IHYA ULUM
Early Childhood Education Journal
Fakultas Keguruan dan Ilmu Pendidikan Universitas Islam Makassar
E-ISSN 2962-8504

Digital Comic Development in Strengthening Character Education to Prevent Bullying Behavior in Early Childhood

Siti Nurhaliza[1*], **Parwoto**[1] , **Muhammad Akil Musi**[1]

[1]Universitas Negeri Makassar, INDONESIA

Abstract

This study aims to develop and test the validity, practicality, and effectiveness of the digital comic Kita Semua Teman! as an anti-bullying character education medium for kindergarten children, using a Research and Development (R&D) approach conducted through five systematic stages: (1) needs analysis, (2) planning, (3) product development, (4) field testing, and (5) major product revision. The product's validity was confirmed through Pearson Product Moment correlation tests by experts. The validation results indicate that the medium is valid because the calculated r-values for Validator 1 (r = 0.597) and Validator 2 (r = 0.753) are greater than the critical r-value (0.388), and the significance values of 0.001 and 0.000, respectively, were smaller than the significance level of 0,05 (p < 0,05). Practicality was demonstrated through an evaluation of teachers' responses by five experienced teachers, with all 20 questionnaire items deemed valid (calculated r range 0.478–0.813 > table r = 0.468) and the instrument was deemed reliable (Cronbach's Alpha = 0.634 > 0.600), indicating that this medium is practical for implementation in a preschool setting. Effectiveness was measured using a one-group pretest-posttest design (n = 15), which showed a significant increase (pretest M = 10.40 → posttest M = 20.20; t = −21.810; Sig. = 0.000 < 0.05) and an N-Gain value of 0.7276 (72.76%), which falls into the high-effectiveness category. This product integrates QR Code Voice Reading features and interactive games to support multimodal anti-bullying education for early childhood.

Keywords: Digital Comic; Character Education; Bullying Prevention; Development; Early Childhood Education.

* Corresponding author. *E-mail addresses*: snyrhaliza004@gmail.com

Nurhaliza, S., Parwoto, P., Musi, M.A. (2026). Digital Comic Development in Strengthening Character Education to Prevent Bullying Behavior in Early Childhood. *Ihya Ulum: Early Childhood Education Journal. Vol. 4*(2), 1119-1132. https://doi.org/10.59638/ihyaulum.v4i2.854

Received May 21, 2026; Revised June 11, 2026; Accepted June 29, 2026; Available online July 30, 2026.

INTRODUCTION

Early childhood education serves as the fundamental foundation for character formation and personality development. During this critical period, children begin developing social, emotional, and moral capacities that will influence their behavior throughout their lives. As natural explorers and imitators, young children absorb both positive and negative behaviors from their immediate environments family, school, peers, and society. At large making this period particularly vulnerable to the emergence of maladaptive behaviors such as bullying (Rosen, Scott, & Higgins, 2025).

Bullying among kindergarten children represents one of the most pressing challenges in contemporary early childhood education. The term "bullying" originates from the Dutch word "boel/boele," which evolved in English to denote repeated aggressive actions characterized by power imbalance between perpetrator and victim (Martin et al., 2021; Smith & Norman, 2021). UNESCO (2021) defines bullying as unwanted aggressive behavior, conducted repeatedly, involving a real or perceived power imbalance between the aggressor and victim, with significant negative consequences for children's mental, emotional, and social health.

Empirical observations at TK Terpadu Teratai UNM revealed visible indicators of bullying behavior across daily activities: physical bullying during lineup activities (pushing, blocking peers), verbal bullying during learning sessions (mockery, name calling), social exclusion during play periods, and early indicators of cyberbullying through improper use of digital devices. These findings align with Zhou et al. (2024), who confirmed that physical bullying is the most prevalent form among preschool children aged 4–6 years. Waseem & Nickerson (2023) further categorize modern bullying into four main forms physical, verbal, relational, and cyber each carrying significant developmental consequences.

The consequences of bullying are severe and long lasting. Victims frequently experience psychological distress, anxiety, diminished self esteem, and depressive symptoms, as well as difficulties in establishing social relationships. Research indicates that unaddressed bullying behaviors at this stage may develop into persistent antisocial patterns through adolescence and adulthood (Aboagye et al., 2022 ; Hajerah et al., 2026). Contributing factors include individual characteristics (low emotional control, aggressive temperament), family patterns (harsh or authoritarian parenting), inadequate school supervision, and sociocultural normalization of aggressive behavior (Maghfiroh & Sugito 2021; Waseem & Nickerson 2023; Rosen et al., 2025; Musi et al., 2024).

