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DEVELOPMENT OF ARABIC TEACHING MATERIALS BASED ON MULTILITERACY AND AUGMENTED REALITY

Tsania Khoirunnisa[*1], Nurhidayati[2], Mohammad Ahsanuddin[3], Moh. Khasairi[4]
[1,2,3,4] Universitas Negeri Malang, Indonesia

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ABSTRACT

The ineffective use of conventional student worksheets for learning *fi'il madli* among ninth-grade students at a *Madrasah Tsanawiyah* in Malang has resulted in limited comprehension and underutilization of technological tools, with 78.9% of 50 students experiencing learning difficulties and 90% scoring below the Minimum Completion Criteria. To address this problem, this study developed and evaluated SAMIL, a teaching material based on multiliteracy learning and Augmented Reality (AR), aimed at improving students' understanding of *fi'il madli*. The research employed the Research and Development (R&D) approach, utilizing the ADDIE model, which consists of five stages: analyzing learning needs, designing teaching material concepts and instruments, developing the product, implementing product trials, and evaluating each stage. Quantitative data were collected through a needs analysis, expert validation scores, and responses from teachers and students, while qualitative data were gathered from classroom observations, interviews, and expert suggestions. The quantitative data were analyzed using descriptive statistics, and the qualitative data were interpreted using descriptive methods. The findings indicate that SAMIL achieved validation scores of 84.45% from subject matter experts, 91.47% from media experts, 90.28% from teachers, and 90.33% from 24 student users. These results demonstrate that the SAMIL materials are both feasible and practical for use in Arabic language instruction. Moreover, the integration of multiliteracy and AR in the teaching materials offers an engaging and interactive learning alternative that addresses students' difficulties in mastering Arabic verb structures, thus contributing to more effective and technology-supported learning experiences in secondary-level Arabic education.

CORRESPONDING AUTHOR:
Tsania Khoirunnisa,
Arabic Literature Department,
Universitas Negeri Malang,
Jl. Semarang 5 Malang 65145 Jawa Timur-Indonesia
Email: tsania.khoirunnisa.2002316@students.um.ac.id

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INTRODUCTION

Indonesia continues to face significant educational challenges, particularly in the areas of literacy and student engagement. Based on the 2017 Global Human Capital Report and UNESCO data, the quality of education and interest in literacy in Indonesia remain low, with only one in a thousand people showing interest in reading (Wahyudi et al., 2022). UNESCO reported that the literacy rate in Indonesia is only 0.001%. This means that only 1 in 1,000 people are interested in reading. Meanwhile, literacy is a crucial component of the learning process. It aims to enable learners to access and understand the information presented, thereby fulfilling 21st-century skills. Literacy skills are essential in Arabic language learning, enabling students to develop proficiency in all four language skills: listening, speaking, reading, and writing. However, low interest in reading harms student learning outcomes.

To address this issue, educators are encouraged to integrate technology into learning to meet the needs of modern students. One such approach to improve students' mastery of Arabic language material is by applying a multiliteracy learning model (Akhsan & Muhammadiyah, 2020; Syagif, 2022). Several studies have been conducted to theoretically define multiliteracy learning in language learning (Amgott, 2023; Masny, 2011). Multiliteracy learning in Arabic applies language literacy that is oriented towards digitalization to meet the needs of Arabic language materials in the 21st Century (Sarif et al., 2024). The right step to deal with it is to think and act on a solution because it is part of creative thinking reform (Sa'adah et al., 2022). Students will be equipped with the ability to utilize technology that supports the learning process of Arabic, making it engaging and avoiding reliance on memorization and lecture methods (Firdausia et al., 2020; Keshav et al., 2022). Based on observations made by researchers, a Madrasah Tsanawiyah in Malang City has implemented the KMA 183 of 2019 curriculum in Arabic language instruction, which includes the study of morphology (*Sharf*) as part of grammar (*qawā'id*) content (Aji, 2022). *Sharf* is the study of how to form *bina'* (Arabic word patterns) based on the origin of letters and their layout, or the science of changing a single original word pattern into various other word pattern forms to produce different meanings (Rahman et al., 2024). Among the *Sharf* material that students must learn is *fi'il madli* for grade IX students of Madrasah Tsanawiyah.

Fi'il madli is a verb that shows activity in the past, usually marked with a fathah at the end of the letter (Fadillah, 2025). Furthermore, *fi'il madli* serves as the foundational basis for understanding other verb forms such as *fi'il mudhari'* and *fi'il amr* (Mukhlisah & Maysarah, 2024). However, the material is extensive and requires a considerable amount of time to master (Hidayat et al., 2022). Students often have difficulty adjusting the *fi'il madli* and its pronouns. Reported that approximately 33% of students' writing assignments contained errors in the usage of "*fi'il madly"*. A needs analysis questionnaire, completed by 50 students of class IX at a Madrasah Tsanawiyah in Malang City who have used the *fi'il madli* material, found that 78.9% of students have difficulty understanding the material. With details showing that 55.8% of students understand less, 17.3% find it difficult to understand, and 5.8% do not understand *fi'il madli* material.

