AJEB
journal.amca2012.org

AMCA Journal of Education & Behavioral Change
e-ISSN 2776-1185
2025, Vol 5(2), 70-86
doi: 10.51773/ajeb.v5i2.437

A Curriculum Model Design for Enhancing Digital Literacy Among Junior High School Students to Prevent Cyberbullying

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Abstract: The increasing cases of cyberbullying among adolescents highlight the urgency of strengthening digital literacy from an early stage of education. This study aims to design and evaluate an integrated and contextual digital literacy curriculum model for junior high school students to enhance their understanding and preventive attitudes toward cyberbullying. This research employed a Research and Development (R&D) approach using the ADDIE model, which includes analysis, design, development, implementation, and evaluation stages. The study involved 84 eighth-grade students, and data were collected through questionnaires, tests, observations, and documentation, and analyzed using both qualitative and quantitative approaches. The findings revealed that students initially had limited understanding of digital ethics, online safety, and cyberbullying. The developed curriculum model was validated by four experts and categorized as very feasible. The implementation results showed a high level of practicality, with an average implementation rate of approximately 90%. Student responses were highly positive, with 94.2% indicating agreement with the learning process. Furthermore, the effectiveness of the model was demonstrated by a significant improvement in students' digital literacy and cyberbullying understanding. The mean score increased from 61.6 in the pretest to 84.0 in the posttest, with a gain of 22.4 points. The paired sample t-test indicated a significant difference between pretest and posttest scores ($t(83) = 18.72$, $p < 0.05$). These results confirm that the developed curriculum model is feasible, practical, and effective in enhancing students' digital literacy and preventing cyberbullying. Therefore, the model can be integrated into school learning to support the development of responsible and ethical digital citizens.

Keywords: Digital Literacy, Cyberbullying, Curriculum, Junior High School Students, Digital Character Education

1 Introduction

Social facts indicate that the issue of cyberbullying is increasingly prevalent among teenagers, especially junior high school students. Data from UNICEF (2020) states that one in three adolescents worldwide has experienced cyberbullying, while data from the Ministry of Women's Empowerment and Child Protection (KPPPA) in Indonesia records a continuous yearly increase in such cases. This phenomenon shows that many teenagers still lack understanding of ethical interaction in the digital world and are unable to recognize and address acts of cyberbullying they experience or witness. (UNICEF, 2020)

Another fact supporting the importance of this research is the reality that most teachers feel they lack systematic and relevant guidelines to teach digital literacy to students. The majority of teachers (89%) revealed that they do not have appropriate teaching guides, making it difficult to deliver the material effectively and contextually. Under these circumstances, it is crucial for education to provide an integrated and structured curriculum so that digital literacy can be taught comprehensively and capable of shaping the character of responsible digital citizens.

Literature shows that although there have been many studies on digital literacy and cyberbullying prevention, there is still a lack of development of an in-

tegrated and contextual curriculum model at the junior high school level. According to (Ng, 2012) and (Rheingold, 2012), digital literacy should comprehensively cover technical, social, and ethical aspects to form responsible digital citizens. However, previous research has not fully developed or tested a curriculum that specifically integrates these aspects within the context of character education and cyberbullying prevention in junior high schools. Therefore, this study is important to bridge that gap by designing and testing a comprehensive and contextual curriculum model that can meet the needs of relevant and effective digital literacy education in the junior high school environment.

Based on the existing literature and social facts, the main assumption in this study is that the development of an integrated and contextual digital literacy curriculum model can significantly improve students' understanding and attitudes toward digital ethics as well as their skills in dealing with cyberbullying. (Livingstone et al., 2021) Beyond merely increasing theoretical knowledge, this curriculum is believed to be capable of shaping students' character as more responsible, empathetic, and critical digital users, thereby reducing their risk of becoming victims or perpetrators of cyberbullying. This argument differs from conventional approaches that focus primarily on technical skill training, as this study emphasizes the importance of integrating social and ethical aspects into digital literacy teaching as an effective step toward building a safe and ethical digital culture within the school environment.

The logical reasons for the importance of this research are as follows:

1. As a strategic step to fill the research gap in developing a contextual and practical digital literacy curriculum model for junior high schools (SMP), especially within the cultural and educational system context of Indonesia.
2. To provide a framework that teachers and educational units can use to effectively implement digital literacy education, including in preventing cyberbullying.
3. To provide empirical evidence on the effectiveness of the developed curriculum model, which can serve as a reference for the development of digital character education policies at both national and regional levels.
4. To help address the increasing cases of cyberbullying and the low understanding of digital ethics among junior high school students by providing systematic and practical solutions.

Therefore, this research is important to ensure that efforts in digital literacy education are truly effective in shaping responsible digital citizens who can face the challenges of the digital world critically and ethically.

2 THEORETICAL FREMWORK

Several theories in this study are used to design, develop, and test the effectiveness of a digital literacy curriculum model that not only includes technical skills aspects but also pays attention to social and ethical dimensions, and can be implemented contextually in the junior high school environment. More than just developing theory, this study aims to produce an educational product in the form of a module that can be practically used in Civics Education (PPKn) or local content subjects, thereby enhancing students' understanding, empathy, and preventive attitudes toward cyberbullying in a practical and sustainable manner. Additionally, this paper aims to provide a comprehensive overview of the gaps in knowledge and awareness of digital literacy among students and teachers, as well as offer practical solutions oriented towards building the character of smart and responsible digital citizens in the era of digital globalization (Livingstone et al., 2021).