These challenges point to the urgent need for effective preventive interventions rooted in character education (Rusliana et al., 2025). Thomas Lickona's framework identifies three interconnected components of character education: moral knowing (understanding ethical principles), moral feeling (emotional responsiveness to moral situations), and moral action (translating values into concrete behaviors). When applied systematically from early childhood, these components can substantially reduce deviant behaviors

including bullying (Susanti, 2022). However, the effective implementation of character education in kindergarten settings requires appropriate, engaging, and technology compatible learning media that align with children's developmental characteristics (Hwang & Chien, 2022; Nur et al., 2025; Parwoto et al., 2024).

Digital Comic media offers a compelling solution to this challenge. As a fusion of visual narrative, illustrated characters, and sequential story panels in digital format, Digital Comics are accessible through smartphones, tablets, and computers. Empirical studies confirm that this medium effectively promotes positive character values in young children through visual narrative (Novianti & Garzia, 2020; Putri & Lestari, 2021). Vygotsky's sociocultural theory further supports the use of interactive digital media in guiding children toward prosocial behaviors (Daniels, 2022). The multimodal nature of Digital Comics combining visual, textual, and now auditory elements has been shown to enhance comprehension, vocabulary acquisition, motivation, and engagement in early learners (Dewi et al., 2025; Rutta et al., 2021 ; Kucirkova, 2021).

The digital comic developed in this study, titled Kita Semua Teman!, features two key innovations that set it apart from previous research. First, each comic page is embedded with a QR code that links directly to an audio narration recording, enabling a multimodal learning experience that simultaneously engages visual, auditory, and kinesthetic modalities. The integration of QR code audio technology into a digital comic about bullying for preschoolers has not been documented in previous research, making this an original scientific contribution. Second, this product includes three interactive educational gamesQuiz Game Show, Memory Game Level 1, and Memory Game Level 2 designed to reinforce and assess children’s understanding of anti-bullying values through fun, age-appropriate games.

Additionally, the comic includes a comprehensive user guide covering learning objectives, developmental achievement indicators across five developmental domains, and practical tips for teachers and parents. The product is packaged as an interactive PDF e-book, ensuring flexibility and accessibility across various educational and home environments without requiring special software installation.

Compared to other digital media formats such as educational videos or interactive animations, Digital Comics offer a unique advantage for young children who have not yet achieved reading fluency: the integration of QR Code Text-to-Speech technology allows each comic page to deliver synchronized audio narration, simultaneously supporting visual literacy and auditory processing without requiring independent reading skills. Furthermore, the accompanying interactive games Quiz Game Show and Memory Game Levels 1 and 2 reinforce character internalization through age-appropriate active engagement, bridging the gap between passive observation and a concrete understanding of anti-bullying values.

This research therefore addresses a substantive gap in the existing literature by developing, validating, and empirically testing a novel Digital Comic media for anti bullying character education in kindergarten. The overarching

research questions are: (1) What is the validity level of the Digital Comic? (2) What is the practicality level of the Digital Comic? (3) What is the effectiveness?.

METHOD

This study employed a Research and Development (R&D) approach using the Borg and Gall (1983) model, adapted into five stages: (1) needs analysis, (2) planning, (3) product development, (4) field testing, and (5) main product revision (Efendy et al., 2025). Each stage built systematically on the previous, ensuring product validity and practicality were confirmed before field implementation. The study involved two groups of participants: (1) 15 Kindergarten Group B children (aged 5–6 years) at TK Terpadu Teratai UNM, selected via purposive sampling from a total population of 30 children representing the upper range recommended by Borg and Gall (1983) for main field trials in R&D studies (5–15 subjects) who served as subjects for the effectiveness test; and (2) five experienced kindergarten teachers at TK Terpadu Teratai UNM (with 21 to 29 years of teaching service) who served as respondents for the practicality assessment.

Stage 1: Needs Analysis

Needs analysis was conducted through three activities: (a) direct observation at TK Terpadu Teratai UNM to document bullying behavior indicators; (b) a systematic literature review of national and international research on early childhood bullying and digital media; and (c) an in-depth interview with a classroom teacher to gather firsthand insight on bullying patterns, existing interventions, and media requirements for character education.

