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Nutritional Numeracy: An Integrated Science-Numeracy Curriculum Model to Shape Healthy Eating Behavior in Early Childhood

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ABSTRACT

This study developed and examined the effectiveness of Nutritional Numeracy, an integrated science-numeracy curriculum model that uses nutrition-related contexts, such as observing and classifying food groups, counting food portions, and comparing nutritional values, to build early childhood science process skills, numeracy competence, and healthy eating behavior. Using a research and development (R&D) design with a simplified Define-Design-Develop model, the curriculum was tested through a quasi-experimental one-group pretest-posttest design involving 32 children aged 5–6 years in Group B of the Peusijuk Hatee Integrated Islamic Kindergarten in Bireuen Regency. Data were collected using a validated nutritional numeracy test and a healthy eating behavior observation checklist. Paired t-test results showed significant improvements in both variables: nutritional numeracy scores rose from 58.4 to 84.1 ($p < 0.001$, Cohen's $d = 1.32$), and healthy eating behavior scores rose from 60.2 to 81.7 ($p < 0.001$, Cohen's $d = 1.21$), both with large effect sizes. Qualitative findings from classroom observations and teacher focus group discussions supported these results, showing increased enthusiasm among children in identifying healthy foods and greater willingness to try vegetables and fruits. These findings extend early childhood curriculum literature by positioning food-related contexts as a practical vehicle for integrating science and numeracy learning, with pedagogical implications for embedding food-based observing, classifying, counting, and comparing activities into daily instruction to cultivate healthy eating habits from an early age.

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INTRODUCTION

Unhealthy eating habits among preschool-aged children remain a pressing concern in Indonesia, with many kindergartens reporting a rise in the consumption of ultra-processed snacks alongside continued low intake of vegetables and fruit. Local observations at the Peusijuk Hatee Integrated Islamic Kindergarten in Bireuen Regency indicate that children's understanding of what constitutes a healthy meal is still limited, and that unhealthy eating

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patterns established in early childhood tend to persist into later life (Hidayah & Rahmawati, 2022). Shaping healthy eating behavior from an early age is therefore a matter of urgency for early childhood education.

Nutrition education in most kindergartens is still delivered through storytelling, picture cards, or short lectures that primarily transfer factual knowledge about food groups. While such approaches can raise awareness, they rarely engage children in the kind of active, hands-on processing that is known to support lasting behavior change (Rizkiani & Nurjanah, 2020). Parents, too, often lack structured guidance on how to reinforce healthy eating habits introduced at school (Mahmudah & Sari, 2018). A recent systematic review of preschool- and childcare-based randomized trials in the United States further found that most interventions that increased fruit and vegetable intake included nutrition education components, while also noting the scarcity of studies that assess long-term behavior change (Hasan et al., 2023).

At the same time, early numeracy is recognized as a foundational competency that children build not through abstract drills but through concrete, everyday, and meaningful experiences (Aprianti, 2020). Reviews of numeracy literacy in early childhood curricula continue to show that number sense is best cultivated when embedded in contexts children encounter daily, rather than taught as an isolated subject (Prasetyo & Wulandari, 2019).

Food and mealtime activities offer one such naturally rich context: counting pieces of fruit, comparing portion sizes, or sorting food items into groups all involve genuine numeracy operations. Yet this everyday context remains underused as a deliberate vehicle for numeracy instruction, with most existing numeracy modules drawing on generic objects such as blocks or beads rather than food (Fitriani & Handayani, 2019).

Parallel to this, the integration of science process skills (observing, classifying, and comparing) into early childhood learning has been shown to stimulate children's logical thinking and curiosity more effectively than fragmented, subject-siloed instruction (Khoiriyah & Sari, 2021). Systematic reviews of STEM integration in early childhood further indicate that combining two or more domains within a single meaningful activity strengthens

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both engagement and retention (Ariyanti & Wulandari, 2023). A more recent integrative review notes that what integration means in early childhood settings, and how to achieve it, remains insufficiently defined (Ng et al., 2022), and inquiry-based science programs have been used to promote science knowledge and problem-solving skills in preschool children (Lin et al., 2021).

