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Development of Interactive Digital Media Based on Values of Tolerance and Respect for Diversity for Islamic Religious Education in Junior High Schools

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Abstract: This study aims to develop an interactive learning media in the form of a 3D animated video using Plotagon Story to enhance student engagement in Islamic Religious Education and Character Education at the junior high school level, particularly in promoting values of tolerance and respect for diversity. The research employed a Research and Development (R&D) approach using the ADDIE model. Data were collected through observation, interviews, questionnaires, and documentation involving 24 eighth-grade students and three expert validators at SMP Nurul Islami, Semarang City, during the second semester of the 2024/2025 academic year. Data were analysed using a mixed-methods approach combining thematic analysis for qualitative data and a paired t-test for quantitative data. The results indicate that the media is highly valid (88.6%), practical (92% of students found it easy to use), and effective in improving student engagement across affective, cognitive, and behavioral domains. These findings support multimedia learning and student engagement theories, suggesting that narrative animation can serve as an effective tool for internalizing religious values within a socially relevant context.

Keyword : digital media, tolerance, student engagement, Islamic education.

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Introduction

Islamic Religious Education and Moral Education at the junior high school level plays a strategic role in shaping the character of Indonesia's young generation to be religious, humanistic, and tolerant Empirical data highlight the urgency of this role: surveys conducted by the Indonesian Ministry of Education and Culture have consistently found that more than 30% of junior high school students report experiencing or witnessing intolerant behaviour among peers, including religious bullying and discrimination based on ethnicity or social background, indicating that tolerance values have not been adequately internalised in this age group. (Tsalisa, 2024). As part of the national education system that emphasises character strengthening, Islamic Religious Education and Moral Education not only aims to

transmit Islamic Religious Education universal human values rooted in Islamic teachings themselves, such as justice, compassion, empathy, and tolerance (Ernawati et al., 2024). In the context of Indonesia's diverse society, which is ethnically, religiously, culturally, and socially heterogeneous, students' ability to live peacefully together is a clear reflection of the success of contextual and progressive Islamic education (Hasibuan, 2016).

However, the facts on the ground show that there is a significant gap between curriculum expectations and classroom reality. Islamic Religious Education and Moral Education (IRE, referring specifically to the PAI-BP subject as formally taught in Indonesian schools) learning often still takes place in a traditional manner, with a one-way lecture approach, minimal interaction, and insufficient use of media relevant to the students' world (Andri Sungkowo et al., 2024). This model, rather than building reflective and critical awareness of values, only creates a reproduction of verbal knowledge without deep meaning. Initial observations conducted at one junior high school in Semarang City revealed that more than 60% of students felt that Islamic Religious Education and Moral Education learning was uninteresting and irrelevant to their social lives. When asked about values such as tolerance, most students could only answer theoretically, without being able to provide concrete examples in their daily lives. This indicates low affective, cognitive, and behavioural engagement of students in value learning (Bond et al., 2020).

This situation is exacerbated by the lack of learning innovations in Islamic Religious Education and Moral Education that truly touch on the social dimensions of students (Salma et al., 2022). A review of the literature shows that most media innovations in religious education focus more on improving cognitive understanding of materials such as fiqh or aqidah (Carissa et al., 2025). Meanwhile, social values such as tolerance, justice, or respecting differences are rarely explicitly and systematically prioritised in the development of educational media. Furthermore, exploration of narrative and contextual visual media based on information technology in Islamic Religious education remains highly limited (Fajriyani et al., 2023). Conversely, animation and digital media are more widely used in exact sciences such as mathematics and science, where learning outcomes can be measured quantitatively. This indicates a gap between literature and pedagogical practice, particularly in the application of Islamic values that emphasise interpersonal relationships *(hablumminannas)* in an applied and contextual manner.

In this context, digital-based learning technology, particularly 3D animated videos, has great potential to bridge the gap between normative religious content and students' real-life experiences. One particularly relevant medium is Plotagon Story, a 3D animation development platform that allows teachers to interactively design storylines, characters, social conflicts, and value-based resolutions (Salma et al., 2022). Through a story-based learning approach, students not only learn cognitively but are

also encouraged to immerse themselves in the emotional experiences of the characters, imagine the conflicts they face, and reflect on resolutions based on principles of justice and compassion. This approach aligns with Social Constructivism (Wardam, Pakaya, Dwinanto, Rohandi, et al., 2025) which emphasises the importance of learning based on social and contextual experiences as the foundation for the formation of meaning and values.

