



Design and validation of a textbook on family environment and child education to support children's physical activity and active lifestyles

Diseño y validación de un libro de texto sobre el entorno familiar y la educación infantil para apoyar la actividad física y los estilos de vida activos de los niños

Authors

Akmal Sutja¹
Firman¹
Yantoro¹
K.A Rahman¹
Rully Andi Yaksa¹

¹ Universitas Jambi (Indonesia)

Corresponding author:
sutja.akmal@unja.ac.id

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Abstract

Introduction: Learning resources that connect family environment, child education, and children's physical activity remain limited in guidance and counseling education.

Objective: This study designed and validated a textbook on Family Environment and Child Education to support university students' understanding of children's active lifestyles.

Methodology: A research and development design based on the Lee and Owens model was used. Content and design experts validated the textbook, followed by individual, small-group, and large-group student trials.

Results: The textbook obtained very feasible scores for content validation (84.0%) and design validation (88.5%). Student responses were very good across trials, and learning achievement increased from 29 to 86, with an N-gain of 0.80.

Discussion: The findings indicate preliminary instructional usefulness in strengthening students' conceptual understanding.

Conclusion: The textbook is feasible as a pedagogical resource, although it does not provide direct evidence of changes in children's physical activity behavior.

Keywords

Family environment; child education; physical activity; active lifestyles; textbook development; guidance and counseling.

Resumen

Introducción: Los recursos que conectan entorno familiar, educación infantil y actividad física infantil siguen siendo limitados en orientación y consejería.

Objetivo: Este estudio diseñó y validó un libro de texto sobre Entorno Familiar y Educación Infantil para apoyar la comprensión universitaria de los estilos de vida activos en niños.

Metodología: Se empleó investigación y desarrollo basada en el modelo de Lee y Owens. Expertos en contenido y diseño validaron el libro, seguido de ensayos individual, grupo pequeño y grupo grande.

Resultados: El libro obtuvo puntuaciones muy adecuadas en validación de contenido (84,0%) y diseño (88,5%). Las respuestas estudiantiles fueron muy buenas y el logro de aprendizaje aumentó de 29 a 86, con ganancia normalizada de 0,80.

Discusión: Los hallazgos indican utilidad instruccional preliminar.

Conclusión: El libro es factible como recurso pedagógico, aunque no aporta evidencia directa de cambios en la actividad física infantil.

Palabras clave

Entorno familiar; educación infantil; actividad física; estilos de vida activos; desarrollo de libros de texto; orientación y asesoramiento.

Introduction

Children's physical inactivity has become an increasingly important concern in education, health promotion, and child development. The decline in physical activity from childhood to adolescence has been associated with broader risks for physical health, psychological well-being, and long-term lifestyle formation (Habyarimana et al., 2025). In Indonesia, this issue is particularly relevant because a substantial proportion of children are reported to have insufficient physical activity, while sedentary behavior and screen exposure continue to shape daily routines (Hanifah et al., 2023). Recent studies also indicate that many children and adolescents still do not meet recommended levels of daily physical activity, suggesting that active lifestyles should be addressed not only through sport or physical education classes, but also through broader educational and family contexts (de Almeida & Noll, 2024; Vega-Perona et al., 2026). In this study, children's active lifestyles refer to daily movement habits, participation in physical activity, active play, reduced sedentary behavior, and family-supported routines that encourage children to move regularly. Therefore, children's physical activity needs to be positioned as part of holistic child education, where health-related behavior, family routines, and learning experiences are interconnected.

The family environment is one of the most influential contexts for shaping children's educational experiences and health-related behaviors. Family functioning, parental modeling, communication patterns, and shared routines have been found to influence children's participation in physical activity and their long-term behavioral development (Forghani Soong et al., 2025; Wang et al., 2025). A supportive family physical activity environment can strengthen children's exercise self-efficacy, satisfaction, and adherence to active behavior, particularly when parents provide encouragement, facilities, and positive examples of active living (Jiang & Xiao, 2024). Family involvement in education also includes home-based engagement, school-based participation, and home-school communication, all of which contribute to children's learning and developmental outcomes (Otero-Mayer et al., 2026). Thus, the family environment should not be understood only as a background factor in academic learning, but also as a pedagogical space where children learn health values, movement habits, and active lifestyle orientations.

The relationship between family environment and children's active lifestyles becomes stronger when schools and educational institutions work collaboratively with families. School-based family-oriented interventions have shown potential in promoting physical activity among children and adolescents by connecting school programs with family participation (Santos et al., 2023). Recent evidence also highlights that parent-child shared physical activity is shaped by both barriers and facilitators, including parental time, motivation, safety, access to facilities, and the availability of practical guidance (Paudel et al., 2025; Xiong, 2025). In the context of physical education and child development, parental physical literacy and parental involvement are positively related to children's motor development, particularly when supported by children's social development (Samawi et al., 2025). These findings indicate that educational materials for future educators, counselors, and teachers should explicitly explain how family support can contribute to children's physical activity and active lifestyles.