Despite these separate lines of evidence, science process skills and numeracy development are still largely taught as two separate curriculum domains in Indonesian kindergartens, and nutrition is rarely used as the shared context that could bring them together. Few, if any, existing models deliberately integrate science and numeracy through a single, nutrition-based content area capable of simultaneously building cognitive competence and shaping healthy behavior.

This study addresses that gap by developing 'Nutritional Numeracy', an integrated science-numeracy curriculum model in which children practice observing, classifying, counting, and comparing using real food as the shared learning content, with the explicit goal of strengthening science process skills and early numeracy competence while also shaping healthy eating behavior. This study aims to develop the model and examine its effectiveness among children in Group B of the Peusijuk Hatee Integrated Islamic Kindergarten in Bireuen Regency.

The novelty of this study lies in treating science and numeracy not as two activities placed side by side but as two skill sets deliberately co-developed through a single nutrition-based content area, an approach that differs from prior curriculum models that integrate science and mathematics without a specific behavioral target such as healthy eating (Rahmawati & Suryani, 2023). It also differs from STEAM-based numeracy interventions that do not explicitly pair numeracy with science process skills through a nutrition-related context (Marlina & Yusuf, 2022).

Theoretically, this study contributes evidence on how deliberate domain integration (science, numeracy, and nutrition) can reinforce both the cognitive and behavioral outcomes

of early childhood learning more effectively than instruction that treats these domains separately (Satori & Handayani, 2021).

Practically, this study offers kindergarten teachers a ready-to-use, time-efficient curriculum model that addresses multiple developmental domains within the limited instructional hours typically available in early childhood settings, building on the efficiency demonstrated by simplified research and development models in similar contexts (Kurniasih & Berlian, 2020). This practical orientation is consistent with research published in JMEA on the development of learning tools (Hidayat & Panggabean, 2022) and interactive learning media (Hayati & Amri, 2022).

The involvement of parents as reinforcing agents is also considered central to this study, since healthy eating habits introduced in the classroom are more likely to be sustained when supported by consistent practices at home (Lestari & Handini, 2023; Mahmudah & Sari, 2018).

This article is organized as follows: the next section describes the research and development method used to construct and test the 'Nutritional Numeracy' model; this is followed by the results of the quasi-experimental trial and a discussion of their pedagogical implications; the article closes with concluding remarks on the model's validity, practicality, and effectiveness.

RESEARCH METHOD

This study adopted a quantitative approach with a research and development (R&D) design to construct the 'Nutritional Numeracy' curriculum model, using a simplified Define-Design-Develop model appropriate for early childhood curriculum products developed under limited time and resources (Kurniasih & Berlian, 2020; Sugiyono, 2019). The model adapts the 4-D framework (Thiagarajan et al., 1974) by retaining the Define, Design, and Develop stages; the Disseminate stage was not carried out in this study.

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The participants were 32 children aged 5–6 years enrolled in Group B of the Peusijuk Hatee Integrated Islamic Kindergarten in Bireuen Regency. Given the relatively small size of the target class, a saturated sampling technique (total sampling) was used, so that every child in the class participated in the study, following the same rationale commonly applied in development research involving limited target groups (Satori & Handayani, 2021).

Two instruments were used: a nutritional numeracy test measuring children's integrated science-numeracy skills, namely observing and classifying food into healthy and less-healthy groups (science process skills) and counting and comparing quantities of food (numeracy skills); and a healthy eating behavior observation checklist completed by classroom teachers during snack and mealtime activities. Both instruments were validated through expert judgment involving early childhood education and nutrition specialists, and their reliability was assessed using Cronbach's Alpha, following standard psychometric procedures (Azwar, 2019).

The nutritional numeracy test consisted of 20 items covering two aspects, namely science process skills (observing and classifying food) and numeracy skills (counting and comparing quantities of food). Each item was scored 1 for a correct response and 0 for an incorrect response, and the total score was converted to a 0–100 scale. The healthy eating behavior checklist contained 15 observable indicators, each rated by the classroom teacher on a four-point scale (1 = never to 4 = always) during snack and mealtime activities, and its total score was likewise converted to a 0–100 scale.

