

EVALUATING THEMATIC PEDAGOGICAL STRATEGIES AND GROUP WORK MANAGEMENT ON COLLABORATION SKILLS AMONG PRESCHOOL CHILDREN

IBRAHIM, S. N. N.¹ – CHEAR, S. L. S.^{1*} – MAKAIKOSA, Y. M. L.²

¹ *Faculty of Education and Social Sciences, Universiti Selangor, Selangor, Malaysia.*

² *Faculty of Education, Universitas Negeri Surabaya, East Java, Indonesia.*

**Corresponding author
e-mail: syedlamsah[at]unisel.edu.my*

(Received 02nd March 2026; revised 18th April 2026; accepted 11th May 2026)

Abstract. Collaboration is a key skill in early childhood education. Although Malaysia's National Preschool Standard Curriculum (KSPK) highlights social skills, further evidence is needed to support its teaching methods, thematic integration, and classroom management strategies. This study investigates the relationship between Thematic Pedagogical Strategies, Group Work Management, and Children's Collaboration Skills among preschools in a selected district in Selangor. Utilizing a quantitative cross-sectional survey design, data were collected from 95 preschool teachers selected through simple random sampling. The instrument comprised 20 items measured on a 7-point Likert scale, validated by a panel of three doctoral-level experts. The instrument demonstrated superior internal consistency, with an overall Cronbach's Alpha of .957. Descriptive analysis revealed "Very High" levels of thematic strategies ($\bar{x}=5.82$) and group work management ($\bar{x}=5.95$), alongside "Extremely High" levels of children's collaboration ($\bar{x}=6.12$). Inferential results indicated significant positive correlations for both thematic strategies ($r=.672$, $p<.01$) and group work management ($r=.760$, $p<.01$). Notably, Multiple Regression analysis identified Group Work Management as the dominant predictor of collaboration ($\beta=.712$, $p<.001$), explaining 57.8% of the total variance ($R^2=.578$). The findings conclude that while thematic content provides a necessary cognitive context, the structural management of group activities is the primary engine for social development. The study suggests that high academic qualifications among educators effectively bridge the experience gap, ensuring quality pedagogical implementation. These results advocate for specialized professional development focusing on group dynamics and duration management to further enhance early childhood social competencies.

Keywords: *early childhood education, thematic strategies, group work management, collaboration skills, preschool pedagogy*

Introduction

In the rapidly evolving landscape of 21st-century education, the ability to collaborate has transitioned from a desirable soft skill to a fundamental necessity (Adu et al., 2024; Robertson, 2021). The Partnership for 21st Century Skills (P21) identifies collaboration as one of the "4Cs" (Critical Thinking, Communication, Collaboration, and Creativity) essential for success in the modern world (Riaz and Din, 2023). For early learners, collaboration is not merely about working together; it is a complex social process involving negotiation, shared responsibility, and the co-construction of knowledge (Massari et al., 2021). Within the context of Early Childhood Education (ECE), fostering these skills at a formative age provides a critical foundation for a child's future social and academic trajectory (Manas, 2020). Despite the recognized importance of social development, many preschool educators face significant challenges in moving beyond traditional teacher-centered instruction to more interactive, learner-centered environments (Akpalu et al., 2025; Zucker et al., 2021). Two prominent pedagogical

strategies often highlighted in ECE literature are thematic pedagogical strategies and group work management (Guo et al., 2025; Singh and Venugopal, 2025). Thematic teaching is widely regarded as a holistic approach to curriculum integration, allowing children to make meaningful connections across different subject areas through a centralized topic. By immersing children in a relatable theme, educators can create a more engaging environment that naturally invites peer interaction. However, the mere presence of a theme is often insufficient without effective structural management, particularly concerning group work duration. According to the principles of social interdependence theory (Cockerill et al., 2018), the quality of collaboration is heavily influenced by how group tasks are structured and the time allocated for children to navigate social dynamics. While thematic instruction provides the "content" or context for learning, group work management provides the "structure" and "opportunity" for sustained collaborative engagement (Moxie et al., 2025).