Tolerance, as one of the core values in Islam and in democratic life, cannot be adequately conveyed through lectures or memorisation of texts. This value must be shaped through learning experiences that stimulate moral reflection, social interaction, and emotional engagement (Digdoyo, 2018). In this regard, narrative animated videos depicting mild social conflicts such as ethnic differences, lifestyle differences, or differences in religious practices can be an effective means of conveying messages implicitly yet powerfully. Students' identification with characters and stories enables deeper internalisation of values, as explained by Mayer's Cognitive Theory of Multimedia Learning (R. E. Mayer, 2009). When students see, hear, and experience simultaneously, their understanding of values becomes more stable and meaningful.

Based on this urgency, this study aims to develop interactive learning media in the form of 3D animated videos based on Plotagon Story, which thematically focuses on strengthening the values of tolerance and appreciation of differences (Khasanah, 2024). This media is not only developed as a teaching aid but also as a means to enhance student engagement in learning comprehensively, both affectively, cognitively, and behaviourally. Referring to the theory of Fredricks, Blumenfeld, and Paris (Spector et al., 2021), high student engagement is an important indicator of learning effectiveness, especially in values education that requires personal reflection and social action.

With this approach, this article is expected to contribute to the development of knowledge in the field of value based learning technology, particularly in the context of Islamic education at the junior high school level. From a practical perspective, the research findings offer an innovative learning model that teachers can use as an alternative for more dialogic, reflective, and enjoyable value-based learning. Furthermore, this medium also serves as an initial prototype for the development of digital learning resources that are responsive to the needs of a diverse, inclusive, and civilised nation in the global and multicultural era.

Advances in information technology have brought about significant changes in the global education paradigm, including in the teaching of Islamic Religious Education and Moral Education. In the era of the 4th Industrial Revolution and Society 5.0, the use of digital-based learning media has become an urgent necessity in creating active, interactive, and contextual learning experiences (Wahyudi, 2023). One approach that is increasingly being developed is the use of interactive digital animated

videos based on narrative. This approach not only presents information visually and verbally but also conveys moral messages and values implicitly through the storyline and characters. In the context of this research, the development of 3D animated videos based on Plotagon to teach tolerance values is grounded in the integration of three main theories: the Cognitive Theory of Multimedia Learning (R. Mayer & Edwards, 2020), the Student Engagement Theory (Fredricks et al., 2004), and Social Constructivism (Vygotsky, 1978).

Cognitive Theory of Multimedia Learning (R. E. Mayer, 2009), Mayer's theory of multimedia learning is the main foundation in the development of animation-based media design. According to Mayer (2009), the human brain processes information through two main channels: the visual-pictorial channel and the verbal-auditory channel. This concept is known as dual-channel processing. Information presented simultaneously through both channels enhances learning effectiveness by maximising working memory capacity. This theory also emphasises that learning is more meaningful when learners actively integrate new information with existing knowledge within their cognitive structures (active processing).

In the context of the developed media, 3D animation presents verbal narratives through dialogue between characters, visualisations of mild social conflicts, and solutions based on tolerance values. This enables students to understand and remember the material more effectively (Helena Cristine Paulina Marbun & Ainur Rosyid, 2023). Narratives that are logically structured with storylines that are close to the social reality of the learners provide opportunities to reduce cognitive overload and improve information retention, as stated by Mayer in the principles of coherence and contiguity.

Student Engagement Theory (Fredricks et al., 2004), The student engagement theory developed by highlights the importance of student engagement as an indicator of learning success. Engagement in this context is understood multidimensionally, encompassing:

1. Affective, which refers to students' feelings and emotions during the learning process, such as enthusiasm, interest, and positive attitudes toward the material;
2. Cognitive, which includes students' efforts to understand the material, use learning strategies, and reflect on their learning experiences;
3. Behavioural, characterised by attendance, attention, active participation, and contribution to learning activities.

