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Journal of General Education and Humanities
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ISSN 2963-7147

Development and Preliminary Evaluation of SOBATKU Social Story Digital Media for Body Boundaries and Privacy Understanding Among Children with Intellectual Disabilities

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Article Info

Article history:

Received 2026-09-11
Revised 2026-10-24
Accepted 2026-11-01

Keywords:

Body Boundaries
Disability Intellectual
Privacy
SOBATKU Digital Media
Social Story

ABSTRACT

Children with intellectual disabilities require concrete, visual, and structured learning materials to understand body boundaries and privacy. This study aimed to develop and preliminarily evaluate SOBATKU Digital Media (Social Story of My Body Boundaries and Privacy) as a learning medium to support this understanding. A research and development approach was employed using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The participants were six children with mild intellectual disabilities aged 8–12 years at the UPTD Disability Services Center in Sidoarjo Regency, Indonesia. Data were collected through expert validation, practicality questionnaires, observations, and pretest–posttest assessments. Data were analyzed using descriptive percentages, the Wilcoxon Signed-Rank Test, and normalized gain (N-Gain). The results indicated that the research instruments achieved 98% validity, while the media received 94% ratings from both material and media experts. Practicality was rated 95%, and learning implementation was 96%. The mean understanding score increased from 76.67 on the pretest to 96.67 on the posttest, with a statistically significant difference (Wilcoxon $p = 0.031$) and a high N-Gain of 0.86. These findings indicate that SOBATKU is feasible and practical and shows preliminary evidence of improved understanding of body boundaries and privacy. However, the small sample and one-group pretest–posttest design limit causal interpretation. Further studies involving larger samples and controlled research designs are needed to confirm these preliminary findings.

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1. INTRODUCTION

Every child, including children with intellectual disability, has the right to get supportive education, development, independence, safety, and ability to protect themselves. Education about body boundaries and privacy is an important part of sexuality and safety

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education that includes understanding body ownership, body parts, personal privacy, consent, rights to say " no ", and methods to look for help. This education is not, by itself, a complete answer to preventing violence against children, but rather one layer of protection, while not quite enough; the main answer still lies with adults, families, institutions, education, and systems that protect children. Children with intellectual disabilities, especially in the mild category, can experience difficulty understanding abstract concepts, reading social situations, recognizing risk, and generalizing information, so that material about body boundaries and privacy needs to be delivered in a way that is concrete, simple, visual, structured, repetitive, and customized to the individual abilities and needs of the child. This education helps children recognize unsafe situations, understand appropriate and inappropriate behavior, and know how to seek help when they feel uncomfortable. Paulauskaite et al. [1] explain that education on relationships and sexuality for participants with intellectual disability needs to cover knowledge about body, social and sexual appropriateness, safety , self, emotions, and interpersonal relationships. However, existing research still mainly measures knowledge and has not yet developed measures of skills and attitudes. Therefore, learning media is needed that not only provides information but also helps children practice skills in maintaining body boundaries and privacy.

Based on initial observations at the UPTD Disability Services Center in Sidoarjo Regency, some children with intellectual disabilities were found to have difficulty identifying private body parts, distinguishing between public and private situations, and responding appropriately to situations that make them feel uncomfortable. Initial interviews with teachers or caregivers indicated that body boundaries and privacy are still taught mainly through verbal explanations and are not yet supported by learning media that connect situations, appropriate responses, and reporting strategies. This finding aligns with Sravanti and Pradeep [2], Paulauskaite et al. [1], and Colarossi et al. [3], who emphasize the importance of concrete, visual, structured, and developmentally appropriate approaches to teaching body boundaries and personal safety to children with intellectual disabilities. Therefore, learning media should present body boundaries and privacy in a concrete, systematic, contextual, and accessible way, while helping children recognize unsafe situations, respond appropriately, and report incidents.

Advances in educational technology offer opportunities to develop learning media that are engaging, interactive, accessible, and repeatable to meet the needs of children with intellectual disabilities. Digital media should support cognitive accessibility by using short, concrete sentences; one main message per screen; consistent illustrations; brief, repeatable audio; simple navigation; and non-judgmental feedback. Recent studies support the potential of interactive videos and digital storytelling to improve learning, cognitive, social, and communication skills among children with intellectual disabilities (Barman & Jena, [4]; Altındağ Kumaş, [5]; Alonso-Campuzano et al., [6]). Therefore, digital media can serve as a relevant alternative for providing concrete, visual, and interactive learning experiences that are easier to understand and adapted to individual learning needs.

One potential approach is Social Story, a learning-based story designed to help individuals understand social situations and information, as well as appropriate responses in certain conditions. Social Stories use simple language, systematic information presentation,

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and visual support to help participants understand social situations that are otherwise difficult to understand. The research reviewed in the proposal shows that Social Stories can increase social skills in children with intellectual disability in the classroom environment. However, much of the strong evidence for the effectiveness of Social Stories comes from research on children with autism, so we cannot directly assume the same effectiveness for children with intellectual disabilities. Based on this research, this study adapts the principle of Social Stories by using descriptive, child-centered sentences and limited commands, then adjusting them to the cognitive and communication characteristics of children with intellectual disabilities. Camilleri et al. [7] showed that digital Social Stories have potential as an intervention medium that parents and practitioners can accept, while supporting children's understanding and self-determination. Digital media also allows stories to be delivered consistently and repetitively, in line with the child's needs.

This study produced digital learning media in the form of SOBATKU (Social Story of My Body Limits and Privacy), developed to help children with intellectual disabilities understand body boundaries and privacy. This media was developed using adapted social story rules (dominance, descriptive sentences, and angular view of children), combined with illustrations, controlled audio, and discrimination exercises, so the child can recognize, differentiate, and choose appropriate responses in everyday life. Product specifications are presented in Table 1.

