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The Development of QR-Code-Based Educational Snake and Ladder Game as A Medium for Islamic Education Learning at SMP Negeri 2 Satu Atap Halongonan

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ABSTRACT

Learning media play a crucial role in enhancing the effectiveness of education. In the subject of Islamic Religious Education (PAI), learning is often perceived as difficult and less engaging, thereby requiring innovations through interactive media. This study aims to develop and assess the feasibility of a learning medium based on the educational board game Snakes and Ladders integrated with QR Codes. The research employed the Research and Development (R&D) approach using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). A limited trial was conducted with 15 seventh-grade students at SMP Negeri 2 Satu Atap Halongonan. Validation results indicated a very high level of feasibility, with scores of 100% from material experts, 97% from media experts, and 91% from peer reviewers. Teacher assessments reached 90%, while student responses achieved 98%, confirming that the medium is highly feasible for use in teaching the topic of *ṭaharah* (purification from impurities and ritual uncleanness). Thus, the QR Code–based Snakes and Ladders medium can serve as an innovative alternative in PAI learning.

Keywords: *Learning Media, Snakes and Ladders, QR Code, Islamic Religious Education*

ABSTRAK

Media pembelajaran berperan penting dalam meningkatkan efektivitas belajar. Pada mata pelajaran Pendidikan Agama Islam (PAI), pembelajaran sering dianggap sulit dan kurang menarik sehingga diperlukan inovasi media yang interaktif. Penelitian ini bertujuan mengembangkan dan menguji kelayakan media pembelajaran berbasis permainan edukatif ular tangga dengan integrasi QR-Code. Jenis penelitian yang digunakan adalah Research and Development (R&D) dengan model ADDIE (Analysis, Design, Development, Implementation, Evaluation). Uji coba dilakukan secara terbatas pada 15 siswa kelas VII SMP Negeri 2 Satu Atap Halongonan. Hasil validasi menunjukkan tingkat kelayakan sangat tinggi, dengan skor dari ahli materi 100%, ahli media 97%, dan peer reviewer 91%. Penilaian guru mencapai 90% dan respon siswa 98%, sehingga media dinyatakan sangat layak digunakan pada materi *ṭaharah* dari *najis* dan hadas. Dengan demikian, media ular tangga berbasis QR-Code dapat menjadi alternatif inovatif dalam pembelajaran PAI.

Kata Kunci**:** *Media Pembelajaran, Ular Tangga, QR-Code, Pendidikan Agama Islam.*

INTRODUCTION

Islamic Religious Education (PAI) is a subject that plays a strategic role in shaping students' character, spirituality, and morals. Through PAI learning, students are expected to be able to understand Islamic teachings comprehensively and implement them in their daily lives (Hasibuan, Lubis, & Usiono, 2023). Therefore, PAI learning not only emphasises cognitive aspects but also includes affective and psychomotor aspects to shape Muslim individuals who are faithful and possess noble character (Rifai & Anni, 2012).

The success of PAI learning is greatly influenced by a systematically and meaningfully designed learning process. A good learning process should foster an active, enjoyable learning environment that encourages optimal student involvement. Learning media plays an important role in supporting the achievement of these objectives by helping teachers deliver material more clearly and engagingly (Arsyad, 2011).

However, in school learning practices, PAI is still often perceived as a difficult and uninteresting subject for students. This perception arises because PAI material contains many abstract concepts and relies heavily on conventional learning methods. Learning that lacks variety tends to make students passive and less motivated to participate in the learning process (Sudjana & Rivai, 2010).

This condition is also found in PAI learning at the junior high school level, especially in fiqh material. Fiqh is a branch of knowledge in PAI that requires an understanding of concepts and the ability to apply them in everyday life. If fiqh material is delivered without appropriate learning media, students will have difficulty understanding the concepts and procedures being studied (Zubaedi, 2025).

One of the fiqh materials that is quite challenging for students is the material on *ṭaharah* from *najis* and *ḥadaṡ*. This material requires a deep understanding of the meaning, types of *najis* and *ḥadaṡ*, shar'i arguments, and the correct procedures for purification. In addition, the material on *ṭaharah* is directly related to daily worship practices, thus requiring a comprehensive and practical understanding.