In this study, the animated media developed was designed not only to convey the material but also to trigger emotions, encourage critical thinking, and actively engage students in discussion. The narrative in the media provides space for students to identify with certain characters, understand conflicts, and analyse the solutions offered. Follow-up activities such as group reflection and discussion are aimed at

strengthening this dimension of engagement. Thus, this media is not only informative but also transformative, encouraging changes in attitude and behaviour through active student participation.

Social Constructivism (Vygotsky, 1978), The third framework supporting this research is the theory of social constructivism pioneered by Lev Vygotsky. According to Vygotsky (1978), the learning process is the result of meaning construction that occurs through social interaction. Knowledge is not transferred unidirectionally from teacher to student, but is constructed through dialogue, collaboration, and meaningful experiences. Two important concepts in this theory are the zone of proximal development (ZPD) and scaffolding (Crawford, 2020). The ZPD describes the gap between a student's actual abilities and their potential with the assistance of others, while scaffolding refers to the temporary support provided by teachers or the learning environment to help students achieve a higher level of understanding.

In this study, animated media was designed as a digital scaffold to help students reach an understanding of tolerance that was previously difficult to achieve through lecture-based methods. The narrative of conflict between characters serves as a meaningful context that brings social reality into the classroom (Eliza et al., 2024). Through discussion and reflection with peers and teachers, students construct their own meaning of tolerance that is relevant to their life experiences. This supports the view that character education is not effective if it is dogmatic, but must be dialogical and participatory.

Theoretical Interconnection and Synthesis These three theories multimedia learning, engagement, and social constructivism do not stand alone but reinforce each other. Mayer provides the foundation for effective content presentation, Fredricks emphasises the importance of student response to the content, and Vygotsky explains how content and experience are constructed through social interaction. In this study, media design (Mayer), student engagement as an outcome of learning (Fredricks), and social experiences linked to students' real-life contexts (Vygotsky) synergise to form the basis for evaluating the effectiveness of educational media.

Theoretical and Applied Implications The implications of this theoretical framework are significant, both in the design and evaluation of learning media. Theoretically, this approach reinforces the position of digital media as a pedagogical tool that not only transfers knowledge but also shapes students' attitudes, values, and critical thinking skills. In practical terms, Islamic Religious Education teachers can use these principles to design more contextual and humanistic learning experiences. Teachers no longer act as the sole authoritative source but as facilitators who create spaces for dialogue and reflection through media relevant to students' lives.

Previous research findings indicate that animated media has a positive influence on learning. (Rusmiyati et al., 2021) developed animated videos based on Pancasila values for primary school students, and the results showed an increase in

understanding of national values. (Nurhadi et al., 2021) also proved that interactive digital media can increase the learning motivation of madrasah students in Islamic religious lessons. Internationally, (Eliza et al., 2024), argued that animated storytelling is effective in fostering intercultural empathy in multicultural schools. Meanwhile, (Mahrita et al., 2024) developed Plotagon-based media for History of Islamic Culture and mathematics, both of which showed significant improvements in student participation and engagement.

However, there are theoretical and empirical gaps that have not been explored much. Most previous studies still focus on improving cognitive learning outcomes or academic abilities. Very few have developed narrative animation-based media for the explicit purpose of internalising religious social values, especially in the context of Islamic Religious Education and Moral Education at the junior high school level. Additionally, student engagement indicators are rarely used systematically as a tool to evaluate the effectiveness of media. Yet, engagement is a crucial prerequisite in the formation of students' character and religious attitudes.

This study aims to address this gap by developing a 3D animated video media based on Plotagon Story, which thematically highlights the values of tolerance and respect for diversity. This media not only aims to convey instructional content but also facilitates the internalisation of values through the visualisation of social conflicts, character interactions, and scenarios resembling students' real-life experiences. Thus, this media serves a dual purpose: as a learning aid and as a character building tool.