Content validity was established through expert judgment by three specialists (two in early childhood education and one in nutrition), who judged the relevance of each item and indicator to the construct it was intended to measure. Items were revised according to their feedback, and the results were summarized using Aiken's V, with values ranging from 0.83 to 1.00 across all retained items. Reliability was examined by trying out the instruments on 12 children aged 5–6 years from a kindergarten with similar characteristics outside the research sample and computing Cronbach's Alpha, which yielded $\alpha = 0.82$ for the nutritional

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numeracy test and α = 0.86 for the healthy eating behavior checklist, indicating good internal consistency (Azwar, 2019).

Data were analyzed descriptively and inferentially using SPSS software. Descriptive statistics (means and standard deviations) were calculated for the pretest and posttest scores of both variables. Data normality was examined using the Shapiro-Wilk test, followed by a paired-sample t-test to compare pretest and posttest scores at a significance level of 0.05, with Cohen's d calculated to determine the magnitude of the observed change and interpreted as small (about 0.2), medium (about 0.5), or large (0.8 or above) following (Cohen, 1988). Qualitative data from classroom observations and focus group discussions (FGDs) with four teachers were analyzed descriptively (through data reduction, data display, and conclusion drawing) and were used to triangulate the quantitative findings.

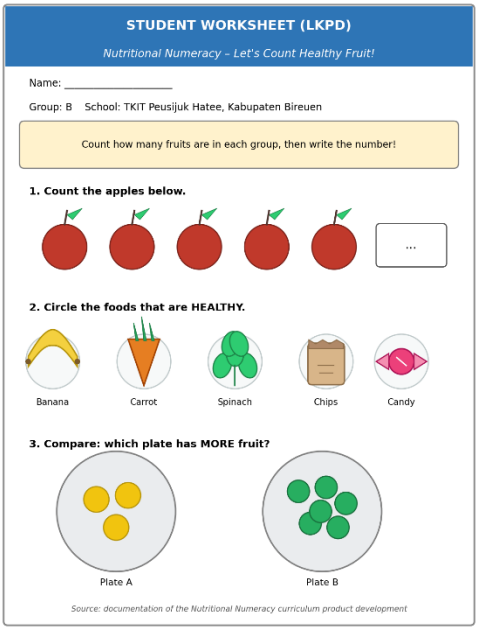


Figure 1. Nutritional Numeracy Student Worksheet (LKPD)

The Define stage involved a needs analysis of the target kindergarten, a review of existing early childhood curriculum guidelines (Kemendikbudristek, 2022), and the identification of nutritional numeracy and healthy eating behavior indicators appropriate for children aged 5–6. The Design stage focused on developing thematic weekly learning units, daily lesson plans (RPPH), and student worksheets (LKPD) centered on food-related counting,

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classification, and comparison activities, supported by real food props and picture cards, consistent with curriculum models that integrate science and numeracy content for young children (Rahmawati & Suryani, 2023). The following is the student worksheet (LKPD) shown in Figure 1.

As shown in Figure 1, the worksheet translates the model's numeracy-embedded science tasks into three concrete activities: children count a row of apples and write down the total, circle the food items that belong to the healthy category (banana, carrot, spinach) as opposed to the less-healthy category (chips, candy), and compare two plates of fruit to decide which one holds more, so that counting, classifying, and comparing are practiced directly on illustrated food items rather than on abstract symbols.

The Develop stage consisted of expert validation of the curriculum materials, revisions based on validator feedback, and a small-scale pilot test prior to full classroom implementation, an iterative process intended to ensure the content, construction, and language of the materials met the criteria of validity and practicality (Husna & Utami, 2024). The following is the research procedure shown in Figure 2 below.