At this school, Arabic language learning is supported by the Independent Learning Activity Unit (UKBM), which organizes teaching materials systematically from the simplest to the most complex, thereby facilitating students' learning (Sholihah, 2023). UKBM is implemented because the school implements the Semester Credit System program. The existence of UKBM can improve the quality of learning, as it is tailored to the level of student

understanding in learning Arabic and can increase student engagement in the learning process (Shobirin, 2023). However, the implementation has faced challenges. Students tend to focus solely on task completion without truly understanding the concepts. This issue is attributed to the abstract and monotonous nature of the material, which lacks interactivity and creativity. Consequently, approximately 90% of the students scored below the Minimum Completion Criteria for the *fi'il madli* topic. Thus, the function of UKBM is less than optimal.

Previous studies have demonstrated that using visual aids and contextualized materials can facilitate the learning of morphology (Budijanto et al., 2022). For instance, it was found that concrete examples and visualizations improved comprehension. Additionally, the positive impact of using quartet cards to enhance mastery of Sharf was also noted. However, these innovations have yet to integrate modern technologies such as Augmented Reality (AR), despite the increasing digitalization of education (Al Rajab et al., 2023). Moreover, multiliteracy-based teaching materials specifically designed for Arabic morphology are still lacking. Therefore, the following research will complement existing research by combining existing media into Arabic teaching materials equipped with augmented reality (Kembuan & Irwansyah, 2019). The existence of problems in the field encourages researchers to develop teaching materials based on multiliteracy learning, in the form of handbooks. This product is equipped with a card and an application that features several useful functions. The application features include a scanner for Augmented Reality, sample sentences using fi'il madli, an Arabic comic to familiarize students with fi'il madli, and an evaluation tool. The selection of Augmented Reality technology can create learning media that displays 2D/3D modeling, making the material more concrete and engaging. Multiliteracy learning is the basis of learning syntax in digital-based teaching materials.

This teaching material product, called SAMIL, is based on multiliteracy and Augmented Reality, and is intended for application in learning *fi'il madli* for Madrasah Tsanawiyah students. It is hoped that the development of these teaching materials will provide students with technology-integrated learning materials that are easy to understand, thereby improving their language skills. Additionally, it is expected to address the lack of creativity and conceptual understanding that UKBM has yet to achieve. SAMIL helps educators deliver material in a well-structured and effective manner, creating a more interactive and meaningful atmosphere for Arabic learning in everyday life. This can also serve as a means for researchers to develop potential and abilities in the field of material development.

METHOD

This study employed a Research and Development (R&D) method to develop and evaluate teaching materials based on multiliteracy and Augmented Reality for fi'il madli students in grades 5 to 9 at the Madrasah Tsanawiyah level. To guide the development process, this study adopted the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model, as formulated by Branch. The model was chosen due to its clear and logical structure, which facilitates the systematic creation and refinement of teaching materials (Haeruddin & Haeriyyah, 2024). It is particularly well-suited for the development of educational products that require continuous testing and improvement to ensure usability, feasibility, and effectiveness. The following are the stages of product development for SAMIL teaching materials, as outlined using the ADDIE model.

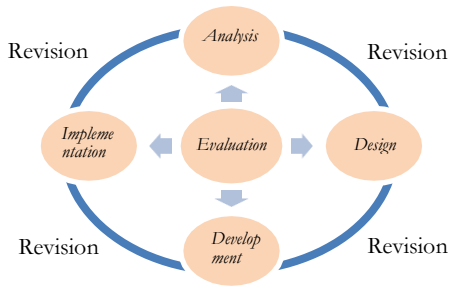

Figure 1. ADDIE Research and Development Model Diagram

Sources: (Branch, 2009)

Researchers provide limitations on this research, namely: (1) the product developed in the form of *Sharf* teaching materials in Arabic language subjects consisting of handbooks, quartet cards, and applications on *fi'il madli* material in the theme Ra's As-Sanatil Hijriyyah, (2) the subjects in this study were ninth-grade students of tahfidz and Arabic language programs at one of the Madrasah Tsanawiyah in Malang City.

The analysis stage is the initial phase of developing the SAMIL teaching materials. Researchers conducted observations, interviews, and questionnaires to identify existing problems and needs related to Arabic language teaching materials used by ninth-grade students at Madrasah Tsanawiyah. Based on the findings, appropriate solutions were designed to address the instructional gaps identified in the field.

