



# The Effect of Technology-Based Management Learning on Children's Organizational Skills Development: A Meta-Analysis Approach

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## Abstract

For This study aims to determine the effect of technology-assisted management learning on children's organisational skills. This type of research is quantitative research with a meta-analysis approach. The inclusion criteria in this study are a) publications come from Google Scholar; ERIC, ScienceDirect, DOAJ, Wiley and Taylor of Francis, b) publications must be indexed by SINTA, Scopus and Web of Science, c) research topics must be relevant, d) research published in 2022-2024, e) publications must have complete data to calculate the effect size value. Data analysis with the help of the JASP application. The results of this study concluded that 1) 21 studies analysed were heterogeneously distributed; 2) there was a significant effect of technology-based management learning on children's organisational skills ( $p < 0.05$ ;  $rRE = 1.25$ ); 3) in this meta-analysis there was no publication bias. These findings indicate the effect of technology-based management learning on children's organisational skills with a very high effect size category.

**Keywords:** *Management Learning; Technology; Effect Size; Organizational Skills*

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## Introduction

Organizational skills are important abilities that children should acquire early on as they play a significant role in their cognitive, emotional and social development. These skills include time management, task organization, and structuring available resources to achieve specific goals (Maksum et al., 2023; Chen, 2021). By having good organisational skills, children can manage their learning activities, play and daily responsibilities more regularly and effectively. This also has a positive impact on the development of the brain's executive functions, such as planning, decision-making and problem-solving, which play a role in children's learning readiness and future academic performance (Zulkifli et al., 2022; Wantu et al., 2024; Abdullah et al., 2024). In addition to cognitive aspects, organisational skills also affect

children's character development and independence. Children with these skills tend to be more responsible for personal tasks, such as tidying up their rooms, completing homework, or organizing their daily schedules. With these habits, children learn to understand the importance of commitment and discipline, which in turn shape a more independent personality that is able to face various challenges in life. In an educational context, children with good organisational skills are also better equipped to work in groups, collaborate and share roles with their peers, thus strengthening their social abilities and interpersonal interactions (Wahyuddin et al., 2022; Multazam et al., 2023).

Furthermore, organisational skills can help children manage stress and pressure in increasingly complex learning environments. By organizing schedules, priorities and tasks well, children will feel more in control in dealing with the demands of school and other activities (Kılıç & Sciences, 2022; Hatipoğlu, 2023). This can minimize the feelings of anxiety and overwhelm that children often experience when having to complete many tasks simultaneously. Therefore, developing organisational skills early on not only supports academic success but also helps children build a strong foundation in time management, responsibility, and life balance in the future. Although organizational skills have an important role in a child's cognitive and social development, the reality is that these skills are often overlooked in the formal education system (Bellini et al., 2007; Yang et al., 2022). The educational curriculum tends to focus more on mastering academic materials than on the development of life skills such as time management, planning, and task structuring. As a result, children do not get systematic learning to develop organizational skills optimally. Teachers and educators also often focus on achieving cognitive learning outcomes, so organizational skills are considered a secondary aspect or even left entirely to the family environment (Luciana, 2022; Bachtiar et al., 2023; Tregagle & Darcy, 2008).

In addition, the limitations of adaptive teaching methods are also a challenge in instilling organizational skills in children (Chu et al., 2017). Many schools still apply conventional learning methods that are one-way and do not provide space for children to learn to manage time and tasks independently. In fact, organizational skills should be fostered through hands-on practices such as project-based assignments, collaborative learning, or personal agenda management. Without the right approach to learning, children do not have the opportunity to practice these skills in a structured and measurable environment (Ali et al., 2024; Ichsan et al., 2023; Dewanto et al., 2023). This is exacerbated by the lack of technology integration in learning, which should be an effective solution to help children hone their organizational skills through an attractive and easy-to-use task and time management application.

Organizational skills in formal education also have an impact on children's readiness to face future challenges (Murray & Rabiner, 2014). The inability to manage tasks and time often causes children to feel overwhelmed by increasingly complex academic demands. As a result, their academic achievement can be disrupted, and even have the potential to reduce motivation to go to school. Furthermore, without these skills, children may have difficulty adjusting to the work environment and social life in adulthood (Gillam et al., 2001). Therefore, this challenge needs to be overcome immediately through innovation in learning methods and the right use of technology to ensure that organizational skills become an integral part of children's education.