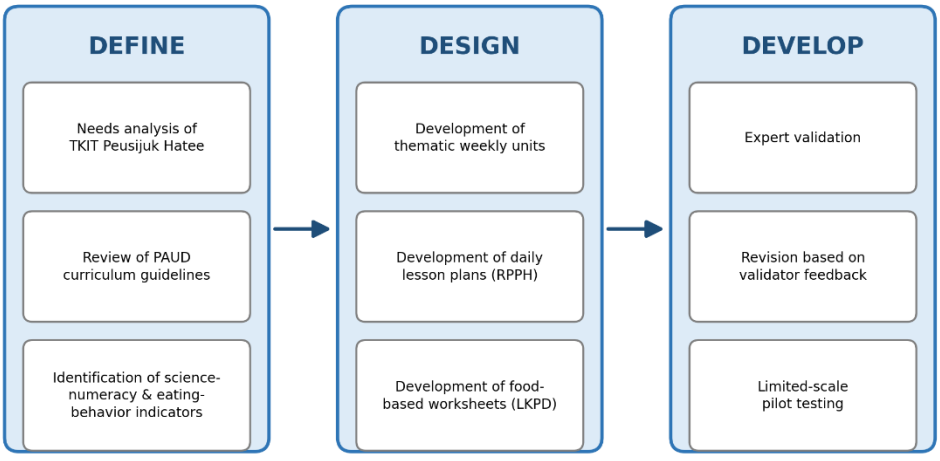


Figure 2. Research Procedure (Simplified 4-D Model)

Figure 2 visually lays out how the three stages connect in a single linear sequence, with each stage box listing its own concrete internal steps and an arrow marking that the output of one stage feeds directly into the next, giving teachers and researchers a compact, at-a-

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glance reference for replicating the same development procedure when adapting the model to other early childhood settings.

RESULTS AND DISCUSSION

Results

This section presents the main findings on the effectiveness of the 'Nutritional Numeracy' curriculum model, covering the characteristics of the participating children, the validity and reliability of the research instruments, and the results of hypothesis testing using SPSS software. Prior to implementation, both nutritional numeracy scores and healthy eating behavior scores fell into the moderate category, indicating clear room for improvement and underscoring the need for a more integrated approach to nutrition and numeracy learning in early childhood.

The research instruments were validated through expert review, and their reliability (assessed using Cronbach's Alpha) met the criteria for internal consistency (Azwar, 2019). The use of a saturated sampling technique for all 32 children further strengthened the representativeness of the data, as every child in Group B participated, rather than relying on a smaller sample that risked selection bias.

A paired-sample t-test was conducted to examine whether there was a statistically significant difference between pretest and posttest scores for both nutritional numeracy and healthy eating behavior. The results of this analysis are presented in Table 1 below.

Table 1. Nutritional Numeracy and Healthy Eating Behavior Pretest and Posttest Results

Variable	Pre-test Mean	Post-test Mean	p-value	Cohen's d	Effect category
Nutritional numeracy	58.4	84.1	<0.001	1.32	High
Healthy eating behavior	60.2	81.7	<0.001	1.21	High

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The data in Table 1 show that both variables experienced a statistically significant increase ($p < 0.001$). The effect sizes (Cohen's d), 1.32 for nutritional numeracy and 1.21 for healthy eating behavior, are both classified as large, indicating that the observed improvements are not only statistically significant but also practically substantial. Children did not merely memorize the names of healthy foods but were able to apply counting and classification skills directly to real food items.

These quantitative findings are supported by qualitative observations from classroom activities and focus group discussions (FGDs) with teachers. Teachers reported that children became visibly more enthusiastic during snack time, frequently counting the number of fruit slices on their plate or asking whether a given snack belonged to the 'healthy' or 'less-healthy' group introduced during the ‘Nutritional Numeracy’ sessions.

Teachers also noted an increase in children's willingness to try vegetables and fruits that they had previously refused, particularly after activities in which children themselves counted and sorted these foods before mealtime. This suggests that active engagement with food as a numeracy material also functions as a form of repeated, low-pressure exposure that supports acceptance of new foods.

From a methodological perspective, the combination of quantitative data (paired t-tests) and qualitative data (classroom observations and FGDs) provided triangulation that strengthens the credibility of the findings. The quantitative data indicate the size and significance of the improvement, while the qualitative data illuminate the everyday classroom processes (curiosity, repeated exposure, and peer discussion) that likely drive this improvement.