In today's digital era, digital literacy has become an urgent need for the younger generation, especially to build responsible character and address various challenges arising in the virtual world, such as cyberbullying and the spread of negative content. Several studies emphasize that mastering technical skills alone is insufficient; ethical and social aspects must also be an integral part of digital literacy to shape critical and empathetic digital citizens. On the other hand, there is a debate regarding the effectiveness of conventional curriculum models versus integrated and contextual models in raising awareness and preventive attitudes toward cyberbullying in schools. This study focuses on three main issues under debate: first, how effective the development of a context-based digital literacy curriculum is in enhancing students' understanding and attitudes; second, how the integration of social and ethical aspects within the curriculum can shape the character of digital citizens; and third, the strategies for implementing this curriculum in the learning context of junior high schools (Selwyn, 2012).

Development of context-based digital literacy curriculum is effective in improving students' understanding and attitudes toward digital issues such as cyberbullying and social media ethics. Several studies show that an integrated and contextual curriculum model

can provide more relevant and applicable learning experiences, enabling students not only to grasp the theory but also to apply the knowledge in daily life. For example, research by (Selwyn, 2012) implies that teaching digital literacy in a contextual way based on real experiences can increase students' critical awareness and responsibility. On the other hand, there is an argument that highly contextualized curriculum development customized to specific environments may have limitations in standardization and generalization, thus its effectiveness still needs to be tested broadly and sustainably. Based on the literature, it is important to further examine how much influence this context-based curriculum model has on improving basic competencies and positive attitudes of students in using technology healthily and responsibly.

The next theory regarding the development of a digital literacy curriculum focuses on the extent to which the integration of social and ethical aspects can shape the character of responsible and empathetic digital citizens. Several researchers emphasize that digital literacy education should not only concentrate on technical skills but must also include learning about media ethics and social responsibility in the digital world. This approach is considered crucial in building positive character traits such as empathy, recognition of others' rights, and awareness of the consequences of online behavior. (Brenner, 2015) even states that developing digital empathy is a key factor in preventing cyberbullying and other negative behaviors on social media.

On the other hand, there are challenges in effectively implementing social and ethical aspects because perceptions and social values vary across different cultural environments and schools. Moreover, there is concern that without proper integration, teaching social and ethical aspects can become abstract and fail to influence students' actual behavior. Therefore, researchers in this study suggest the need to develop a curriculum that not only covers theoretical knowledge but also includes practical experiences and habituation of ethical values capable of shaping digital citizens who are critical, empathetic, and responsible.(Brenner, 2015).

The theory on the strategy for implementing a digital literacy curriculum in junior high schools emphasizes the importance of systematic integration through contextual and participatory approaches to ensure effectiveness in the school environment. This approach involves training and mentoring teachers in the use of the curriculum module, along with the application of active learning methods such as discussions, simulations, and case studies that are relevant to students' daily lives. Researchers also stress that collaboration among schools, parents, and the community is crucial in supporting successful curriculum implementation, as it helps reinforce the messages and values taught in the classroom.

Additionally, challenges arise from the diversity of resources and teacher capacities in effectively delivering digital literacy content, necessitating ongoing professional development and training. Some studies also propose using digital platforms and technology-based learning media to facilitate the execution and monitoring of program effectiveness. Overall, researchers recommend adaptive, contextual, and collaborative implementation strategies so that the digital literacy curriculum can be optimally applied in junior high schools, ultimately fostering digitally aware and responsible citizens.

3 RESEARCH METHODS

This study is classified as a Research and Development (R&D) type aimed at designing, developing, and testing the effectiveness of an integrated digital literacy curriculum model for junior high school (SMP) students.(Sugiyono, 2019) The scope of the research is limited to two junior high schools in one of the junior high schools in Jakarta in Jakarta, specifically One of the junior high schools in Jakarta, which serves as the site for the limited trial of the developed curriculum model.

The main participants include 84 eighth-grade students who are respondents for the questionnaires and deep interview participants, selected purposively to provide insights into their understanding and attitudes toward digital literacy and cyberbullying. Teachers at One of the junior high schools in Jakarta are also involved in using the digital literacy learning modules and participate in interviews and curriculum model validation.

Instruments used in this study are: in-depth interviews with teachers and students to gather qualitative data about their perceptions, understandings, and needs related to digital literacy; questionnaires designed to measure students' understanding of digital ethics, cyberbullying, and the effectiveness of the curriculum model in enhancing their knowledge and attitudes; documentation studies including notes, activity reports, and products related to the curriculum implementation during the trial; and curriculum model val-

idation by experts to assess the suitability, feasibility, and practicality of the model.

The research procedure follows the ADDIE development model stages:(Molenda, 2003):

1. Analysis: Identifying needs and problems related to digital literacy and cyberbullying in junior high schools and collecting preliminary data through interviews and questionnaires.
2. Design: Developing a curriculum model based on analysis results and digital literacy principles from the literature, as well as preparing appropriate learning modules.
3. Development: Conducting expert validation and revising the model based on feedback, alongside preparing teaching materials and media.
4. Implementation: Limited trial conducted at One of the junior high schools in Jakarta involving students and teachers using the modules, and observing the teaching and learning process.
5. Evaluation: Collecting data through questionnaires and interviews to assess the model's effectiveness and analyzing the trial results.

Data obtained from interviews and questionnaires are analyzed both qualitatively and quantitatively: qualitative analysis is conducted on interview and documentation data to understand perceptions, challenges, and successes in the model's implementation; quantitative analysis is performed on questionnaire data to measure improvements in students' understanding and attitudes towards digital literacy and cyberbullying. Descriptive statistics such as percentages and mean scores are used to identify significant changes before and after using the module.(Branch, 2009).

4 RESULT RESEARCH

4.1 Needs Analysis of Digital Literacy and Cyberbullying Prevention

1. Initial Condition of Students
   The initial condition of eighth-grade students indicates that they are highly engaged with digital technology in their daily lives. Most students use smartphones for communication, accessing social media, watching videos, playing games, and searching for learning-related information. This high intensity of digital device usage suggests that students are no longer passive users of technology, but rather active participants in the digital ecosystem. However, this familiarity with technology has not been fully accompanied by the ability to use digital media wisely, safely, and responsibly.