Based on preliminary observations conducted at SMP Negeri 2 Satu Atap Halongonan, it was found that the teaching of *ṭaharah* from *najis* and *ḥadaṡ* was not yet optimal. The learning process was still dominated by lectures, with learning media limited to textbooks and PowerPoint presentations. Students tend to be passive and less actively involved in learning, which affects low student learning outcomes, many of which remain below the Minimum Completion Criteria (KKM) (Arsyad, 2011).

The limited use of learning media indicates that PAI learning has not been fully tailored to students' characteristics. Seventh-grade junior high school students are in a developmental phase that requires active, contextual learning. Monotonous, less

interactive learning can cause students to quickly become bored and less focused on the learning process (Sudjana & Rivai, 2010).

Learning media serve a strategic function by conveying learning messages in ways that are easier for students to understand. Sadiman, Rahardjo, and Haryanto (2014) state that learning media can clarify the presentation of material, increase attention and motivation to learn, and help create more effective interactions between teachers and students. Therefore, the selection and development of learning media must be tailored to the characteristics of the material and students.

Along with the development of information and communication technology, the use of technology-based learning media has become an alternative in the learning process. Digital technology-based learning media allow students to access learning resources more broadly and flexibly. However, the use of technology in learning still needs to be guided to ensure it does not deviate from the learning objectives (Azizah & Humaisi, 2021).

One form of learning media innovation that can be developed is educational game-based media. Educational games can create a fun learning atmosphere, foster learning motivation, and encourage active student involvement. Game-based learning is considered capable of providing a meaningful learning experience because students are directly involved in the learning process (Prensky, 2001).

Snakes and Ladders is a traditional game that is easy to play and widely known by students. This game can be modified into a learning medium by incorporating elements of lesson material. Research by Auliyawati and Oktian (2023) shows that snakes-and-ladders learning media can increase students' motivation to learn. In addition, Sulistyorini and Sumajaya (2024) stated that the snake-and-ladder game is an effective learning medium that encourages student activity.

During development, the snake-and-ladder learning medium can be integrated with digital technology, for example, through QR codes. QR codes enable students to access additional learning materials on their devices. The integration of QR codes into learning media is considered to enrich learning resources and increase students' learning independence (Sadiman et al., 2014).

Research conducted by Harahap (2024) shows that QR code-based snake-and-ladder media is highly feasible and can increase student engagement in learning. However, the development of Islamic Religious Education learning media based on QR Code-integrated snake-and-ladder games, especially on the subject of *ṭaharah* fiqh, remains relatively limited. This indicates a research gap that needs to be filled (Harahap, 2024).

Given these issues, there is a need to develop innovative Islamic Education learning media that are suitable for students' characteristics. Therefore, this study focuses on the development of Islamic Education learning media using QR-code-based

snake-and-ladder games on the subject of *ṭaharah* from *najis* to *ḥadaṡ* for seventh-grade students at SMP Negeri 2 Satu Atap Halongonan. This study uses the ADDIE development model, which includes the stages of analysis, design, development, implementation, and evaluation (Branch, 2009; Sugiyono, 2018).

This study aims to determine the process of developing QR-Code-based snake-and-ladder game learning media and to assess its feasibility through expert validation, teacher assessment, and student responses. The results of this study can contribute to the development of innovative Islamic Religious Education learning media that are relevant to schools' learning needs (Slamet, 2022).

METHODS

This study uses a Research and Development (R&D) approach with the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation (Branch, 2009). This model was chosen because it is systematic, simple, and relevant for producing learning products that have been tested for feasibility. The research subjects were seventh-grade students at SMP Negeri 2 Satu Atap Halongonan in the 2024/2025 academic year, with a limited trial involving 15 students. In addition, the research involved PAI teachers and validators, comprising subject matter experts, media experts, and peer reviewers.

Data collection was conducted through observation, interviews, and questionnaires. Observation was used to identify learning needs and classroom conditions (Sugiyono, 2018). Interviews were conducted with PAI teachers to gain deeper insight into learning obstacles, while questionnaires were used to assess feasibility with experts, teachers, and students. The questionnaire instrument was validated based on content feasibility, presentation, language, graphics, and usefulness (Arikunto, 2010).