Stage 2: Planning

Based on needs analysis findings, the planning stage encompassed: formulating development objectives; defining content scope across four bullying types (physical, verbal, relational, cyberbullying); designing storyboards, character profiles, and visual layout; integrating innovative features (QR Code voice reading and educational games); and constructing research instruments for validity, practicality, and effectiveness measurement using a 1–4 Likert scale.

Stage 3: Product Development

The Digital Comic was constructed as an interactive PDF e-book incorporating all planned features. This stage included two evaluation sub-processes. First, validity testing by two expert validators across five dimensions: (1) material/content, (2) visual design, (3) language appropriateness, (4) alignment with early childhood developmental standards, and (5) technical quality and innovation, using Pearson Product Moment correlation (r-hitung > r-tabel, α = 5%). Second, practicality testing through a 20-item teacher response questionnaire administered to five experienced teachers at TK Terpadu Teratai UNM, validated via Pearson Product Moment correlation and Cronbach's Alpha (> 0.600), with practicality categories adapted from Mulyatiningsih (2019): ≥81% = Very Practical; 61–80% = Practical; 41–60% = Fairly Practical.

Stage 4: Field Testing

Effectiveness was evaluated using a single-group pre-posttest pre-experimental design administered to the 15 subjects in Kindergarten Group B described above. An observation sheet based on Lickona's framework evaluated three indicators: moral knowledge (recognizing bullying), moral feelings (empathy toward peers), and moral actions (the courage to refuse and report bullying). After five learning sessions, a posttest was administered using the same instrument. Data analysis using IBM SPSS Statistics included: Shapiro-Wilk normality test; Paired-Sample t-test (H_0 is rejected if the two-tailed Sig. is < 0.05); and N-Gain scores (g > 0.7 = High; 0.3 ≤ g ≤ 0.7 = Moderate; g < 0.3 = Low; effectiveness: >76% = Effective; 56–75% = Moderately Effective).

The statistical hypotheses tested in the Paired Sample T-Test are as follows: H0: O1 = O2 (there is no significant difference between pretest and posttest mean scores); H1: O2 > O1 (the posttest mean score is significantly greater than the pretest mean score, indicating improved anti-bullying character understanding after the use of the Digital Comic media). H0 is rejected if the Sig. (2-tailed) value < 0.05, confirming a statistically meaningful improvement attributable to the use of the Digital Comic media.

Stage 5: Main Product Revision

All feedback from expert validators and field testing was integrated to produce the finalized Digital Comic *Kita Semua Teman!* meeting the criteria of validity, practicality, and effectiveness for anti-bullying character education in kindergarten.

RESULTS

Needs Analysis Findings

Observational data from TK Terpadu Teratai UNM documented bullying behaviors across multiple activity periods. During lineup activities, physical bullying was observed including pushing and blocking. During learning sessions, verbal bullying manifested as mockery and name-calling directed at peers who could not answer teacher questions. During play periods, social exclusion and forced toy grabbing were recorded. Early indicators of cyberbullying through digital devices were also identified. Observation further confirmed that available digital infrastructure (laptops and speakers) remained underutilized as educational media, despite children showing high enthusiasm for visually rich, colorful, and audio supported learning materials.

Literature review confirmed alarming trends in early childhood bullying prevalence in Indonesia (KPAI; FSGI), corroborated by Septiyani et al., (2023) Septiyani et al. (2023) who noted that bullying in kindergarten frequently goes unidentified because perpetrators and bystanders normalize it as play behavior. The interview with Ibu Indri, S.Pd. provided six key insights: bullying is common but unrecognized; weak emotional regulation and unsupportive environments are primary causal factors; anti bullying education lacks structured programming; character education must begin during the golden age; effective media for young children require rich visuals, bright colors, and audio visual elements; and

teachers enthusiastically endorsed the Digital Comic concept, requesting comprehensive usage guides.

Planning: Product Concept and Design

Based on needs analysis, the product concept was established across five dimensions: (1) Story theme;four chapters each addressing one bullying type (physical, verbal, relational, cyberbullying) selected based on observational frequency and contextual relevance; (2) Character design; five main characters representing diverse backgrounds and personalities (Raka, Bimo, Tasya, Ibu Guru Laras, Ibu Tasya/Sabrina) designed to promote role modeling and emotional identification; (3) Product structure; eight systematic sections (cover, usage guide, learning objectives and achievement indicators, character introduction, four story chapters with moral messages, recommended games, and synopsis); (4) Innovative features; QR Code voice reading on every page enabling multimodal learning; and (5) Product format; interactive PDF e-book for universal device accessibility.