During the design stage, the researchers conceptualized the structure and appearance of the SAMIL teaching materials in response to the specific needs of ninth-grade students. This stage also involved the development of research instruments, including validation sheets for media and material experts, as well as teacher and student response questionnaires. The validation sheets for media and material experts employed a 5-point Likert scale with the following categories: very valid, valid, somewhat valid, somewhat invalid, and invalid (Sugiyono, 2019). The same scale was also applied to the teacher response questionnaire. Meanwhile, the student questionnaire employed a Guttman scale with binary options ("Yes" = 1, "No" = 0), designed to ensure clarity and eliminate neutral answers in student responses (Berliana et al., 2023).

During the development stage, the researchers transformed the design into actual teaching materials, which were then subjected to expert validation using the prepared instruments. Revisions were made based on the validators' suggestions to ensure the quality and appropriateness of the materials before field testing.

The implementation stage involved testing the validated SAMIL teaching materials on ninth-grade students at Madrasah Tsanawiyah. Teachers and students completed response questionnaires to assess the feasibility of the materials. The data collected were analyzed quantitatively and qualitatively. The following is the calculation formula for quantitative data analysis.

$$Average\ score = \frac{\sum \text{Score obtained}}{\sum Total\ score} \times 100\%$$

After obtaining the results, the researcher determined the product feasibility value using the following criteria table.

Table 1. Product Validity Criteria

No	Validity Criteria	Validity Level
1	X = 100	Highly valid, can be used without revision
2	80 ≥ X < 100	Valid, can be used with minor revision
3	60 ≥ X < 80	Less valid, recommended not to use, moderate revision
4	40 ≥ X < 60	Invalid, major revision, cannot be used
5	20 ≥ X < 40	Highly invalid, should not be used, total revision

Source: (Aka et al., 2018)

The product is categorized as "Feasible" if the final assessment from material experts and media experts yields a minimum score of 81. Similarly, student responses were interpreted using practicality criteria, with a minimum score of 81 indicating the product is "Practical" for classroom application.

At this stage, the researcher determines the evaluation criteria based on the results of the media and material validation test conducted by the validator and makes formative revisions to the instruments compiled and the products developed, following the input provided by the validator.

RESULTS AND DISCUSSION

Development of Teaching Materials Based on Multiliteracy and Augmented Reality on *Fi'il Madli*

This study aimed to develop and describe the feasibility of SAMIL teaching materials, based on the multiliteracy learning model and Augmented Reality (AR) for learning *fi'il madli* at the Madrasah Tsanawiyah level. The development process followed the five stages of the ADDIE model: analysis, design, development, implementation, and evaluation, with the evaluation stage serving to refine instruments and product formats. The following presents the results and discussion based on each stage.

Analysis Stage

At this stage, the observation results indicate that a Madrasah Tsanawiyah in Malang City utilizes Arabic teaching materials in the form of student worksheets (UKBM). These materials tend to promote teacher-centered learning, causing students to rely heavily on the information provided by the teacher. Interviews with several students revealed that the UKBM content lacked variety and reference sources, which negatively affected students' literacy skills and motivation to learn, particularly in the *fi'il madli* material. This indicates a misalignment between the current UKBM content and the learning preferences of students from the digital generation, as suggested by Natsir et al., who emphasized the need for interactive content to support digital learning.

The average Arabic score in the *fi'il madli* topic, obtained by 90% of the 50 students surveyed, was below or only reached the Minimum Completeness Criteria (KKM) of 80. A needs analysis questionnaire administered to 50 ninth-grade students—who had studied *fi'il madli*—revealed that 78.9% of them experienced difficulties in understanding the material. Specifically, 55.8% reported limited understanding, 17.3% found it difficult to understand, and 5.8% stated that they did not understand the material at all. Students also explained that *fi'il madli* was perceived as a complicated topic requiring strong memorization skills. They

struggled to remember the signs and changes in verb forms that occur when the *dhamir* (personal pronoun) changes.

Mastery of *fi'il madli* is essential in Arabic language learning, as it serves as the foundation for constructing *fi'il mudhari'* and subsequently *fi'il amr*. Since *fi'il madli* has a different letter structure compared to *fi'il mudhari'* and *fi'il amr*, students who fail to understand it thoroughly are likely to encounter difficulties in future Arabic learning (Ardiansyah & Muhammad, 2020). Therefore, the researcher conducted a needs analysis to examine the current conditions and availability of teaching materials used by students, as this information is fundamental to supporting Arabic language instruction, particularly for *fi'il madly* at the Madrasah Tsanawiyah.