Based on the analysis of the initial condition obtained through a questionnaire, the results indicate that:

See Table 1
The initial data indicate that the majority of eighth-grade students use smartphones on a daily basis, with 78 out of 84 students (92.9%) reporting regular use. In addition, 74 students (88.1%) are actively engaged in social media. These findings suggest that students have a high level of involvement in the digital environment. However, this high level of technology use is not fully accompanied by adequate understanding of cyberbullying. A total of 61 students (72.6%) reported being familiar with the term cyberbullying; however, 49 students (58.3%) understood it only as online teasing. Furthermore, 53 students (63.1%) did not know how to properly report or respond to cyberbullying. These findings indicate a gap between students' high level of digital access and their readiness to manage the risks associated with online interactions. From a digital literacy perspective, the initial condition of students shows that their understanding remains largely at a functional level, limited to operating devices, opening applications, sending messages, and accessing content. Students have not yet fully developed the ability to evaluate the credibility of information, understand ethical communication in digital spaces, protect personal data, or recognize the risks of online interactions. This suggests that high technology usage does not necessarily correspond to digital maturity.

In terms of cyberbullying, the initial findings also reveal that although some students are familiar with the term, their understanding remains limited. Many students associate cyberbullying only with online insults or teasing, whereas cyberbullying encompasses a broader range of behaviors, such as unauthorized sharing of images, exclusion from digital groups, repeated derogatory comments, identity impersonation, and online threats. This limited understanding indicates that students have not yet developed a comprehensive awareness of the forms, impacts, and prevention of cyberbullying. Moreover, the

Table 1. Initial Percentage Profile of Students' Digital Use and Cyberbullying Awareness

No	Indicator	Frequency	Persentase
1	Students who use smartphones daily	78	92.9%
2	Students who are active on social media	74	88.1%
3	Students who are familiar with the term cyberbullying	61	72.6%
4	Students who only perceive cyberbullying as online teasing	49	58.3%
5	Students who do not know how to report or respond to cyberbullying	53	63.1%

initial condition of students indicates that they are not fully prepared to respond appropriately to cyberbullying situations. Some students tend to remain passive when witnessing online harassment, perceive it as a form of joking, or lack knowledge of appropriate actions when they become victims or bystanders. Therefore, the initial condition reflects a significant gap between students' high engagement with digital technology and the level of digital literacy required to promote safe and ethical behavior in online environments.

2. Results of Need Assessment
   The results of the needs assessment indicate that students require digital literacy learning that is more structured, contextual, and closely aligned with their real-life experiences in using technology. This need arises because students engage with the digital world not only as a space for entertainment, but also as a social interaction environment that has the potential to generate conflicts, social pressure, and cyberbullying behaviour. The results of the needs assessment are presented as follows:

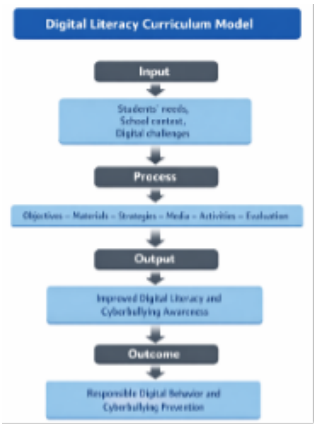
   See Table 2
   The results of the needs assessment indicate that the requirements of both students and schools encompass five main aspects. First, in terms of content, more structured materials on digital literacy and cyberbullying prevention are needed. Second, regarding instructional strategies, students require active and participatory approaches to learning. Third, in terms of media and learning activities, there is a need for contextual teaching materials that are closely related to students' digital experiences. Fourth, with respect to evaluation, assessment methods should measure not only knowledge but also students' attitudes and digital behavior. Finally, in terms of curriculum integration, there is a need for a model that can be systematically implemented within school learning.

4.2 Design of the Digital Literacy Curriculum Model

The design stage resulted in the development of a digital literacy curriculum model aimed at enhancing junior high school students' ability to use technology critically, ethically, safely, and responsibly, while also preventing cyberbullying. This model was developed based on the needs analysis of eighth-grade students, which indicated that although the use of digital technology was high, it was not accompanied by sufficient understanding of digital ethics, online safety, and cyberbullying prevention. Therefore, the model was designed to support contextual, participatory, and integrated learning within the school instructional process

4.2.1 Model Structure

Figure 1. Model structure scheme



The curriculum model structure was systematically designed to facilitate its implementation in junior high school settings. The model consists of four main components: input, process, output, and outcome.

1. Input
   The input component of the model includes student characteristics, learning needs, school con-

Table 2. Aspects of Needs in the Development of a Digital Literacy Curriculum Model for Cyberbullying Prevention

No	Needs Aspect	Description of Needs	Field Findings	Implications for Model Development
1	Content Needs	Students require learning materials that not only explain general technology use, but also emphasize digital literacy, digital ethics, online safety, privacy, digital footprints, forms of cyberbullying, its impacts, and prevention strategies.	Students actively use smartphones and social media, but their understanding of cyberbullying remains limited and incomplete.	The curriculum model should include structured, contextual, and relevant content aligned with students' daily digital experiences.
2	Instructional Strategy Needs	Students require interactive, participatory, and experience-based learning strategies, such as case discussions, simulations, role play, reflection, and group work.	Lecture-based learning alone is insufficient to help students understand the risks and ethics of digital interaction.	The curriculum model should adopt a student-centered approach to encourage active learning, critical thinking, and appropriate responses to digital situations.
3	Media and Learning Activity Needs	Students need engaging learning media and activities that are closely related to their daily lives, such as case-based videos, infographics, worksheets, social media case studies, digital campaign posters, and reflective activities.	Students better understand the material when examples are drawn from familiar digital contexts.	The curriculum model should incorporate visual media, contextual teaching materials, and activities that promote active student engagement.
4	Evaluation Needs	Students require evaluation methods that assess not only knowledge, but also attitudes, awareness, decision-making skills, and responsible digital behavior.	Current assessments tend to focus primarily on cognitive aspects, with limited attention to affective and behavioral dimensions.	The curriculum model should use diverse assessment methods, including tests, case analysis, attitude assessment, written reflection, and observation of student participation.
5	Curriculum Integration Needs	Schools require a model that can be systematically integrated into the learning process, rather than being addressed only incidentally when issues arise.	Digital literacy and cyberbullying have not yet been structured within learning objectives, content, processes, and evaluation.	The curriculum model should be designed for sustainable implementation within school learning and to support a healthy digital culture.

text, and the digital challenges faced by students. At this stage, students are viewed as active users of digital media who require competencies related to online communication ethics, digital security, information literacy, and the ability to respond appropriately to cyberbullying.