The product developed was a learning medium in the form of a 100 × 100 cm QR-Code-based Snakes and Ladders game, equipped with a game board, pawns, dice, and material cards, question cards, answer cards, violation cards, and rule cards. These cards were equipped with QR codes that could be scanned with a device to access digital material in the form of a flipbook. The media was designed using the Canva for PC graphics application.

The data were analysed descriptively and quantitatively by calculating percentages of validation results and Likert-scale responses (Sudijono, 2011). The percentage results were then interpreted into feasibility categories to determine the quality of the learning media developed.

RESULT

This study produced a learning medium in the form of a QR-Code-based Snakes and Ladders game on the subject of *ṭaharah* from *najis* and *ḥadaṡ* for seventh-grade students at SMP Negeri 2 Satu Atap Halongonan. This medium was developed through the ADDIE model stages, limited to the implementation stage, as follows:

1. Analysis Stage

The analysis stage serves as the foundation for the development of QR-Code-based educational snake-and-ladder game learning media. At this stage, the researcher conducted a learning needs analysis through direct observation in class VII of SMP Negeri 2 Satu Atap Halongonan and interviews with Islamic Education teachers. The analysis focused on learning conditions, student characteristics, media availability, and the suitability of *ṭaharah* material to student needs.

The results of the observation showed that lecture methods and the use of textbooks as the main learning resource still dominated the PAI learning process. Teachers tended to explain the material in a one-way manner, while students acted as recipients of information. The learning media used were limited to blackboards and occasionally simple PowerPoint presentations. These conditions led to learning that was not very varied and did not optimally engage students. As a result, the classroom atmosphere tended to be passive, and students became easily bored, especially when studying fiqh material, which is conceptual and procedural.

In addition, interviews with Islamic Education teachers revealed that the material on *ṭaharah* from *najis* and *ḥadaṡ* was considered difficult by students. This difficulty is caused by students' limited understanding of the basic concepts of *ṭaharah* and by the lack of media that can help visualise and relate the material to everyday practices. Teachers also said that the limitations of learning media are among the obstacles to creating active and enjoyable PAI learning.

Analysis of student learning outcomes shows that the level of learning completion remains relatively low. Daily test scores show that only about 40% of students have met the Minimum Mastery Criteria (KKM), while about 60% have not yet mastered the material. This indicates that the learning methods and media used are not yet fully effective in helping students understand the *ṭaharah* material. The low learning outcomes also correlate with low motivation and interest among students during the learning process.

In terms of student characteristics, seventh-grade students are in the early stages of adolescence and tend to prefer interactive, challenging, and game-based learning activities. Students find it easier to understand the material when they are directly involved in fun and non-monotonous learning activities. However, the existing learning conditions do not fully accommodate these characteristics, so the students' potential for active learning has not been fully explored.

Based on these analysis results, the researcher concluded that innovative learning media is needed to overcome PAI learning problems, especially in the material on *ṭaharah* from *najis* and *ḥadaṡ*. The media developed must be interactive, engaging, easy to use, and able to integrate game elements with learning materials. In addition, the use of digital technology is considered relevant for supporting students' characteristics and learning development in the digital era.

Therefore, a QR-Code-based educational snake and ladder game was chosen as a solution for developing learning media. This media is expected to increase students' motivation, engagement, and understanding of *ṭaharah* material through more active, contextual, and enjoyable learning. This analysis stage provides a strong foundation for researchers in designing and developing learning media that meet real needs in the field.

2. Design Stage

The next stage after analysis is the design stage. The results of the analysis in the previous stage can be used to develop PAI learning media using QR-Code-based snakes and ladders. In this stage, the learning media is designed by creating a prototype that begins with collecting relevant material, designing the game board, dice, and pawns, cards, reference material, question-and-answer cards, and validation and student response sheets.