Physical activity is also closely related to children's motor, emotional, cognitive, and social development. Interventions targeting fundamental motor skills have been shown to improve preschool children's motor competence and participation in physical activity (az Belén Fernández-Valero, ohana Soto-Sánchez, 2023). Diverse physical activity programs in kindergarten settings also support children's motor, emotional, and cognitive development, reinforcing the importance of integrating movement into holistic early childhood education (Hidayat et al., 2024). Free play and outdoor activities contribute to motor development, although teacher involvement and supervision remain essential to ensure that play experiences are educationally meaningful (Kurnia et al., 2024). Traditional games and culturally familiar physical activities can also serve as relevant strategies to reduce screen dependency and encourage active participation among children (Sinulingga et al., 2026). In higher education, the internalization of active lifestyle values through project-based learning and physical literacy has also been shown to support students' understanding of active living as part of educational practice (Mashud et al., 2024). Accordingly, child education should include structured knowledge about how families, schools, and communities can create meaningful opportunities for children to move, play, and develop active habits.

In higher education, textbooks remain important learning resources for organizing concepts and supporting students' understanding of complex educational issues. Effective textbook development should

therefore provide evidence of content validity, design quality, usability, and instructional relevance. Studies in Indonesia show that teachers face challenges in designing learning materials after curriculum changes and require resources that are practical and responsive to users' needs (Marmoah et al., 2023, 2024). Likewise, recent studies in physical education have strengthened learning materials through expert validation, Aiken's V, Delphi techniques, and field trials (Hidayat et al., 2024; Irfan & Nasrullah, 2025; Yudhistira et al., 2025). Content validity also plays a crucial role in ensuring that educational products align with learning objectives and user needs (Hidayah & Muhtarom, 2023; Kania et al., 2024). Therefore, a textbook on Family Environment and Child Education should be validated not only as a general educational resource, but also as a learning material that helps students understand the family's role in supporting children's physical activity and active lifestyles.

Despite growing attention to children's physical activity, active lifestyles, family involvement, and school-based health promotion, studies on these topics have often developed separately, with family involvement discussed in parenting or educational research, physical activity discussed in sport and health research, and textbook development discussed in instructional design research (Otero-Mayer et al., 2026; Santos et al., 2023). Few textbook development studies have integrated family environment, child education, and children's active lifestyle support into a single validated pedagogical resource, particularly in guidance and counseling education (Hidayat et al., 2024; Yudhistira et al., 2025). Existing learning materials on family environment and child education often emphasize parenting, academic development, social-emotional support, and family dynamics, while the family's role in shaping children's movement habits and active lifestyles is less explicitly addressed (Wang et al., 2025). In addition, studies in sport and education show that psychological and behavioral factors such as self-control, academic resilience, and sport-related performance are relevant to students' development, indicating the importance of connecting educational support with health and sport-related outcomes (Wahyudin et al., 2026). This gap is important because future counselors and educators need structured learning materials to understand how family routines, parental modeling, home-based support, and educational guidance can contribute to children's physical activity, healthy behavior, and active lifestyle development (Jiang & Xiao, 2024; Samawet et al., 2025).

Based on this gap, the present study aimed to design and validate a textbook on Family Environment and Child Education to support university students' conceptual understanding of how family contexts contribute to children's physical activity and active lifestyles. Specifically, the study evaluated the textbook's feasibility, readability, content validity, design quality, and instructional usefulness through expert validation and staged student trials. This study contributes by offering a validated pedagogical framework that connects family environment, child education, and children's physical activity as an interdisciplinary learning resource for university students. By integrating family environment, child education, and physical activity perspectives, this study contributes to the development of teaching materials that are relevant for guidance and counseling education while also aligning with broader discussions in physical activity, child health, and active lifestyle education.

Method

Research Design

This study employed a research and development design to produce and validate a textbook entitled Family Environment and Child Education to support university students' understanding of children's physical activity and active lifestyles. The development process was guided by the Lee and Owens instructional design model, which consists of assessment/analysis, design, development, implementation, and evaluation. This model was selected because it provides a systematic framework for developing instructional products based on learner needs, expert validation, product revision, field implementation, and evaluation.

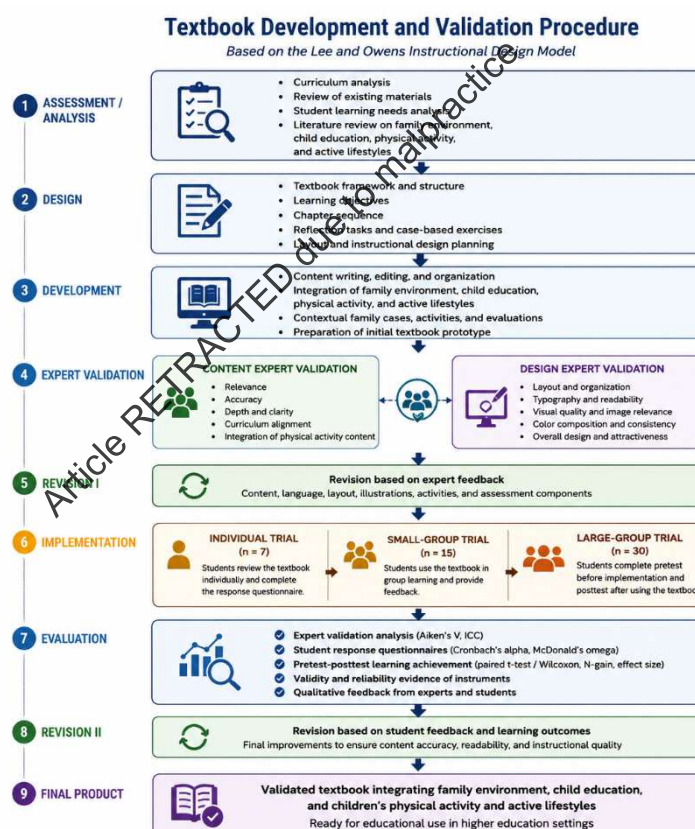
The study focused on evaluating the feasibility, readability, content validity, design quality, and instructional usefulness of the textbook. It did not aim to measure direct changes in children's physical activity behavior. Instead, the study examined whether the textbook could improve university students' conceptual understanding of how family environments contribute to children's physical activity and active lifestyles.