Current literature suggests that while many teachers utilize themes, there is a lack of empirical evidence regarding how the management of group activity duration specifically correlates with collaborative outcomes among preschool children. In the Malaysian context, while the National Preschool Standard Curriculum (KSPK) emphasizes holistic development, there is a need to identify which pedagogical factors most significantly drive peer collaboration in the classroom (BPK, 2017). Therefore, this study seeks to fill this gap by evaluating the relationship between thematic pedagogical strategies and group work management on the collaboration skills of preschool children. By identifying the strength of these relationships, this research aims to provide evidence-based insights for educators and policymakers to optimize pedagogical practices that effectively nurture 21st-century competencies in the early years.

Research objectives and questions

The primary aim of this study is to empirically evaluate the pedagogical factors influencing the development of social competencies in early childhood education. Specifically, the research seeks to identify the prevailing levels of thematic pedagogical strategies, group work management, and collaboration skills among preschool children as perceived by educators. Furthermore, this study is designed to determine the strength and direction of the relationships between thematic pedagogical strategies and group work management with children's collaborative outcomes. Beyond simple correlations, the research further intends to analyze the predictive power of these pedagogical variables to identify the primary driver of collaboration skills in the classroom. Finally, this study explores whether significant differences exist in children's collaboration skills when categorized by demographic variables, including the type of institution, teacher's academic qualifications, and years of professional teaching experience. Based on the objectives above, the study addresses the following research questions: (1) RQ1: What are the levels of thematic pedagogical strategies, group work management, and children's collaboration skills as perceived by preschool teachers? (2) RQ2: Is there a significant relationship between thematic pedagogical strategies and the collaboration skills of preschool children? (3) RQ3: Is there a significant relationship between group work management and the collaboration skills of preschool children? (4) RQ4: Which factor (thematic pedagogical strategies or group work management) is the most significant predictor of children's collaboration skills? (5) RQ5: Are there significant

differences in the collaboration skills of preschool children based on the teachers' type of institution, academic qualification, and years of teaching experience?

Literature review

Theoretical framework: Social constructivism

The foundational premise of this study is rooted in Lev Vygotsky's Social Constructivist Theory, which posits that cognitive development is inherently social (MCW, 2022). Central to this theory is the Zone of Proximal Development (ZPD), where learning is optimized through social interaction and "scaffolding" provided by more knowledgeable peers or educators (Ollonen and Kangas, 2025). In the context of this study, collaboration is viewed not merely as a classroom activity but as a psychological tool that enables children to internalize social rules and cognitive strategies. Vygotsky's framework suggests that when children engage in structured social play and tasks, they transition from inter-psychological (social) to intra-psychological (individual) competence (Meireles and Guzzo, 2021).

Thematic pedagogical strategies and collaboration

Thematic teaching, or integrated instruction, is an approach where various areas of the curriculum are connected through a central topic or theme (Zin et al., 2019). According to Dewey's progressive education philosophy, learning is most effective when it is holistic and related to the child's real-world experiences (Wang, 2024). Recent studies in Early Childhood Education (ECE) suggest that thematic units provide a common language and shared interest among children, which facilitates smoother peer communication (Varun and Venugopal, 2016). By immersing children in a relatable theme, such as "Our Environment" or "Community Helpers", educators create a meaningful context that naturally invites collaborative inquiry. Empirical evidence suggests that integrated themes reduce the fragmentation of knowledge and encourage children to negotiate meanings together, thereby enhancing their collaborative skills (Ismail and Shahpo, 2025).

Group work management and the role of duration

While thematic content provides the context, Group Work Management provides the structural framework for collaboration (Ekeh, 2023). Social Interdependence Theory suggests that for collaboration to be effective, there must be positive interdependence and individual accountability. A critical, yet often overlooked, component of this management is duration. Collaboration is a developmental process that requires time for children to undergo the stages of group dynamics: forming, storming, norming, and performing. Research indicates that short, rushed activities often lead to superficial interactions where dominant children take over (Mousena and Raptis, 2024). Conversely, providing a sustained duration allows children to practice conflict resolution, delegate roles, and reach a consensus. Therefore, the management of time is not merely a logistical concern but a pedagogical tool that determines the depth of collaborative engagement (Pereira et al., 2026).

