Effectiveness of an Interactive Media-Based Contextual Learning Model in Improving Discipline Character among Early Childhood Children at Panca Budi Kindergarten

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Abstract

Discipline education in early childhood still tends to be one-way and instructional, so that children's compliance is driven more by external pressure than by self-awareness. This study aims to describe the discipline character of children aged 5–6 years before and after the implementation of the Contextual Learning Model (Contextual Play) Based on Interactive Media, and to analyze its effectiveness. The study used a quantitative approach with a one-group pretest-posttest pre-experimental design. The subjects were all children in Group B at Panca Budi Kindergarten, Medan (N = 22; total sampling). Data were collected using a rating-scale observation sheet with five discipline indicators (punctuality, waiting for one's turn, tidying up materials, rule compliance, and self-control; total score 5–20) and were analyzed using the Shapiro-Wilk test, the paired-samples t-test, and the Wilcoxon signed-rank test at a significance level of 0.05. The mean score increased from 8.23 (SD = 1.48) at the pretest to 17.86 (SD = 1.52) at the posttest. The data in both conditions were normally distributed ($p = 0.424$ and $p = 0.117$), and the difference test showed a highly significant difference, $t(21) = 62.19$; $p < 0.001$, which was corroborated by the Wilcoxon test ($p < 0.001$). All 22 children showed an increase in total score, and all five indicators improved significantly; the smallest increase occurred in the tidying-up indicator. These findings support the effectiveness of the Contextual Learning Model, although the absence of a control group limits causal inference. The results provide a basis for developing a guidebook and for replication in other early childhood education institutions.

Keywords: Learning model, contextual play, interactive media, discipline character, early childhood

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Introduction

Early childhood education (ECE) plays a fundamental role in laying the foundation for children's growth and development across the physical-motor, cognitive, language, and social-emotional domains, as well as religious and moral values. One aspect of particular importance is discipline character, namely a child's ability to understand, accept, and consistently follow rules and routines. Ages 5–6 years constitute a decisive period for the formation of long-term behavioral patterns [1]. At this age, children begin to be able to understand simple rules, follow step-by-step instructions, and develop self-control (self-regulation), but these abilities still depend heavily on how the environment stimulates and habituates them [2].

However, the practice of instilling discipline in many ECE institutions, including that observed at Panca Budi Kindergarten in Medan, still tends to be one-way and instructional, for example through verbal reprimands, written rules, and repeated instructions without a meaningful play context. Guidance that overemphasizes external compliance without involving the child's understanding risks producing fragile compliance, in which children obey rules out of fear of being reprimanded rather than out of internal awareness [3]. Problems commonly found among children aged 5–6 years include difficulty completing tasks on time, difficulty waiting for their turn, inconsistency in tidying up toys, and the need for repeated reminders about classroom routines.

Theoretically, play is the natural vehicle for learning in early childhood, enabling the active construction of knowledge and self-regulation [4], [5]. Contextual learning emphasizes connecting content to learners' real lives so that learning becomes meaningful [6]. Recent studies report that structured play activities are associated with children's executive function and self-regulation [7], [8], while the use of interactive media is reported to strengthen understanding and learning engagement [9], [10].

Based on these studies, the research team designed a Contextual Learning Model that integrates three elements: play activities as a vehicle for learning, children's real-life contexts as learning content, and interactive media as a learning aid. The model is designed so that children directly experience situations that demand discipline, such as queuing, waiting for their turn, and tidying up play materials, in play scenarios close to their everyday experience. Research that empirically tests the integration of these three elements for instilling discipline remains limited. Existing studies examine shifts in teachers' pedagogical practices in play-based programs [11] or the influence of parenting style on children's discipline [12], but have not tested an integrated model. This study is also aligned with the direction of the Merdeka Curriculum for ECE, which emphasizes play-based, contextual, and child-centered learning [13].

This study aims to (1) describe the discipline character of children aged 5–6 years at Panca Budi Kindergarten, Medan, before the implementation of the Contextual Learning Model, (2) describe it after the implementation, and (3) analyze the effectiveness of the Contextual Learning Model in improving discipline character. The alternative hypothesis (Ha) states that there is a significant difference in discipline scores before and after the implementation of the model, whereas the null hypothesis (H0) states that there is no difference.