Table 1 Specifications SOBATKU Digital Media Products

No.	Aspect	Description Product
1	Product name	SOBATKU Digital Media (*Social Story of* My Body's Limits and Privacy)
2	Media types	Digital learning media based on *social story* (digital social story)
3	Target users	Children with disability intellectual
4	Objective development	Increase understanding of the concept of body boundaries and privacy
5	Material learning	Ownership of body and body parts; personal; approval and rejection; private and public situations; appropriate and inappropriate touch; appropriate (including exception care / medical with explanation and guidance); the secret that makes no one comfortable; trusted adult network and how to report
6	Product format	Interactive e-book or digital applications Simple enough to run on smartphones, tablets, and computers
7	Form presentation	Simple text, contextual illustrations, short audio narration that can be repeated on and off, practice discrimination, situation-based images, and feedback.
8	Visual design	Two-dimensional cartoon illustrations, simple, contextual, and encompassing scenarios with known people and No known, in various places (home, school, clinic, living room, public)
9	Language	Simple, concrete, one Indonesian message per screen, dominant sentence descriptive and affirmative, avoiding blaming sentences for the child
10	Size text	18-24 pt for support legibility
11	Audio	Short duration per piece; speak slowly; clear articulation; can be repeated; volume control and on/off buttons; no music in the background.
12	Difficulty level	Low to medium, served gradually from draft simple to draft more complex
13	Interactivity	Navigation knob big, practice choice images (2-4 options), personalization adult network trusted, and bait non- judgmental back.
14	Duration use	±15-20 minutes per session learning
15	Companion use	Teachers, parents, or companion at UPTD Services Disability Regency Sidoarjo
16	Data security	Personalization data (name, photo) is stored locally/offline, not uploaded publicly, and used only with parental/guardian consent.
17	Product supporters	Book guide use of media and instruments evaluation
18	Criteria quality product	Fulfil aspects of validity (material, language, media, accessibility), cognitive, and protection of children, practicality, and effectiveness in improving understanding.

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SOBATKU Media is expected to become appropriate alternative learning medium with characteristics suited to children with intellectual disabilities, and to help educators convey body boundaries and privacy material in a concrete, systematic, and child-appropriate way. In this regard, Kurniawan and Kanaha [8] show that using technology in learning can effectively increase involvement and participants' learning capability. This research uses the Research and Development (R&D) method with the ADDIE model, which includes Analyze, Design, Develop, Implement, and Evaluate stages to produce learning-based technology products.

Previous studies show gaps that still need to be addressed. Research on Social Stories has focused a lot on social skills and has been performed on autistic children, whereas its implementation in a way specific to learning about body boundaries and privacy in children with intellectual disability is still limited. Kamaludin et al. [9] emphasized that providing sexuality education to children with intellectual disability faces obstacles in the form of limited parental knowledge, time, family values and culture, as well as communication obstacles with the child. This highlights the importance of developing simple, visual, concrete, and easy media for children and their companions.

However, research on digital media for children with intellectual disabilities remains limited; most studies focus on face-to-face training, while digital media research often focuses on social integration, ownership, consent, privacy, refusal, and adult trust and reporting. Research on digital media for children with intellectual disabilities also discusses social and digital security skills. Thus, there is a need for media that integrate concrete, visual, contextual, and appropriate learning for children with intellectual disability. Furthermore, van den Toren et al. [10] showed that the education program structured sexuality can increase knowledge, attitudes, and self-efficacy in individuals with intellectual disability. This strengthens the importance of systematic education interventions to build children's ability to protect their health, safety, and personal boundaries.

Based on problems and gaps mentioned, it is necessary to develop learning media that is not only visually interesting but also valid, aligned with children's cognitive needs, practical for use by teachers or companions, and mindful of children's protection and safety. Therefore, this research develops the SOBATKU Digital Media (Social Story of My Body and Privacy Limits) as a Social Story-based learning medium. This medium is designed as an interactive e-book or simple digital application that can be used on smartphones, tablets, and computers, with simple text, contextual illustrations, repeatable audio narration, practice discrimination in situations, positive reinforcement, simple navigation, and trusted adult networks. The material covers body ownership and parts, personal boundaries, approval and rejection, private and public situations, appropriate and inappropriate touch (including the "secret" that makes you uncomfortable), and how to seek help and report. Thus, SOBATKU Digital Media is expected to become alternative learning medium that is concrete, visual, structured, and child-centered, to increase understanding of body boundaries and privacy in children with intellectual disabilities in UPTD Services Disability Regency Sidoarjo.

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2. RESULTS AND DISCUSSION

2.1 Research Design

This study uses Research and Development (R&D) methods to produce a learning product and test its effectiveness before using it in the learning process. According to Sugiyono [11], research and development is a research method used to produce a product and test its effectiveness. In line with this view, this research focuses on the systematic development of learning products, starting with needs identification, design, development, and testing of product effectiveness. This research uses the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation), as described in [12]. The ADDIE model was chosen because its stages are systematic and allow development and evaluation to occur gradually at each phase.