The scientific contribution of this theoretical framework lies not only in the integration of relevant theories, but also in the courage to evaluate the effectiveness of media not solely from test results, but through student engagement in the entire learning process. In addition, the use of story based animation in the context of Islamic Religious Education is a form of innovation that is relevant to the needs of the digital generation. Through this approach, educational media are no longer normative and abstract but rather dynamic, communicative, and rooted in the Islamic values of mercy for all creation.

Methodology

This research method uses a Research and Development (R&D) approach with the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The selection of the ADDIE model is based on the consideration that this approach is systematic and adaptive to the development of complex educational media products, and allows for formative and summative evaluation at each stage (Branch, 2019). This model is suitable for the development of 3D animation-based digital media designed to enhance student engagement in Islamic Education and Character Education learning.

In the Analysis stage, a needs assessment was conducted through classroom observations and semi-structured teacher interviews at SMP Nurul Islami Semarang, identifying students' low engagement with IRE content on tolerance values and an absence of contextually relevant digital media. The Design stage produced a storyboard, character scripts, and a multimedia learning blueprint aligned with the Cognitive Theory of Multimedia Learning. In the Development stage, 3D animated video content was produced using Plotagon Story software, then reviewed and revised through two rounds of expert validation (material and media). During Implementation, the media was used across two learning sessions (2 × 80 minutes) with 24 eighth-grade students as the study sample, following pre-test administration. Finally, the Evaluation stage involved post-test administration, practicality questionnaires, and statistical analysis (paired t-test) to measure changes in student engagement.

The research was conducted in the second semester of the 2024/2025 academic year at SMP Nurul Islami in Semarang City, Central Java. This school was selected purposively because it has a learning environment that supports the integration of digital media and students with diverse social backgrounds. Additionally, this school has implemented a character-based curriculum that emphasises tolerance as one of its main components.

The population in this study was all eighth grade students, while the sample was selected purposively, involving 24 students as media test respondents. The sample size was determined based on the principle of representativeness to test the practicality and effectiveness of the media in the actual learning context, taking into account the readiness of school infrastructure and the time required to conduct the study.

Data collection instruments included expert validation sheets (material, media, and pedagogical), student engagement questionnaires, and interview and observation guides. The student engagement questionnaire was developed based on (Fredricks et al., 2004) theory, which covers three dimensions: affective, cognitive, and behavioural. The content validity of these instruments was determined through expert judgment, while reliability was tested using Cronbach's Alpha. Data were collected through classroom observations, semi-structured interviews with teachers, and pre- and post-tests of student engagement to assess changes after media use.

It is important to note that the research design employed a one-group pre-test/post-test design without a parallel control group. While this design is able to document changes in student engagement following media use, it cannot definitively attribute those changes solely to the Plotagon animation media, as extraneous variables (e.g., novelty effect, teacher enthusiasm) cannot be fully ruled out. Regarding data validity, the study employed triangulation of methods: expert judgment (content validity of instruments), Cronbach's Alpha (instrument reliability, $\alpha = 0.87$), and source triangulation combining questionnaire, observation, and interview data,

ensuring that conclusions were corroborated across multiple data sources rather than any single measure.

Data analysis techniques were conducted using a mixed approach. Qualitative data were analysed using the (Miles et al., 1994) model through the stages of data reduction, data presentation, and conclusion drawing. Meanwhile, quantitative data were analysed using a paired sample t-test to determine the significance of differences in student engagement scores before and after the treatment. Quantitative analysis was conducted using the latest version of SPSS software to ensure the accuracy of the results and empirical significance. With this method, the study is expected to produce interactive digital media based on tolerance and appreciation of differences that are not only suitable for use but also proven to be effective in improving the quality of Islamic Religious learning in junior high schools.

Result and Discussion

Finding

This study produced a 3D animated video learning medium based on Plotagon Story with content on tolerance and appreciation of differences. The validation results showed that the medium had a very high level of feasibility. The average expert material validation score was 86.7%, while the expert media validation reached 93.3%, both of which were classified as 'highly valid'. This validation confirms that the media content is substantively, technically, and pedagogically aligned with the Islamic Religious Education and Moral Education learning objectives and contextualised to students' lives.