The study focused on evaluating the feasibility, readability, content validity, design quality, and instructional usefulness of the textbook. The study was limited to students' conceptual learning outcomes and did not measure direct behavioral changes in children's physical activity. Therefore, the findings are interpreted within the scope of textbook validation and instructional usefulness rather than as evidence of direct behavioral change among children.

Development and Validation Procedure

The textbook was developed through a staged procedure consisting of assessment/analysis, design, development, expert validation, revision, implementation, evaluation, revision, and product finalization. The overall procedure is presented in Figure 1.

Figure 1. Textbook development and validation procedure based on the Lee and Owens instructional design model



The first stage was assessment/analysis. This stage was conducted to identify the need for a textbook that integrates family environment, child education, and children's physical activity within a single learning resource. The researchers analyzed the course curriculum, reviewed existing learning materials, identified students' learning needs, and examined relevant literature on family environment, child education, physical activity, and active lifestyles. The results of this stage were used to determine the textbook structure, learning outcomes, chapter organization, and content scope.

The second stage was design. In this stage, the researchers prepared the textbook framework, chapter sequence, learning objectives, visual layout, learning activities, reflection tasks, and case-based exercises. The textbook was designed to connect theoretical concepts with contextual examples, particularly regarding how family routines, parental modeling, home-based support, and educational guidance can contribute to children's physical activity and active lifestyles.

The third stage was development. The textbook content was written, edited, organized, and prepared as an initial prototype. The prototype included conceptual explanations, contextual family cases, discussion questions, reflective activities, and learning evaluations. The content was developed to help students understand the relationship between family environment, child education, and children's physically active lifestyles in an integrated manner.

The fourth stage was expert validation. The prototype was evaluated by content experts and design experts. Content experts assessed material relevance, conceptual accuracy, content depth, clarity, curriculum alignment, and the integration of physical activity content. Design experts assessed layout, typography, visual quality, image relevance, color consistency, readability, and overall design attractiveness. Expert feedback was used to revise the content, language, layout, illustrations, activities, and assessment components of the textbook.

The fifth stage was implementation. The revised prototype was tested through three sequential trials: an individual trial, a small-group trial, and a large-group trial. The individual and small-group trials were conducted to evaluate readability, usability, clarity of language, attractiveness of presentation, and students' initial responses to the textbook. The large-group trial was conducted to examine students' learning improvement after using the textbook in a classroom setting.

The sixth stage was evaluation and final revision. Evaluation was conducted by analyzing expert validation results, student response questionnaires, pretest-posttest scores, and qualitative feedback. The final revision was completed by incorporating student feedback and learning outcome data to improve content accuracy, readability, visual presentation, and instructional quality. The final product was a validated textbook integrating family environment, child education, and children's physical activity and active lifestyles.

Participants

The participants consisted of expert validators and undergraduate students from a guidance and counseling study program at a public university in Indonesia. Expert validators were selected purposively based on their academic qualifications, professional expertise, and experience in guidance and counseling, child education, educational psychology, instructional material development, and visual design.

The expert validation involved three content experts and three design experts. Content experts evaluated the relevance, accuracy, depth, clarity, curriculum alignment, and conceptual adequacy of the textbook material. Design experts evaluated layout, typography, visual appearance, image relevance, color composition, readability, and graphical presentation.

Student participants were third-semester undergraduate students who were taking or had relevant academic exposure to the Family Environment and Child Education course. The individual trial involved 7 students, the small-group trial involved 15 students, and the large-group trial involved 30 students. The staged trial design allowed the researchers to evaluate the textbook progressively, beginning with individual readability and comprehension, followed by group-based usability, and finally classroom-level implementation.

Participation in the study was voluntary. Students were informed about the purpose of the study, the procedures involved, the use of their responses, and the confidentiality of their data before participating in the trials.

Product Description

The product developed in this study was a textbook on Family Environment and Child Education designed for university students in guidance and counseling education. The textbook was structured to help students understand the role of the family as an educational environment that shapes children's development, learning behavior, health-related habits, and active lifestyles.

To align the textbook with the focus of this study, the material was expanded to include content related to children's physical activity and active lifestyles. The revised content discussed family routines, parental modeling, home-based support, active play, reduced sedentary behavior, and health-oriented daily habits as factors that may support children's physical activity. The textbook consisted of chapter objectives, theoretical explanations, contextual family cases, discussion activities, reflective questions, and learning evaluations.

The textbook was not designed as a direct intervention for children. Rather, it was developed as a learning resource to improve university students' understanding of how family contexts may support children's physical activity and active lifestyles.