Along with rapid advances in technology, the world of education now has access to various innovations that can support the development of life skills, including management and organizational skills in children. Learning-based technologies, such as task management apps, time planning software, and digital learning platforms, offer effective solutions to help children develop their ability to manage their schedules, tasks, and priorities (Chen et al., 2022; Urrea et al., 2024). By using this technology, children can learn through more interactive and engaging approaches, such as gamification or simulations that encourage the development of regular habits and discipline. For example, a digital calendar app or a task management app

allows children to create daily to-do lists, set deadlines, and monitor their progress independently (Ito et al., 2021).

Furthermore, artificial intelligence (AI)-based learning technologies and content personalization are making it easier to integrate organizational skills into the learning process. Modern learning platforms can provide task recommendations that suit children's individual needs and abilities, so they learn how to plan and prioritize more effectively. The technology also allows teachers and parents to monitor the development of children's organizational skills through accurate evaluation and reporting features (Cannon & Edmondson, 2005). In addition, technology-enabled project-based learning, such as virtual collaboration apps and group planning tools, encourages children to practice working together, dividing roles, and managing time with their peers (Mallory & Hampshire, 2022). Thus, technological developments in education not only improve academic learning outcomes but also instill essential management and organizational skills for children in this digital era (Asnur et al., 2024; Maksum et al., 2023).

Assisted management learning technology has an important role in helping children develop skills to manage time, tasks, and resources more systematically and efficiently. With application-based technology or learning management software, children can learn to compile daily activity schedules, set task priorities, and divide time in a balanced way between academic, non-academic, and rest periods (Marulis & Neuman, 2010; Hollingworth et al., 2011; Raggi & Chronis, 2006). Applications such as task managers, calendar tools, and learning management system-based platforms provide practical experience for children in organizing activities independently, monitoring the progress of completing tasks, and understanding the consequences of delays or omissions in planning. This technology helps children build habits of discipline and responsibility from an early age with a more interactive and measurable approach (Timotheou et al., 2023).

In addition, assisted learning technology allows for personalized learning according to children's needs and abilities. Through the automation and monitoring features that technology provides, children can get recommendations for more optimal timing and resource management strategies, such as task reminders, time allocation for specific activities, or priority settings based on deadlines (Hamdani et al., 2021). For example, artificial intelligence (AI)-based platforms can analyze children's learning patterns and provide tailored suggestions to improve their management effectiveness. This not only helps children become more organized in their daily activities but also equips them with critical thinking, problem-solving, and long-term planning skills that are important in life (Pourdana, 2022; Sarnoko et al., 2024).

Previous research by Dabbagh and Kitsantas (2012) showed that self-regulated learning-based technologies such as learning management systems (LMS) can improve students' ability to manage their time, set goals, and monitor their learning progress independently. Research by Leh Bergman et al. (2016) on the use of task management applications in basic education shows a positive impact on children's time management skills. Research by Kulik and Fletcher (2016) shows that adaptive learning-based educational technology can help personalize the learning process, including in the development of organizational skills. Through algorithms that adjust to the individual needs of students, this technology is able to provide specific suggestions to set study schedules, divide priorities, and monitor the progress of tasks that are being done.

Although various studies have addressed the role of technology in learning, most studies still focus on improving general academic learning outcomes, such as improving students' understanding of concepts or achievement (Hamilton-Giachritsis et al., 2021). Research that specifically explores the role of technology in helping children's organizational skills development, such as timing, tasks, and resources, is still limited. In addition, the technological approach used in previous studies often lacked attention to personalizing learning according to the individual needs of children. This creates a research gap in

understanding how technology-assisted management learning can be effectively integrated to instill organizational skills in children in formal and informal educational settings.

Furthermore, previous research has not fully evaluated how the use of technology based on task management and adaptive learning can help children independently manage their activities in the long term. Most studies have focused only on short-term effects or experiments in the context of classroom learning. Thus, comprehensive research is still needed that highlights the impact of technology in building sustainable organizational habits in children, both in school and out-of-school learning activities. Based on this, this study aims to provide a more effective technology-based learning method in equipping children with organizational skills through meta-analysis.

## Methodology

This study uses a meta-analysis approach to determine the effect of technology-assisted management learning on children's organizational skills. Meta-analysis is a research approach that evaluates previous research statistically to reach a conclusion (Tamur et al., 2020; Badawi et al., 2023; Nurtamam et al., 2023; Zulyusri et al., 2023). The meta-analysis research procedure is 1) determining the research inclusion criteria, 2) collecting data and coding, 3) analyzing the data statistically.