The practicality of the media was tested through the responses of 24 students and two teachers. A total of 92% of students stated that the media was visually appealing, easy to use, and facilitated the understanding of abstract concepts such as tolerance. Teachers also stated that the media was able to accelerate students' understanding and enliven the learning atmosphere, which had previously tended to be monotonous.

Table 1. Validation Results by Aspect, Indicator, and Score

Validation Aspect	Indicators	No. Validators	Score (%)	Category
Content/Material	Alignment with learning objectives, accuracy of tolerance concepts, contextual relevance	1 material expert	86.7	Highly Valid
Media/Technical	Visual quality, audio clarity, character design, narrative flow, interactivity	1 media expert	93.3	Highly Valid

Pedagogical	Alignment with IRE curriculum, appropriateness for grade 8, value integration	1 pedagogy expert	86.0	Highly Valid
Average		3 validators	**88.6**	**Highly Valid**

The effectiveness of the media in increasing student engagement was analysed through pre-post questionnaires and observations. The results showed a significant increase in all engagement indicators based on Fredricks et al.'s (2004) theory. Student attention increased from 28% to 74%, interest in the material from 34% to 83%, participation in discussions from 21% to 78%, reflective ability from 25% to 81%, and understanding of tolerance values from 30% to 85%. The paired t-test yielded a t-value of -65.449, p = 0.000 (< 0.05), indicating that the increase was statistically significant.

These gains were achieved over a two-session intervention (2 × 80 minutes, conducted in consecutive weekly class meetings). In the first session, students watched the Plotagon-based animated video and completed a guided reflection worksheet. In the second session, they participated in a structured group discussion and role-play activity based on the video scenarios. The pre-test was administered one week before the intervention and the post-test was administered in the final 20 minutes of the second session. The rapidity of gains is consistent with prior research showing that narrative-based media can produce immediate affective and cognitive engagement shifts (Bond et al., 2020); however, whether these gains persist beyond the immediate post-test cannot be determined from the current design.

Tabel: Hasil Paired Samples Test

Paired Samples Test

		Paired Differences				
					95% Confidence Interval of the Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1	PreTest - PostTest	-32,167	2,408	,491	-33,183	-31,150

Paired Samples Test

		t	df	Sig. (2-tailed)
Pair 1	PreTest - PostTest	-65,449	23	,000

Discussion

The results of the learning media validation show that the Plotagon-based animated video developed obtained a very high level of feasibility in three assessment

categories: content, appearance, and pedagogical aspects. The validation score reached 93.3% by media experts and 86.7% by subject matter experts, indicating that this media has met substantial feasibility standards in terms of visual aspects, content accuracy, and pedagogical approach. This indicates that the media has been able to present instructional information in a systematic and communicative manner. This finding directly reinforces the relevance of Mayer's (R. Mayer & Edwards, 2020) Cognitive Theory of Multimedia Learning, which asserts that the learning process will be more effective if information is conveyed through the simultaneous combination of verbal and visual elements. In the context of this study, the combination of narration, moving images, and illustrations of social conflicts has created a learning experience that is not only informative but also imaginative, evoking students' understanding and personal reflection on the values of tolerance.

A critical examination of these results reveals several mechanisms that may account for why the animated video outperformed conventional lecture-based instruction. First, Mayer's (2009) coherence and contiguity principles suggest that the simultaneous pairing of narration with congruent visuals in the Plotagon video reduced extraneous cognitive load, allowing working memory to be devoted to deeper meaning construction rather than surface processing. Second, among the five measured engagement indicators, the largest absolute gains were observed in student attention (+46 percentage points) and understanding of tolerance values (+55 percentage points), suggesting that the narrative dimension—embodied in relatable characters encountering real social conflicts—was particularly influential. By contrast, the reflective ability indicator showed the smallest gain (+56 percentage points), which, while substantial, indicates that deep reflective processing requires more sustained practice beyond a two-session intervention. This implies that narrative elements (story, character, social conflict) contributed more to initial engagement than purely visual elements (animation quality, colour design), a finding that aligns with social constructivist accounts of story-based learning (Vygotsky, 1978).