The expected product of this research is a type of learning media in the form of a QR-Code-based snake and ladder game measuring 100 x 100 cm, which contains material reference cards, game rules and procedures, question cards and answer cards, and violation cards, using QR-Code technology and several game tools in the form of dice and pawns, as well as a designed snake and ladder board. The QR-Code-based snakes-and-ladders learning media produced is intended for seventh-grade junior high school students and can be accessed on a cell phone by scanning the QR code on the cards provided, which will direct them to a page. The page will include information such as learning materials, game instructions, and more. The QR-Code-based snakes and ladders learning media was designed using Canva for PC graphics software.

At this design stage, the researcher began to compile the initial design of the PAI learning media product using a QR code-based snake and ladder game in accordance with the learning needs of the *ṭaharah* from *najis* and *ḥadaṡ* material for seventh-grade junior high school students. The media design includes a game board, dice, and pawns, as well as supplementary cards containing game rules and procedures, material reference cards, question cards, answer cards, and violation cards.

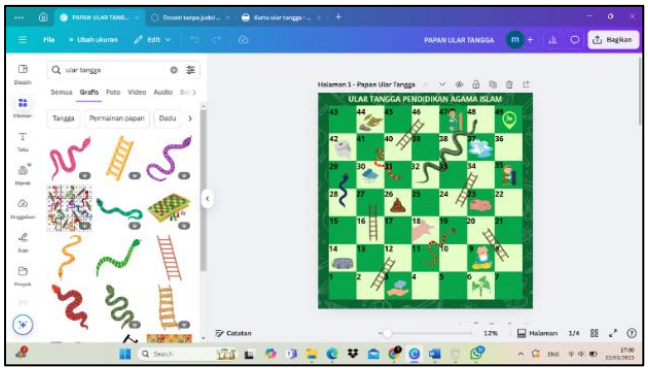

Figure 1. Game Board Design

The snakes-and-ladders game board is 100 x 100 cm and consists of 43 boxes tailored to learning needs. Each box is given a design and elements related to the material of *ṭaharah* from *najis* and *ḥadaṡ*. In addition to the game board, this media includes dice and pawns as game movers.

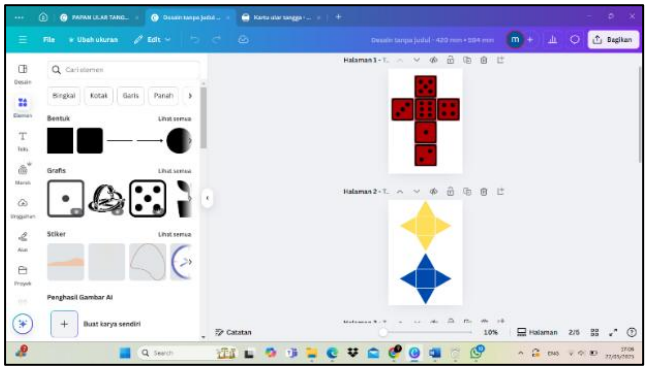

Figure 2. Dice and Pawn Design

In addition, the researcher designed supplementary cards for the game. These cards consist of game rules and procedures cards, question cards, answer cards, violation cards, and material reference cards. The material reference cards include QR codes that can be scanned with a mobile phone to access learning materials in digital form.

Figure 3. Game Cards

With the design of this learning media, it is hoped that the developed media will assist teachers in delivering the material on *ṭaharah* from *najis* and *ḥadaṡ*, and help students understand the material more effectively and enjoyably.

3. Development Stage

During the development stage, the QR-Code-based snake-and-ladder game learning media prototype was realised in physical form and then validated by experts. This validation aimed to determine the feasibility of the learning media developed before it was implemented with students (Hamdi et al., 2024).

The validation results show that the QR-code-based snake-and-ladder game learning media is in the highly feasible category. The assessment was carried out by several validators, including instrument experts, material experts, media experts, peer reviewers, and PAI teachers. Details of the learning media feasibility assessment results are shown in Table 1 below.

Table 1. Snake and Ladder Media Assessment

No.	Validator	Number of Indicators	Maximum Total Score	Average Total Score	Ideal Percentage
1.	Instrument Experts	12	60	54	90%
2.	Material Experts	18	90	90	100%
3.	Media Experts	20	100	97	97%
4.	Peer Reviewers	20	100	91.3	91.3%
5.	Islamic Education Teachers	20	100	93	93%
Total		**90**	**450**	**425.3**	**94.51%**

Based on Table 1, the instrument experts' assessment yielded 90%, indicating that the instrument has met the feasibility criteria. Furthermore, the assessment by the material expert yielded a score of 100%, indicating that the learning material presented was in accordance with the basic competencies, learning objectives, and the substance of the Islamic Education material. The media expert's assessment yielded a score of 97%, indicating that the visual and technical aspects of the learning media were in the very feasible category.

