology into the learning process in the preschool learning environment, in terms of attitude, is 4.15 with a standard deviation of 0.72, indicating generally positive attitudes towards integrating technology in the preschool learning environment.

3.2 Extent of Availability of Technology Resources

This section shows the extent of technology resource availability in the preschool learning environment.

Table 4 presents the extent of technology resource availability in the preschool learning environment. The respondents reported that the technology and media resources available in their classroom are up-to-date and reliable. At the same time, the technology and media resources in their classroom are easy to access and use, with the highest response, a mean of 3.54, indicating that these resources are often available in the classroom.

This implies that access minimizes technical challenges and reduces hesitation, particularly in early childhood settings where fluid transitions and active engagement are essential. Furthermore, it enhances instructional planning and encourages the use of interactive, developmentally appropriate tools that can capture young learners' attention and support diverse learning styles. When resources are modern and function reliably, they enable teachers to plan and deliver lessons with confidence, ensuring that instructional time is maximized and not interrupted by technical issues. Up-to-date tools also allow access to the latest educational applications and interactive media, which are often better aligned with current early childhood learning standards and engagement strategies. Moreover, reliable technology reduces frustration for both teachers and learners, creating a smoother, more productive learning experience.

Additionally, observational research has highlighted that while devices like tablets and computers are relatively common in preschool classrooms, their use depends heavily

on accessibility and teacher support; classrooms with greater technology availability demonstrate higher levels of instructional integration (Dore & Dynia, 2020).

Table 4: Extent of availability of technology and media resources

S/N	Indicators	WM	SD	Verbal Description
1	The technology and media resources available in my classroom, they are up-to-date and reliable.	3.54	0.93	Often Available
2	My classroom has sufficient technology and media resources to meet the needs of all children.	3.39	0.98	Sometimes Available
3	The technology and media resources in my classroom are easy to access and use.	3.54	0.97	Often Available
4	My school provides ongoing support and training for teachers to effectively use technology and media resources in the classroom.	3.15	1.02	Sometimes Available
5	The available technology and media resources in my classroom are sufficient to support all types of student learning styles.	3.26	0.91	Sometimes Available
6	The technology and media resources in my classroom are well-maintained and updated.	3.28	0.98	Sometimes Available
	Aggregate Weighted Mean	**3.36**		**Sometimes Available**
	Aggregate Standard Deviation		**0.96**	

Legend: 4.21-5.00-Very Positive; 3.41-4.20-Positive; 2.61-3.40-Neutral; 1.81-2.60-Negative; 1.00-1.80-Very Negative.

In addition, the respondents claimed that their classroom has sufficient technology and media resources to meet the needs of all children, with the second-highest mean of 3.39, indicating that technology resources are sometimes available.

This implies that when adequate resources are available to support every child regardless of their learning style, ability, or pace, teachers are empowered to design inclusive, engaging, and developmentally appropriate learning experiences. This sufficiency enables educators to implement differentiated instruction using digital tools, ensuring that all learners can access and benefit from technology-enhanced activities. It also reflects a supportive learning infrastructure in which technological integration is not limited by scarcity but is driven by intentional planning and resource allocation.

The presence of sufficient technology and media resources in preschool classrooms plays a critical role in determining the readiness and effectiveness of technology integration in early childhood education. When teachers perceive that their classrooms are equipped with adequate and appropriate digital tools, they are more confident and prepared to design inclusive learning experiences that meet the needs of all learners (Maćkowski *et al.*, 2023). This sufficiency is particularly important for addressing the diverse developmental needs of children, including those with disabilities, as it allows educators to incorporate assistive and adaptive technologies that enhance participation and engagement (Navas-Bonilla *et al.*, 2025). Furthermore, access to up-to-date and functional digital resources has been found to influence the frequency and quality of

technology use in the classroom, with teachers more likely to embed digital media into daily instruction when resources are both accessible and reliable (Dore & Dynia, 2020). In summary, the overall mean of the extent of technology resource availability in the preschool learning environment is 3.36, with a standard deviation of 0.96, indicating that the resources are sometimes available.

3.3 Correlation Analysis between the Respondents' Perception and Availability of Technology Resources

This section presents the significant relationship between respondents' perceptions of the integration of technology into the learning process and the extent of availability of technology resources.