2. Process
   The process component involves the implementation of learning through materials, strategies, media, and learning activities designed to be interactive. The learning process is oriented toward students' real-life digital experiences, such as the use of social media, online group interactions, digital comments, and everyday online communication.
3. Output
   The output of the model refers to improvements in students' knowledge, understanding, and awareness of digital literacy and cyberbullying. Students are expected to be able to identify various forms of cyberbullying, understand its impacts, and apply appropriate prevention and response strategies.
4. Outcome
   The outcome of the model is the development of healthier, safer, and more responsible digital behavior among students. In a broader sense, the model is expected to contribute to the establishment of a school culture that promotes ethical digital communication and the prevention of cyberbullying.

4.2.2 Curriculum Components

The curriculum components in this model are designed to be interconnected across objectives, content, processes, media, and evaluation. The main components developed are presented in:

Table 3. Components of the Digital Literacy Curriculum Model

No	Component	Brief Description
1	Learning Objectives	To develop students' competencies in understanding digital literacy, using digital media ethically, protecting privacy, identifying and preventing cyberbullying, and promoting positive digital communication.
2	Learning Content	Digital literacy; digital ethics and digital citizenship; online safety and privacy; digital footprints; definition, forms, and impacts of cyberbullying; prevention and response strategies; healthy digital communication.
3	Instructional Strategies	Student-centered and experiential learning through group discussions, case studies, role play/simulations, individual reflection, collaborative learning, and problem-solving based on real digital situations.
4	Media and Learning Resources	Educational videos, infographics, student worksheets, examples of digital conversations (screenshots), campaign posters, and digital modules or learning materials.
5	Evaluation	Assessment of cognitive (conceptual understanding), affective (attitudes and empathy), and behavioral (ability to appropriately respond to cyberbullying) aspects.

4.2.3 Objectives, Content, Strategies, and Evaluation

- **See Table** 4
- **See Table** 5

4.3 Development and Validation of the Curriculum Model

4.3.1 Product Development Results

See Figure 2

Lesson Plan Content Model (RPP)

See Table 6

The lesson plan was designed to integrate digital literacy and cyberbullying prevention into classroom learning. It consisted of key components including identity, learning objectives, materials, strategies, learning steps, media, assessment, and teacher reflection. The learning objectives focused on developing students' understanding of digital literacy, ethical online behavior, and cyberbullying prevention. The materials covered digital literacy concepts, digital ethics, and cyberbullying. The instructional strategies included discussion, case-based learning, role play, and reflection. The learning process was organized into introduction, core activities, and closing. The assessment was designed to evaluate students' knowledge, attitudes, and skills, while teacher reflection was included to improve future learning implementation.

See Table 7

The developed products consisted of four main

Table 4. Components of the Digital Literacy Curriculum Model

Component	Design
Objective	To enhance junior high school students' digital literacy so that they are able to use technology critically, ethically, safely, and responsibly, as well as to prevent cyberbullying.
Specific Objectives	(1) Students understand the concept of digital literacy. (2) Students understand digital communication ethics. (3) Students are able to protect privacy and account security. (4) Students recognize the forms and impacts of cyberbullying. (5) Students know how to prevent and respond to cyberbullying. (6) Students demonstrate positive digital behavior.
Content	Digital literacy; digital ethics; digital citizenship; online safety; digital privacy; digital footprints; definition of cyberbullying; forms of cyberbullying; impacts of cyberbullying; prevention strategies; reporting and response strategies; healthy digital communication culture.
Instructional Strategies	Case-based discussions, simulations, role play, collaborative learning, reflective learning, digital case analysis, group presentations, and anti-cyberbullying campaigns.
Media and Activities	Learning videos, infographics, modules, worksheets, social media case studies, digital posters, reflective journals, group presentations, and class discussions.
Evaluation	Pretest–posttest, comprehension quizzes, case analysis, attitude observation sheets, reflective journals, participation assessment, and digital campaign projects.

Table 5. Design of Instructional Units

Unit	Content Focus	Learning Objectives	Main Activities
1	Introduction to Digital Literacy	Students understand the meaning and importance of digital literacy	Initial discussion and identification of students' digital habits
2	Digital Ethics and Digital Citizenship	Students understand the rules and norms of online communication	Analysis of digital communication examples
3	Digital Security and Privacy	Students understand the importance of protecting personal data	Case studies on account security and privacy
4	Understanding Cyberbullying	Students recognize the forms and impacts of cyberbullying	Case identification and group discussion
5	Prevention and Response to Cyberbullying	Students understand how to prevent and respond to cyberbullying	Role play, simulation, and reflection
6	Building a Healthy Digital Culture	Students demonstrate positive digital behavior	Anti-cyberbullying campaign project