In addition, the peer reviewers' assessment obtained a score of 91.3%, indicating that the learning media was considered good in terms of conceptual suitability and integration between the material and the media. Islamic Education teachers, as learning practitioners, gave a rating of 93%, indicating that the learning media was considered practical and could be applied well in the classroom learning process. Overall, the validation results from all validators averaged 94.51%, indicating that the QR-Code-based snake-and-ladder game learning media was deemed very feasible for use and was moved to the implementation stage.

4. Implementation Stage

The implementation stage is the stage of applying the QR-Code-based snake-and-ladder game learning media that have been developed and validated. At this stage, the learning media declared feasible by subject matter and media experts is tested with seventh-grade students at SMP Negeri 2 Satu Atap Halongonan. The implementation of learning media is carried out to determine the media's feasibility and students' responses during the learning process.

The implementation of the learning media was carried out during Islamic Education learning activities, using material on *ṭaharah* from *najis* and *ḥadaṡ*. Before the learning activities began, the teacher explained the learning objectives, game rules, and procedures for using the QR-code-based snake-and-ladder learning media to the students. This explanation was intended to help students understand the game's flow and participate in the learning activities in an orderly manner.

During the learning process, students were divided into several small groups. Each group played the Snakes and Ladders game according to the established rules. Students played the game by throwing dice and moving the pawns according to the numbers obtained. When students were on a certain square, they were asked to take the appropriate card and scan the QR code using their cell phones to access the available material or questions. This activity encourages students to actively engage in learning and work together with their group members.

The role of the teacher at the implementation stage is as a facilitator who directs the game, provides guidance to students, and reinforces the material being learned. Teachers also observe students' activities during learning to ensure that media use aligns with predetermined learning objectives. During implementation, the learning atmosphere was more active and conducive than in conventional learning.

After the learning activity was completed, students were asked to complete a questionnaire about their responses to the use of the QR code-based snake-and-ladder learning media. The questionnaire was used to determine students' levels of interest, ease of use, and perceived benefits of the learning media. The data from the student response questionnaire were analysed to determine the practicality and acceptance of the learning media.

Based on limited trials conducted with 15 seventh-grade students, the QR-code-based snake-and-ladder learning media received a very positive response. Teachers gave a rating of 93%, indicating that the learning media developed was considered very feasible and practical for use in the Islamic Education learning process. Meanwhile, the results of the student response questionnaire showed an

average score of 90.59%, with 91.43% for the material presentation aspect, 85% for the graphics aspect, and 93% for the implementation aspect.

These results indicate that the learning media developed is capable of presenting material well, has an attractive visual appearance, and can be implemented effectively in classroom learning activities. Thus, the QR-Code-based snake-and-ladder game learning media is not only suitable for use as PAI learning media but also has the potential to increase student activity and motivation to learn. These findings confirm that the developed learning media has met the criteria of feasibility and practicality, so that it can be used as an alternative innovative learning media in Islamic Religious Education, especially in the material on *ṭaharah* from *najis* and ḥadas.

DISCUSSION

The results of the study indicate that the QR-Code-based snake and ladder learning media developed has a very high level of feasibility. This is demonstrated by validation results from learning experts and practitioners, with an average of 94.51%. These findings indicate that the developed learning media has met the criteria of content feasibility, media display, and practicality of use in Islamic Religious Education.

In terms of content suitability, high ratings from subject matter experts indicate that the material on *ṭaharah* from *najis* and *ḥadaṡ* is in line with the basic competencies and learning objectives for 7th-grade junior high school students. The material is organized systematically, the language is easy to understand, and it is relevant to the needs of students. This is important because fiqh material, especially ṭaharah, is often considered abstract by students when it is only delivered through lectures. Good learning media can help concretize these concepts through more realistic learning experiences. These findings are in line with the research by Winarko et al., (2025) which states that learning media that is appropriate to the characteristics of the material and students can improve the understanding of religious concepts more effectively (Winarko et al., 2025).