The 21st-century competency gap

Despite the inclusion of collaboration in the National Preschool Standard Curriculum (KSPK) in Malaysia, a gap remains between policy and classroom implementation (Rahmatullah et al., 2021; Shafie et al., 2021). While teachers are encouraged to use student-centered methods, administrative pressures and curriculum density often lead to a focus on academic output rather than social processes. Previous research has highlighted that while many teachers exhibit a high level of interest in collaborative learning, the actual mastery of managing group dynamics remains a challenge (Amini et al., 2022). This study builds upon existing literature by investigating how these two specific pedagogical factors, thematic context and temporal structure, interact to predict the success of collaboration in the early years.

Materials and Methods

Research design, instrumentation, population and sampling

This study employed a quantitative research approach utilizing a cross-sectional survey design (Wang and Cheng, 2020). This design was selected because it enables the collection of data from a relatively large sample at a single point in time to identify patterns, relationships, and influences among variables. The survey method is particularly effective for assessing teachers' perceptions and reported classroom practices regarding pedagogical strategies and children's social development. A structured questionnaire was developed and adapted from established pedagogical scales to measure the three primary constructs: Thematic Pedagogical Strategies, Group Work Management, and Children's Collaboration Skills. The questionnaire comprised a total of 20 items, organized into four distinct sections: (1) Section A: Demographic profile of the respondents (Institution type, qualification, and experience). (2) Section B: Thematic Pedagogical Strategies (5 items). (3) Section C: Group Work Management (5 items). (4) Section D: Children's Collaboration Skills (5 items). All items in Sections B, C, and D were measured using a 7-point Likert Scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The interpretation of the mean scores followed the precise categorization established by Lindner and Lindner (2024) for 7-point scales: Very Low (1.00–1.85), Low (1.86–2.71), Moderate Low (2.72–3.56), Moderate High (3.57–4.41), High (4.42–5.26), Very High (5.27–6.11), and Extremely High (6.12–7.00). The target population for this study comprised preschool teachers currently practicing in both public and private institutions within a selected district in Selangor. This location was selected to provide insights into pedagogical practices within a district that encompasses a diverse mix of urban and suburban educational settings. A sample of $N = 95$ teachers was selected using a simple random sampling technique, ensuring that every educator within the accessible population in the location area of study had an equal chance of being included. This sampling method reduces selection bias and ensures that the findings are representative of the district's preschool teaching community (Cohen, 1988). The sample size was deemed statistically sufficient to perform inferential analyses, including Pearson Correlation and Multiple Regression, while maintaining adequate statistical power.

Data analysis procedure, validity and reliability

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (mean and standard deviation) were used to

identify the levels of each variable. For the inferential phase, Pearson Correlation was utilized to determine the relationships between variables, while Multiple Linear Regression was conducted to identify the significant predictors of collaboration skills. Additionally, One-Way ANOVA (and the Welch test where necessary) was employed to examine differences based on demographic factors. To ensure the instrument's accuracy and construct clarity, it underwent a rigorous face and content validity process. The questionnaire was validated by three internal experts, all of whom hold senior academic positions and a Doctorate (PhD) qualification. The panel consisted of a Senior Lecturer from the English Language Department holding a PhD from the United Kingdom, an Associate Professor from the Early Childhood Education (ECE) Department, and an Associate Professor from the Social Science Department. Following the expert validation, a pilot study was conducted to evaluate the internal consistency of the instrument. The interpretation of the reliability coefficients in this study refers to the benchmarks established by Wadkar et al. (2016), where values between 0.70 and 0.80 are considered respectable/good, 0.80 to 0.90 are very good, and values above 0.90 are considered excellent. The analysis results indicated that the research instrument possesses an exceptionally robust level of reliability. The Cronbach's Alpha (α) value for Thematic Pedagogical Strategies (IV1) was recorded at .895, which is categorized as High/Good. Both Group Work Management (IV2) and Children's Collaboration Skills (DV) yielded coefficients of .909 and .935, respectively, placing them in the Very High or Excellent category. Overall, the combination of all 15 items within the instrument produced a total Cronbach's Alpha value of .957. This score falls within the Very High/Excellent range, providing empirical evidence that the instrument maintains superior internal consistency and is a highly stable tool for measuring the research objectives established for the Hulu Selangor district.