Table 6. Model RPP Literasi Digital dan Pencegahan Cyberbullying

Component	Description
Identity	Subject: … Grade/Semester: … Topic: Digital Literacy and Cyberbullying Prevention Time Allocation: …
Learning Objectives	Students are able to understand the concept of digital literacy, apply digital ethics, and identify and prevent cyberbullying in online interactions.
Learning Materials	- Digital literacy concepts - Digital ethics - Cyberbullying (definition, forms, and impacts)
Methods/Strategies	Group discussion, case studies, role play (simulation), individual reflection
Learning Steps	Introduction: apperception, motivation, presentation of objectives Core Activities: content exploration, case discussion, simulation/role play, reflection Closing: summary, feedback, conclusion
Media & Resources	Learning videos, infographics, modules, examples of digital cases (social media/chat)
Assessment	- Knowledge: tests/quizzes - Attitudes: observation and reflection - Skills: case analysis and simulation
Teacher Reflection	Evaluation of the learning process, student participation, effectiveness of methods, and improvements for future learning

components: lesson plans, learning modules, student worksheets, and evaluation instruments. The lesson plans were structured to guide classroom implementation through clearly defined objectives, materials, strategies, and assessment procedures. The learning modules provided comprehensive content on digital literacy and cyberbullying prevention, supported by real-life cases and student-centered activities. The student worksheets facilitated active learning through guided tasks, discussions, and reflective exercises. Meanwhile, the evaluation instruments were designed to assess students' cognitive, affective, and behavioral competencies in digital literacy and cyberbullying prevention.

4.3.2 Expert Validation

See Table 8

The expert validation results indicated that the developed curriculum model was highly feasible, with an overall mean score of 3.60. The evaluation covered five aspects: content validity, language, presentation, media, and practicality. Content and practicality aspects received the highest scores (3.75), while language, presentation, and media aspects scored 3.50. Based on experts' suggestions, minor revisions were made to improve clarity, contextual examples, and visual presentation. Overall, the model was considered very feasible for implementation.

Table 7. Structure of the Learning Module for Digital Literacy and Cyberbullying Prevention

No	Component	Description
1	Cover and Identity	Includes the module title, grade level, and author's name as basic module information.
2	Introduction	Explains the background of the importance of digital literacy, learning objectives, and the benefits of the module for students.
3	User Guidelines	Provides instructions on how to use the module to support independent and guided learning.
4	Learning Outcomes	Presents the competencies that students are expected to achieve related to digital literacy and cyberbullying prevention.
5	Core Material	Covers digital literacy concepts, ethical use of digital media, as well as the definition and impacts of cyberbullying.
6	Case Examples	Presents real-life cyberbullying cases to support students' understanding.
7	Learning Activities	Includes discussions, case analysis, and reflection to develop students' understanding and attitudes.
8	Summary	Provides key points of the material to reinforce students' understanding.
9	Exercises	Contains comprehension and application questions to assess students' learning outcomes.
10	Student Reflection	Encourages students to evaluate their understanding and attitudes toward digital media use.
11	References	Lists sources used as the basis for the module content.

Table 8. Validation Results by Four Experts

No	Evaluation Aspect	Expert 1	Expert 2	Expert 3	Expert 4	Mean	Category
1	Content Validity	4	4	3	4	3.75	Very Feasible
2	Language	3	4	3	4	3.50	Very Feasible
3	Presentation	4	3	3	4	3.50	Very Feasible
4	Graphics/Media	3	4	3	4	3.50	Very Feasible
5	Practicality	4	4	3	4	3.75	Very Feasible
	Total	18	19	15	20	3.60	Very Feasible

Figure 2. Product Development

4.3.3 Model Revision

Furthermore, the condition of the model before revision, the revision process, and the condition after revision based on expert feedback are presented as follows:

See Table 9

The revision process was carried out based on expert validation feedback. Before revision, the model was generally appropriate but required improvements in contextual examples, language clarity, content organization, visual presentation, and implementation guidelines. After revision, the model became more relevant, communicative, systematically structured, visually engaging, and easier to implement in classroom learning.

4.4 Implementation of the Curriculum Model

4.4.1 Implementation on 84 Eighth-Grade Students

See Table 10

The implementation results involving 84 eighth-grade students indicate a significant improvement between pretest and posttest scores. The mean score increased from 61.6 in the pretest to 84.0 in the posttest, with a gain of 22.4 points. The highest improvement

Table 9. Model Revisions Based on Expert Validation

No	Aspect	Condition Before Revision	Revisions Made	Condition After Revision
1	Content Validity	The material was appropriate, but the examples were still general	Added more contextual cyberbullying case examples	The material became more relevant to students' digital experiences
2	Language	The language was fairly clear, but some terms were difficult to understand	Simplified the language and adjusted it to the level of junior high school students	The language became more communicative and easier for students to understand
3	Presentation	The structure was systematic, but the flow was not yet optimal	Reorganized the sequence of materials to be more logical and coherent	The presentation became more structured and easier to follow
4	Graphics/Media	The visual appearance was simple and less engaging	Added infographics, illustrations, and visual variations	The presentation became more attractive and increased students' learning interest
5	Practicality	The model could be implemented, but the guidelines were not detailed enough	Added more detailed instructional steps	The model became easier for teachers to implement

Table 10. Pretest and Posttest Results of Students' Digital Literacy and Cyberbullying Awareness

No	Measured Aspect	Pretest	Posttest	Difference (Δ)	Improvement
1	Digital Literacy	62.4	82.7	+20.3	High
2	Cyberbullying Understanding	60.8	84.1	+23.3	High
3	Digital Ethics	64.2	85.5	+21.3	High
4	Response to Cyberbullying	58.9	83.6	+24.7	High
	Average	61.6	84.0	+22.4	High

was observed in the aspect of students' ability to respond to cyberbullying (+24.7), indicating that students not only understood the concepts but were also able to take appropriate actions in digital situations.