From a media perspective, the results of validation by media experts and peer reviewers show that the game design, visual appearance, and QR code integration are considered very feasible. The use of snakes and ladders as a learning medium provides a more interactive and enjoyable learning atmosphere. Game-based media allows students to learn while playing, thereby reducing boredom in learning. This is supported by research by Ihsan and Jadmiko (2025), which states that educational games can increase student engagement and make the learning process more interesting (Ihsan & Jadmiko, 2025).

The integration of QR codes in learning media provides added value because it combines conventional games with digital technology. QR codes allow students to

quickly access additional materials, questions, or explanations through their devices. These findings indicate that combining conventional game media with digital technology can be an innovative solution in PAI learning. These findings are in line with research by Handayani & Haryati (2024), which states that the use of QR codes in learning facilitates access to information, increases learning independence, and supports learning in the digital age.

The positive assessment from PAI teachers as learning practitioners confirms that the developed learning media is not only theoretically feasible but also practical for classroom implementation. Teachers assessed that this media is easy to use, fits within the allocated learning time, and increases student engagement during the learning process. This is reinforced by the results of limited trials showing very positive student responses across material presentation, graphics, and media implementation.

The results of student responses in limited trials show a very positive category. Students are interested in the media display, enjoy learning through play, and are more active during the learning process. These positive responses indicate that QR-Code-based snake and ladder games can increase student motivation and activity. Students not only receive information, but also engage directly through play, discussion, and problem-solving activities. This condition is in line with the active and constructivist learning approach, where students build their own understanding through meaningful learning experiences (Julia, Fitriani, & Setiawan, 2024).

Overall, the developed QR-Code-based snake-and-ladder game learning media has great potential to improve the quality of Islamic Religious Education learning, especially in the subject of *ṭaharah* from *najis* and *ḥadaṡ*. This media is not only feasible and practical to use but also relevant to students' characteristics and the demands of learning in the digital age. Therefore, this learning media can serve as an innovative alternative for teachers in developing more engaging, effective, and meaningful Islamic Religious Education.

CONCLUSION

This study developed innovative learning media in the form of a QR-Code-based Snakes and Ladders game on *ṭaharah* from *najis* to *ḥadaṡ* for seventh-grade students at SMP Negeri 2 Satu Atap Halongonan. The media was developed through the ADDIE stages, starting from needs analysis, design, development, limited implementation, and evaluation. Validation by instrument experts, subject matter experts, media experts, peer reviewers, and Islamic Education teachers yielded a highly feasible category, with an average score of 94.51%. Limited implementation with 15 students also received positive responses with an average of 90.59% (very good category).

These findings confirm that learning media that combines traditional games with digital technology can increase student motivation, engagement, and

understanding of PAI material, which is often considered difficult. In practice, this media can be an innovative alternative for teachers to create more interactive, enjoyable, and student-friendly learning experiences.

The suggestion for further research is to conduct trials with a broader scope, both in terms of the number of students and the variety of other PAI materials, to test the media's effectiveness more comprehensively. Further research can also examine the quantitative influence of this media on learning outcomes. Thus, QR-code-based snakes-and-ladders media has the potential to make a real contribution to the development of educational game-based learning strategies in the digital era.

DECLARATIONS

Author contribution statement

This research was conducted entirely by the author, from problem formulation and theoretical review, to learning media design, data collection through observation and interviews, validation by experts and limited trials with students, to data analysis and research report writing.

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Data availability statement

The research data is available in the author's thesis document. The data includes research instruments, expert validation results, student response questionnaires, and documentation for learning media products. The data can be obtained from the author upon reasonable request.

Declaration of interests statement

The author declares that there are no conflicts of interest affecting this research or the writing of this article.

Additional information

The author declares that there are no financial conflicts of interest or personal relationships with parties involved in this research, including instrument experts, material experts, media experts, PAI teachers, peer reviewers, and students of SMP Negeri 2 Satu Atap Halongonan, that could influence the research results.

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