Development Of Science Adventurer Learning Media in Increasing Science Learning Motivation In Madrasah Ibtidaiyah

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Abstract: *This study aims to develop Science Adventure learning media to improve students' motivation to learn Natural and Social Sciences (IPAS). This research was conducted with development research using the Borg & Gall procedure written in ten stages of development. This research was conducted at MIN 04 Blitar Class V with data collection techniques through observation, interviews, and questionnaires, while data analysis was carried out using the t-test. This study shows that the Science Adventurer learning media is very feasible to use with the validation results from material experts, media experts, and learning experts, each obtaining a score of 94%, 96%, and 94%. This media has also proven effective in improving students' learning motivation, as evidenced by the independent sample t-test, which has a 2-tailed significance value of 0.000. so it can be concluded that the Science Adventure learning media is feasible and effective in improving the motivation to learn IPAS in grade 5 elementary school students.*

Keywords: *Science Adventurer Learning Learning Media, Motivation, Natural and Social Sciences.*

A. Introduction

Learning is a relatively lengthy process that occurs within a person. The learning process requires internal and external factors to continue to exist and be able to survive (Azhari et al., 2023; Zaini et al., 2023). However, learning also experiences ups and downs in its development (Fajra & Novalinda, 2020). The decline in students' enthusiasm for learning is a severe problem in the world of education in the digital era (Burhendi et al., 2019). The success of the learning process itself is influenced by several non-intellectual factors such as a person's ability to motivate themselves, invitations from friends, and so on (Saeid & Eslaminejad, 2016). Motivation acts as an absolute factor driving the emergence of enthusiasm for learning in students (Mukhibat et al., 2023).

Motivation plays a significant role in generating enthusiasm for learning (Wulangsih et al., 2018). Certain conditions will result in overlapping needs because the needs are only fulfilled temporarily (Kristiantari, 2021). The implication of enthusiasm for learning in teaching and learning activities is that students hungry for motivation

cannot optimally participate in the learning process. The main impact of providing motivation continues to increase enthusiasm for learning with the speed of technological development, which impacts lifestyle changes, thought patterns, character, and psychology (Sundari et al., 2022). Educational problems caused by a decline in enthusiasm for learning can spread to the socio-economic and legal realms (Lubis, 2021).

The reality in the field is contrary to expectations, hampering the learning process. Teachers, who primarily only act as educators, make the learning process monotonous so that students quickly feel bored (Yee & Tasir, 2023). Quality education programs are implemented as a form of state responsibility, which is explicitly regulated in the preamble to the 1945 Constitution, which essentially outlines that education is the right of every Indonesian citizen and must be implemented by the government as the state's duty bearer in a system National Education (Idrus, 2019).

The teacher's task as a facilitator provides direction with an orientation towards everyday life, enabling students to actively find understanding independently (Ferdiansyah et al., 2023; Lestari, 2020). So that students can construct concepts through observing activities, formulating problems, proposing hypotheses, and collecting and analyzing data so that they can actively communicate the conclusions they get (Yumiarty et al., 2021)So, developing interactive learning methods that can create enjoyable learning without compulsion is urgent and necessary, especially in learning Natural and Social Sciences.

The purpose of developing the teaching materials used cannot be separated from the instructional objectives that students must achieve. IPAS (Natural and Social Sciences) is a science that studies the interactions that occur between living things and inanimate objects in the universe, such as human interactions with fellow humans and human interactions with natural surroundings. Science material is included in the main content, directly related to daily life, but due to the lack of motivation in students, their enthusiasm for learning has decreased. Meanwhile, students must always memorize various theories and concepts in science and science subjects. Mastery of theories and concepts themselves is essential because the essence of science lessons is to understand and memorize theories and concepts so that they can put them into practice (Asrul & Pia, 2022). Practicing theories and concepts in IPAS can start by understanding the theories and concepts themselves (Hikmawati, 2020).