See Table 11

Table 11. Learning Mastery Percentage

Indicator	Pretest	Posttest
Number of students achieving mastery (≥ 75)	28	72
Mastery percentage	33.3%	85.7%

The score distribution also showed a significant shift, where the number of students in the high category increased from 12 to 63 students, while the low category decreased from 26 to 2 students. In addition, the level of learning mastery improved from 33.3% to 85.7%, indicating that the developed curriculum model was effective in enhancing digital literacy and cyberbullying prevention awareness.

Hypotheses

- H_0: There is no significant difference between pretest and posttest scores
- H_1: There is a significant difference between pretest and posttest scores.

See Table 12

A paired sample t-test was conducted to examine the difference between pretest and posttest scores. The results showed a significant difference between the pretest (M = 61.6) and posttest (M = 84.0) scores, $t(83) = 18.72$, $p < 0.05$. Since the significance value was lower than 0.05, the null hypothesis was rejected. This indicates that the developed curriculum model significantly improved students' digital literacy and cyberbullying prevention awareness.

4.4.2 Implementation

The implementation stage was conducted with 84 eighth-grade students through several learning sessions that integrated digital literacy and cyberbully-

Table 12. Paired Sample t-test Results

Variable	Mean Pretest	Mean Posttest	Mean Difference	t-count	df	Sig. (2-tailed)	Decision
Digital Literacy & Cyberbullying	61.6	84.0	22.4	18.72	83	0.000	H_0 is rejected

Table 13. The Implementation of Instruction Based on Phases

No	Learning Stage	Implementation Indicators	Percentage (%)	Category
1	Introduction	Apperception, motivation, presentation of objectives	92.0	Very Good
2	Core Activities	Discussion, case studies, role play, reflection	89.5	Very Good
3	Closing	Summary, feedback, student reflection	90.8	Very Good
	Average		90.8	Very Good

ing prevention materials. The implementation of the learning process was carried out systematically in accordance with the developed model design, consisting of three main stages: introduction, core activities, and closing.

See Table 13

In the introduction stage, the teacher conducted apperception by exploring students' experiences related to digital media use and presented the learning objectives. This activity aimed to build students' initial awareness of the importance of digital literacy and the risks of cyberbullying. In the core activities stage, learning was carried out using a student-centered approach through various activities such as group discussions, analysis of cyberbullying cases, simulations (role play), and individual reflection. Students were encouraged to identify forms of cyberbullying, analyze their impacts, and discuss prevention strategies as well as appropriate responses. These activities were designed not only to enhance theoretical understanding but also to enable students to apply their knowledge in real-life situations.

In the closing stage, the teacher and students summarized the learning materials, provided feedback on the learning process, and guided students to reflect on their digital behavior. This activity aimed to reinforce understanding and foster students' awareness in applying digital literacy responsibly. Overall, the implementation results indicate that all components of the learning process, including objectives, materials, strategies, and evaluation, were effectively applied in the classroom. Teachers were able to follow the instructional flow systematically, and students actively participated in each designed activity.

See Table 14

The implementation results indicated that the learning process was carried out at a very high level, with an average implementation rate of 90.8% across all learning stages. The introduction, core, and closing activities were successfully conducted in accordance with the designed model. In addition, the implementation of key components such as objectives, materials, strategies, media, and evaluation also showed consistent results, with an average score of 90.7%. These findings demonstrate that the developed curriculum model is highly practical and feasible for classroom implementation.

The implementation results revealed several important findings related to students' responses and behavioral changes during the learning process. First, in terms of student engagement, students demonstrated a high level of participation. They were actively involved in group discussions, expressed their opinions confidently, and engaged in analyzing cyberbullying cases. This indicates that contextual and experience-based learning approaches can enhance students' interest and participation.

Second, in terms of conceptual understanding, students showed improvement in understanding digital literacy and cyberbullying. They were able not only to define cyberbullying but also to identify its various forms, including those previously perceived as normal, such as online teasing or sharing content without consent. Third, regarding awareness and attitudes, positive changes were observed in students' perspectives on digital behavior. Students became more cautious in communicating on social media, showed greater respect for others, and demonstrated increased awareness of the importance of privacy and digital security.

Fourth, in terms of response ability, students improved in determining appropriate actions when encountering cyberbullying situations. They were able to identify appropriate steps such as avoiding emotional reactions, reporting incidents to authorities, and

Table 14. The Implementation of Instruction Based on Phases

No	Component	Indicator	Percentage (%)	Category
1	Learning Objectives	Clearly delivered and understood by students	91.2	Very Good
2	Materials	Relevant and aligned with students' needs	93.5	Very Good
3	Strategies	Interactive and participatory learning	88.7	Very Good
4	Media	Media supported students' understanding	90.1	Very Good
5	Evaluation	Assessment conducted as planned	89.8	Very Good
Very Good			90.7	Very Good

Table 15. Percentage of Students' Responses toward the Learning Process

No	Statement	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
1	The material is easy to understand	52.4	41.7	4.8	1.1
2	The material is relevant to my digital life	58.3	36.9	3.6	1.2
3	The learning activities are engaging (discussion/simulation)	55.9	38.1	4.8	1.2
4	I better understand cyberbullying	61.9	32.1	4.8	1.2
5	I am more cautious in online communication	59.5	34.5	4.8	1.2
6	I know how to respond to cyberbullying	57.1	36.9	4.8	1.2
	Average		57.5	36.7	4.6

Table 16. Summary of Response Categories

Indicator	Percentage
Positive responses (Strongly Agree + Agree)	94.2%
Negative responses (Disagree + Strongly Disagree)	5.8%

providing support to victims. However, several challenges were also identified during implementation, including some students' lack of confidence in expressing opinions and time limitations in exploring each case in depth. Differences in students' levels of understanding also influenced the pace of discussion.