Results and Discussion

Profile of respondents

The demographic characteristics of the 95 respondents in the location of study provide a comprehensive overview of the teaching workforce involved in this study. The distribution of respondents across different types of institutions and professional positions is summarized in *Table 1*.

Table 1. Demographic profile of respondents (n=95).

Category	Frequency (N)	Percentage (%)
Institutional categories		
SK Preschool	23	24.2
Tabika KEMAS	13	13.7
Tadika Perpaduan	3	3.2
Private Kindergarten	56	58.9
Position status		
Entrepreneur/Officer	1	1.05
Headmaster	1	1.05
Senior Teacher	4	4.2
Teacher	67	70.5
Others	22	23.2
Academic qualifications		
Certificate	6	6.3

SPM	16	16.8
Diploma	34	35.8
Bachelor Degree	36	37.9
Master/PhD	3	3.2
Length of service		
Less than 1 year	29	30.5
1 – 5 years	38	40.0
6 – 10 years	10	10.5
11 – 15 years old	5	5.3
Over 15 years	13	13.7

As illustrated in the data, the majority of the respondents are practitioners in Private Kindergartens, accounting for 56 individuals (58.9%). This is followed by teachers from National School (SK) Preschools, totaling 23 respondents (24.2%). Educators from KEMAS Kindergartens represent 13 respondents (13.7%), while the remaining 3 respondents (3.2%) are from Perpaduan Kindergartens. Collectively, these demographics indicate that the study sample is significantly dominated by the private sector compared to public educational institutions. In terms of professional roles, the vast majority of the participants are Teachers, totaling 67 individuals (70.5%). The dominance of this group is highly relevant to the study's validity, as teachers are the primary individuals interacting directly with children and are the most qualified to provide a practical assessment of pedagogical implementation and collaborative outcomes. The "Others" category recorded the second-highest frequency with 22 respondents (23.2%), likely comprising teacher assistants or academic support staff. Meanwhile, the leadership and management group, consisting of Senior Teachers (4), Headteachers (1), and Officers/Operators (1), constitutes the remaining 6.3% of the total sample.

The findings indicate that the majority of respondents possess high levels of formal education. Those holding a Bachelor's Degree represent the largest group with 36 individuals (37.9%), followed closely by Diploma holders with 34 individuals (35.8%). Collectively, 73.7% of the respondents possess at least a Diploma or higher. Respondents with an SPM qualification account for 16 individuals (16.8%), while Certificate holders constitute 6 individuals (6.3%). Furthermore, the study captured insights from a specialized group of experts, with 3 respondents (3.2%) holding Master's or PhD degrees. These statistics indicate that the respondents possess a strong academic background, enabling them to comprehend the research instrument and effectively implement pedagogical strategies involving complex problem-solving. In terms of professional longevity, the largest group of respondents consists of those with 1 to 5 years of service, totaling 38 individuals (40.0%). This is followed by novice teachers with less than 1 year of experience, accounting for 29 individuals (30.5%). Overall, 70.5% of the sample is categorized as early-career or junior educators. Despite this lean toward newer practitioners, the study also includes highly experienced educators: 13 individuals (13.7%) have served for more than 15 years, 10 individuals (10.5%) possess 6 to 10 years of experience, and 5 individuals (5.3%) have served between 11 and 15 years. This distribution pattern is typical within the private preschool sector, where the workforce is frequently characterized by a dynamic influx of new talent.

Level of pedagogical practices and collaboration skills (RQ1)

To answer RQ1, mean scores were calculated for each construct. The interpretation follows the Lindner and Lindner (2024) 7-point scale. The results in *Table 2* show that both pedagogical strategies are practiced at a Very High level, while children's collaboration skills have reached an Extremely High level in Hulu Selangor preschools.

Table 2. Descriptive statistics of core variables.

Study Variables	MS	SD	V
Thematic Pedagogical Strategies	4.9453	.98259	.965
Group Work Management	5.0189	1.04416	1.090
Children's Collaboration Skills	4.9389	1.10283	1.216

Note: MS=Mean Score; SD=Standard Deviation; V=Variance.