Science learning that can motivate students is carried out by introducing the material through real-life examples, which are considered more effective because students have experienced it themselves (Resty et al., 2019). However, most of what happens in implementing the material is generally limited to the teacher reading with the students listening and then immediately memorizing it (Dari & Ahmad, 2020). This learning process requires high concentration so students can memorize the theories and concepts the teacher explains (Arifah & Saefudin, 2017). Students who lack focus will experience difficulties and feel that science lessons are challenging and tedious. Researchers conducted interviews and observations of students before developing; the

result was that many students were bored with science subjects due to boredom in thinking and excessive focus. Learning packaging that attracts students' interest is needed to implement the learning of IPAS. It is hoped that introducing IPAS concepts and theories will attract students' attention so they can memorize and apply them in a fun way.

B. Methods

This research is development research oriented towards educational game media products. Development research is a method that is quite powerful in improving learning practices (Gate, 2014). Learning media development research adopts research method steps developed by Borg & Gall, among others (Gate, 2014): 1) research and information gathering; 2) planning; 3) Development of learning media design; 4) Initial trial of learning media products on a control group; 5) Limited revision of learning media products; 6) Field trials on experimental groups; 7) Operational product revision, 8) Feasibility test, 9) Final revision of feasibility test results, 10) Dissemination and implementation of final product (see figure 1).
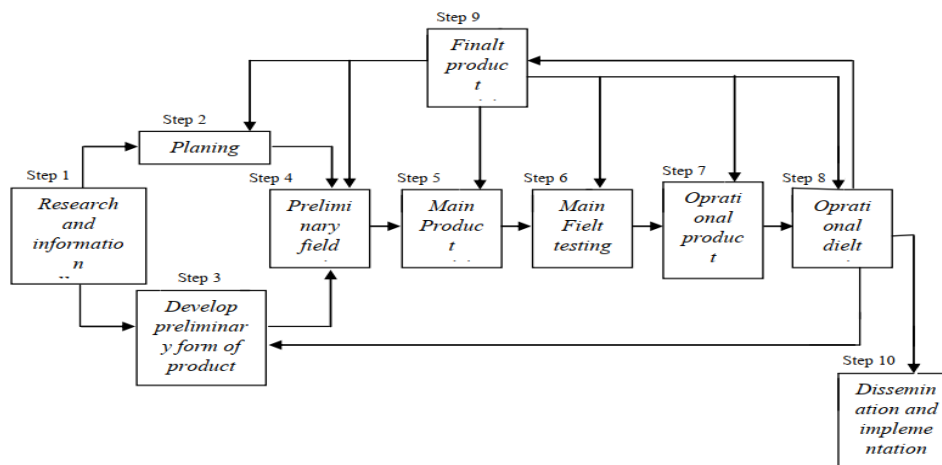

Figure 1 Media development stages

Data collection is carried out to collect information as material for planning the creation of learning media to overcome the problems. Data collection instruments used in learning media development research include observation, which is used to determine the condition of learning motivation directly. These questionnaires use motivation questionnaires based on Maslow's theory, which has been applied to learning (Cahyono et al., 2022), and interviews (Seidman, 2006), both closed and intensive.

The development research data analysis technique was carried out using descriptive methods. Descriptive statistics are statistics used to analyze data by describing data that has been collected in absolute terms and does not intend to make general conclusions or generalizations. Qualitative data is transformed based on predetermined score weights into quantitative data by determining the percentage of scores obtained.

Before analysis is carried out using the t-test, validation is first carried out, which helps determine the validity and feasibility of game-based learning media with qualifications for the level of feasibility (Ayuka et al., 2021). Then, proceed with the t-test. The t-test was conducted using a questionnaire to determine the influence of learning

media on research objects (Mertens, 2009). The t-test was carried out with a significance level of <0.05, so it could be stated that there was a significant difference in motor skills. Meanwhile, if the significance level is > 0.05, then it is stated that there is no significant difference.