In addition to cognitive gains, the success of this model appears closely tied to motivational factors: because the numeracy tasks used real, familiar food rather than abstract counters, children could immediately see the relevance of what they were counting and classifying, which in turn appeared to sustain their attention and participation throughout each session.

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Discussion

Improvements in nutritional numeracy can be explained through the concrete-to-abstract progression that characterizes early mathematical thinking: by counting and comparing real, familiar food items, children build number sense through experiences that are directly meaningful to them, rather than through decontextualized counters (Aprianti, 2020).

Improvements in healthy eating behavior likely extend beyond factual knowledge gain to encompass repeated, active exposure to healthy foods within a positive, activity-based context. Rather than being told which foods are healthy, children discovered this for themselves through classification tasks, which appears to have supported a genuine shift in preference and willingness to try new foods (Rizkiani & Nurjanah, 2020).

The design of the 'Nutritional Numeracy' model does not merely place science and numeracy side by side but weaves science process skills (observing and classifying food attributes such as color, texture, and food group) directly into numeracy tasks such as counting and comparing quantities, an approach consistent with evidence that integrated activities strengthen both engagement and skill retention in young children (Ariyanti & Wulandari, 2023).

The role of teacher-completed behavioral observation was also important in this study, functioning not merely as a measurement tool but as a means for teachers to notice and respond to individual children's emerging food preferences in real time, consistent with the use of structured observation instruments in similar early childhood research (Nurhasanah & Fadillah, 2021).

These findings align with previous studies showing that logical thinking and engagement improve when science process skills are embedded in meaningful early childhood activities (Khoiriyah & Sari, 2021), and that STEAM-based approaches can enhance numeracy competence among children in Group B kindergarten classes (Marlina & Yusuf, 2022). Unlike

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those studies, however, this research explicitly targets a behavioral outcome, namely healthy eating, as a co-equal goal alongside cognitive development.

Compared with curriculum models that integrate science and mathematics without a specific behavioral target (Rahmawati & Suryani, 2023), the 'Nutritional Numeracy' model demonstrates that anchoring an integrated curriculum to a concrete, everyday behavior such as eating can make abstract cognitive skills more tangible for young children while simultaneously working toward a health-related outcome.

The involvement of parents, although not directly measured in this study, is likely an important moderating factor for the sustainability of the observed behavior change. Prior research indicates that healthy eating habits introduced at school are more likely to persist when reinforced consistently at home (Mahmudah & Sari, 2018), and that food-based educational games can further strengthen children's classification skills when extended into home or community settings (Lestari & Handini, 2023).

From a curriculum policy perspective, these findings suggest that thematic units linking nutrition and numeracy could be usefully incorporated into broader early childhood curriculum guidelines, offering a concrete example of how the flexibility encouraged in current curriculum frameworks can be operationalized in the classroom (Kemendikbudristek, 2022).

Practical implementation of this model requires relatively modest resources (real food props, picture cards, and simple worksheets) but does require initial teacher training in facilitating food-based counting and classification activities safely and hygienically, as well as sensitivity to children's food allergies and family dietary practices.

These findings are also relevant to the broader framework of foundational early childhood competencies, which increasingly emphasizes not only academic readiness but also health-related self-regulation. Children who are accustomed to actively examining and

classifying the food they eat may be better prepared to make informed food choices as they grow older.

It should be noted that this study used a single-group quasi-experimental design (one-group pretest-posttest) without a control group; therefore, the observed improvements cannot be attributed exclusively to the 'Nutritional Numeracy' intervention without considering possible influences of maturation, novelty effects, or concurrent exposure to nutrition messages from other sources.

The study was also limited to a single kindergarten and a relatively short implementation period, which restricts the generalizability of the findings and does not allow conclusions about whether the observed changes in eating behavior persist over time. Future research should employ a control-group design, involve multiple kindergartens, and include a delayed posttest to assess the durability of behavior change. This recommendation is consistent with a recent systematic review that called for preschool-based interventions to be tested with objective measures of intake and followed over the long term (Hasan et al., 2023).