In addition to product development, this research used a one-group pretest-posttest design to improve understanding of children after using SOBATKU Digital Media. At this stage, subjects take a pretest to measure initial ability, then receive treatment in the form of learning using SOBATKU Digital Media, and are then given a posttest to measure changes in understanding after treatment. Research design can be depicted as $O_1 – X – O_2$, with O_1 as pretest, X as learning using SOBATKU media, and O_2 as the posttest. A one-group design was chosen because the sample was small (six children) and the subjects were heterogeneous, so a control group was not feasible. This design interprets the results as an indication of improved understanding, not as proof of complete causal control over internal validity threats. While the one-group design was feasible given the institutional setting and target population, it presents inherent internal validity threats. Specifically, this design cannot control for history, maturation, testing repetition effects, or facilitator attention (Hawthorne effect). Consequently, the empirical outcomes are interpreted as preliminary evidence of feasibility, practicality, and initial learning association rather than conclusive proof of full causal efficacy.

2.2 Procedure Development

Procedure: SOBATKU Digital Media development is implemented through the five stages of the ADDIE model. At the Analysis stage, the team conducts a needs analysis through observation and interviews, beginning with the teacher or companion at UPTD Services Disability Regency Sidoarjo. The analysis also includes characteristics of children with intellectual disabilities, as well as relevant body boundaries and privacy considerations for developing learning media. This stage serves as the basis for determining needed content, language, visual form, and level of media interactivity.

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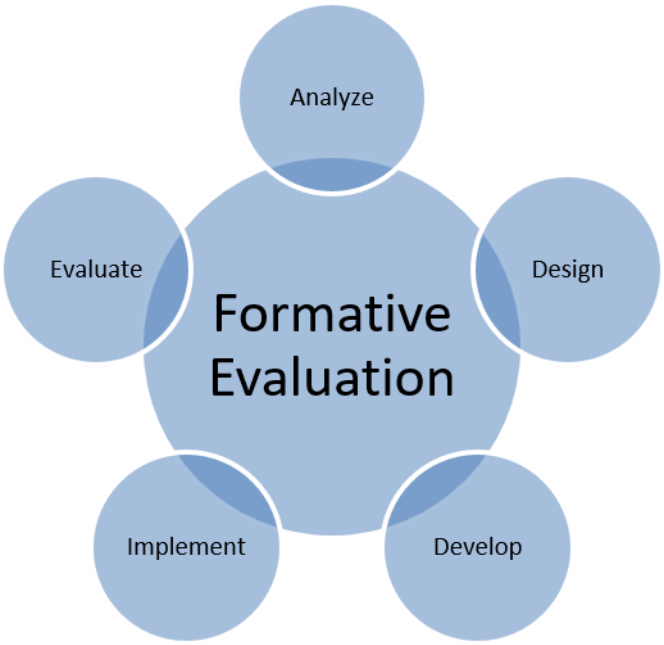


Figure 1. ADDIE Development Model (Branch, 2009)

The design stage involves compiling the Media Content Outline (GBIM), script story or Social Story script, and a storyboard that describes design of every media display. At this stage, we also design instruments to evaluate the media's feasibility, practicality, implementation, and effectiveness. The media structure is arranged to gradually move from character introductions, boundary recognition, differentiation between appropriate and inappropriate touches , steps for self-protection, and finally to exercises or quiz-based activities.

Development stage is carried out by realizing storyboards and scripts into a complete digital media product. Development covers creating illustrations, audio narration, and features appropriate for children with intellectual disabilities. Products were developed and then validated by material and media experts. Validators also assessed the instrument to ensure the construct, language, content, measurement technique, and feasibility of use were suitable. Validation results informed revisions before product was implemented in the study.

Implementation stage is carried out after the product is deemed worthy. SOBATKU Digital Media was implemented with six children with intellectual disability using a one-group pretest-posttest design. This stage involves measurement at the beginning through pretest, learning using SOBATKU media, and measurement at the end through posttest. In addition, teacher or companion evaluates the media's practicality and observes the learning implementation process.

Evaluation stage is carried out in two forms: formative and summative evaluation. Formative evaluation is done at every stage of development to identify shortcomings and repair the product sustainably. Summative evaluation is conducted at the end of the study by analyzing data on the feasibility, practicality, and effectiveness of SOBATKU Digital Media.

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2.3 Place and Subject Study

This study was implemented at the Service UPTD Disability Regency Sidoarjo for two months, from August to September 2026, with implementation stages including preparation and needs analysis, product development and validation, media implementation, and data collection and analysis.

Subject study consists of on six child with disability intellectual category light 8–12 years old registered as participant educate or recipient services at UPTD Services Disability Regency Sidoarjo, which was chosen in a way purposive with consider criteria that child capable communicate in a way simple, follow instructions One steps, responding to visual stimuli, and follow learning using digital media with assistance. In addition, this research involved one expert in the material, two media experts, and one Special Educator as product validators; two experts as validators of eligibility instrument; and teachers or companions who served as respondents for questionnaire practicality and as observers of implementation.

2.4 Techniques and Instruments Data Collection

Data collection was carried out through questionnaires, tests, and observations. The questionnaire was used to evaluate experts' views on media suitability and teachers' responses, as well as the media's practicality. Tests were used to measure children's understanding of body boundaries and privacy through pretests and posttests based on visual scenarios. Meanwhile, observations were conducted during the learning process to assess the implementation and use of SOBATKU Digital Media.

The research instruments included validation sheets for the material expert, media expert, and Special Education expert; a practicality questionnaire; the pretest–posttest understanding test; and a learning-implementation observation sheet. The instrument-feasibility assessment used a 1–4 scale with the original categories “Feasible,” “Fairly Feasible,” “Less Feasible,” and “Not Feasible.” The material-expert, media-expert, and Special Education expert validation forms used a 1–4 scale with the original categories “Good,” “Quite Good,” “Less Good,” and “Very Poor.” The practicality questionnaire used the categories “Practical,” “Fairly Practical,” “Less Practical,” and “Not Practical,” while the learning-implementation observation sheet used “Feasible,” “Fairly Appropriate,” “Less Appropriate,” and “Not Appropriate.”