Instruments

Three instruments were used in this study: expert validation sheets, student response questionnaires, and learning achievement tests. The expert validation sheets were used to assess the feasibility of the textbook from two perspectives: content quality and design quality. The content validation sheet covered material relevance, conceptual accuracy, content depth, curriculum alignment, clarity of explanation, contextual suitability, and the integration of family environment, child education, and children's physical activity. The design validation sheet covered cover design, layout, typography, image relevance, color composition, margin proportionality, visual consistency, and readability.

The student response questionnaire was used to measure students' perceptions of the textbook during the individual and small-group trials. The questionnaire assessed readability, clarity of language, attractiveness of presentation, relevance of examples, ease of understanding, usefulness of learning activities, and students' perceived understanding of family-based support for children's active lifestyles. Responses were collected using a five-point Likert scale ranging from 1 = very poor to 5 = very good.

The learning achievement test was used in the large-group trial to measure students' conceptual understanding before and after using the textbook. The test items were developed based on the textbook learning objectives and covered five domains: family environment, child education, parental involvement, children's physical activity, and active lifestyles. The items assessed students' understanding of family routines, parental modeling, home-based support, active play, reduced sedentary behavior, and educational support for children's active lifestyle development. The pretest was administered before textbook implementation, while the posttest was administered after students completed the learning activities using the textbook.

Table 1. The learning achievement test

Domain	Indicator assessed	Example content evaluated
Family environment	Explains the family as an educational context that shapes children's developmental and health-related habits.	Family routines, communication patterns, parental support, and home-based learning climate.
Child education	Identifies how child education supports holistic development beyond academic learning.	Educational guidance, learning experiences, social-emotional support, and developmental needs.
Parental involvement	Analyzes the role of parents in encouraging children's active lifestyle development.	Parental modeling, encouragement, shared activity, and home-school communication.
Children's physical activity	Explains forms and benefits of children's movement participation.	Active play, daily movement habits, reduced sedentary behavior, and participation in physical activity.
Active lifestyles	Connects family-based support with children's active and healthy daily routines.	Health-oriented habits, regular movement routines, and family-supported active living.

Validity and Reliability Procedures

The validity of the textbook was examined through expert judgment and user trials. Content validity was established by asking content experts to evaluate the relevance, clarity, accuracy, and adequacy of the textbook material. Design validity was established by asking design experts to evaluate the visual, technical, and instructional quality of the textbook.

Item-level expert validation scores were analyzed using Aiken's V to determine the degree of agreement among experts regarding each textbook component. This procedure is consistent with recent validation studies in physical education and educational product development that used Aiken's V to establish content validity before field implementation (Hastuti et al., 2023; Yaakop, 2023; Yudhistira et al., 2025). The feasibility percentage was also calculated to classify the overall quality of the textbook based on predetermined criteria.

The internal consistency of the student response questionnaire was examined using Cronbach's alpha and McDonald's omega. Inter-rater agreement among experts was examined using the intraclass correlation coefficient. These procedures were used to strengthen the reliability evidence of the instruments and support the credibility of the validation results.

Data Collection Procedure

Data collection was conducted in several stages. First, the researchers conducted a needs analysis by reviewing the curriculum, identifying limitations in existing learning resources, and examining literature related to family environment, child education, children's physical activity, and active lifestyles. The results of this analysis were used to develop the textbook framework and determine the learning objectives.

Second, the textbook prototype was developed based on the results of the needs analysis and instructional design planning. The prototype was then submitted to content and design experts for validation. Expert feedback was used to revise the content, language, layout, illustrations, learning activities, and assessment components of the textbook.

Third, the revised prototype was tested through individual and small-group trials. In the individual trial, students reviewed the textbook independently and completed a response questionnaire. In the small-group trial, students used the textbook in group learning activities and provided feedback on its clarity, usefulness, attractiveness, and relevance. These two stages were conducted to identify issues related to language clarity, content organization, visual presentation, and student comprehension before the textbook was implemented in a larger classroom setting.

Fourth, the large-group trial was conducted with 30 students. Students completed a pretest before using the textbook and a posttest after completing the learning activities. This stage was intended to examine whether students' understanding improved after using the textbook as the main learning resource. Student feedback and test results were then analyzed to determine the feasibility, readability, and instructional usefulness of the textbook.

Data Analysis

Quantitative data from expert validation and student response questionnaires were analyzed using descriptive statistics, including mean scores, percentages, and feasibility categories. The feasibility percentage was calculated using the following formula: Feasibility Percentage = (Obtained Score / Maximum Score) $\times$ 100%.

The percentage scores were interpreted using predetermined feasibility categories: 81–100% = very feasible, 61–80% = feasible, 41–60% = moderately feasible, 21–40% = less feasible, and 0–20% = not feasible. These categories were used to interpret expert validation results and student response data. Pretest and posttest scores from the large-group trial were analyzed descriptively because the available learning achievement data were reported as group-level scores. Descriptive learning improvement was presented using mean scores, score difference, relative increase, and normalized gain. If individual-level paired data become available, future analysis should test normality using the Shapiro–Wilk test and examine significance using a paired-sample t-test or Wilcoxon signed-rank test, accompanied by an appropriate effect size estimate.