In the specific context of the Peusijuk Hatee Integrated Islamic Kindergarten in Bireuen Regency, these findings offer a concrete, locally grounded response to concerns about children's eating habits, and the model can likely be adapted to other kindergartens in the region by adjusting the specific foods used to reflect local dietary staples and preferences, in line with the broader goal of building curriculum models tailored to local needs (Wahyuni & Astuti, 2020; Winarni & Purwandari, 2021).

Overall, the quantitative and qualitative findings in this study reinforce one another and indicate that an integrated science-and-nutrition approach to numeracy learning is a promising strategy for simultaneously strengthening early numeracy competence and shaping healthy eating behavior among young children.

CONCLUSION

This study successfully developed 'Nutritional Numeracy', an integrated science-numeracy curriculum model that uses real food as the shared material through which science process skills and early numeracy are co-developed. The model met the criteria of validity and practicality, as evidenced by expert review of the curriculum materials (thematic units, lesson plans, and worksheets), which were judged to be highly relevant for children aged 5–6 in Group B kindergarten.

The model's effectiveness is evidenced by the significant increase in both nutritional numeracy and healthy eating behavior scores following its implementation, indicating that deliberately pairing science process skills with numeracy learning through a nutrition-based context can make abstract cognitive skills more meaningful while simultaneously supporting healthier eating habits. Theoretically, this study contributes evidence on the value of co-developing science and numeracy competence through a single, food-based content area in early childhood curricula; practically, it underscores the importance of curriculum innovation that addresses cognitive and behavioral goals together, and points to the need for wider testing of similar integrated models in other early childhood settings.

REFERENCES

Aprianti, N. (2020). Kemampuan Numerasi Awal Anak Usia Dini melalui Kegiatan Berhitung Kontekstual. *Jurnal Pendidikan Usia Dini*, *14*(1), 33–45.

Ariyanti, T., & Wulandari, R. (2023). Integrasi STEM dalam Pembelajaran Anak Usia Dini: Sebuah Tinjauan Sistematis. *Jurnal Ilmiah Pendidikan Anak*, *8*(1), 55–70.

Azwar, S. (2019). *Reliabilitas dan Validitas* (5th ed.). Pustaka Pelajar.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Fitriani, L., & Handayani, E. (2019). Pengembangan Modul Numerasi Berbasis Konteks Pangan untuk Anak Taman Kanak-Kanak. *Jurnal Cakrawala Pendidikan*, *38*(3), 456–467.

Hasan, F., Nguyen, A. V, Reynolds, A. R., You, W., Zoellner, J., Nguyen, A. J., Swift, D., &

Kranz, S. (2023). Preschool- and childcare center-based interventions to increase fruit and vegetable intake in preschool children in the United States: A systematic review of effectiveness and behavior change techniques. *International Journal of Behavioral Nutrition and Physical Activity*, *20*(1), 66. https://doi.org/10.1186/s12966-023-01472-8

Hayati, E., & Amri, Z. (2022). Interactive learning media on mathematics problem solving elementary school students. *Journal of Mathematics Education and Application*, *1*(2), 89–96. https://doi.org/10.30596/jmea.v1i2.10555

Hidayah, N., & Rahmawati, D. (2022). Perilaku Makan Sehat Anak Usia Dini: Studi Deskriptif di Wilayah Perkotaan Aceh. *Jurnal Ilmu Gizi Indonesia*, *5*(2), 88–97.

Hidayat, M., & Panggabean, S. (2022). Development of learning tools to improve students self-efficacy. *Journal of Mathematics Education and Application*, *1*(2), 107–111. https://doi.org/10.30596/jmea.v1i2.10620

Husna, A., & Utami, T. P. (2024). Model Kurikulum Terintegrasi Sains dan Numerasi untuk Anak Usia Dini di Aceh. *Jurnal Pendidikan Anak Usia Dini Aceh*, *3*(1), 12–24.