The multiliteracy learning model implemented in Arabic language instruction can empower students to acquire new knowledge, understanding, and skills through their learning activities (Kusumadewi et al., 2024). Unfortunately, the questionnaire results revealed that 63.5% (33 students) reported that their teacher had never applied a multiliteracy-based learning model. Additionally, the integration of Augmented Reality (AR) technology into Arabic language learning has not been widely adopted. This is supported by the data, which shows that 94.2% (49 students) stated that their teacher had never used augmented reality in the learning process. AR technology offers students the opportunity to learn from various literacy sources, including digital media, rather than solely relying on printed teaching materials. Moreover, students can gain immersive learning experiences by interacting with virtual environments. As a result, they can visualize learning content, develop a deeper understanding, and explore specific topics more comprehensively (Asbulah et al., 2022). Thus, Augmented Reality facilitates the multiliteracy learning process in Arabic language education.

A total of 84.6% or 44 students support the development of teaching materials based on multiliteracy learning and Augmented Reality technology for the *fi'il madli* material. However, in its use, additional media is needed to visualize objects that have been marked using markers, namely, applications. Nevertheless, 88.5% or 46 students agree that the application facilitates learning. This is because the application is not only useful for viewing augmented reality scans, but also has the advantage of being flexible for its users (it can be used anytime and anywhere), and other features make learning Arabic fun. The results of interviews with teachers also received a positive response to the development of media or teaching materials that support *fi'il madli* learning activities (Jamil & Agung, 2022; Sa'adah et al., 2022). Moreover, madrasahs have now implemented digital learning, so that teaching materials or media that are integrated with technology are needed.

Teaching materials are one of the essential components in learning, as they provide guidelines that make learning more conducive (Ma'suq et al., 2024; Pernantah et al., 2022). Therefore, researchers conducted a basic needs analysis through interviews with teachers and students, observations, and questionnaires to obtain original data in the field (Wati et al., 2020). The data is then analyzed to identify the problems and formulate suitable solutions. Based on the results of the basic needs analysis, more interactive and representative teaching materials are needed to increase students' interest in learning and maximize their mastery of the material. Analysis activities are conducted in-depth by researchers to determine concepts, materials, and illustrations in the development of SAMIL teaching materials. Thus, the

teaching materials can be applied, following the indicators and learning objectives outlined in the *fi'il madli* material.

Design Stage

In this part of the process, the concept design of teaching materials, consisting of handbooks, cards, and applications for learning fi'il madli in the form of mujarrad and mazid, is carried out. The material content in the handbook, cards, and applications is adjusted to the *fi'il madli* material in the KMA curriculum No. 183 of 2019 and the Merdeka curriculum (Aini, 2022). This aligns with Al Farisi et al.'s view that the development of teaching materials heavily depends on the syllabus or curriculum model in effect at a given time (Al Farisi et al., 2024). Likewise, SAMIL must be able to respond to the competency standards and basic competencies that represent the ultimate educational goals of that curriculum. The learning stages in this teaching material are based on multiliteracy learning. Students are directed to utilize all components of the prepared teaching materials, including handbooks, card games, and the SAMIL application. The compiled handbook is a modification of the 2020 printed Arabic language book by the Ministry of Religious Affairs.

After developing the concept design for the teaching materials, the researcher created a storyboard for the card game. This card is adapted from a traditional quartet card design; however, it offers several advantages, including an age-appropriate layout that appeals more to students, as well as the addition of augmented reality markers that can be visualized in 2D or 3D. The researcher identified the content, questions, and components on the cards. The identification resulted in (1) 56 main cards and eight special cards; (2) the main card consists of several parts, namely illustrative images, example sentences supporting images, card game categories containing *dlamir*, sub-categories with four *fi'il madli* according to illustrative images of *fi'il madli mujarrad* and *mazid*; (3) the main card is equipped with interactive and real 3D visualization that can be accessed through the application; (4) special cards consist of questions and QR-Code integrated links containing answers. The following is the storyboard design of the card game.

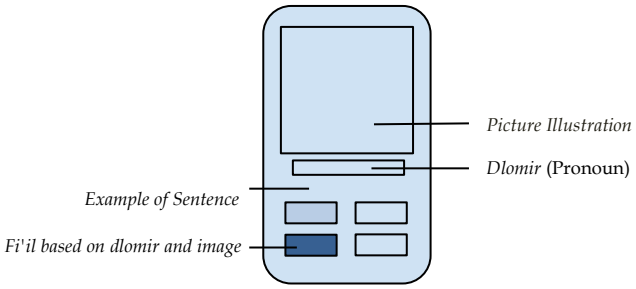

Figure 2. Storyboard of Card Game

Researchers then designed a manual sketch of the User Interface (UI) for the application to facilitate easier interaction with digital products through their visual appearance (Li & Kim, 2023). In addition, researchers also designed a use case diagram and user treatment model for the application system, as well as an activity diagram and workflow for the application system, to facilitate development (Yue et al., 2009). The SAMIL application presents six features consisting of (Comics, Example Sentences of *Fi'il Madli Mujarrad*, Example Sentences of *Fi'il Madli Mazid*, Scan Augmented Reality to see 3D markers

from card illustrations, Scan QR to see the answers on the card, and evaluation to provide peer assessment of the presenting group. Below is the Use Case diagram and Activity Diagram of the SAMIL Application developed.