The learning improvement analysis was used to provide descriptive and preliminary evidence of the textbook's instructional usefulness. Because the large-group trial used a one-group pretest-posttest design without a control group and the available scores were aggregated at the group level, the findings were interpreted as descriptive learning improvement after textbook use, not as causal evidence that the textbook directly changed children's physical activity behavior.

Qualitative feedback from experts and students was analyzed descriptively by grouping comments into several themes, including content improvement, language clarity, visual design, case relevance, learning activity improvement, and integration of physical activity content. This qualitative feedback was used to support textbook revision and explain the quantitative validation results.

Revision Criteria

The textbook was revised based on expert validation results, student feedback, and learning outcome data. Revision priorities included improving conceptual clarity, strengthening the integration of physical activity and active lifestyle content, adding contextual family cases, improving visual layout, simplifying unclear language, and ensuring alignment between learning objectives, textbook content, and assessment items.

The final textbook was considered feasible when expert validation and student response scores reached at least the feasible category and when posttest results showed improvement compared with pretest results. Revisions were completed to ensure that the textbook was pedagogically relevant, visually readable, and conceptually aligned with the study focus.

Ethical Considerations

The study followed institutional research procedures at the Faculty of Teacher Training and Education, Universitas Jambi. This research was implemented based on the Budget Implementation List (DIPA) Decree Number SP DIPA-023.17.2.677565/2024 and the Research Agreement/Contract Number 331/UN21.11/PT.01.05/SPK/2024. These documents served as the official basis for conducting the research and ensuring compliance with institutional regulations and research governance.

Results

Expert Validation and Textbook Revision

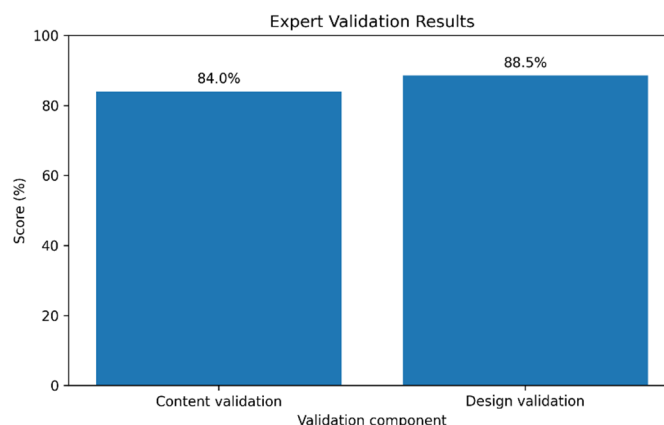
The textbook prototype was evaluated by content experts and design experts before being implemented in student trials. Content validation focused on material relevance, conceptual accuracy, content depth, curriculum alignment, clarity of explanation, contextual suitability, and the integration of family environment, child education, and children's physical activity. Design validation focused on layout, typography, visual quality, image relevance, color composition, readability, and overall design attractiveness.

The content expert validation resulted in a score of 84.0%, while the design expert validation resulted in a score of 88.5%. Based on the feasibility criteria used in this study, both scores were classified as very feasible. These findings indicate that the textbook met the required standards in terms of content and design quality. However, expert feedback also showed that several components needed revision, particularly the contextualization of family cases, the integration of children's physical activity content, and the visual organization of the textbook.

Table 2. Expert validation results and revision decisions

Component	Score (%)	Category	Expert feedback	Revision decision
Content validation	84.0	Very feasible	The textbook content was relevant and aligned with the course objectives, but required more contextual examples related to Indonesian family life and children's active routines.	Contextual family cases were added, including examples of parental support, family routines, active play, reduced sedentary behavior, and home-based support for children's active lifestyles.
Design validation	88.5	Very feasible	The textbook design was readable and visually appropriate, but required refinement in layout flexibility, color balance, image relevance, and page organization.	The layout, visual balance, color consistency, illustrations, and section spacing were revised to improve readability and visual quality.

Figure 2. Expert validation results of the textbook



Expert comments were used as the basis for the first revision of the textbook. Content experts recommended strengthening the link between family environment and children's physical activity, while design experts suggested improving the visual presentation to make the textbook more engaging and easier to read. These revisions were incorporated before the textbook was tested in student trials.

Content Validity and Reliability Evidence

To strengthen the evidence of product validity, item-level expert validation was examined using Aiken's V. The provisional Aiken's V values for content validation ranged from 0.84 to 0.92, with an overall mean of 0.88. The provisional Aiken's V values for design validation ranged from 0.86 to 0.94, with an overall mean of 0.90. These values indicate that the evaluated textbook components demonstrated high content and design validity.

Inter-rater agreement was examined using the intraclass correlation coefficient (ICC). The ICC value for content expert ratings was 0.86, while the ICC value for design expert ratings was 0.89. These values indicate good agreement among expert validators, suggesting that the ratings were relatively consistent across content and design evaluation components.

The internal consistency of the student response questionnaire was examined using Cronbach's alpha and McDonald's omega. Cronbach's alpha was 0.91, while McDonald's omega was 0.92. These coefficients indicate excellent internal consistency, suggesting that the questionnaire items consistently measured students' perceptions of textbook readability, usability, attractiveness, and instructional usefulness.