The understanding test used five multiple-choice items based on visual scenarios. Each correct answer received 1 point, and each incorrect answer received 0 points, giving a maximum raw score of 5. Scores were converted to a 0–100 scale by dividing the number of correct answers by five and multiplying by 100. Assistance during responses (independent, verbal, gestural, or physical) was documented separately as descriptive information about response independence and was not included in the test-score calculation. The pretest and posttest data reported in the results are based on the same five-item scoring rule.

2.5 Validity Instruments and Products

Validity instruments and products are determined through *expert judgment.* Assessment expert material covers aspect suitability material, truth concept, language, presentation, content material, value educational, and eligibility general; assessment media

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experts include aspect appearance, visual content, navigation, function learning, suitability users, and eligibility general; whereas evaluation Special Educators include aspect suitability characteristics children and aspects SPECIAL EDUCATOR learning. Assessment results are expressed as a percentage based on scores obtained compared to the maximum score. Instruments and products are rated as good/decent and used without revision if they achieve a minimum percentage of 90%, and as good/decent and used with minor revisions if they fall in the 80–89% range, according to guidelines interpreted on each sheet validation. Research did not use formal validity and reliability tests in separate analyses because experts determined eligibility, and the instrument's consistency was assessed through clear instructions and measurability indicators.

Data collection relied on three validated instrument packages:

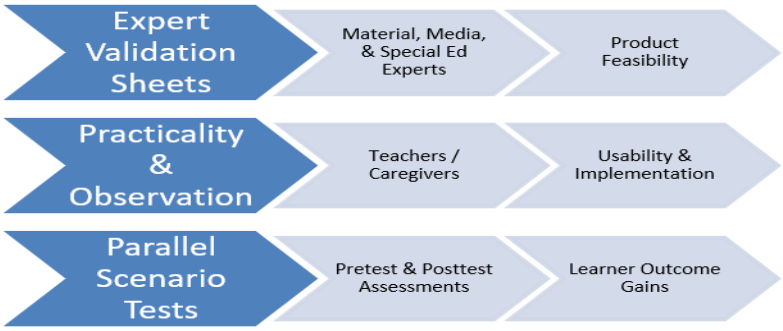


Figure 2. Data collection relied on three validated instruments

Development & Validation Protocol

1. Expert Validation Sheets: Drafted across specific evaluation dimensions (relevance, conceptual accuracy, language, accessibility, and visual usability). Two measurement expert validators evaluated the instruments using a 4-point Likert scale (1 = Poor to 4 = Excellent), achieving an overall instrument validity score of 98%.
2. Product Validation: Evaluated by one material expert, two media experts, and one special educator. Revisions were made based on qualitative feedback on text size, visual contrast, audio pacing, and button navigation before implementation.
3. Practicality and Observation Instruments: A 15-item practicality questionnaire (4-point scale) completed by teachers/caregivers and a structured observation checklist (scale 1–4) used during sessions to evaluate implementation fidelity

2.6 Data Analysis Techniques

Media suitability data from expert materials and media experts, practical data from the teacher or companion, and implementation data were analyzed using the percentage used compared with ideal score ($P = \Sigma x / \Sigma xi \times 100\%$). Interpretation percentages refer to adapted criteria from Akbar (2013): 90–100% feasible (used without revision), 80–89% sufficient (worthy; a little revision), 65–79% less worthy (lots of revision), and 55–64% very poor worthy. SOBATKU Digital Media is declared feasible and practical if it receives a minimum percentage in the "Sufficient " category (“Eligible") (≥ 80%).

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Media effectiveness is analyzed based on changes in pretest and posttest scores. Because the sample size is small (n=6), difference scores were analyzed using the Wilcoxon Signed-Rank Test, a nonparametric test for paired data that does not require normally distributed data. In addition to the difference test, an increase in understanding is also analyzed using N-Gain to determine the level of improvement from pretest to posttest. The N-Gain criterion used refers to Hake (1999):≥0.70 is high, 0.30–<0.70 is moderate, and <0.30 is low. SOBATKU Digital Media is considered effective if there is significant improvement between the posttest and pretest scores using the Wilcoxon Test, and the minimum group N-Gain value falls within the current category.

2.7 Ethics and Protection of Participants

This study involved a child with intellectual disability and used related materials , with attention to body boundaries and privacy; the research followed ethical protocols for participant protection. The research was conducted after obtaining institutional permission, along with written informed consent from parents or guardians and assent from child, using simple language and accessible materials. Children have right to refuse or stop participation at any time. All sessions are accompanied by a known companion, and the session stops if child shows signs of distress. Instrument: Do not ask about personal experiences directly; use scenarios and images. Personal data such as name, photo, and recording are saved safely and in a limited way; after learning with sensitive material, the child is given chance for follow-up sessions, calming, or debriefing.

3.1. Results

3.1.1. Results of SOBATKU Digital Media Development

This study produced a product in the form of SOBATKU Digital Media (Social Story of My Body and Privacy Limits), which was designed as a digital learning medium for children with intellectual disability. Media development was carried out using the ADDIE model, consisting of five stages: *Analysis*, *Design*, *Development*, *Implementation*, and *Evaluation*. Results from each stage show that the media is organized around children's learning needs, the subject's cognitive characteristics, and the need for material on body boundaries and privacy.

At the analysis stage, we found that children with intellectual disabilities need concrete, simple, visual, and actionable learning, with repetition. The results showed that children need to understand body parts, private and public situations, appropriate and inappropriate touch, and steps to protect themselves; this content should be delivered through more structured media. Therefore, SOBATKU Digital Media was designed with blend of simple visual illustrations, audio narration, story-based content, interactive exercises, and positive feedback.