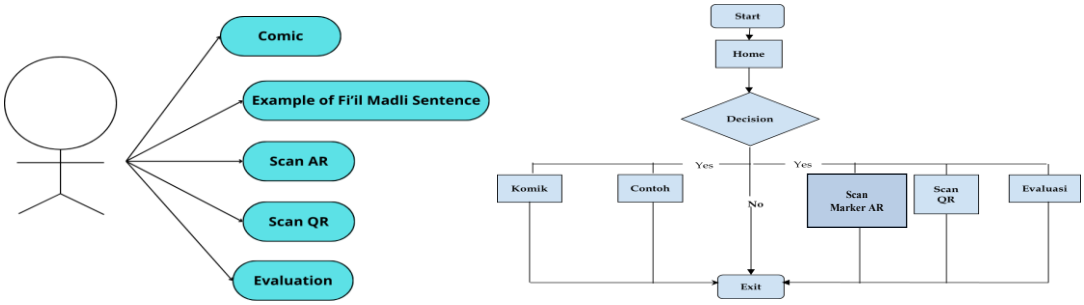

Figure 3. *Use Case Diagram* and *Activity Diagram*

In addition to drafting teaching materials, researchers compiled instruments at this stage, including needs analysis questionnaires, media validation sheets, validation of teaching materials, student response questionnaires, and teacher response questionnaires. These instruments were developed by referring to existing media evaluation instruments, which were modified to meet the research needs.

SAMIL teaching materials use the multiliteracy learning model as syntax. The model is suitable for application in learning that utilizes various types of digital-based media (Budijanto et al., 2022). When these teaching materials are applied in the classroom, students become more active and interactive in following the learning process. This is because students not only understand the theory but will also present the results of their understanding directly (Mahmudah, 2023). This learning model is effective for improving students' language skills.

Development Stage

The products designed in the previous stage began to be manufactured at this stage (Cahyadi, 2019). The handbook is designed in A5 size and full color to ensure portability and visual clarity for junior high school learners, in line with research that emphasizes the role of visual media in enhancing comprehension and retention (Mayer, 2014). The cover illustration includes the title, a brief product description, the author's name, the product logo, and the author's institutional affiliation. The content of the module comprises the multiliteracy learning flow (including guidelines for using the card game and the application), along with explanations and exercises related to the *fi'il madli* topic. Upon completion, the cover was printed on 210 gsm soft cover paper, while the handbook content used 60 gsm HVS paper.

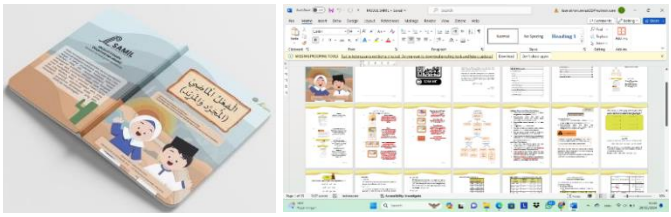

Figure 4. Mock Up Display and Drafting Stage of the SAMIL handbook

The SAMIL cards, which have been designed, are then printed on A3 300 gsm art paper. After that, the paper is cut into 8 cm x 11 cm cards. The card falls into the hand-held size category, suitable for the palm size of junior high school students. When students feel comfortable using a particular medium, it has the potential to enhance their focus and minimize boredom and fatigue during the learning process (Rizal et al., 2023).

Figure 5. The Process of Making a Card Game: Product Design and Appearance

The SAMIL application has a file size of approximately 120 MB and is packaged in the .apk (Android application package) format. Its development process included the following stages: (1) developing the instructional content within the application, (2) designing illustrations and user interface (UI/UX) elements using CorelDraw, (3) producing 3D objects for Augmented Reality integration to support immersive and interactive learning, which has been shown to improve motivation and conceptual understanding (Billinghurst et al., 2015), (4) creating 3D visual illustrations as display elements, (5) linking the cards as markers for 3D objects using Unity 3D, (6) programming interactive commands in Unity, and (7) exporting the finished application as a .apk file for use on mobile devices.