Table 5: Correlation Analysis

Variables	r-value	Strength of Correlation	p – value	Decision	Remarks
Perceptions and Availability of Technology and Media Resources	0.497***	Weak Positive	0.000	Reject Ho	Significant
***significant at p<0.001 (two-tailed)					

Table 5 shows a weak positive correlation between respondents' perceptions of technology integration and the availability of technology resources, with an r-value of 0.497. Moreover, the p-value of 0.000, which is less than the 0.05 significance level, led to rejection of the null hypothesis, indicating a significant relationship between the two variables. This finding implies that positive perceptions of technology integration are linked to better availability of technological tools and resources. When teachers see technology as beneficial and effective for classroom or work purposes, it is often accompanied by improved technological support and preparedness.

Emerging evidence suggests that as teachers develop more positive perceptions of and confidence in integrating technology, institutional support, in terms of resource accessibility and readiness, tends to improve correspondingly. Educators who recognize the value of technology in enhancing instruction tend to advocate for better infrastructure, such as reliable internet, updated tools, and dedicated learning spaces, leading administrators to allocate increased resources accordingly (Akram *et al.,* 2022)

5. Conclusion

Based on the study's findings, the teachers held predominantly positive views on integrating technology into the preschool learning setting, expressed strong beliefs in its benefits, constructive attitudes toward its application, and a fair assessment of their own understanding. Teachers see technology as a valuable aid to conventional teaching, especially in boosting engagement, enhancing learning experiences, and equipping young students for future challenges, which aligns with modern expectations for early childhood education in the Philippines. Nevertheless, although educators demonstrate

willingness and openness to incorporating technology into their teaching methods, the results also suggest that the availability of technological and media resources in classrooms remains limited and uneven. Availability of current, adequate, and properly maintained resources, along with ongoing institutional backing and training, is not consistently guaranteed, indicating a discrepancy between teachers' favorable views and the real working conditions they face. More importantly, the strong connection between teachers' views and resource availability suggests that enhancing access to technology can boost teachers' confidence, attitudes, and successful classroom integration. From a professional standpoint, the findings underscore the necessity for ongoing capacity-building initiatives that emphasize not only technical skills but also effective and developmentally suitable applications of technology for young students. For effective policy implementation, the results highlight the necessity of enhancing governmental and educational investments in early childhood technological infrastructure, ongoing maintenance, and continuous professional development programs. Guaranteeing fair access to technology in public preschool environments, especially in provincial areas, can aid teachers in converting favorable views into reliable teaching methods, thereby enhancing an inclusive, engaging, and future-ready learning environment for Filipino children.

Conflict of Interest Statement
The authors declare no conflicts of interest.

About the Author(s)
Ailyn T. Gilay holds a degree of BEED Bachelor of Elementary Education major in General Education at University of Cebu Lapu-Lapu and Mandaue, holds a diploma in Early Childhood Education and postgraduate qualifications in MAED major in Early Childhood Education at Cebu Technological University main campus. She is a public-school teacher for 10 years. She is passionate elementary educator who believes that all students have the opportunity to reach their fullest potential through quality education. She provides experiential and hands-on learning to let my students have a meaningful learning experience. Her research explores study assessed teachers' perceptions of the

integration of technology into the learning process and its availability in the preschool learning environment at a public elementary school in the province of Cebu, Philippines, for the school year 2025–2026.

Aizabeth S. Anga is an elementary teacher at Liloan Central Elementary School. She holds a Bachelor's degree in Elementary Education. At present, she is an MA candidate in M.A. in Education (Early Childhood Education). Her research interests include Early Childhood Education and Mother Tongue-Based Multilingual Education in Cebuano.