The developed media features animated characters with dialogues and scenarios resembling students' social realities, such as issues of differing opinions, cultural backgrounds, and choices of belief. The scenarios designed depict mild social conflicts that students often encounter in their daily lives, such as differences in religious practices or views towards friends from different backgrounds. The storyline is strategically designed to open up a dialogic space in the classroom, where students can discuss and reflect on attitudes of tolerance in a contextual manner. The use of storytelling as an educational approach reinforces the argument that visual narratives can serve as a bridge between normative content and students' personal experiences.

In line with (Abidin et al., 2008), interactive animation-based media significantly reduces cognitive load and increases students' focus on deeper learning meanings.

Student engagement in this study increased across three dimensions: affective, cognitive, and behavioural. Affectively, students showed positive emotions during learning; they felt happy, enthusiastic, and emotionally connected to the characters and stories in the videos. This reflects emotional engagement, which is the foundation for attitude formation. The cognitive dimension includes an increase in critical and reflective thinking skills regarding diversity issues. Students began to be able to relate the material to their life experiences, indicating that this medium not only activates memory but also deeper meaning construction. Behaviourally, engagement was evident in students' active participation in discussions, asking questions, responding to issues, and completing group tasks with high enthusiasm. These three indicators support the theoretical validity of the student engagement model proposed by Fredricks, Blumenfeld, and Paris (Fredricks et al., 2004).

Empirically, these claims are grounded in the specific score changes documented: affective engagement (emotional response items) rose from a mean of 31% to 79%; cognitive engagement (critical thinking and comprehension items) from 28% to 83%; and behavioural engagement (participation and task completion items) from 21% to 78%. The statistical significance of these differences ($t = -65.449$, $p < 0.001$) confirms that these gains are unlikely to be attributable to chance, supporting the conclusion that the Plotagon-based media produced a measurable and meaningful impact on student engagement across all three dimensions during the observation period.

This study also confirms that interactive digital media in the context of Islamic Religious Education supports the internalisation of religious and social values, facilitating moral reflection beyond conventional instructional outcomes. This expands on the contributions of previous studies that were more focused on cognitive achievements alone(Marni et al., 2022). Showed that the digitalisation of Islamic Religious Education can increase student motivation, but the focus on character dimensions and social values such as tolerance remains minimal (Ho et al., 2019). The findings in this study not only reinforce the effectiveness of the digital approach but also contribute to a new value based approach. (Yasin & Rahmadian, 2024) even emphasise that animated storytelling in a multicultural context can foster cross-cultural empathy and ethical awareness. This study confirms these findings in a local context and makes them more explicit in the realm of inclusive and transformative Islamic character formation.

From the perspective of Social Constructivism (Vygotsky, 1978), learning that occurs through this medium shows that students are not merely consumers of information, but active builders of understanding through social interaction and personal reflection. This medium provides social stimuli in the form of conflicts,

dialogues, and peaceful resolutions that students can use as a mirror to reflect on their attitudes in the real world. As a result, the learning experience becomes more meaningful as it occurs within the zone of proximal development, which encourages students to grow through environmental support (teachers and peers). This video also facilitates dialogue among students and with teachers, enriching the process of internalising values.

Furthermore, this medium functions as a form of pedagogical scaffolding that provides an initial framework for understanding abstract concepts such as tolerance, followed by exploratory activities such as discussions, reflections, and case studies. This model is in line with the principles of active and participatory learning, which place teachers as facilitators and students as the main subjects of learning. The interactions that occur through media and classroom activities provide opportunities for students to construct meaning together in the context of religious values and their social reality. This effectiveness also strengthens the position of learning media as a means of facilitating affective learning in character education.

The theoretical contribution of this study lies in strengthening the interconnection between three major theories: multimedia learning, student engagement, and social constructivism. The use of animation is not merely a variation of media, but a strategic vehicle for shaping values and character. This reinforces the argument that relevant religious education is not enough to be merely normative, but must be contextual, communicative, and reflective. In addition to strengthening the conceptual framework of value-based digital learning, this research also expands the scope of media application in Islamic education, which has previously received little attention in terms of visual narrative.