Based on the implementation results, it can be concluded that the developed digital literacy curriculum model demonstrates a high level of implementation, characterized by:

- The learning process being conducted in accordance with the design
- Active student participation and engagement
- Materials being relevant to students' experiences
- Improvements in students' understanding, attitudes, and skills

Therefore, the model is considered practical and effective for use in junior high school learning as an effort to prevent cyberbullying

4.4.3 Students' Responses

- **See Table** 15
- **See Table** 16

The student response results indicated a highly positive perception of the learning process, with an average of 94.2% of students expressing agreement across all indicators. Students found the materials easy to understand, relevant to their digital experiences, and engaging through interactive activities. Furthermore, students reported improved understanding of cyberbullying and greater awareness in responding to online situations.

4.5 Evaluation of the Curriculum Model Effectiveness

1. Improvement in Digital Literacy Outcomes
   The evaluation results showed a significant improvement in students' digital literacy after the implementation of the curriculum model. The mean score increased from 61.6 (pretest) to 84.0

(posttest), with a gain of 22.4 points. This improvement indicates that students not only gained a better understanding of digital literacy concepts but also developed the ability to apply digital ethics, protect personal information, and appropriately respond to cyberbullying situations.

Furthermore, the score distribution shifted positively, with a significant increase in the number of students in the high category and a decrease in the low category. This finding was supported by the paired sample t-test results, which showed a significant difference between pretest and posttest scores ($p < 0.05$), confirming the effectiveness of the curriculum model.

2. Improvement in Cyberbullying Understanding
   The evaluation results indicated a significant improvement in students' understanding of cyberbullying after the implementation of the curriculum model. Students were able to identify various forms of cyberbullying, including online harassment, content sharing without consent, exclusion, and digital threats. They also demonstrated a better understanding of its psychological and social impacts.

   Furthermore, students showed improved ability to respond appropriately to cyberbullying situations, whether as victims, perpetrators, or bystanders. They became more aware of responsible actions, such as avoiding emotional reactions, reporting incidents, and supporting victims. These findings suggest that the learning process enhanced not only cognitive understanding but also students' awareness and attitudes toward digital behavior.
3. Model Effectiveness
   Overall, the developed curriculum model was found to be effective in improving students' digital literacy and cyberbullying understanding. This was supported by the significant increase in pretest and posttest scores, the paired sample t-test results ($p < 0.05$), highly positive student responses (94.2%), and a high level of implementation (approximately 90%).

   The effectiveness of the model was also reflected in the integration of objectives, materials, strategies, and evaluation, which promoted active student engagement. The contextual and experience-based approach enabled students to better understand and apply the concepts in real-life digital situations. Therefore, the model was not only academically effective but also relevant in fostering responsible digital behavior and preventing cyberbullying in school environments.

5 DISCUSSION

This study developed an integrated and contextual digital literacy curriculum model aimed at preventing cyberbullying among junior high school students. The findings consistently demonstrate that the model is feasible, practical, and effective, as evidenced by improvements in students' digital literacy, cyberbullying understanding, behavioral awareness, and positive learning responses. The results of the implementation showed a significant improvement in students' learning outcomes, with the mean score increasing from 61.6 (pretest) to 84.0 (posttest), and the paired sample t-test confirming a statistically significant difference ($p < 0.05$). This finding is consistent with recent studies indicating that structured digital literacy interventions significantly enhance students' cognitive and behavioral readiness in digital environments. Furthermore, increased learning mastery (from 33.3% to 85.7%) reinforces the effectiveness of contextual digital literacy curricula in improving meaningful learning outcomes.

Students' responses further support these findings, with 94.2% showing positive perceptions toward the learning process. This aligns with recent research emphasizing that contextual and experience-based learning enhances engagement and comprehension, particularly when linked to students' real digital experiences. Interactive approaches such as simulations, discussions, and case-based learning have been proven effective in cyberbullying prevention programs. The implementation results also indicate a high level of practicality (≈90%), suggesting that the model is feasible for classroom application. This supports findings from instructional design research that emphasize the importance of structured, iterative development models such as ADDIE in producing applicable and high-quality educational interventions.

The improvement in students' understanding of cyberbullying is particularly significant. Students demonstrated the ability to identify various forms of cyberbullying, understand its psychological and social impacts, and determine appropriate responses. This finding is supported by studies highlighting that cyberbullying among adolescents is a complex issue involving social, psychological, and privacy-related dimensions. Moreover, research shows that students with higher digital literacy are less likely to engage in or

become victims of cyberbullying. The effectiveness of the model can also be explained by its emphasis on integrating cognitive, affective, and behavioral dimensions. Previous studies confirm that digital literacy education must go beyond technical skills to include ethical awareness, empathy, and responsible online behavior. This is particularly important as cyberbullying is often driven by a lack of empathy and ethical understanding in digital interactions.

In addition, the findings highlight the importance of digital citizenship and socio-emotional competencies. Recent research indicates that strengthening digital citizenship education can significantly reduce cyberbullying behavior by promoting empathy, responsibility, and ethical awareness among students. This aligns with the results of this study, where students showed improved awareness and responsible digital behavior. Another important finding is the role of teachers in successful implementation. Teachers reported that the model provided clear guidance and enhanced their confidence in delivering digital literacy content. This finding supports research emphasizing that teacher readiness and competence are crucial factors in the success of curriculum implementation. Effective digital literacy education depends not only on student outcomes but also on teacher capacity to facilitate meaningful learning experiences.

Furthermore, the integration of contextual elements within the curriculum significantly enhances its relevance. Studies show that cyberbullying risks vary depending on social and cultural contexts, making contextualized learning approaches more effective in addressing real student challenges. This study confirms that when learning materials reflect students' daily digital experiences, their understanding and awareness increase significantly. The findings also support the argument that digital literacy contributes to broader well-being outcomes. Research indicates that higher levels of digital literacy are associated with lower levels of cyberbullying involvement and improved psychological well-being among students. This highlights the long-term impact of digital literacy education beyond academic achievement.