Kemendikbudristek, D. P. (2022). *Panduan Pengembangan Kurikulum Operasional Satuan Pendidikan pada PAUD*. Kemendikbudristek.

Khoiriyah, U., & Sari, D. P. (2021). Pengembangan Perangkat Pembelajaran Sains untuk Menstimulasi Kemampuan Berpikir Logis Anak Usia Dini. *Jurnal Pendidikan Anak*, *10*(2), 101–113.

Kurniasih, I., & Berlian, S. (2020). Model 4-D dalam Pengembangan Bahan Ajar Anak Usia Dini. *Jurnal Pengembangan Pendidikan*, *17*(1), 1–10.

Lestari, W., & Handini, M. C. (2023). Pengaruh Permainan Edukatif Berbasis Makanan terhadap Kemampuan Klasifikasi Anak Usia Dini. *Jurnal Pendidikan Usia Dini*, *17*(2), 145–156.

Lin, X., Yang, W., Wu, L., Zhu, L., Wu, D., & Li, H. (2021). Using an inquiry-based science and engineering program to promote science knowledge, problem-solving skills and

approaches to learning in preschool children. *Early Education and Development*, *32*(5), 695–713. https://doi.org/10.1080/10409289.2020.1795333

Mahmudah, S., & Sari, N. (2018). Peran Orang Tua dalam Membentuk Perilaku Makan Sehat Anak Usia Dini. *Jurnal Keluarga Dan Anak*, *6*(1), 45–53.

Marlina, R., & Yusuf, M. (2022). Efektivitas Pembelajaran STEAM terhadap Kemampuan Numerasi Anak Kelompok B. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(4), 2765–2776.

Ng, A., Kewalramani, S., & Kidman, G. (2022). Integrating and navigating STEAM (inSTEAM) in early childhood education: An integrative review and inSTEAM conceptual framework. *Eurasia Journal of Mathematics, Science and Technology Education*, *18*(7), em2133. https://doi.org/10.29333/ejmste/12174

Nurhasanah, & Fadillah, M. (2021). Pengembangan Instrumen Observasi Perilaku Makan Sehat Anak Usia Dini. *Jurnal Pendidikan Anak Usia Dini*, *5*(2), 88–99.

Prasetyo, B., & Wulandari, E. (2019). Kajian Literasi Numerasi pada Kurikulum PAUD di Indonesia. *Jurnal Ilmiah Pendidikan Anak Usia Dini*, *7*(1), 22–34.

Rahmawati, F., & Suryani, I. (2023). Model Kurikulum Terintegrasi untuk Mengembangkan Kemampuan Sains dan Numerasi Anak Usia Dini. *Jurnal Cakrawala Pendidikan Dasar*, *9*(2), 178–190.

Rizkiani, N., & Nurjanah, S. (2020). Efektivitas Pendidikan Gizi Berbasis Cerita Bergambar terhadap Pengetahuan Gizi Anak Prasekolah. *Jurnal Gizi Dan Pangan*, *15*(2), 89–97.

Satori, D., & Handayani, R. (2021). Analisis Kebutuhan Pengembangan Model Pembelajaran Terpadu Sains-Matematika di PAUD. *Jurnal Pendidikan Dasar Dan Anak Usia Dini*, *6*(1), 15–27.

Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Thiagarajan, S., Semmel, D. S., & Semmel, M. I. (1974). *Instructional development for training teachers of exceptional children: A sourcebook*. Indiana University, Center for Innovation in

Vol. 05, No 3, October 2026 , pp. 205-220 DOI: https://doi.org/10.30596/jmea.v5i1.32214

Teaching the Handicapped.

Wahyuni, S., & Astuti, P. (2020). Konsep Dasar Pendidikan Gizi untuk Anak Usia Dini. *Jurnal Ilmu Gizi Indonesia*, *4*(1), 10–19.

Winarni, E. W., & Purwandari, E. (2021). Pembelajaran Sains untuk Anak Usia Dini Berbasis Eksplorasi Lingkungan. *Jurnal Ilmiah Pendidikan Anak*, *6*(2), 77–88.