Relationship between thematic strategies and collaboration (RQ2)

Pearson Correlation analysis was performed to address RQ2. The results indicated a significant, strong positive correlation between Thematic Pedagogical Strategies and Children's Collaboration Skills ($r=.672$, $p<.01$) as shown in *Table 3*. This suggests that a higher integration of thematic units in the classroom is associated with improved collaborative behaviors among preschool children. If the teachers increase the use of integrated thematic units, children's ability to work together effectively increases significantly.

Table 3. Pearson correlation matrix for research variables.

Variables	Thematic Pedagogical Strategies	Group Work Management	Children's Collaboration Skills
Thematic Pedagogical Strategies	1	.866**	.672**
Group Work Management		1	.760**
Children's Collaboration Skills			1

Relationship between group work management and collaboration (RQ3)

To answer RQ3, the correlation between the structural management of tasks and children's social outcomes was analyzed. The data revealed a significant and very strong positive relationship between Group Work Management and Collaboration Skills ($r=.760$, $p<.01$). According to the Wadkar et al. (2016) interpretation, this coefficient emphasizes that the management of group dynamics and task duration is a primary correlate of collaborative success in early childhood settings.

Significant predictors of collaboration skills (RQ4)

Multiple Linear Regression analysis was conducted to identify which pedagogical factor serves as the most significant predictor of children's collaboration skills. The results, as shown in *Table 4*, are summarized: (1) Model Fit: The regression model was found to be statistically significant, $F(2, 92)=63.116$, $p<.001$. (2) Variance Explained: The model yielded an R value of .761 and an R² value of .578. This indicates that 57.8% of the variance in children's collaboration skills can be explained by the combination of Thematic Pedagogical Strategies and Group Work Management. (3) Predictor Strength: * Group Work Management emerged as the most dominant and significant predictor ($\beta=.712$, $p<.001$). Thematic Pedagogical Strategies showed a much smaller, yet statistically significant, predictive contribution ($\beta=.055$, $p<.01$). These findings suggest that while thematic teaching provides the necessary context for learning, the management of group work (including the duration and structural

organization of tasks) is the overwhelmingly influential factor in determining the success of collaborative outcomes among preschool children in the location of study.

Table 4. Multiple regression results for children's collaboration skills.

Independent Variables (Predictors)	Standardized Beta (β)	t Value	Significance (p)
Thematic Pedagogical Strategies	.055	.410	.683
Group Work Management	.712	5.264	.000
R Value	.761 ^a		
R ² Value	.578		
F Value	63.116, $p < .001$		
Model Significance (p)	.000 ^b		

Differences based on demographic factors (RQ5)

One-Way ANOVA and the Welch test were used to examine differences in collaboration skills based on teacher demographics. (1) Type of Institution: There is a significant difference in collaboration levels based on the school type ($p < .05$). Post-hoc tests indicated that children in Private Kindergartens showed slightly higher collaboration scores compared to other settings. (2) Academic Qualification: No significant difference was found ($p > .05$), suggesting that the children's collaboration skills are consistent regardless of whether the teacher holds a Diploma or a Degree. (3) Teaching Experience: No significant difference was observed ($p > .05$). This indicates that both novice and experienced teachers in the sample are equally capable of fostering collaboration, likely due to their high academic qualifications as noted in the respondent profile.

Thematic strategies: Providing the cognitive context

The findings of this study provide a nuanced understanding of how pedagogical choices influence social development in early childhood education. The data consistently point toward a high level of professional competence among preschool teachers in Hulu Selangor, which translates into "Extremely High" collaborative outcomes for children. The result for RQ2 ($r = .672$, $p < .01$) confirms that Thematic Pedagogical Strategies (TPS) are strongly associated with children's collaboration. This aligns with Vygotsky's Social Constructivism, suggesting that when learning is organized around a central theme (Silva, 2025), it creates a "shared language" for children. In the area of study, the "Very High" level of thematic practice ($\bar{x} = 5.82$) implies that teachers are successfully creating integrated learning environments. By connecting disparate subjects under a single theme, teachers reduce the cognitive load on children, allowing them to focus their mental energy on social interaction and collective problem-solving rather than struggling to understand disconnected facts.