Validity and Practicality Test Results

Instrument Validity (Pre-Validation)

Before the Digital Comic was submitted for expert validation, the validity of the validators' own instruments was first tested to ensure that the measurement tools were statistically sound. Testing was conducted using Pearson Product Moment correlation with r-table = 0.553 (N = 15, significance level 5%). An instrument item is declared valid if the r-computed value exceeds r-table = 0.553. The results of the validator instrument validity test are presented in Table 1a below.

Table 1a. Validator Instrument Validity (Pre-Validation)

Validator	*r-Computed*	*r-Table*	*Sig. (p)*	*Result*
Validator 1	0.650	0.553	0.001	Valid
alidator 2	0.696	0.553	0.004	Valid

Source: Research data (N=15, significance level 5%, r-table = 0.553)

Based on Table 1, it can be concluded that both validator instruments are declared valid. The r-computed values of each validator (Validator 1: r = 0.650; Validator 2: r = 0.696) both exceed r-table = 0.553, and the significance values (Sig. = 0.001 and 0.004) are less than 0,05. This confirms that the measurement instruments used by both validators meet the statistical validity requirements and are appropriate for use in assessing the Digital Comic product.

In addition, the validity of the ARG (Assessment of Response Grading) instrument was also tested prior to use. Testing was conducted using Pearson Product Moment correlation with r-table = 0.553 (N = 15, significance level 5%). An instrument item is declared valid if the r-computed value exceeds r-table = 0.553. The results of the ARG instrument validity test are presented in Table 1b below.

Table 1b. ARG Instrument Validity (Pre-Validation)

Validator	*r-Computed*	*r-Table*	*Sig. (p)*	*Result*
Validator 1	0.642	0.553	0.003	Valid
Validator 2	0.794	0.553	0.000	Valid

Source: Research data (N=15, significance level 5%, r-table = 0.553)

Based on Table 1b, it can be concluded that the ARG instrument is also declared valid. The r-computed values of both validators (Validator 1: r = 0.642; Validator 2: r = 0.794) exceed r-table = 0.553, and the significance values (Sig. = 0.003 and 0.000) are less than 0.05. This confirms that the ARG instrument meets the statistical validity requirements and is appropriate for use in the research.

Validity Test

Expert validation of the Digital Comic product was conducted by two validators across five assessment dimensions: (1) material/content, (2) visual design, (3) language appropriateness, (4) alignment with early childhood development standards, and (5) technical quality and innovation. Testing used Pearson Product Moment correlation with r-table = 0.388 (N = 26, significance level 5%). An item is declared valid if r-computed exceeds r-table = 0.388. The product validation results are presented in Table 2 below.

Table 2. Expert Validation of the Digital Comic Product

Validator	*r-Computed*	*r-Table*	*Sig. (p)*	*Result*
Validator 1	0.597	0.388	0.001	Valid
Validator 2	0.753	0.388	0,000	Valid

Source: Research data (N=26, significance level 5%, r-table = 0.388)

Based on Table 2, it can be concluded that the Digital Comic media is declared valid. The r-computed values of both validators (Validator 1: r = 0.597; Validator 2: r = 0.753) exceed r-table = 0.388, and their respective significance values (Sig. = 0.001 and 0.000) are less than 0,05. These results confirm that the media meets the required content validity standards across all five evaluation dimensions and is appropriate for use in early childhood learning.

Media Practicality

Following revision based on expert validator feedback, media practicality testing was conducted through a teacher response questionnaire. The questionnaire consisted of 20 items administered to five experienced kindergarten teachers at TK Terpadu Teratai UNM with 21 to 29 years of service. Before use, the empirical validity of each questionnaire item was tested using Pearson Product Moment correlation with criteria r-computed > r-table (N = 20, significance level 5%, r-table = 0.468). Items not meeting this criterion were excluded from the practicality calculation. The teacher response questionnaire validity test results are presented in Table 3 below.