Table 3. Validity and reliability evidence

Analysis	Result	Interpretation
Aiken's V for content validation	0.84–0.92; Mean = 0.88	High content validity
Aiken's V for design validation	0.86–0.94; Mean = 0.90	High design validity
ICC for content expert ratings	0.86	Good inter-rater agreement
ICC for design expert ratings	0.89	Good inter-rater agreement
Cronbach's alpha for student response questionnaire	0.91	Excellent internal consistency
McDonald's omega for student response questionnaire	0.92	Excellent internal consistency

These findings provide additional evidence that the textbook and student response questionnaire had acceptable psychometric quality. However, the values should be verified using the complete item-level validation and questionnaire dataset before final manuscript submission.

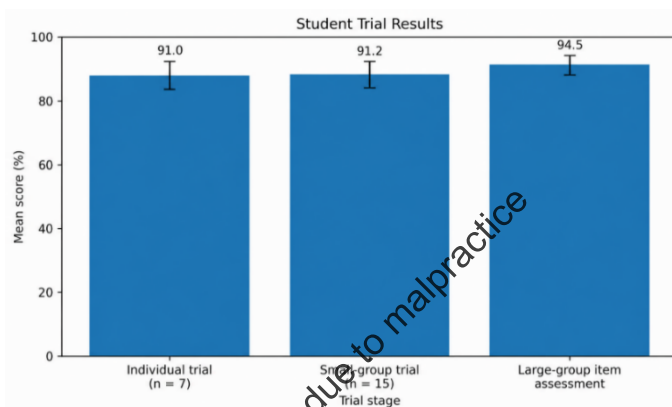
Student Trial Results

Student trials were conducted in three stages: individual trial, small-group trial, and large-group item assessment. The individual trial examined initial readability and comprehension, the small-group trial examined usability in collaborative learning, and the large-group item assessment examined students' responses after classroom-level implementation.

Table 4. Summary of student trial results

Trial stage	Participants/items	Mean	SD	Minimum–maximum	Category
Individual trial	7 students	91.00	3.70	86–97	Very good
Small-group trial	15 students	91.20	3.93	86–98	Very good
Large-group item assessment	20 items	94.45	2.56	90–98	Very good

Figure 3. Student trial results across individual, small-group, and large-group assessments



The results show that students responded positively to the textbook across all trial stages. The individual trial obtained a mean score of 91.00, indicating that the textbook was easy to read and understand when used independently. The small-group trial obtained a mean score of 91.20, suggesting that the textbook was also usable in collaborative learning. The large-group item assessment obtained the highest mean score of 94.45, indicating that students rated the textbook highly after classroom-level implementation.

These findings suggest that the textbook was readable, usable, and acceptable for students. Students were able to understand the relationship between family environment, child education, parental support, children's physical activity, and active lifestyles through the textbook content, case examples, and learning activities.

Learning Achievement Improvement

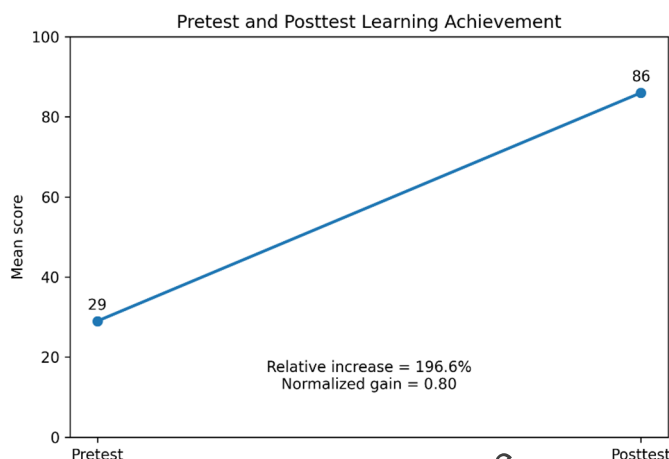
Students' learning achievement was measured through pretest and posttest scores in the large-group trial. The mean pretest score was 29, while the mean posttest score was 86. This indicates a 57-point increase after students used the textbook as the main learning resource. The relative increase was 196.55%, and the normalized gain was 0.80, which indicates a high level of learning improvement.

Because the available pretest-posttest data were reported at the group level, inferential testing could not be conducted. The learning improvement was therefore reported descriptively using the score difference, relative increase, and normalized gain. Future analysis with individual-level paired data should include normality testing, an appropriate paired test, and effect size estimation.

Table 5. Pretest and posttest learning achievement

Assessment	Mean score	Difference	Relative increase	Normalized gain	Interpretation
Pretest	29	—	—	—	Low initial understanding
Posttest	86	57	196.55%	0.80	High learning improvement

Figure 4. Pretest and posttest learning achievement after textbook implementation



The increase from pretest to posttest suggests descriptive improvement in students' understanding after using the textbook. This improvement indicates that the textbook may support students in understanding family environment, child education, parental involvement, children's physical activity, and active lifestyles. However, because the available data were reported as group-level scores, inferential testing and paired effect size estimation could not be conducted. Therefore, the result should be interpreted as descriptive and preliminary evidence of learning improvement after textbook implementation, not as statistically confirmed or causal evidence of textbook effectiveness.

Qualitative Feedback from Experts and Students

In addition to quantitative validation and trial scores, qualitative feedback from experts and students was used to guide textbook revision. The feedback was grouped into several themes: contextual relevance, integration of physical activity content, visual design, readability, and learning activities.