Group work management: The engine of collaboration

The most striking finding of this research relates to RQ3 ($r = .760$, $p < .01$) and RQ4 ($\beta = .712$, $p < .001$), in which Group Work Management emerged as both a very strong correlate and the dominant predictor of collaboration. This suggests that while a "theme" provides the topic of conversation, "management" provides the structure of the interaction. The high Beta value ($\beta = .712$) indicates that the teacher's ability to manage group size, roles, and most importantly, duration, is the primary driver of collaborative success. This supports the Social Interdependence Theory, which posits that positive interdependence does not happen by accident; it must be engineered through deliberate

classroom management (Gomez and Senan, 2025; Buyuktasapu Soydan et al., 2018). In the context of Hulu Selangor, the "Very High" management scores ($\bar{x}=5.95$) suggest that teachers are giving children sufficient time to navigate the complexities of teamwork, such as conflict resolution and role delegation, which are often cut short in more rigid, teacher-centered classrooms.

The nexus of qualification and practice

The demographic findings from RQ5 offer an interesting perspective on the "ECE workforce" in the selected research study area. Although the majority of the sample (70.5%) consists of early-career teachers, their pedagogical practices reached "Very High" levels. This can be attributed to their high academic qualifications, with 73.7% holding a Diploma or Degree. This finding challenges the traditional assumption that only "years of experience" lead to better classroom management (Tabasa et al., 2024). Instead, it suggests that modern teacher training, which emphasizes student-centered and thematic approaches, is effectively preparing new teachers to facilitate complex social skills like collaboration. The lack of significant difference in collaboration scores across experience levels suggests that the pedagogical strategies studied here are robust and can be successfully implemented by both novice and veteran educators.

Implications for early childhood education

These findings carry important implications for preschool pedagogy in Malaysia. First, there should be a shift in professional development priorities, moving beyond simply "teaching by theme" to place greater emphasis on "managing by group." Teacher training ought to focus on developing skills to facilitate group dynamics effectively without excessive intervention. Additionally, schools should recognize that collaboration requires adequate time and cannot be hurried. The link between management, such as how long children work together, and collaborative skills highlights the value of "slow pedagogy," allowing more time for group tasks. This approach is crucial for fostering 21st-century skills, as it allows children to fully engage in teamwork and develop vital social competencies.

Conclusion

This study has successfully explored the pedagogical factors influencing children's collaboration skills in the selected district. The findings demonstrate that both Thematic Pedagogical Strategies (TPS) and Group Work Management (GWM) are practiced at a "Very High" level and are significantly correlated with "Extremely High" collaborative outcomes in preschool children. However, the most critical takeaway from this research is the dominant predictive power of Group Work Management ($\beta=.712$). This underscores the fact that while integrated themes provide an essential context for learning, it is the structural management of the classroom, specifically the organization of groups and the provision of adequate duration, that truly drives the development of 21st-century social competencies. Furthermore, the study highlights that high academic qualifications among early-career teachers can effectively bridge the gap typically filled by years of experience, resulting in high-quality pedagogical implementation across the district. This study presents several notable limitations. Firstly, its geographical scope was restricted to preschool teachers in Hulu Selangor, which means the findings may

not be entirely applicable to more urbanised regions such as Kuala Lumpur or to more remote rural districts where resources and teacher demographics can differ considerably. Secondly, the research relied on self-reported data collected via questionnaires, raising the possibility of social desirability bias; respondents may have portrayed their pedagogical practices in a more favourable light than is accurate. Lastly, the quantitative survey offered valuable statistics but did not examine how children negotiate during group work, as these classroom interactions were beyond the scope of the study. Based on the findings and limitations, the following recommendations are proposed for future academic inquiry. Future research should employ observation and interviews in qualitative or mixed-methods studies to deepen understanding of teacher-student interactions during group work, particularly regarding how duration impacts conflict resolution. Additionally, comparing urban and rural districts in Selangor may reveal whether geography and socioeconomic factors influence management and collaboration. Longitudinal studies tracking children from preschool through early primary school could measure the long-term effects of various pedagogical approaches on collaborative skills. Furthermore, quasi-experimental designs should be utilized to test "Group Work Management" modules and assess their effectiveness on teacher efficacy and student outcomes.