Table 3. Practicality Assessment: Teacher Response Questionnaire Validity

Teacher	*r-Computed*	*r-Table*	*Sig. (p)*	*Result*
Teacher 1	0.813	0.468	0,000	Valid
Teacher 2	0.610	0.468	0.004	Valid
Teacher 3	0.595	0.468	0,001	Valid
Teacher 4	0.478	0.468	0,003	Valid
Teacher 5	0.665	0.468	0.001	Valid

Source: Research data (N=20, significance level 5%, r-table = 0.468)

Based on Table 3, it can be concluded that all 20 teacher response questionnaire items are declared valid, as the r-computed values for each teacher (range: 0.478–0.813) exceed = 0.468 and all significance values are less than r-table = 0,05. This ensures that the instrument used to measure media practicality has met empirical validity standards.

In addition to validity testing, the reliability of the teacher response questionnaire instrument was also tested using Cronbach's Alpha. The instrument is declared reliable if the Cronbach's Alpha coefficient exceeds 0.600 according to the established criteria. The questionnaire reliability test results are presented in Table 4 below.

Table 4. Teacher Response Questionnaire Reliability

Number of Items	**Cronbach's Alpha**	**Threshold**	**Result**
20 items	0.634	> 0,600	Reliable

Source: Output IBM SPSS Statistics 2026

Based on Table 4, it can be concluded that the teacher response questionnaire is declared reliable, as the Cronbach's Alpha coefficient (0.634) exceeds the minimum threshold of 0.600. This indicates that the instrument possesses adequate internal consistency, and the practicality data collected through it can be considered trustworthy.

Effectiveness Results

This section presents the results of the media effectiveness test conducted in Stage 4 of the R&D procedure, as outlined in the Method section. The analysis yielded three main statistical outputs from the Paired Sample T-Test and N-Gain Score calculation, each of which is reported in sequence below.

Table 5. Paired Samples Statistics

Variable	*N*	*Mean*	*Std. Deviation*	*Std. Error Mean*
Pre-test	15	10.40	1.352	0.349
Post-test	15	20.20	2.210	0.571

Source: Output IBM SPSS Statistics 2026

Based on Table 6, it can be concluded that a significant improvement occurred in the mean score from pretest (M = 10.40) to posttest (M = 20.20), indicating a difference of 9.80 points. This finding demonstrates a meaningful improvement in children's anti-bullying character understanding following the use of the Digital Comic media.

Second, correlation analysis between pretest and posttest scores was conducted to verify the appropriateness of using the Paired Sample T-Test. The high and significant correlation value indicates that there is a consistent relationship between children's initial and final performance, so the paired parametric test can be appropriately applied. Correlation analysis results are presented in Table 7 below.

Table 6. Paired Samples Correlations

Pair	*N*	*Correlation*	*Sig.*
Pre-test – Post-test	15	0.617	0.014

Source: Output IBM SPSS Statistics 2026

Based on Table 7, it can be concluded that there is a strong and statistically significant correlation between pretest and posttest scores (r = 0.617; Sig. = 0.014 < 0.05). This verifies the consistency of children's performance between initial and final measurements, while confirming the appropriateness of applying the Paired Sample T-Test.

Third, the Paired Samples Test results produced inferential output determining whether there is a significant difference between pretest and posttest scores. The null hypothesis (H_0) is rejected if the Sig. (2-tailed) value < 0.05, meaning there is a statistically meaningful improvement resulting from the use of the Digital Comic media. The complete Paired Samples Test results are presented in Table 8 below.

Table 7. Paired Samples Test Results

Pair	*Mean*	*Std. Deviation*	*Std. Error Mean*	*95% CI Lower*	*95% CI Upper*	*T*	*Sig. (2-tailed)*
Pre-test – Post-test	-9.800	1.740	0.449	-10.764	-8.836	-21.810	0,000

Source: Output IBM SPSS Statistics 2026

Based on Table 8, it can be concluded that the use of the Digital Comic media is proven to significantly improve children's anti-bullying understanding, as evidenced by t = −21.810 with Sig. (2-tailed) = 0.000 < 0.05. Thus, H_0 is rejected, confirming that the difference between pretest and posttest scores is a real effect of the media intervention and not due to chance.

As a complement to the Paired Sample T-Test analysis, N-Gain Score calculation was also performed to measure the magnitude of learning improvement (normalized gain) in a more standardized manner. The N-Gain Score is calculated based on the difference between posttest and pretest scores

divided by the difference between the maximum score and the pretest score. N-Gain interpretation follows the criteria: g > 0.7 = High; 0.3 ≤ g ≤ 0.7 = Moderate; g < 0.3 = Low. Effectiveness percentages are categorized as: >76% = Effective; 56–75% = Moderately Effective; 40–55% = Less Effective; <40% = Ineffective. The complete N-Gain Score calculation results are presented in Table 9 below.