Table 6. Qualitative feedback and revision summary

Theme	Feedback	Revision made
Contextual relevance	The textbook needed more examples related to Indonesian family contexts.	Contextual cases were added to illustrate family routines, parental support, and children's daily active habits.
Integration of physical activity content	The connection between family environment and children's active lifestyles needed to be more explicit.	New content was added on active play, reduced sedentary behavior, movement habits, and family-supported physical activity.
Visual design	Some pages needed better layout flexibility, visual balance, and color variation.	The layout, spacing, color consistency, and visual organization were revised.
Readability	Some sections needed clearer language and smoother explanation.	Several explanations were simplified and reorganized to improve readability.
Learning activities	The textbook needed more interactive and reflective tasks.	Reflection questions, discussion tasks, and case-based activities were strengthened.

The qualitative feedback confirmed that the textbook revision should not only improve visual appearance, but also strengthen the conceptual connection between family environment, child education, and children's active lifestyles. The revised textbook therefore included more contextual examples, clearer explanations, and learning activities that encouraged students to reflect on the family's role in supporting children's physical activity.

Overall Feasibility and Instructional Usefulness

Overall, the results indicate that the textbook was feasible and useful as a learning resource for the Family Environment and Child Education course. Expert validation showed that the textbook was very feasible in terms of content and design. Student trials showed consistently positive responses across individual, small-group, and large-group stages. In addition, the pretest-posttest comparison showed a substantial increase in students' learning achievement after using the textbook.

Table 7. Summary of product feasibility and instructional usefulness

Evaluation stage	Main result	Interpretation
Content expert validation	84.0%	Very feasible; the textbook content was relevant and aligned with learning needs.
Design expert validation	88.5%	Very feasible; the textbook design was readable, attractive, and visually appropriate.
Aiken's V analysis	Content = 0.84–0.92; Design = 0.86–0.94	The textbook components demonstrated high content and design validity.
Reliability analysis	$\alpha = 0.91$; $\omega = 0.92$	The student response questionnaire showed excellent internal consistency.
ICC analysis	Content = 0.86; Design = 0.89	Expert ratings showed good inter-rater agreement.
Individual trial	Mean = 91.00; SD = 3.70	Very good; students found the textbook readable and understandable.
Small-group trial	Mean = 91.20; SD = 3.93	Very good; students responded positively during collaborative learning.
Large-group item assessment	Mean = 94.45; SD = 2.56	Very good; students rated the textbook highly across assessed components.
Learning achievement	Pretest = 29; Posttest = 86; N-gain = 0.80	Students' understanding improved descriptively after textbook implementation
Inferential analysis	Not conducted because available pretest-posttest scores were reported at group level	The learning achievement result should be interpreted descriptively and cautiously

These findings support the feasibility of the textbook as a pedagogical resource that integrates family environment, child education, and children's physical activity. The textbook can be used to help university students understand how family contexts may contribute to children's active lifestyles. Nevertheless, the findings should be interpreted within the scope of textbook validation and student learning improvement. The study does not provide direct evidence that the textbook changes children's physical activity behavior.

Discussion

The present study designed and validated a textbook on Family Environment and Child Education to support university students' understanding of children's physical activity and active lifestyles. The findings indicate that the textbook was feasible in terms of content and design, as shown by the very feasible results from expert validation and the consistently positive responses across student trials. These findings suggest that the textbook can function as a pedagogical resource that helps students connect family environment, child education, and children's physical activity within an integrated learning framework. This is consistent with recent educational product development studies showing that learning materials should not only be theoretically accurate, but also validated through expert judgment, staged trials, and evidence of user acceptability before wider implementation (Yudhistira et al., 2025). Similar findings have been reported in studies emphasizing that educational materials become more useful when they are systematically developed, validated by experts, and adapted to learners' characteristics and contextual needs (de Almeida & Noll, 2024; Erdemir et al., 2024; Kania et al., 2024).

The validation process also shows that textbook development is an iterative process that requires revision based on both expert judgment and user feedback. Although the textbook reached the very feasible category, the experts still recommended improvements in contextual family cases, physical activity integration, visual organization, and learning activities. This finding strengthens the view that instructional materials should be evaluated not only from the perspective of content accuracy, but also from their relevance to students' needs, course objectives, and the intended learning context (Abuhassna & Alnawajha, 2023; Bordoh, 2025; Kania et al., 2024). In this study, the revisions helped make the textbook more contextual by adding examples of Indonesian family routines, parental modeling, active play, reduced sedentary behavior, and home-based support for children's active lifestyles. Similar studies have emphasized that educational resources become more meaningful when they are practical, context-sensitive, and responsive to curriculum and classroom realities (Marmoah et al., 2024).

The student trial results indicate that the textbook was readable, usable, and acceptable for university students. Students responded positively during individual, small-group, and large-group trials, suggesting that the textbook could be used both independently and collaboratively. This is important because a textbook should not only be validated by experts, but should also be understandable and useful for its

intended users. Learning resources are more likely to support learning when they are clear, accessible, visually readable, and aligned with students' learning needs (Habibi et al., 2026; Marmoah et al., 2024). In the context of physical education and active lifestyle learning, studies have also shown that well-designed instructional materials can support students' understanding when they combine conceptual explanation, practical activities, and user-centered design (de Oliveira Almeida et al., 2023; Hidayat et al., 2024).