At the design stage, we developed structured media content consisting of an opening page, main menu, character introductions, stories about body boundaries, permissible and unacceptable touch , self-protection steps, practice or quizzes, and a cover page. The main content includes introduction to personal boundaries, understanding privacy, differentiating

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appropriate and inappropriate situations based on ability, rejecting or avoiding situations that make you uncomfortable, and recognizing trusted adults as places to seek help.

Stage development produces SOBATKU Digital Media, which can be used on digital devices and has a simple, easy-to-operate interface. All materials are delivered through social media channels and supported by illustrations and narratives. The media also includes exercise-based pictures to help children identify specific situations and select appropriate responses. Product development was further revised based on validator input before being used in the study's implementation stage.

3.1.2. Validation Results Instrument Evaluation Eligibility Instrument Study

Instrument validation covered the material-expert, media-expert, special-education, practicality, pretest–posttest, and learning-implementation instruments. The combined percentages reported for the six instruments ranged from 90.00% to 97.50%. These figures represent judgments of the research instruments and should not be interpreted as the validation percentages of the SOBATKU product itself.

The evaluation shows that instrument validation materials, media experts, Special Educators, and practicality are relevant to objective research, systematic, and easy for the validator to understand. In contrast, instrument test understanding and observation sheets for implementation learning can clearly and objectively measure students' understanding and implementation learning. Overall, the validation results show that the developed research instruments meet the eligibility criteria and can be used as data-collection tools during the implementation and testing of SOBATKU Digital Media products.

3.1.3. SOBATKU Digital Media Validation Results

Table 2. Summary of Instrument and Product Validation

Assessment	Validator(s) or source	Assessment dimensions	Reported result	Revision or follow-up
Research instruments	Expert reviewers; the exact allocation of reviewers to instruments should be confirmed	Relevance, accuracy, coverage, clarity, and structure	98% overall	Reported as suitable for use without revision; retain individual comments if available.
Material validation	Material expert(s); number to be confirmed	Content suitability, conceptual accuracy, language, learning objectives, and suitability for children	94%	Refine material in accordance with documented validator feedback
Media validation	Media expert(s); number to be confirmed	Appearance, illustrations, navigation, interactivity, readability, audio, and usability	94%	Adjust illustrations, font size, instructions, screen layout, and audio settings.
Special education suitability	Special educator(s); number and score to be confirmed	Suitability for children's characteristics and special education learning principles	Not separately reported in the available results	Insert the actual score and documented recommendations from the validation sheet.
Practicality assessment	Teacher(s) or companion(s) who used the media	Ease of use, clarity of instructions, operational convenience, efficiency, language, attractiveness, benefits, and flexibility	95%	Report any specific improvements suggested by respondents
Learning implementation	Observation during the intervention	Implementation of planned learning activities	96%	Report deviations from the planned procedure, if any

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The material expert's validation produced a score of 79 out of 84, equivalent to 94.05%. The result indicates a high assessment of the material's relevance to learning objectives, conceptual accuracy, language, and suitability for children with intellectual disabilities. The validator's suggestion to add audio narration was recorded as input for product refinement.

The two media experts each awarded 46 out of 48 points, for a combined score of 92 out of 96 (95.83%). The assessment covered appearance, illustrations, navigation, interactivity, readability, audio, and usability. Suggestions included adding the SOBATKU title to the opening screen, aligning question text to the left, adding the UNESA logo, and including the developer profile.

3.1.4. Practical Results of Media

The practicality of SOBATKU Digital Media is based on results of a questionnaire given to the teacher or companion after using media in the learning process. Practicality evaluation covers convenience of use, clarity of instructions, ease of operation for teachers and students with intellectual disabilities, efficiency, linguistic appeal, benefits, flexibility, and overall practicality.

Based on teacher and companion assessments, SOBATKU Digital Media received a practicality score of 94 out of 96 (97.92%). The results indicate that the media was considered easy to use and operate, with clear instructions and relevant support for teaching body boundaries and privacy. The assessment also noted areas for improvement, including time efficiency and language presentation.

3.1.5. Special Educator results

Validation by a SPECIAL EDUCATOR (Outdoor Education) expert (usually) is done to evaluate the suitability of SOBATKU Digital Media for children with intellectual disabilities, as well as its alignment with Special Education Learning Principles. Assessment validation covers two aspects, namely suitability for children (including suitability of language, fulfillment of visual needs through images/illustrations, support for understanding children, and suitability for children at their developmental level) and aspects of Special Educator learning (includes support for understanding concrete through social stories, use of illustrations for help understanding, understanding body boundaries and privacy in a gradual way, and support skills for children to protect themselves).

Based on the Special Educator validation sheet, SOBATKU Digital Media obtained 30 out of 32 points, equivalent to 93.75%. The score indicates that the media was assessed positively in relation to children's language abilities, visual needs, developmental level, and the use of Social Stories to present body boundaries and privacy concretely and gradually. The validation form itself recorded 93%; the percentage calculated from the item scores is 93.75%.

3.1.6. Pretest and Posttest Results: Children's Understanding

The effectiveness of SOBATKU Digital Media was examined using a one-group pretest–posttest design involving six children with intellectual disabilities. The five-item

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multiple-choice test assessed identification of private body parts, differentiation between safe and unsafe touch, refusal of unsafe touch, identification of a trusted adult to report to, and privacy-protective behavior. Each correct response was scored 1 and each incorrect response 0; the score was then converted to a 0–100 scale. Assistance levels were recorded separately and were not added to the test score.