(a) (b) (c) (d) (e)

Figure 6. a) UI App, b) Digital Comic Feature, c) *Fi'il Madli* Example Sentence Feature, d) QR Scanner Feature, e) 3D Augmented Reality Card Game Feature SAMIL

After the product was developed, it underwent validation by both material and media experts with relevant expertise in their respective fields. Laily Maziyah, S.Pd.., M.Pd, a lecturer in the Department of Arabic Literature at the State University of Malang, conducted the material validation. As a material expert, she has extensive experience in developing Arabic instructional content and authoring educational books, qualifying her to assess the relevance and appropriateness of the materials included in the SAMIL teaching product. Similarly, the media validation was carried out by Dr. Moch. Wahib Dariyadi, M.Pd, is also a lecturer in the same department. He is experienced in mentoring and evaluating instructional media, particularly those integrated with Augmented Reality (AR) technology. His

background in Arabic language education further ensured that the media components aligned with both the subject matter and the intended learning objectives. Based on the feedback provided by both experts, the product was revised accordingly to enhance its feasibility and ensure its readiness for student trials.

The SAMIL teaching materials for learning *fi'il madli* are designed to encourage students to be more active through the use of technology-integrated visual media. The inclusion of a printed handbook helps students practice *maharah kitabah* (writing skills) and serves as an alternative for those who do not have access to digital devices such as smartphones or tablets. According to Millar & Schrier, printed books remain more practical and easier to comprehend than digital ones (Millar & Schrier, 2015). The card game component further promotes student engagement by stimulating their exploration of *ilm sharf*, particularly the *fi'il madli* topic (Armier et al., 2016). Additionally, the application embedded in the teaching material helps students become familiar with digital media. In the context of Society 5.0, digital literacy is essential for meeting the evolving demands of the modern era (Adillah et al., 2023).

Implementation Stage

At this stage, the SAMIL teaching materials were tested after undergoing validation and revision by material and media experts. The trial involved 24 ninth-grade students from the Arabic Tahfidz program at a Madrasah Tsanawiyah, a number determined using purposive sampling—a common method in developmental research to select participants directly relevant to the instructional context (Sugiyono, 2019). These students had prior experience learning the *fi'il madli* material, making them suitable for evaluating the clarity and functionality of the content. Following the implementation, students completed a response questionnaire to assess the developed materials, while teachers also provided feedback through a separate questionnaire. The responses were analyzed using quantitative percentage calculations. According to Gall et al., small-group trials in the early stages of development research typically involve 6 to 30 participants to identify deficiencies and obtain qualitative feedback for revision, which aligns with the chosen sample size in this study.

The implementation process included: (1) a brief explanation by the researcher on how to use the SAMIL materials, (2) students divided into five groups, each receiving one handbook and one card set, (3) students followed the multiliteracy learning steps provided in the handbook, and (4) each group presented their results while being assessed by peer groups.

The multiliteracy learning model is a learning approach that requires high ability in understanding reading, good writing skills, effective speaking skills, and the ability to master various digital media (Sang, 2017). The applied model, based on the Differential Integrative Multiliteracy model, followed five main stages—engagement, response, elaboration, review, and presentation—and was implemented across three learning phases: pre-activity, activity, and post-activity (Abidin et al., 2017; Habibah, 2018; Morocco et al., 2010). The phases and stages of multiliteracy learning are illustrated in the following diagram.

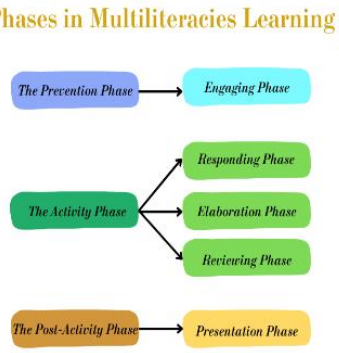

Figure 7. Diagram of phases and stages of multiliteracy learning

In the pre-activity phase, students engaged with digital comics presenting cultural and social issues. During the activity phase, they responded to handbook questions, elaborated on them through guided group card games, and conducted peer group reviews. In the post-activity phase, students presented their findings orally, while non-presenting peers conducted assessments via the Evaluation feature in the SAMIL application. Through this implementation, students were actively engaged in applying the *fi'il madli* material, which supported their mastery of the topic.

Evaluation Stage

At this stage, researchers revised the instruments before using them to collect research data, including needs analysis, validation tests, and response questionnaires. Additionally, researchers revised products related to content and appearance based on input from validators. This stage is the last in the ADDIE model development research (Safitri & Aziz, 2022). Based on Branch's theory, evaluation is carried out formatively after passing each stage of the research. The evaluation was conducted to obtain feedback and measure the feasibility of SAMIL teaching materials based on multiliteracy learning integrated with augmented reality on the *fi'il madli* material.