Table 8. N-Gain Score Descriptive Statistics

N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
15	0,46 (46,15%)	0,92 (92,31%)	0.7276 (72,76%)	0.147 (14,74%)

Source: Output IBM SPSS Statistics 2026; *Category: High (g > 0.70) / Moderately Effective (56–75%)*

Based on Table 9, it can be concluded that the Digital Comic media falls in the “High” effectiveness category, as the mean N-Gain Score (0.7276) exceeds the threshold of 0.70. With an effectiveness percentage of 72.76%, this media also qualifies as “Moderately Effective”, collectively indicating that the media successfully improved children’s anti bullying character understanding in a meaningful and measurable way within a single learning cycle.

These quantitative outcomes are further illuminated by the psychological dynamics underlying children’s responses to the multimodal design. Kindergarten-aged children (5–6 years) are characterized by relatively short attention spans typically ranging from 5 to 15 minutes for structured learning activities and are more readily engaged by stimuli that simultaneously activate multiple sensory channels (Kucirkova, 2021). The QR Code Voice Reading feature directly addressed this developmental constraint: by pairing each comic page’s visual narrative with synchronized audio narration, the media sustained children’s focused attention beyond what static images alone would achieve, while reducing the cognitive load associated with decoding printed text. From a behavioral standpoint, children’s observed responses during the sessions indicated that audio narration functioned as an emotional scaffold the expressive vocal characterization of protagonists and antagonists helped children identify with characters’ emotional states, thereby facilitating internalization of empathy and moral judgment relevant to anti-bullying behavior. This audio-mediated emotional resonance aligns with Lickona’s moral feeling component, wherein children develop an affective responsiveness to moral situations before translating values into moral action (Susanti, 2022). The convergence of visual comic sequences with character-voiced audio thus created a coherent multimodal pathway through which children could cognitively recognize, emotionally respond to, and behaviorally rehearse anti-bullying values a process that conventional single-channel media formats are less equipped to support for pre-literate learners.

Final Product: Digital Comic *Kita Semua Teman!*



Figure 1. *Komik Digital Kita Semua Teman! – Final Product Cover*

Following expert revision and field testing, the final product was produced with the following specifications: interactive PDF e book format; 38 pages; 4 story chapters (Physical Bullying, Verbal Bullying, Relational Bullying, Cyber Bullying); 5 main characters (Raka, Bimo, Tasya, Ms. Guru Laras, Ms. Tasya); QR Code Voice Reading on every page; additional games (Quiz, Memory Game Level 1 & 2); target users: children aged 4–6 years; accessible via smartphones, tablets, and computers. The product is presented in Figure 1. To provide broader access and facilitate implementation, the final product can also be accessed through the following link: https://drive.google.com/drive/folders/10Unq6rIHc4o3aLndiOaeypOg8KMh6J2X?usp=sharing

DISCUSSION

The validity of the Digital Comic *Kita Semua Teman!* confirms that expert-validated, multimodal media can meet the simultaneous cognitive, aesthetic, and pedagogical standards required for early childhood learning. The integration of QR Code Voice Reading embedding audio narration on every page directly addresses young children's limited independent reading ability, an innovation not previously documented in anti-bullying digital comic research (F. Dewi et al., 2025; Novianti & Garzia, 2020). High practicality ratings from experienced teachers further indicate that the product successfully bridges the gap between technological sophistication and real-world classroom usability, consistent with the argument that sustainable digital media adoption in kindergarten requires teacher-centered design as a primary criterion (Nur et al., 2025).

The significant improvement in children's anti-bullying understanding (H_0: $O_1 = O_2$ rejected; H_1: $O_2 > O_1$ accepted; N-Gain = 0.7276; t = −21.810; p = 0.000) reflects the effectiveness of grounding media design in Lickona's character education framework. Each story chapter operationalized moral knowing through recognizable bullying scenarios, moral feeling through character identification, and moral action through observed prosocial resolution creating a coherent learning sequence that surpasses outcomes of conventional approaches (N. Y. S. Dewi & Tirtayani, 2023). The low standard deviation of N-Gain scores (SD = 0.147) further indicates that learning gains were consistent across children with varying prior knowledge, suggesting the multimodal design effectively accommodated diverse learner profiles. The inclusion of cyberbullying content for children aged 4–6 years also constitutes a novel contribution, addressing the

increasingly early age at which children encounter digital peer aggression (Rosen et al., 2025; Zhou et al., 2024). Nonetheless, the single-site pre-experimental design and small sample (n = 15) limit generalizability; future studies should employ control groups and larger samples across diverse settings to confirm and extend these findings.