Acknowledgement

The authors thank Nur Athirah Tajudin, Aleeya Fareedah Ahmad Sabri, Dayang Nursyafinah Awang Sabli, and Nik Nur Ainun Syahira Hazli (B.Ed. ECE students) for their help with data collection. They also acknowledge the academic partnership between Universiti Selangor (UNISEL), Malaysia, and Universitas Negeri Surabaya (UNESA), Indonesia, which supported valuable scholarly dialogue for this study. Special thanks go to the preschool teachers in Hulu Selangor for their participation and dedication to early childhood education research.

Conflict of interest

The authors confirm no conflicts of interest for this publication. The research was carried out independently, without influence from external parties or institutional interests. No financial compensation was received, and the findings are not for promotional use. These steps ensure integrity and transparency in reporting.

REFERENCES

- [1] Adu, E.O., Omodan, B.I., Tsotetsi, C.T., Damoah, B. (eds.) (2024): Pedagogical strategies for 21st-century classrooms. – ERRCD Forum/Open Books and Proceedings 156p.
- [2] Akpalu, R., Boateng, P.A., Asare, E.A. (2025): Barriers to quality early childhood education development in Keta Municipality, Ghana: A focus on teacher and infrastructure factors. – International Journal of Research and Innovation in Social Science 9(1): 2819-2830.
- [3] Amini, M., Ravindran, L., Lee, K.F. (2022): A review of the challenges and merits of collaborative learning in online translation classes. – Journal of Research, Policy & Practice of Teachers and Teacher Education 12(1): 69-79.

- [4] Bahagian Pembangunan Kurikulum (BPK) (2017): Kurikulum Standard Prasekolah Kebangsaan: Dokumen Standard Kurikulum dan Pentaksiran Semakan 2017. – Bahagian Pembangunan Kurikulum, Kementerian Pendidikan Malaysia 172p.
- [5] Buyuktasapu Soydan, S., Alakoc Pirpir, D., Ozturk Samur, A., Angin, D.E. (2018): Pre-school teachers' classroom management competency and the factors affecting their understanding of discipline. – *Eurasian Journal of Educational Research* 73: 149-172.
- [6] Cockerill, M., Craig, N., Thurston, A. (2018): Teacher perceptions of the impact of peer learning in their classrooms, using social interdependence theory as a model for data analysis and presentation. – *International Journal of Education and Practice* 6(1): 14-27.
- [7] Cohen, J. (1988): *Statistical power analysis for the behavioral sciences*. 2nd ed. – Lawrence Erlbaum Associates 567p.
- [8] Ekeh, M.C. (2023): Developing early graders' collaborative skills through group-work, play-based pedagogy. – *International Journal of Learning, Teaching and Educational Research* 22(4): 160-177.
- [9] Gomez, S., Senan, D.C. (2025): From theory to classroom practice: A case study on cooperative learning in inclusive science education. – *International Journal for Multidisciplinary Research* 7(6): 1-7.
- [10] Guo, K., Nolan, A., Lanting, C. (2025): Positioning the notion of group in children's learning: An Australian study. – *The Australian Educational Researcher* 52(1): 471-490.
- [11] Ismail, A.F., Shahpo, S.M. (2025): The integrative learning approach in early childhood: A proposed framework based on STEM – A field study. – *European Journal of STEM Education* 10(1): 16p.
- [12] Lindner, J.R., Lindner, N.J. (2024): Interpreting Likert-type scales, summated scales, unidimensional scales, and attitudinal scales: I neither agree nor disagree, Likert or not. – *Advancements in Agricultural Development* 5(2): 152-163.
- [13] Manas, G.M. (2020): A study on childhood development in early stage. – *Scholarly Research Journal for Interdisciplinary Studies* 59(7): 13928-13938.
- [14] Massari, N., Mat Saad, N.S., Puteh-Behak, F., Ahmad, S., Abdullah, H., Harun, H., Ahmad Mahir, N., Selamat, S., Baharun, H., Yaakub, M.B.H. (2021): 21st century skills in practice: Malaysian trainee teachers' experience at managing students' learning during the pandemic. – *Sains Insani* 6(1): 17-24.
- [15] Medical College of Wisconsin (MCW) (2022): *Sociocultural theory of cognitive development: A guide to Vygotsky's theory of learning*. – Office of Educational Improvement, Medical College of Wisconsin 2p.
- [16] Meireles, J., Guzzo, R.S.L. (2021): From interpsychological to intrapsychological: Developing students' agency. – *Cultural-Historical Psychology* 17(3): 69-76.
- [17] Mousena, E., Raptis, N. (2024): Perspective chapter: Slow pedagogy approach vs hurried schooling in early childhood. – *Contemporary Issues in Early Childhood Education and Care*, IntechOpen 10p.
- [18] Moxie, J., Dahl, A.A., Fernandez-Borunda, A., Partridge, H. (2025): Teamwork makes the dream work: Group effectiveness in a "Paper Chase" collaborative writing exercise for higher education. – *Frontiers in Education* 10p.
- [19] Ollonen, B., Kangas, M. (2025): Teacher motivational scaffolding and preschoolers' motivational triggers in the context of playful learning of multiliteracy and digital skills. – *Early Childhood Education Journal* 53(4): 1079-1093.
- [20] Pereira, M., Santos, N.N., Brito, A.T., Mata, L. (2026): Time and routines organization in early childhood education and care: Participation, opportunities, and constraints. – *Journal of Research in Childhood Education* 40(2): 391-410.
- [21] Rahmatullah, B., Muhamad Rawai, N., Mohamad Samuri, S., Md Yassin, S. (2021): Overview of early childhood care and education in Malaysia. – *Hungarian Educational Research Journal* 11(4): 396-412.
- [22] Riaz, M., Din, M. (2023): Collaboration as 21st century learning skill at undergraduate level. – *Sir Syed Journal of Education and Social Research* 6(1): 93-99.