Literature Review

2.1 Discipline Character in Early Childhood

Discipline in early childhood is understood as the ability to understand and follow rules, manage oneself, and take responsibility for daily tasks and routines. Social learning theory explains that children's behavior is formed through imitation, reinforcement, and direct experience in their social environment [14]. An authoritative parenting style, which balances the demands of rules with warmth and explanation, is associated with better discipline development than an authoritarian style that merely demands obedience [3]. Instilling discipline

should ideally be done through habituation that is consistent, enjoyable, and developmentally appropriate [2], [15]. Recent national findings are consistent with this: positive discipline based on habituation and role modeling in Sekolah Penggerak (Driving Schools) is reported to be effective in fostering character values [16], and consistent habituation by teachers is reported to shape children's sense of responsibility [17], although these claims have not been tested experimentally and quantitatively.

2.2 Play and Contextual Learning

Piaget viewed play as a means of assimilating new experiences into the child's cognitive structures [4], whereas Vygotsky emphasized the role of play in the development of higher mental functions, including self-regulation, through the zone of proximal development [5]. Contextual teaching and learning links content to learners' real situations [6]; in early childhood, this means linking discipline learning to experiences such as queuing to wash hands or tidying up toys.

Empirical evidence supports the role of play. A randomized controlled trial involving 1,313 children in 96 ECE settings in Norway reported that the Playful Learning Curriculum improved children's school readiness, including mathematics, language, and executive function [18]. A play-based ECE program implemented consistently in Nova Scotia was reported to support school readiness and family engagement [19], and the quality and intensity of play in kindergarten correlate with children's executive function [20]. Structured block play improves preschoolers' executive function [7], play-based classrooms support the development of self-regulation [8], and a scoping review reports contributions of play-based learning to cognitive, social, and self-regulatory development [21].

2.3 Interactive Media

Multimedia learning theory explains that a combination of visual elements, audio, and interaction can strengthen information processing compared with a single channel alone [9]. Traditional games combined with interactive elements are reported to train children's executive function skills, including controlling themselves and following rules [10]. The Merdeka Curriculum for ECE also encourages the use of varied media and learning resources [13].

The Contextual Learning Model combines (1) play as a vehicle for learning, (2) children's real-life contexts as learning content, and (3) interactive media, for example illustrated visual media, interactive board games, or simple audio-visual materials, which reinforce instructions and feedback. The model also considers the teacher's role as a facilitator [11] and parental involvement as partners in reinforcing discipline at home [12]. It is implemented as a series of structured play sessions that simulate situations demanding discipline.

From the mapping of previous research, structured play, contextual learning, and interactive media have each been examined separately, while studies of discipline tend to be qualitative-descriptive. The gap addressed by this study is a quantitative-experimental test of an integrated model that treats discipline character as the primary dependent variable in the context of Islamic early childhood education in Indonesia.

Research Methods

3.1 Design, Location, and Subjects

The study used a quantitative approach with a one-group pretest-posttest pre-experimental design (O1 X O2), in which one group is measured before (O1) and after (O2) a treatment (X, the implementation of the Contextual Learning Model) without a comparison group [22].

The study was conducted at Panca Budi Kindergarten, Medan City, North Sumatra, over four months (1 July–30 October 2026): preparation in Weeks 1–2 of July, the pretest in Week 3 of July, the treatment from Week 4 of July to Week 3 of September, the posttest in Week 4 of September, and analysis and report writing in October. The population was all children in Group B (aged 5–6 years), totaling 22 children; because the number was limited, saturated sampling was used, so the sample comprised 22 children [22].

3.2 Variables and Instruments

The independent variable was the Contextual Learning Model, applied consistently to Group B children over several cycles of sessions; its implementation was monitored using a learning implementation checklist. The dependent variable was discipline character, measured using a rating-scale observation sheet on five indicators (Table 1). Each indicator was scored 1–4 (1 = not yet developing; 2 = starting to develop; 3 = developing as expected; 4 = developing very well), so the total score ranged from 5 to 20.

Table 1. Observed Discipline Character Indicators

Code	Indicator	Observed Behavior
A	Punctuality in completing tasks	Completes tasks within the time limit without needing repeated reminders.
B	Ability to wait for one's turn	Queues and waits for one's turn during play or group activities without cutting in line.
C	Responsibility for tidying up toys/learning materials	Independently returns toys or learning materials to their original place.
D	Compliance with classroom rules and routines	Follows routines for lining up, praying, and transitioning between activities without many reminders.
E	Self-control (self-regulation)	Controls impulses/emotions and adjusts behavior to the situation and rules.