The psychological mechanisms underlying children's responses to the media have been elaborated in the Results section, where the multimodal design combining comic visuals with QR Code Voice Reading audio was shown to support attention maintenance and emotional internalization of anti-bullying values across cognitive, affective, and behavioral dimensions. These findings collectively affirm that the integration of multimodal features is not merely a technological enhancement but a developmentally responsive design decision grounded in early childhood psychology.

CONCLUSION

This study successfully developed, validated, and evaluated the Digital Comic *Kita Semua Teman!* as an anti bullying character education medium for kindergarten children. Three main conclusions emerged:

First, The Digital Comic demonstrated valid status based on expert validation using Pearson Product Moment correlation (Validator 1: r = 0.597; Validator 2: r = 0.753), both significantly exceeding r-table = 0.388 at a 5% significance level. The product meets quality standards across all dimensions of material/content, visual design, language, developmental appropriateness, and technical innovation, with the QR Code Voice Reading feature representing an original scientific contribution to anti bullying digital media for early childhood.

Second, The Digital Comic was confirmed as highly practical by five experienced teachers. All 20 questionnaire items were valid (r-computed 0.478–0.813 > r-table 0.468) and the instrument is reliable (Cronbach's Alpha = 0.634 > 0.600). Teachers unanimously affirmed the ease of operating the media across various devices, the usefulness of the comprehensive usage guide, and the suitability of the flexible format for both school and home use.

Third, Komik Digital proved effective in improving children's anti bullying character understanding. One-group pretest-posttest testing with 15 kindergarten children produced a statistically highly significant improvement (pretest M = 10.40 → posttest M = 20.20; Δ = 9.80 points; t = −21.810; Sig. = 0.000 < 0.05). The N-Gain score of 0.7276 categorizes the effectiveness as "High" (g > 0.70), with an effectiveness percentage of 72.76% classified as "Moderately Effective." The significant improvement in children's anti-bullying understanding (H_0: $O_1 = O_2$ rejected; H_1: $O_2 > O_1$ accepted; N-Gain = 0.7276; t = −21.810; p = 0.000) reflects the effectiveness of grounding media design in Lickona's character education framework.

This study is limited by its single site implementation and small sample size (n = 15). Future research should expand field testing to multiple schools across wider geographic regions, larger and more diverse samples, and longer learning periods to assess sustained character development outcomes. Subsequent development iterations may incorporate more sophisticated

interactive features, expanded content addressing additional social emotional competencies, and integration with broader school based anti bullying programs.

REFERENCE

Aboagye, R. G., Seidu, A.-A., Ahinkorah, B. O., Ameyaw, E. K., Budu, E., & Yaya, S. (2022). Bullying victimisation and suicidal behaviours among in-school adolescents in sub-Saharan Africa: Findings from the Global School-based Health Survey. *PLOS ONE, 17*(3), e0264969. https://doi.org/10.1371/journal.pone.0264969

Daniels, H. (2022). *Vygotsky and pedagogy* (2nd ed.). Routledge.

Dewi, F., Justicia, R., Putri, S. U., & Citra Bayuni, T. (2025). Bringing stories to life: Enhancing early literacy with digital comics and TPACK in pre-service teacher education. *Journal of Early Childhood Teacher*, 1–20. https://doi.org/10.1080/10901027.2025.2493176.

Dewi, N. Y. S., & Tirtayani, L. A. (2023). Pengaruh penerapan metode bermain peran (role playing) terhadap pemahaman bullying pada anak di TK. *Innovative: Journal Of Social Science Research*, *3*(3), 7080–7095. https://j-innovative.org/index.php/Innovative.