Table 3. Results scores of each subject

Subject	Pretest Score	Posttest Score	Difference
NR	40	100	60
FA	80	100	20
RR	80	100	20
RM	80	100	20
FQ	60	80	20
DV	40	80	40
Average	63.33	93.33	30.00

The mean pretest score was 63.33, and the mean posttest score was 93.33, representing an average increase of 30 points. All six participants scored higher on the posttest than on the pretest. These values are based on the five-item instrument and the six participants reported in the thesis results.

3.1.7. Implementation Results Learning with Media

Implementation learning with SOBATKU Digital Media was obtained by observing results during the ongoing learning process. Observations were conducted to determine how far along the planned learning stages are and whether they can be implemented using SOBATKU Digital Media.

The learning-implementation instrument contained 13 indicators, with a maximum score of 52. Each of the two observation sheets recorded 51 out of 52 points, equivalent to 98.08%; the combined score was 102 out of 104, also equivalent to 98.08%. The results indicate that the planned learning stages were implemented well, while time allocation remained an area for attention.

The high implementation percentage shows that SOBATKU Digital Media can support the learning process systematically and help students follow every stage of the learning activity. Thus, SOBATKU Digital Media is implemented well in the learning process and supports body boundaries and privacy for children with intellectual disabilities.

3.1.8. Results of the Wilcoxon Signed Rank Test

To determine significant differences between pretest and posttest scores, data were analyzed using the Wilcoxon Signed Rank Test. This test was used because the study sample was relatively small and data came from two paired measurements. The results show a significant difference ($p = 0.031$). Because the significance level is smaller than 0.05, it can be concluded that children's understanding scores differ significantly before and after using SOBATKU Digital Media. The results showed a significant difference between pretest and posttest results. Thus, using SOBATKU Digital Media significantly improved understanding of body boundaries and privacy.

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The Wilcoxon Signed-Rank Test was used to compare paired pretest and posttest scores for the six participants. The exact two-sided p-value was 0.03125, below the 0.05 significance level. Thus, the pretest and posttest scores differed significantly in this group. Because the design did not include a control group, this result should be interpreted as evidence of an observed improvement rather than definitive proof that the media alone caused the change.

3.1.9. N-Gain Analysis Results

N-Gain was calculated for each participant using g = (posttest − pretest)/(100 − pretest), and the individual values were then averaged. The mean individual N-Gain was 0.861 (86.11%), which falls in the high category using the stated criterion of g ≥ 0.70. Four participants had high N-Gain values, and two had moderate values. The mean of individual N-Gain values differs from N-Gain calculated from the group mean scores.

3.1.10. Summary of Research Results

Across the development stages, SOBATKU Digital Media was developed using the ADDIE model and assessed through instrument validation, product validation, practicality, implementation, and pretest–posttest measurement. The material expert score was 94.05%, the media expert score was 95.83%, and the Special Educator score was 93.75%. Practicality was 97.92%, while learning implementation was 98.08%. The six participants' mean scores increased from 63.33 at pretest to 93.33 at posttest; the Wilcoxon exact two-sided p-value was 0.03125 and mean individual N-Gain was 0.861. These findings indicate potential for SOBATKU in the studied group, subject to the limitations of the small sample and one-group design.

3.2 Discussion

a. Development of SOBATKU Digital Media Based on Social Stories

The findings indicate that SOBATKU Digital Media is a potentially useful learning medium to support children with intellectual disabilities in understanding body boundaries and privacy. The media was developed through the ADDIE model and evaluated for feasibility, practicality, implementation, and changes in test scores. The findings should be interpreted in line with the actual five-item scoring procedure, the separate descriptive record of assistance, the six participants, and the one-group pretest–posttest design. The results show that SOBATKU Digital Media is an effective learning medium designed to help children with intellectual disabilities understand body boundaries and privacy. Media development uses the ADDIE model, which includes Analysis, Design, Development, Implementation, and Evaluation stages. Selecting this model supports systematic development, starting with needs identification, material and appearance design, product development, implementation, and evaluation and revision. Approach: This is relevant to characteristics study development because the product is not only produced but also validated through practicality and understanding tests.

The development of SOBATKU is based on needs of children with intellectual disabilities, who need presentation materials that are concrete, visual, simple, structured, and

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repetitive. These characteristics are important because children with intellectual disabilities may have difficulty understanding abstract concepts, remembering information, and generalizing learning to new situations. These findings align with research by Barman and Jena [4], which shows that interactive, video-based instruction delivered repetitively can improve performance and social skills in children with intellectual disabilities. Thus, the use of visual elements, audio, interactivity, and repetition in SOBATKU has strong foundation in previous studies.

The characteristics of SOBATKU also align with findings by Altindağ Kumaş [5] on using digital stories with children with intellectual disability. Research shows that, when designed appropriately, digital stories can increase children's understanding and involvement in learning. In this context, the story is used not just for entertainment, but as a structured way to deliver information that helps the child understand connection between a situation, the behavior that occurs, and the appropriate response. Therefore, integrating stories, illustrations, audio, and exercises in SOBATKU makes learning more concrete than delivering material verbally only.

b. Social Story Compliance with Child Characteristics

Using the Social Story approach in SOBATKU is an important way to support children with intellectual disabilities. Social stories deliver material through familiar situations children experience, using simple language, consistent illustrations, and structured flow. In SOBATKU, the principle is implemented through story about body boundaries: what is permissible and what is not; how to refuse touch; stay away; report; and recognize trusted adults. Media not only provide information but also help children understand social situations from a more concrete perspective .