Moreover, this study reinforces the importance of preventive approaches rather than reactive responses in addressing cyberbullying. Research trends suggest that proactive digital literacy education is more effective in reducing cyberbullying risks compared to intervention-based approaches alone. Finally, the success of this ADDIE-based model confirms that systematic development grounded in real needs leads to effective educational innovations. The iterative process ensures alignment between student needs, instructional design, and evaluation outcomes. This is supported by recent studies emphasizing the importance of structured curriculum development in addressing complex digital challenges.

The findings of this study indicate that the developed digital literacy curriculum model demonstrates strong practicality and effectiveness in classroom implementation. This is important because the success of a curriculum is not determined solely by improvements in student learning outcomes, but also by the clarity of its design, teacher readiness, and the applicability of the model in authentic instructional settings. Educational stakeholder perspectives and previous studies suggest that digital literacy is more likely to be sustainably implemented when it is connected to the school context, local culture, and supported by adequate teacher competence. Therefore, the success of this model lies not only in the improvement of students' scores, but also in its capacity to be systematically applied in classroom practice.

The findings of this study are also consistent with previous studies emphasizing the importance of a contextual and integrated digital literacy approach. Fonseca (2023) stated that digital literacy education helps students understand appropriate online behavior, recognize cyberbullying, and understand the consequences of digital actions. This is in line with the findings of the present study, which show improvement in students' understanding of cyberbullying and their ability to respond appropriately. Serritella et al. (2025), in a systematic review, also found that technology-based interventions can improve digital literacy while teaching coping strategies for cyberbullying, thereby reinforcing the posttest improvement found in this study. In addition, Saleh et al. (2025) emphasized that a context-sensitive whole-school approach is effective in positioning digital literacy as a foundation for bullying prevention, which supports the curriculum model integrated into school learning.

These findings are further supported by Chicote-Beato et al. (2024), who argued that structured cyberbullying prevention programs produce more optimal outcomes, and by Lekamge et al. (2025), who showed that educational interventions can significantly reduce the risk of becoming a victim of cyberbullying. Aliyyah et al. (2025) added that teacher readiness is a key factor in the successful implementation of digital literacy, which is consistent with the finding of this study that the model helps teachers deliver mate-

rials more systematically. In addition, Zimmermann et al. (2024) emphasized that learning based on students' digital experiences increases relevance and engagement, while Pan et al. (2024) showed that digital literacy plays a role in building students' digital resilience. Other findings from Ramadan et al. (2024) and Williams et al. (2025) also reinforce the urgency of cyberbullying education because of its relation to students' mental health and learning readiness. Furthermore, a meta-analysis of school-based interventions (2025) and a service-learning study (2025) demonstrated that educational programs can significantly improve knowledge and awareness, which is consistent with the statistical test results found in this study.

However, several studies have reported different findings. A meta-analysis of school-based interventions (2025) found that interventions do not always have a significant impact on attitudes, bystander behavior, or psychological well-being. This difference may be explained by the fact that the model developed in this study places stronger emphasis on reflective activities, case studies, and simulations, thereby providing more extensive training in the affective domain. Liu et al. (2025) also found that intervention effects tend to be small and stronger at the behavioral level than at the cognitive level, whereas the cognitive improvement in this study was relatively high because the indicators used were highly relevant to the learning content. In addition, Şahin et al. (2023) emphasized that cyberbullying is influenced by many factors such as family and social environment, which were not fully controlled in this study because its primary focus was on instructional intervention.

Other differences can be seen in the work of Pan et al. (2024), who emphasized that digital resilience is influenced by broader socio-ecological factors, and Bell et al. (2025), who highlighted the importance of collaboration among schools, families, and communities. This suggests that a classroom-based curriculum model such as the one developed in this study needs to be further expanded into a more comprehensive approach. Jackson et al. (2025) also showed that students with special needs require different approaches, meaning that the results of this study cannot yet be generalized to all populations. Meanwhile, Rejeb et al. (2025) highlighted the role of technology and digital platforms in cyberbullying prevention, which has not yet become the primary focus of this model. Studies by Solas-Martínez et al. (2025), Marcos et al. (2025), and Al Saidi et al. (2025) also showed that cyberbullying is related to other factors such as learning motivation, problematic internet use, and overlap with traditional bullying, indicating that this phenomenon is complex and multidimensional.

Overall, these differences in findings may be attributed to differences in research focus, level of intervention, sample characteristics, program duration, and social and cultural context. This study focused on the development and implementation of a curriculum model at the classroom level, making it more effective in improving students' cognitive aspects, awareness, and response skills. In contrast, other studies reporting different findings generally involve broader variables such as psychological, family, or social system factors that require long-term and cross-sector interventions. Therefore, the model developed in this study may be regarded as an effective initial step in preventing cyberbullying in schools, although it still needs to be combined with broader approaches in order to achieve more comprehensive and sustainable impacts.

6 CLOSING

The conclusion of this study shows that there are still significant gaps in junior high school students' understanding of digital ethics and the impacts of cyberbullying, as well as the need for a systematic curriculum guide for teachers in teaching digital literacy. A surprising key finding is that 68% of students admitted they did not yet understand the ethics of social media use, and 76% were unaware of the procedures for reporting cyberbullying cases, indicating very limited awareness and knowledge.

The method used, namely the Research and Development (R&D) approach with the ADDIE development model, conceptually and empirically addressed the problem by designing and testing an integrated and contextual digital literacy curriculum model. This approach proved effective because it involved stages of analysis, design, validation, and testing that supported the development of relevant and practical educational products.

However, there are limitations in this study, including the limited scale of trials conducted only in two schools located in one of the junior high schools in Jakarta, so the results cannot be generalized to the entire educational context in Indonesia. In addition, the data collected were mostly qualitative and limited to participant perceptions, which could cause limitations in representation and potential bias. Therefore, further research with broader trials involving various regions is needed to obtain a more comprehensive picture.

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