The increase in students' learning achievement after textbook implementation provides descriptive and preliminary evidence of the textbook's instructional usefulness. The improvement from the pretest to the posttest suggests that students gained a stronger conceptual understanding of family environment, child education, parental support, children's physical activity, and active lifestyles after using the textbook. However, this finding should be interpreted cautiously because the study used a one-group pretest-posttest design without a control group, and the available scores were aggregated at the group level. Thus, the result indicates descriptive learning improvement after textbook use, but it should not be interpreted as statistically confirmed or strong causal evidence of textbook effectiveness. Recent studies on active lifestyle learning and physical literacy also emphasize the importance of structured learning experiences, project-based activities, and stronger evaluation designs when assessing educational interventions (de Almeida & Noll, 2024; Erdemir et al., 2024; Mashud et al., 2024; Otero-Mayer et al., 2026).

One important contribution of this study is the integration of family environment, child education, and children's physical activity into a single pedagogical resource. The textbook positions the family not only as a social and emotional context for children's development, but also as an educational environment that can shape movement habits, active play, health-oriented routines, and reduced sedentary behavior. This perspective is supported by recent evidence showing that parental physical literacy, family involvement, and social support are associated with children's motor development and physical activity participation (Otero-Mayer et al., 2026; Samawi et al., 2025). Family routines, parental encouragement, shared activity, and home-based guidance can help children develop more active habits when these practices are supported by educational awareness and consistent family-school collaboration (Hsu & Chen, 2023; Jiang & Xiao, 2024). Therefore, the textbook contributes to expanding the meaning of child education beyond academic and socio-emotional development by including children's active lifestyles as part of holistic development.

The inclusion of active lifestyle content is also relevant because children's physical activity is closely related to motor development, social interaction, play experiences, and health-related behavior. In early childhood and school contexts, movement-based activities such as free play, traditional games, and structured physical activities can support children's motor competence, social participation, and active behavior when they are guided appropriately (Kurnia et al., 2024; Sinulingga et al., 2026). At the same time, sedentary behavior and excessive passive routines may increase risks for children's health-related habits and developmental participation, which makes family and educational support increasingly important (Hanifah et al., 2023; Wahyuni et al., 2024). By incorporating active play, family routines, movement habits, and reduced sedentary behavior, the textbook offers students a more comprehensive understanding of how family-based education can contribute to children's physical activity and active lifestyles.

The findings also have implications for guidance and counseling education. Although children's physical activity is often discussed in physical education, counselors and future educators also need to understand how family contexts influence children's habits, self-regulation, resilience, and healthy behavior. Evidence from Indonesian students shows that self-control is related to academic resilience and sports performance, suggesting that psychological regulation and sport-related outcomes can be discussed within broader educational and counseling frameworks (Wahyudin et al., 2026). In addition, validation studies in higher education contexts highlight the importance of culturally adapted and psychometrically tested instruments, which is relevant to the present study's emphasis on validation and user-oriented educational resources (Oktasari et al., 2026). Although these studies do not directly examine family-based physical activity among children, they support the broader argument that counseling education can engage with health-oriented, resilience-related, and activity-related developmental issues.

Despite its contributions, this study has several limitations. First, the study measured students' understanding and responses to the textbook, not direct changes in children's physical activity behavior.

Therefore, the findings should be interpreted as evidence of textbook feasibility and instructional usefulness rather than evidence that the textbook directly promotes children's active lifestyles. Second, the large-group trial used a one-group pretest-posttest design without a control group, limiting causal interpretation. Third, the available pretest-posttest data were reported at the group level; therefore, inferential testing, paired effect size, and individual learning trajectories could not be examined in this study. Fourth, the validity and reliability evidence should be verified using complete item-level expert ratings and questionnaire data before broader implementation. Future research should test the textbook with larger and more diverse samples, compare its use with conventional learning materials, involve students from different institutions, and examine whether students who learn through this textbook are better prepared to design family-based educational programs that support children's physical activity and active lifestyles.

Conclusion

This study demonstrates that the Family Environment and Child Education textbook is feasible and useful as a pedagogical resource for helping university students understand the relationship between family contexts, child education, children's physical activity, and active lifestyles. The expert validation and student trial results indicate that the textbook has acceptable content quality, design quality, readability, usability, and instructional relevance. The descriptive improvement in students' learning achievement suggests that the textbook can support conceptual understanding of family routines, parental modeling, home-based support, active play, and reduced sedentary behavior as factors related to children's active lifestyles. The main contribution of this study lies in integrating family environment, child education, and children's physical activity into a single validated learning resource for guidance and counseling education. However, the findings should be interpreted within the scope of textbook validation and student learning improvement, as the study did not directly measure changes in children's physical activity behavior, did not include a control group, and did not conduct inferential testing due to group-level pretest-posttest data. Future research should verify the psychometric evidence using complete item-level data, involve larger and more diverse samples, and examine the textbook's effectiveness in preparing students to design family-based educational programs that support children's physical activity and active lifestyles.

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Authors and translators' details:

Akmal Sutja	sutja.akmal@unja.ac.id	Author
Firman	firmam.fkip@unja.ac.id	Author
Yantoro	yantoro@unja.ac.id	Author
K.A Rahman	ka_rahman@unja.ac.id	Author
Rully Andi Yaksa	rullyandi@unja.ac.id	Author