References

Abdullah, N. M., & Rahman, N. A. (2024). Technology integration in early childhood education: Voices from under-resourced preschool teachers in Southeast Asia. *International Journal of Early Childhood, 56*(1), 21–40. https://doi.org/10.1007/s13158-023-00325-4

Adaya, J., Boquila, J. M., Jerusalem, J. B., Kilat, B. M. G. (2025). Technology Integration in Kindergarten Classroom: A Boon or A Bane. *International Journal of Research and Innovation in Social Science (IJRISS), 9*(06), 1704-1727. https://dx.doi.org/10.47772/IJRISS.2025.906000134

Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching–learning practices: A systematic review. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.920317

Aksan, A. N., & Kutluca, A. Y. (2021). Investigation of preschool teachers' use of technology in teaching in terms of technology self-efficacy levels. *Kastamonu Education Journal, 29*(3), 611–626. Retrieved from https://dergipark.org.tr/en/pub/kefdergi/article/738068

Almusharraf, N., & Khahro, S. H. (2024). Teachers' attitudes toward technology integration in early education: A systematic review. *Early Childhood Education Journal, 52*(1), 33–48. https://doi.org/10.1007/s10643-023-01489-6

Alotaibi, M. S. (2023). Factors influencing early childhood educators' use of digital educational aids: A sequential explanatory study. *Sage Open, 13*(4). https://doi.org/10.1177/21582440231217727

Bonghanoy, M. R., & Reyes, P. G. (2024). Integrating digital tools in early childhood classrooms: The experiences of preschool teachers in Cebu Province. *Philippine Journal of Early Childhood Education, 14*(1), 22–35.

Budiarti, E., & Shintarahayu, B. (2024). Evaluating Kindergarten Teachers' Readiness for Technology-Integrated Pedagogy: An Analysis Based on the TPACK Framework. *Jurnal Pendidikan Progresif, 14*(3), 2219-2233. https://doi.org/10.23960/jpp.v14.i3.2024149

Calderon, R. D., & Tumibay, G. M. (2024). Digital readiness of Filipino educators: A study on early childhood teachers' access and competencies. Asia Pacific Journal of Education, 44(2), 105–122. https://doi.org/10.1080/02188791.2023.2223345

Carcosia, J. S., Miras, J. J. M., & Ricaforte, R. M. (2025). The Relationship between Teachers' Technology Integration and Students' Learning Engagement. *Asian Journal of Education and Social Studies*, *51*(7), 404-409. Retrieved from https://journalajess.com/index.php/AJESS/article/view/2131/4797

Chan, W. H., Tan, L. M., & Lim, J. S. (2024). Digital pedagogies in preschool classrooms: A comparative study of teacher experiences in Finland, Singapore, and Australia. *Early Years: An International Research Journal*, 44(2), 215–232. https://doi.org/10.1080/09575146.2023.2256789

Dore, R. A., & Dynia, J. M. (2020). Technology and media use in preschool classrooms: Prevalence, purposes, and contexts. In *Frontiers in Education* (Vol. 5, p. 600305). Frontiers Media SA. https://doi.org/10.3389/feduc.2020.600305

Hong, X., Zhang, M., & Liu, Q. (2021). Preschool teachers' technology acceptance during the COVID-19: An adapted Technology Acceptance Model. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.691492

Lu, X., Liu, H., & Zhang, S. (2022). The relationship between teachers' information technology integration self-efficacy and TPACK: A meta-analysis. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.1091017

Maćkowski, M., Brzoza, P., & Spinczyk, D. (2023). An alternative method of audio-tactile presentation of graphical information in mathematics adapted to the needs of the blind. *International Journal of Human-Computer Studies, 179*. https://doi.org/10.1016/j.ijhcs.2023.103122

Navas-Bonilla, C. D., Guerra-Arango, J.A., Oviedo-Guado, D.A. & Murillo-Noriega, D.E. (2025). Inclusive education through technology: a systematic review of types, tools and characteristics. *Front. Educ. 10.* https://doi.org/10.3389/feduc.2025.1527851

Otom, J. E., Peteros, E. D. L., Opingo, K. M. M., Revalde, H. O., Pinili, L. C., & Espina, R. C. (2025). Pre-Service Teachers' Attitudes Toward ICT, TPACK Acquisition, and Readiness in Fostering Education for Sustainable Development. *International Journal of Learning, Teaching and Educational Research, 24*(5). https://doi.org/10.26803/ijlter.24.5.31

Tufekci, H., & Candan, F. (2023). Preschool Teachers' Use of Technology in Instructional Environments and Opinions of Pre-School Teachers on Technological Pedagogical Content Knowledge (TPACK). *International Journal of Trends and Developments in Education, 3*(1), 19-52. Retrieved from https://jtade.com/makale/5126