This indicates that Social Stories can enhance social skills, adaptive behavior, and rule-following abilities in children with special needs. These findings align with research by Bae and Park [13] and Akgün-Giray and Ergenekon [14], which demonstrates that Social Stories can support social skills; similarly, Piper et al. [15] found that this approach improves the social skills of children with intellectual disabilities in classroom settings, specifically regarding rule-following and appropriate interactions with teachers and peers. Such findings reinforce the idea that social stories help children comprehend abstract social situations through concrete, structured information. However, SOBATKU possesses unique characteristics, as it adapts Social Stories principles to address body boundaries and privacy, tailoring the content to the cognitive and communication abilities of children with intellectual disabilities. While SOBATKU does not claim to meet every formal criterion of Social Stories, it flexibly applies the core principles to align with learning objectives and the children's need for self-protection.

c. Digital Media as Supporters Understanding Body Boundaries and Privacy

Digital media in SOBATKU offers several benefits for learning among children with intellectual disabilities by presenting materials through a combination of simple text, illustrations, audio, video, and interactive activities, making information more concrete, engaging, and easier to understand. Digital media also lets children repeat learning materials

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as needed, which helps reinforce understanding and skills. This aligns with AlRawi and AlKahtani [16], who found that digital technology can support the academic, social, and behavioral development of children with intellectual disabilities, and with Barman and Jena [4], who reported that interactive video-based learning can improve social skills through structured, repeated practice. In addition, the use of storytelling in SOBATKU is supported by Altindağ Kumaş [5], who found that digital storytelling can improve learning skills among children with intellectual disabilities through the integration of text, images, and audio. Thus, the digitalization of SOBATKU is not merely a shift from printed to digital materials, but enables the integration of narratives, visualizations, audio, repetition, and interactive activities into a learning experience that meets the needs of children with intellectual disabilities. Moreover, media does not replace teachers; it supports them by enabling more consistent, systematic, and engaging delivery of learning materials.

d. Learning Body Boundaries and Privacy as Part of Protection Self

Learning about body boundaries and privacy has strong relevance for children with intellectual disability because this group has higher social risk vulnerability. Children may have difficulty recognizing dangerous situations, understanding others' intentions, setting interpersonal boundaries, and choosing the right response. Therefore, learning should not only introduce the names of body parts, but also develop ability to differentiate situations, understand what is right and wrong, refuse inappropriate treatment, and seek help.

The findings of this study are consistent with previous research indicating that children with intellectual disabilities are more vulnerable to various forms of abuse and therefore require safety education that is adapted to their characteristics and learning needs. Recent studies have shown that children with intellectual disabilities may experience difficulties in recognizing dangerous situations, understanding personal boundaries, refusing unwanted actions, and selecting appropriate responses when facing potentially unsafe situations. Warraitch et al. [17] demonstrated that systematic education can improve knowledge and skills related to abuse prevention among children with intellectual disabilities. This finding is supported by Celik. [18], whose systematic review highlighted that relationship and sexuality education for individuals with intellectual disabilities should address personal safety, privacy, recognition of inappropriate behavior, and decision-making skills. More recent research has also emphasized that violence-prevention programs for children with intellectual and developmental disabilities should employ adaptive, concrete, and developmentally appropriate approaches so that knowledge can be applied to real-life situations. Therefore, safety education should not be limited to providing information; it should also develop practical skills for recognizing risks and choosing appropriate responses. Based on these findings, the SOBATKU material is relevant to safety interventions for children with intellectual disabilities because it emphasizes recognizing potentially dangerous situations and choosing appropriate responses through the concepts of “refuse, stay away, and report.” These concepts teach children to refuse unwanted actions (refuse), move away from situations or individuals that may pose a risk (stay away), and seek help by reporting the incident to a trusted adult (report). This approach is consistent with recent evidence emphasizing the importance of developing self-protection skills, decision-making

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abilities, and help-seeking behaviors in safety education for children with intellectual disabilities. Therefore, the SOBATKU material is not only relevant for increasing children's knowledge of personal safety but may also support the development of functional skills that enable them to recognize risks and respond appropriately when encountering unsafe situations.

e. Use of Concrete and Visual Media in Sexuality Education

The development of SOBATKU also strengthens the importance of concrete and visual media in teaching body boundaries, privacy, and sexuality to children with intellectual disability. Concepts like privacy, consent, appropriate touch, and inappropriate situations can feel relative and abstract for some children. Presenting material through pictures and scenarios helps children connect concepts to observable situations and choose appropriate responses.

The findings of this study are consistent with previous research demonstrating the effectiveness of concrete, interactive, and developmentally appropriate media in sexuality education for students with intellectual disabilities. Luthfiah et al. [19] found that the Busy Box Sex Education Module was effective in increasing sexuality knowledge among students with mild intellectual disabilities, suggesting that concrete, engaging, and interactive learning media can facilitate understanding of sexuality and self-protection concepts. This finding is supported by Alamdarloo et al. [20], who reported that sexuality education interventions can improve knowledge among individuals with intellectual disabilities regarding body parts, public and private areas, puberty, social relationships, sexual boundaries, and self-protection. Similarly, Pérez-Curiel et al., [21]. These findings support the principles underlying SOBATKU, although the learning media differ. While the Busy Box emphasizes direct manipulation of concrete objects, SOBATKU integrates social stories with visual, audio, and digital activities to facilitate learning. Both approaches demonstrate that sensitive and abstract sexuality-related concepts can be made more accessible when they are presented through concrete, visual, interactive, and multimodal representations that are adapted to the learning characteristics and needs of students with intellectual disabilities. Therefore, SOBATKU's effectiveness may be attributed not only to the sexuality content itself but also to its accessible, engaging format, which helps students understand and apply concepts related to sexuality and self-protection more meaningfully.