The content validity of the instrument was reviewed through expert judgment in the ECE field regarding relevance, clarity of language, and the appropriateness of the items for the developmental stage of children aged 5–6 years. Reliability was maintained through observation by more than one observer (the classroom teacher and a team member), by comparing the level of inter-observer agreement before the main data collection, and through the use of a standardized scoring guide and a brief briefing for all observers. Documentation in the form of photographs and videos of activities was used as supporting data.

3.3 Data Analysis

The data were analyzed using descriptive statistics (mean, standard deviation, minimum–maximum), the Shapiro-Wilk normality test, and a paired-samples t-test for the total score. As a cross-check, because observational data are discrete, the non-parametric Wilcoxon signed-rank test was also used, and it was also applied to each indicator. All tests used a significance

level of 0.05. The Contextual Learning Model was considered effective if there was a significant difference with posttest scores higher than pretest scores.

Results and Discussion

4.1 Description of Pretest and Posttest Scores

At the pretest, the total scores of the 22 children ranged from 5 to 11, with a mean of 8.23 (SD = 1.48) on a maximum scale of 20; most children were in the "starting to develop" category on almost all indicators. After the implementation of the Contextual Learning Model, posttest total scores ranged from 15 to 20 with a mean of 17.86 (SD = 1.52), and the majority of children were in the "developing as expected" to "developing very well" categories. Details for each indicator are presented in Table 2 and Figure 1.

Table 2. Descriptive Statistics and Wilcoxon Test by Indicator (N = 22)

Indicator	Pretest M (SD)	Posttest M (SD)	Mean difference	Wilcoxon (p)
A. Punctuality	1.91 (0.43)	3.91 (0.29)	+2.00	6.12×10^{-6}
B. Waiting for turn	1.55 (0.60)	3.41 (0.67)	+1.86	1.39×10^{-5}
C. Tidying up materials	1.41 (0.50)	3.23 (0.75)	+1.82	1.08×10^{-5}
D. Rule compliance	1.68 (0.48)	3.64 (0.49)	+1.95	4.22×10^{-6}
E. Self-control	1.68 (0.48)	3.68 (0.48)	+2.00	2.73×10^{-6}
Total (scale 5–20)	8.23 (1.48)	17.86 (1.52)	+9.64	< 0.001

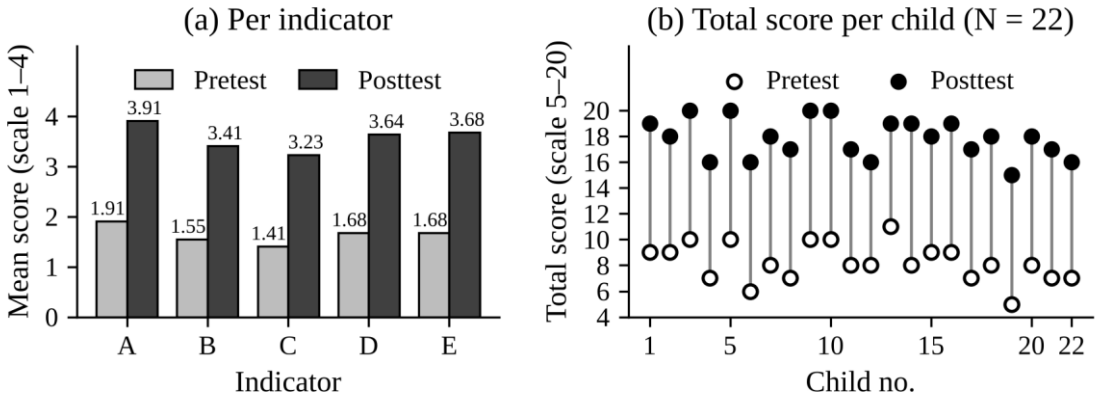


Figure 1. Discipline character scores before and after the implementation of the Contextual Learning Model: (a) mean per indicator; (b) total score per child

Figure 1b shows that all 22 children experienced an increase in total score, with a mean gain of 9.64 points on the 5–20 scale. Improvements also occurred on almost all indicators for each child; on the self-control indicator (E), for example, all children increased by exactly 2 points.

4.2 Normality and Hypothesis Tests

The Shapiro-Wilk test showed that the pretest total score ($W = 0.957$; $p = 0.424$) and the posttest total score ($W = 0.929$; $p = 0.117$) were normally distributed ($p > 0.05$), so testing proceeded with a paired-samples t-test (Table 3). The result was $t(21) = 62.19$ with $p < 0.001$, so H0 was rejected and Ha was accepted. The Wilcoxon test as a cross-check yielded the same

decision (W = 0; p < 0.001). Tests by indicator also showed a significant improvement on all five indicators (p < 0.001; Table 2).