### Eligibility Criteria

In the process of searching for data through the Google Scholar, ScienceDirect, Wiley, ERIC, ProQuest, Frontiers and Web of Science databases, the research must meet several inclusion criteria, namely are a) publications come from Google Scholar; ERIC, ScienceDirect, DOAJ, Wiley and Taylor of Francis, b) publications must be indexed by SINTA, Scopus and Web of Science, c) research topics must be relevant, d) research published in 2022-2024, e) publications must have complete data to calculate the effect size value. . From the data search, 21 studies were obtained that met the inclusion criteria published in 2020-2024 which can be seen in Table 2.

### Statistical Analysis

Data analysis in this study calculates the effect of technology-assisted management learning on children's organisational skills. According to (Borenstein et al., 2007) The stages of data analysis in the meta-analysis can be seen in (Figure 1.). Furthermore, the criteria for the effect size value in the study can be seen in Table 1.

**Table 1. Category Effect Size Value**

Effect Size	Category
$0.0 \leq ES \leq 0.2$	Low
$0.2 \leq ES \leq 0.8$	Medium
$ES \geq 0.8$	High

Source: (Borenstein et al., 2007);Oktarina et al., 2021; Nurtamam et al., 2023)

## Result and Discussion

Based on the data search results through the database, 21 studies/articles met the inclusion criteria. The effect size and error standard can be seen in Table 2. Based on Table 2, the effect size value of the 21 studies ranged from 0.35 to 2.77. According to Borenstein et al., (2007) Of the 21 effect sizes, 7 studies had medium criteria effect sizes and 14 studies had high criteria effect size values. Furthermore, 24 studies were analyzed to determine an estimation model to calculate the mean effect size. The analysis of the fixed and random effect model estimation models can be seen in Table 3.

**Table 2. Effect Size and Standard Error Every Research**

Code Jurnal	Years	Effect Size	Standard Error	Country
AP 1	2020	1.23	0.38	China
AP 2	2022	0.99	0.19	Indonesia
AP 3	2023	1.72	0.44	Indonesia
AP 4	2021	0.78	0.29	USA
AP 5	2021	1.58	0.40	USA
AP 6	2023	1.92	0.30	Indonesia
AP 7	2024	1.19	0.35	Indonesia
AP 8	2024	0.66	0.29	Malaysia
AP 9	2024	0.83	0.32	Thailand
AP 10	2024	0.35	0.18	India
AP 11	2020	0.58	0.12	India
AP 12	2021	0.82	0.29	Indonesia
AP 13	2021	1.98	0.45	Indonesia
AP 14	2020	0.48	0.20	Indonesia
AP 15	2020	1.18	0.44	Yunani
AP 16	2021	1.47	0.37	China
AP 17	2022	1.63	0.30	Malaysia
AP 18	2021	2.77	0.58	Indonesia
AP 19	2021	1.74	0.40	Turki
AP 20	2022	0.50	0.24	Turki
AP 21	2022	0.42	0.21	Indonesia

Table 3. Fixed and Random effect

	Q	df	p
<b>Omnibus test of Coefficients Model</b>	77.182	1	< 0.001
<b>Test of Residual Heterogeneity</b>	112.092	20	< 0.001

Based on Table 3, a Q value of 112.092 was obtained higher than the value of 77.182 with a coefficient interval of 95% and a p value of  $0.001 <$ . The findings can be concluded that the value of 24 effect sizes analyzed is heterogeneously distributed. Therefore, the model used to calculate the mean effect size is a random effect model. Furthermore, checking publication bias through funnel plot analysis and Rosenthal fail safe N (FSN) test (Tamura et al., 2020; Badawi et al., 2022; Ichsan et al., 2023b; Borenstein et al., 2007; Asnur et al., 2024; Ghofur et al., 2024). The results of checking publication bias with funnel plot can be seen in Figure 2.

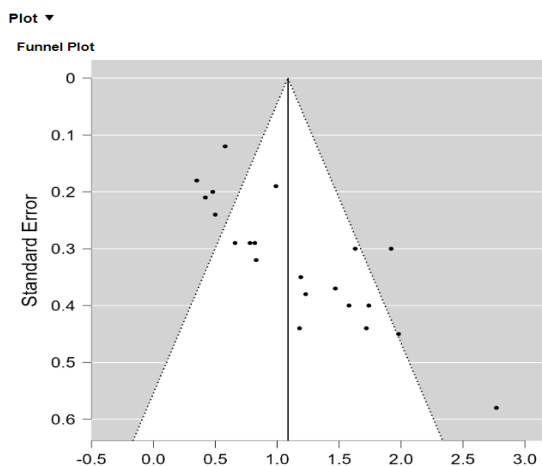


Figure 2. Funnel Plot

Based on Figure 2, the analysis of the funnel plot is not yet known whether it is symmetrical or asymmetrical, so it is necessary to conduct a Rosenthal Fail Safe N (FSN) test. The results of the Rosenthal Fail-Safe N calculation can be seen in Table 4.