Feasibility of Teaching Materials Based on Multiliteracy Learning Model Integrated with Augmented Reality on *Fi'il Madli* Material

The feasibility of SAMIL teaching materials, based on multiliteracy learning integrated with augmented reality, can be determined from the results of the validation test conducted by material and media experts. The following are the results of the material expert validation calculation, as shown in Table 2.

Table 2. Likert Scale Calculation Results: Material Validation Test

No	Indicator	Percentage (%)	Criteria
1	Feasibility and completeness of material content in teaching materials (handbooks, cards, and applications)	82,85%	Valid
2	Feasibility of language in teaching materials	82,5%	Valid
3	Presentation of material content in teaching materials	88%	Valid
	Average	**84,45%**	**Valid**

Based on the validation results from the material experts in Table 2, the teaching materials are deemed valid, with a percentage of 84.45%. Teaching materials can be applied in learning the ' *fi'il madli* material with some revisions. During the validation process, the material expert provided guidance on teaching materials, emphasizing the importance of selecting precise words in sentence structure, for example, جَدْوَالُ الْمُحْتَوِيَاتِ should be قَائِمَةُ الْمُحْتَوِيَاتِ. This is done to fit the context used. Additionally, the handbook contains some content that, according to the validator, should be revised in Arabic to better align with Arabic language learning. Nevertheless, in general, the content of the material is good and follows the grade level of the learners, making it feasible to apply in learning.

In media development, the quality of the material must be validated before it is given to students, with attention to indicators such as feasibility, completeness, language suitability, and the presentation of material content (Ningtyas & Rahmawati, 2023). *Fi'il madli* is the basic word in Arabic word formation, so if students do not understand *fi'il madli* well, it will affect their understanding of word changes in other *wazan* (Arif et al., 2022; Defnaldi, 2022). Furthermore, the results of the media expert validation test are presented in Table 3.

Table 3. Likert Scale Calculation Results Media Validation Test

No	Indicator	Percentage (%)	Criteria
1	Interface display on teaching materials (handbooks, cards, and applications)	88,57%	Valid
2	Handbook size	90%	Valid
3	Display of images and illustrations on teaching materials (handbooks, cards, and applications)	93%	Valid
4	Display of writing	94,29%	Valid
	Average	**91,47%**	**Valid**

Based on Table 3, the percentage of validation results from media experts is 91.47%. This indicates that teaching materials have valid criteria for application to learning materials, with some revisions that need to be made. In the validation process, there are suggestions from media experts on teaching materials, namely providing a cover to complement the card, paying attention to the selection of writing colors so as not to contrast with the background color or image, being consistent in the use of fonts used on cards, and clarifying the guidebook to make it easier for students to understand.

Media validation indicators on SAMIL teaching materials, including interface appearance, handbook size, image and illustration display, and writing display, are considered to follow the learning needs of *fi'il madli* for grade IX Madrasah Tsanawiyah students. SAMIL teaching materials are considered good not only because the content is easy to understand, but also because the presentation and display of interesting material support student understanding. Teaching materials with an attractive appearance can enhance student interest in learning (Marici et al., 2023). In addition, based on the role of teaching materials described by Magdalena et al. (2020), SAMIL teaching materials can also play a role in reducing the teacher's time spent on instruction, facilitating students' access to materials, and enhancing interaction and learning effectiveness. The use of AR technology in teaching materials also enhances students' understanding of Arabic learning concepts, creates an increasingly

interactive learning environment, and supports educators in delivering learning materials (Wan Daud et al., 2021).

The results of the calculation of the percentage of student response questionnaires can be seen in Table 4:

Table 4. Results of Likert Scale Calculation of Student Response Questionnaire

No	Indicator	Percentage	Criteria
1	Media Aspect	87,5%	Practical
2	Learning Aspect	95,3%	Practical
3	Media Display Aspects	88,2%	Practical
	Average	**90,33%**	**Practical**

Based on the percentage calculation in Table 7, the student's response result is 90%, indicating the practical category. According to students, from a media aspect, SAMIL teaching materials are interesting and suitable for application in learning *fi'il madli*. The instructions for use provided are also clear, making it easier for students to use the product. In the learning aspect, SAMIL teaching materials can make it easier for students to learn and master the *fi'il madli* material. The suitability of images and content helps students to understand the material. The representation of 3D augmented reality objects contained in the card game makes it easier for students to visualize the material. As for the visual aspect, SAMIL teaching materials use fonts that are clear and easy to read. The color selection is also appropriate, ensuring that it does not cause students difficulty reading. The innovation of 3D augmented reality also increases students' motivation to learn *fi'il madli* material. In addition to students, teachers were also asked to complete a response questionnaire to provide an assessment, as shown in Table 8 below.