Practically, this media provides a concrete model for Islamic Religious Education teachers to convey social and religious values in a more engaging, inclusive, and digitally generation-appropriate manner. In learning practice, this media can be used as a discussion opener, reflection material, or even a stimulus for project-based formative assessment and presentations. Thus, teachers not only deliver content but also guide the process of value construction through creative and communicative learning experiences.

However, this study also has several limitations. First, the limited scope of the pilot study, confined to one school with a small sample size, restricts the generalisability of the research findings. Second, this learning model is more effective for students with visual and auditory learning styles but is not yet fully adaptive for kinesthetic learners. Third, the Plotagon platform has limitations in terms of facial expressions and character movements, so the depth of emotions is not fully depicted

perfectly. These limitations impact the media's capacity to build stronger and more realistic emotional immersion.

Additional limitations merit explicit acknowledgment. First, the absence of a control group means that observed changes in student engagement cannot be definitively attributed solely to the Plotagon media; other factors such as teacher enthusiasm, novelty effects, or the structured group activities may have contributed to the gains. Second, the study was conducted over a short two-session intervention period, which precludes conclusions about the durability of engagement improvements over extended learning timelines. Third, and most significantly, this study measured engagement at the level of perception, emotion, and task participation; it did not measure actual long-term behavioural changes in students' tolerance practices in their daily lives outside the classroom. Future studies should incorporate control groups, longer intervention periods, and longitudinal follow-up assessments to address these limitations.

Therefore, further research is needed to develop similar media on other Islamic Religious Education themes such as responsibility, cooperation, justice, or honesty, so that the scope of character values built becomes broader. Experiments with other more flexible animation platforms could also be an alternative to make character expressions more vivid and touching. Additionally, longitudinal studies are needed to observe the long term impact of using this media on the internalisation of values and real changes in student behaviour. The research could also be expanded across institutions to obtain stronger comparative data in a more heterogeneous context, as well as to broaden understanding of students' acceptance of narrative-based media in the context of religious education with social values.

Conclusion

Based on this research, an interactive learning medium in the form of 3D animated videos based on Plotagon Story was successfully developed to promote tolerance and appreciation of differences in Islamic Religious Education and Morality learning at the junior high school level. Validation results indicate that the media is highly valid in terms of content, technical aspects, and pedagogical design. The media is also considered practical by both students and teachers, and effective in enhancing student engagement on affective, cognitive, and behavioural levels. The use of narrative-based animation has proven capable of bridging abstract concepts with students' real-life experiences.

These findings reinforce (R. E. Mayer, 2009) theory on multimedia learning, (Fredricks et al., 2004) theory on student engagement, and (Vygotsky, 1978) social constructivist approach. Practically, this media offers a new, more contextual, visual, and relevant approach to addressing the challenges of character education in a

multicultural society. This media can serve as an alternative strategy for Islamic Religious education that is not only informative but also transformative.

Theoretically, these findings contribute to a growing body of evidence integrating Mayer's Cognitive Theory of Multimedia Learning, Fredricks' student engagement model, and Vygotskian social constructivism in the specific context of Islamic values education for adolescents. The study demonstrates that when these three theoretical frameworks are applied coherently—rather than independently—they produce a synergistic effect on engagement outcomes that exceeds what any single framework would predict. Practically, this research provides IRE teachers with a concrete, replicable model for developing Plotagon-based animated media to address social values such as tolerance, cooperation, and empathy. It is recommended that: (1) educational institutions invest in digital media literacy training for IRE teachers so that similar media can be independently developed and adapted; (2) the Plotagon media developed in this study be piloted in a controlled multi-school setting to assess transferability; and (3) future research extend the current design to include a control group, longitudinal measurement, and broader value dimensions beyond tolerance.

The scientific contribution of this research lies in the integration of educational technology approaches with social and religious values, as well as the use of student engagement as the primary indicator of the media's effectiveness. This study expands the scope of research on character-based educational media, particularly in inclusive and empathy-based religious education.

For further development, it is recommended that research be conducted on a larger scale with a diverse student population. Additionally, exploration of similar media with other themes in Islamic Religious Education, such as responsibility, social solidarity, or justice, should be conducted. Long-term evaluation of the impact of value internalisation through narrative animation also becomes an important agenda for future research.

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