Table 3. Normality and Hypothesis Tests of the Total Score

Statistical test	Value	Decision
Shapiro-Wilk, pretest	W = 0.957; p = 0.424	Normal (p > 0.05)
Shapiro-Wilk, posttest	W = 0.929; p = 0.117	Normal (p > 0.05)
Paired-samples t-test (df = 21)	t = 62.19; p < 0.001	H0 rejected, Ha accepted
Wilcoxon signed-rank (cross-check)	W = 0; p < 0.001	H0 rejected, Ha accepted

It should be noted methodologically that the differences in scores between individuals varied very little because almost all children showed a similar pattern of improvement. This produced very large test statistics in both testing methods. Besides reflecting a uniform improvement, this was also influenced by the relatively coarse 1–4 observation scale.

4.3 Discussion

Before the treatment, children's discipline character was in the low-to-moderate category (total mean of 8.23 out of 20), with the lowest score on tidying up toys/learning materials (M = 1.41). This finding is consistent with the initial conditions, which indicate that one-way instructional discipline education tends to produce fragile compliance that depends on adult reminders [3].

After the implementation of the Contextual Learning Model, all indicators improved significantly and the mean total score more than doubled (from 8.23 to 17.86). The improvement in all children is consistent with the view that children learn discipline through imitation and reinforcement in repeated scenarios [14], and that play is a natural vehicle for the construction of knowledge and self-regulation [4], [5]. These results are also consistent with studies linking structured play to executive function and self-regulation [7], [8], [18], as well as with findings that habituation and role modeling are effective in fostering character [16], [17].

The greatest improvements occurred in punctuality (A) and self-control (E), each at 2.00 points, which suggests that play scenarios that place children in real situations requiring task completion and impulse control are fairly effective in training both aspects. By contrast, tidying up materials (C), although it improved significantly, still had the lowest posttest score (M = 3.23). This behavior appears to require longer habituation, consistent with the view that discipline is instilled through repeated habituation rather than short-term intervention [15].

These achievements are also relevant to the Learning Outcomes of the Identity (Jati Diri) element of the Merdeka Curriculum for ECE, which includes the development of self-regulation and responsibility [13]: the mean posttest scores on the five indicators ranged from 3.2 to 3.9 on the 4-point scale, i.e., the "developing as expected" to "developing very well" categories.

These results should be interpreted with caution because of several limitations. First, a pre-experimental design without a control group cannot control for the influence of other factors, such as age-related maturation or routine habituation in the classroom, so the observed improvement cannot be fully attributed to the treatment. Second, the small sample (22 children) from a single ECE institution limits generalizability. Third, the coarse 1–4 observation scale

contributed to the uniform pattern of improvement. In addition, this study tested the model as a whole rather than comparing the contribution of each element (play, context, media), so the claim that integrating all three is superior to applying any single element requires further testing.

Theoretically, these results provide initial empirical support for a synthesis of social learning theory, constructivist play theory, and multimedia learning within a single learning model. Practically, teachers can integrate the three elements gradually, beginning with the most responsive indicators (punctuality and self-control) before strengthening the indicators that require longer habituation (tidying up materials). For educational institutions, the Contextual Learning Model can serve as a reference for developing teaching modules or character-strengthening programs aligned with the Merdeka Curriculum for ECE [13].

Conclusion

Before the implementation of the Contextual Learning Model, the discipline character of Group B children at Panca Budi Kindergarten, Medan, was in the low-to-moderate category (mean = 8.23; SD = 1.48 on a scale of 20), with the lowest score on tidying up toys/learning materials. After the implementation, scores increased to the "as expected" to "very good" categories (mean = 17.86; SD = 1.52), occurring in all 22 children and on all five indicators. The paired-samples t-test, $t(21) = 62.19$; $p < 0.001$, corroborated by the Wilcoxon test ($p < 0.001$), rejected H0 and supports the conclusion that the Mainko Model is effective in improving the discipline character of early childhood children in the context of this study.

As an implication, the Contextual Learning Model is worth developing into a guidebook for teachers and submitting for intellectual property rights (HKI) protection, with strengthened habituation of tidying up materials in every play session. Future research is recommended to use a quasi-experimental design with a control group, a broader sample and more locations, instruments with a finer scale range, and follow-up observation to test long-term consistency. Replication in ECE institutions in other regions, including through collaboration with UIN Ar-Raniry Banda Aceh, would test the generalizability of the model in different socio-cultural contexts.

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