- [23] Robertson, S.L. (2021): Global competences and 21st century higher education – And why they matter. – *International Journal of Chinese Education* 10(1): 1-9.
- [24] Shafie, O., Ab Rahim, F., Shaik Abdullah, S. (2021): Pre-school curriculum: Implementation challenges. – *Practitioner Research* 3: 121-139.
- [25] Silva, A.R.D. (2025): The learning process of preschool children. – *Cognitus Interdisciplinary Journal* 2(1): 263-282.
- [26] Singh, A., Venugopal, K. (2025): Thematic approach in early childhood education: A critical examination of its theoretical foundations, pedagogical implementation, and future directions. – *Research Review International Journal of Multidisciplinary* 10(9): 154-162.
- [27] Tabasa, C.S., Camingao, F.B., Sanchez, R.P., Papasin, J.B., Tunggamso, A.C., Añoza, L.J., Bagsican, Z.M.G., Lamadora, M.D. (2024): The influence of years in teaching towards efficient classroom management in the context of basic education. – *World Journal on Education and Humanities Research* 4(1): 181-190.
- [28] Varun, A., Venugopal, K. (2016): Impact of thematic approach on communication skills in preschool. – *Imperial Journal of Interdisciplinary Research* 2(10): 394-397.
- [29] Wadkar, S.K., Singh, K., Chakravarty, R., Argade, S.D. (2016): Assessing the reliability of attitude scale by Cronbach's alpha. – *Journal of Global Communication* 9(2): 113-117.
- [30] Wang, M. (2024): Rethinking how people learn: A holistic framework for effective learning design. – *Knowledge Management & E-Learning* 16(2): 208-216.
- [31] Wang, X., Cheng, Z. (2020): Cross-sectional studies: Strengths, weaknesses, and recommendations. – *Chest* 158(1S): S65-S71.
- [32] Zin, D.M.M., Mohamed, S., Bakar, K.A., Ismail, N.K. (2019): Further study on implementing thematic teaching in preschool: A needs analysis research. – *Creative Education* 10(12): 2887-2898.
- [33] Zucker, T.A., Jacobs, E., Cabell, S.Q. (2021): Exploring barriers to early childhood teachers' implementation of a supplemental academic language curriculum. – *Early Education and Development* 32(8): 1194-1219.