f. Improvement in Understanding After Media Usage

The results show higher posttest scores than pretest scores after using SOBATKU Digital Media, indicating that the medium positively contributes to children's understanding of body boundaries and privacy. This improved understanding is evident in the children's ability to recognize private body parts, distinguish between private and public situations, identify appropriate and inappropriate touch, determine how to respond, such as by refusing or moving away when faced with inappropriate situations, and identify trusted adults from whom they can seek help. These indicators align with the operational definitions of body boundary and privacy understanding used in this study. The findings are consistent with Beccaluva et al. [22], who demonstrated that digital media combining visual and auditory

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stimuli can support learning and memory processes in children with intellectual disabilities, and with Alvarenga et al. [23], who indicated that various educational interventions, including technology-based approaches, have the potential to support the development of learning abilities in children and adolescents with intellectual disabilities. These findings are particularly relevant to the need for self-protection education, as Hole et al. [24] emphasized the importance of access to sexual health information for individuals with intellectual disabilities, including information on safety and decision-making, while research on sexual health education using the Mastery Learning Model has shown increased knowledge regarding sexual development and health among children with intellectual disabilities following educational interventions.

Furthermore, Kurt et al. [25] on developing sexuality education guidelines and activity kits for children with mild intellectual disabilities highlight the importance of using simple language, visual media, interactive activities, and contextual scenarios when delivering sexuality education material. Thus, the increase in posttest scores in this study can be understood as a result of the alignment between the characteristics of SOBATKU Digital Media and the learning needs of children with intellectual disabilities, specifically, the need for learning that is concrete, visual, interactive, repetitive, and contextual. SOBATKU Digital Media serves not only as a medium for conveying information but also as a tool that helps children build an understanding of body boundaries, privacy, safe behavior, responses to inappropriate touch, and strategies for seeking help from trusted adults.

If the Wilcoxon test results show $p < 0.05$, then improvement in pretest and posttest scores can be stated as statistically significant. If N-Gain value is in the current or high category, the findings show that understanding improved after using SOBATKU. However, the interpretation must still consider the one-group pretest-posttest design and the small sample size of only six children. With this design, the increase in scores cannot be considered proof of complete causality, as it may reflect other factors, such as effect of repeated testing or development during the study. The proposal also explicitly limits its claim of effectiveness as indication of improved understanding after media use. The findings should be interpreted in light of the limitations of a one-group pretest–posttest design and a sample of six children. The increase in scores cannot be treated as definitive causal proof that excludes other influences, such as familiarity with the test or development during the study. In addition, the five-item test measures only the specified indicators. Assistance levels are reported separately from correct/incorrect scores, so an increase in test scores should not automatically be interpreted as full independence for every participant.

g. Contribution Study to Study Previously

Overall, this research strengthens previous findings about the importance of concrete, visual, interactive, and repetitive learning for children with intellectual disability. Barman and Jena [4] provide evidence for the benefits of interactive video learning and show the potential of digital storytelling to increase conceptual understanding, while Camilleri et al. [7] show the benefits of digitalizing Social Stories to support implementation by parents and practitioners. These findings provide a theoretical and empirical basis for using digital media in this study.

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This study focuses on implementation in a more context-specific way, namely understanding body boundaries and privacy for children with intellectual disabilities. Previous research on Social Stories has focused more on social skills, whereas studies on sexuality education and self-protection generally use approach training or concrete media. SOBATKU integrates a second approach through digital media based on Social Stories, presenting material on body ownership, privacy, appropriate and inappropriate touch, conformity, rejection, self-protection, trusted adult networks, and reporting. Thus, this research expands the use of Social Stories from learning social skills to learning safety and self-protection. Findings also offer practical implications for teachers and companions of children with intellectual disabilities. Structured media can help teachers deliver sensitive material more consistently, while images, audio, and exercises allow children to study in accordance with their information-processing characteristics. However, media use must be placed within a broader protection system. Body boundary education is not intended to provide complete protection for children, but to strengthen their knowledge and skills in recognizing situations and seeking help. The approach aligns with findings that safety education needs adult support and a safe environment.

Thus, this discussion shows that SOBATKU Digital Media development is grounded in strong theoretical and empirical evidence. It combines Social Stories, digital media, concrete visuals, audio, interactive practice, and adult supervision, aligned with the needs of children with intellectual disabilities. Previous research supports using visual, interactive media to increase learning, Social Stories to develop social skills, and concrete media to increase understanding of sexual education and self-safety. This study integrates these approaches in a unique way to develop understanding of body boundaries and privacy in children with intellectual disability.

4. CONCLUSION

This study shows that SOBATKU Digital Media, developed using the Social Story approach and the ADDIE model, is a relevant potential learning alternative for supporting children's understanding of body boundaries and privacy. In the six participants, the mean score increased from 63.33 at pretest to 93.33 at posttest, with a Wilcoxon exact two-sided p-value of 0.03125 and a mean individual N-Gain of 0.861. The results support further use and evaluation of the media, while recognizing the limits of the small sample, five-item test, and one-group design.

ACKNOWLEDGEMENTS

The authors express sincere gratitude to Universitas Negeri Surabaya for providing academic support and research facilities throughout this study. The authors also thank UPTD Services Disability Regency Sidoarjo for granting permission and providing support during the needs analysis, development, validation, and implementation of the SOBATKU digital learning media. Special thanks are addressed to the teachers, caregivers, and children who participated in the research and contributed valuable information and experiences throughout the study. The authors are also grateful to the material and media experts for their constructive feedback and recommendations, which helped improve the SOBATKU media.

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Finally, the authors appreciate all parties who provided assistance, encouragement, and support in completing this research.

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