Table 5. Results of Likert Scale Calculation of Teacher Response Questionnaire

No	Indicator	Percentage	Criteria
1	Media Aspect	100%	Practical
2	Learning Aspect	87,5%	Practical
3	Display Aspect	83,33%	Practical
	Average	**90,28%**	**Practical**

The teacher response questionnaire was completed by Siti Nurul Fitriani, S.Ag., M.Pd, as the IX-grade Arabic teacher at this Madrasah Tsanawiyah. The results of the teacher's response obtained an average percentage of 90.28% and showed a practical category. According to the teacher, from the media aspect, SAMIL teaching materials can attract students' attention and are suitable for application in learning *fi'il madli*. The instructions for use provided make it easy for students to use the product during learning. Additionally, there are suggestions and input from teachers regarding the implementation of the review stage. When students do jigsaw, they not only gather with fellow students who have successfully collected similar cards, but students who are experts in *fi'il madli* material are prepared to become guides. Nevertheless, this media is practical for teachers and students in schools, making it suitable for large-scale trials.

SAMIL adopts a multiliteracy learning model integrated with Augmented Reality (AR) technology. It provides multimodal learning tools such as a handbook, AR-integrated cards, and an interactive application that accommodate diverse student learning preferences and foster multimodal engagement. This approach aligns with the core principles of multiliteracy pedagogy (Neina et al., 2024). Moreover, the 3D visualizations offered through the AR features help students conceptualize complex Arabic morphological structures, thereby enhancing both engagement and comprehension (Akcayir & Akcayir, 2017; Wan Daud et al., 2021). Positive feedback from students and teachers indicates the practicality and appeal of this learning medium, while contextual features such as comics and card games further boost student motivation (Ardiansyah, 2021; Budijanto et al., 2022).

Despite these advantages, SAMIL also has certain limitations. The current content is limited to *fi'il madli* material and has only been piloted with a small group of ninth-grade students at a single institution. This narrow implementation restricts the generalizability of its use across different educational levels and school environments, especially those with limited digital infrastructure. Additionally, while the printed handbook serves as an alternative, the full potential of AR features can only be realized if students have access to digital devices such as smartphones or tablets, which may not be equitably available (Keshav et al., 2022).

In the future, SAMIL teaching materials can be further developed to include additional Arabic grammar content, such as other *qawā'id* topics. Furthermore, future research could enhance accessibility by adapting SAMIL into a web-based platform or integrating it with Learning Management Systems (LMS). Such advancements would strengthen SAMIL's potential to optimize Arabic language instruction and contribute to digital transformation in the field of education.

CONCLUSION

The teaching materials developed in this study comprise handbooks, quartet cards, and "SAMIL" applications, which are based on multiliteracy and Augmented Reality for *fi'il madli* material. The process of developing SAMIL teaching materials only goes through 4 stages of the ADDIE model, (a) the analysis stage analyzes basic needs with interviews with teachers and students, observations, and surveys at an educational institution, (b) the design stage designs the concept of teaching materials consisting of handbooks, cards, and applications; the preparation of research instruments consisting of a needs analysis questionnaire, media validation sheet, material validation sheet, student response questionnaire, and teacher response questionnaire, (c) The development stage begins to develop the product, product usage guide for teachers and students included in the SAMIL handbook content; product validation to material experts and media experts who are experienced in their fields, (d) the implementation stage tests teaching materials on 24 class IX students from the Arabic language tahfidz program at a Madrasah Tsanawiyah in Malang City; filling out response questionnaires by students and teachers to find out their responses to the SAMIL teaching materials that have been developed, (e) the evaluation stage, determines the evaluation criteria and makes formative revisions to the instruments and products.

Teaching materials were deemed valid after undergoing a validation process conducted by experts, with an average score of 84.45% for material validation and 91.47% for media validation, both categorized as "Feasible." After being validated, the teaching materials were

tested, yielding results of 90.33% and 90.28% for student and teacher response questionnaires, respectively, in the "Practical" category. The findings demonstrate that the product effectively addresses the learning difficulties associated with fi'il madli and enhances student engagement through its interactive features. This research contributes to the innovation of Arabic language learning media by combining printed and digital formats that are flexible, accessible, and pedagogically relevant. However, the development process also faced several challenges, including technical complexities in integrating AR, limited access to digital devices among students, and the need to harmonize content across different media formats. These findings highlight the importance of developing contextually appropriate, interactive, and inclusive teaching materials to support 21st-century language learning.

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AUTHOR CONTRIBUTIONS STATEMENT

[TK] designed the study, conducted the data collection, and drafted the initial manuscript. [N] contributed to the formulation of the theoretical framework, validation process, and data analysis. [MA] developed the instructional materials and facilitated the product trials. [MK] supervised the research, provided critical feedback, and ensured the academic rigor of the entire project. All authors reviewed and approved the final version of the manuscript.

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