**Table 4. Fail-Safe N**

<b>File Drawer Analysis</b>			
	Fail-Safe N	Target Significance	Observed Significance
<b>Rosenthal</b>	2079	0.050	< 0.001

Based on Table 4, the Fail Safe N value of 2504 is greater than the value of  $5k + 10 = 5(21) + 10 = 125$ , so it can be concluded that the analysis of 21 effect sizes in this data is not biased by publication and can be scientifically accounted for. Next, the p-value is calculated to test the hypothesis through the random effect model. The results of the summary effect model analysis with the random effect model can be seen in Table 5.

**Table 5. Mean Effect Size**

<b>Coefficient</b>						
	Effect Size	Standard Error	z	p	95 % Coefficients Interval	
					Lower	Upper
<b>Intercept</b>	1.086	0.128	8.509	< 0.01	0.836	1.337

Table 5, the summary effect size value is 1,086 with a standard error of 0.128 and the 95% confidence level is lower 0.836 and upper 1,337. These findings explain the significant influence of technology-based management learning on organizational skills in children compared to the conventional learning model with a value of  $z = 8.509$ ;  $p < 0.001$  high effect size category. Organizational skills are an important part of a child's development that contributes to their academic success and daily life. These skills involve the ability to plan, manage time, and prioritize completing tasks. At a young age, the mastery of organizational skills plays a very important role in forming a structured and productive mindset. One way to improve these skills is through a technology-based learning approach that can provide interactive and engaging tools for children (Shafique et al., 2013). Technology makes it easy for children to learn how to manage their time and tasks in a timely manner more efficient, which ultimately has the potential to improve their organizational skills (Rijal et al., 2021).

The use of technology in learning organizational skills in children has become increasingly popular in recent years (Bundgaard, 2019). Digital tools such as time management apps, digital calendars, and learning software can help children learn to plan and organize their activities in a fun and engaging way. According to research conducted by Zhang et al. (2021), the use of technology-based learning applications can improve students' organizational skills because it provides a more personalized and structured learning experience. The app allows children to manage their tasks, remember deadlines, and set priorities, all of which are essential parts of effective organizational skills (Adolfo et al., 2023; Lee et al., 2023; Ichsan et al., 2023).

The impact of technology-based learning on children's organizational skills can be seen through increased efficiency in time management and task management (Nieuwenhuis et al., 2021). By using technology, children can have easier access to monitor and manage their activities, both at home and at school. This can reduce confusion and increase their sense of responsibility for the tasks given. A study by Cheng and Lee (2019) revealed that children who use technology to learn to manage their tasks show improvements in organizing and completing tasks in a timely manner. This increase is mainly due to the existence of a clearer

reminder system and grouping of tasks through management applications (Lee et al., 2023; Santosa & Sepriyani., 2020).

## Conclusion

From the results of this meta-analysis, it can be concluded that the 21 studies analyzed were heterogeneously distributed; there is a significant influence of technology-based management learning on organizational skills in children ( $p < 0.05$ ;  $rRE = 1.086$ ; in this meta-analysis, there is no publication bias. This finding shows that technology-based management learning influences organizational skills in the category with a very high effect size. This research provides important implications for education policy related to the development and integration of technology in learning. Governments and policymakers can see the results of this research as a basis for expanding access to technology in schools, especially in areas with limited digital access. Providing hardware and software that supports technology-based learning is indispensable to ensure that all students have an equal opportunity to develop the necessary organizational skills. By ensuring more equitable access to technology, education policies can foster the development of 21st-century skills, including managing time and tasks, which are critical in an increasingly digital world.

Further research can be conducted with a longitudinal approach to explore the long-term impact of technology-based learning on children's organizational skills development. The focus of the research can be directed to the dynamics of changes in children's organizational skills at different age stages and levels of education, as well as how contextual factors, such as social environment, parental support, and teacher involvement, affect the effectiveness of such technologies. Additionally, research can expand the scope by exploring differences in impact based on the type of technology used, such as management applications, gamification, or artificial intelligence, and assessing their contribution to additional skills, such as collaboration, problem-solving, and adaptability. The study can also consider cross-cultural aspects to understand how differences in values and norms affect the acceptance of technology in supporting organizational skills and identify potential ethical and social challenges that arise in its implementation.

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