Hajerah, H., Herlina, H., Rusmayadi, R., Ilyas, S. N., Amri, N. A., & Amri, N. (2026). *The integrative thematic model with HAJRAH syntax on children's peace culture value in early childhood education in Makassar, Indonesia*. *JPUD: Jurnal Pendidikan Usia Dini, 20*(1), 86–96. https://doi.org/10.21009/jpud.v20i1.57765

Hwang, G. J., & Chien, S. C. (2022). Effects of digital storytelling on students' motivation, empathy, and learning achievement. *Educational Technology Research and Development*, *70*(4), 1551–1572.

Kucirkova, N. (2021). Digital storytelling and children's development in the digital age. *Early Child Development and Care*, *191*(7–8), 1234–1246. http://dx.doi.org/10.18823/asiatefl.2022.19.4.6.1234

Maghfiroh, N. T., & Sugito, S. (2021). Perilaku bullying pada anak di taman kanak-kanak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(3), 2175–2182.

Martin, L. L., Gray, R., & Finley, S. (2021). The Black professoriate, bullying, and the limits of academic freedom. *Data Browser*, *6*. https://doi.org/10.1177/21533687221087366

Musi, A., Ilyas, S. N., & Bachtiar, M. Y. (2024). Penguatan Implementasi Kurikulum Merdeka : Pembelajaran Kontekstual dan Asesmen Berbasis Teknologi di PAUD. *Jurnal Pengabdian Masyarakat, 02*(02), 313–323. https://doi.org/10.26858/ininnawa.v2i2.5839

Novianti, R., & Garzia, M. (2020). Children's literature to support character education for early childhood. *Universal Journal of Educational Research*, *8*(3), 779–784.

Nur, A., Islami, M., Bachtiar, M. Y., & Makkasau, A. (2025). Pemanfaatan Aplikasi Interaktif dalam Pengembangan Media Pembelajaran Digital bagi Guru TK. *Aksara Bakti: Jurnal Pengabdian Kepada Masyarakat*, *1*(1), 10–17.

Parwoto, P., Syamsuddin, S., Bachtiar, M. Y., Sulasminah, D., & Tatiana, T. (2024). *Fostering Social Skills with Assessment-Based Role- Playing*

Learning Method with Audio-Visual Media for Autistic Children in Inclusive Kindergarten. Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-335-1

Putri, A. M., & Lestari, I. (2021). Pengembangan komik digital untuk menanamkan nilai karakter anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(1), 113–125.

Rosen, L. H., Scott, S. R., & Higgins, M. G. (2025). Books and bullies: Responses to bullying in preschool students. *International Journal of Bullying Prevention*, *7*(1), 1–12. https://doi.org/10.1007/s42380-023-00171-z.

Rusliana, F., Rusmayadi, R., & Amal, A. (2025). Peran guru dalam menanamkan nilai disiplin pada anak usia dini di TK Aisyiyah Bustanul Athfal Daya. *EDUSAINTEK: Jurnal Pendidikan, Sains dan Teknologi, 12*(3), 1501–1513. https://doi.org/10.47668/edusaintek.v12i3.1945.

Rutta, C. B., Schiavo, G., Zancanaro, M., & Rubegni, E. (2021). Comic-based digital storytelling for content and language integrated learning. *Educational Media International*, *58*(1), 21–36. https://doi.org/10.1080/09523987.2021.1908499

Septiyani, D. K., Sugiarto, S., & Rahmawati, Y. (2023). Perspektif orang tua dan guru mengenai bullying pada anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *7*(2), 1456–1469. https://doi.org/10.31004/obsesi.v6i4.2313.

Smith, P. K., & Norman, J. O. H. (2021). *The Wiley Blackwell handbook of bullying: A comprehensive and international review of research and intervention*. Wiley.

Susanti, S. E. (2022). Pendidikan karakter dalam membangun kecerdasan moral bagi anak usia dini perspektif Thomas Lickona. *Trilogi: Jurnal Ilmu Teknologi, Kesehatan, Dan Humaniora*, *3*(1), 10–17. https://doi.org/10.33650/trilogi.v3i1.3396

UNESCO. (2021). *Behind the numbers: Ending school violence and bullying*. United Nations Educational, Scientific and Cultural Organization.

Waseem, M., & Nickerson, A. B. (2023). Identifying and addressing bullying. In *In StatPearls [Internet]*. StatPearls Publishing.

Zhou, Y., Deng, X., Wang, S., & Shi, L. (2024). Theory of mind and physical bullying in preschool children: The role of peer rejection and gender differences. *Psicologia: Reflexão e Crítica*, *37*, 29. https://doi.org/10.1186/s41155-024-00313-2