C. Result and Discussion

An analysis of media needs was initially conducted to determine whether science adventurer game media was needed. The results of the needs analysis in the form of a questionnaire were then analyzed using a Likert scale (Phakiti, 2020; Suasapha, 2020). The initial conclusion is that this science adventurer game media is necessary and urgent to increase student motivation. Then, continue with the development process. The process of developing the Science Adventurer game media can be described as follows:

Research and information gathering

In this section, the researcher collects and analyzes existing references and selects the research location, MIN 04 Blitar. Researchers then conducted observations and interviews with teachers at MIN 04 Blitar, which revealed that learning sciences requires learning media that helps students understand the science material more efficiently.

Planning

Developers can continue with the second step, namely planning research. R & D research planning includes: 1) formulating research objectives, namely: developing Science Adventurer Game media to make it easier to understand the science material at MIN 04 Blitar; 2) the researcher conducted research at MIN 04 Blitar for three months with the researcher himself as an active observer and developer; 3) researchers actively participate in developing learning media because researchers can develop learning media.

Develop a Preliminary form of the Product

The first step in making a product is to determine the design of the product. Likewise, the creation of educational game-based Science Adventurer learning media products is shown in Figure 2. The Science Adventurer learning media is an innovation from the MSG (Monopoly Smart Games) game applied to learning activities, in this case, class V science material. Taking real examples aims to make it easier for students to receive the material so that they can restore their enthusiasm for learning and build their learning motivation in students.

The Science Adventurer Game Media has a 30-40 cm game mat with 20 boxes containing quizzes, one challenge box, one chance box, one stop box, and one start box on edge. The game media mat is designed with quiz boxes lining the four sides and opportunity, challenge, stop, and start boxes at each end. The quiz box has a number code on the top right edge that indicates the quiz code on the question card that must be completed.
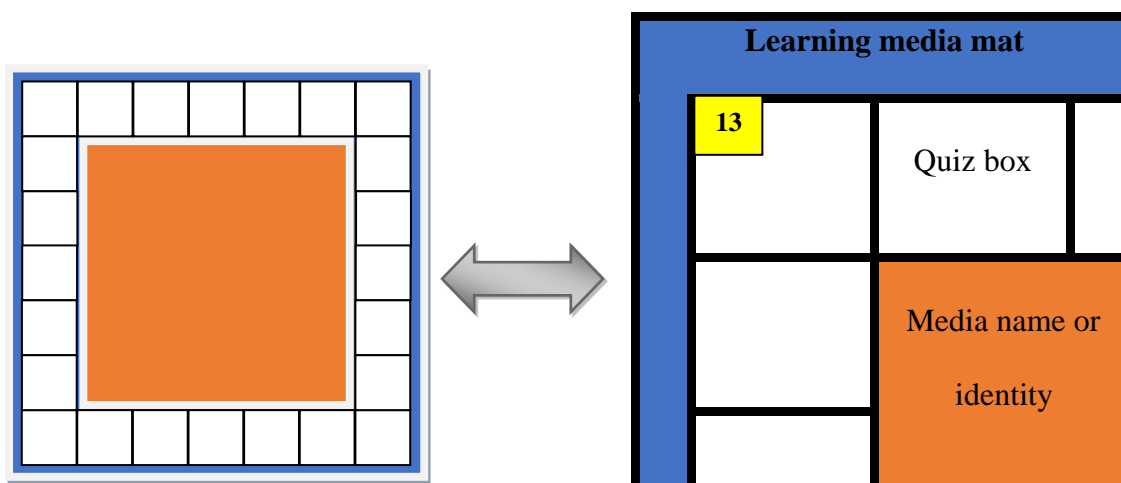
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Figure 2 Science Adventurer game mat design framework

Preliminary Field Testing

The Science Adventurer trial was carried out using validation from design and language experts, and trials were conducted using a questionnaire of 5-10 people. In the aspect of the validity of the material contained in the development of the Science Adventurer learning media, the validation results show a validity percentage of 93.3% taken from three language expert validators, and the Science Adventurer learning media that has been developed shows a validity percentage of 88.5% taken from three media expert validator person. Language experts' suggestions revolve around simplifying language use in products.

Main Product Revision

In the next stage, researchers made product revisions to the Science Adventurer learning media based on educational games. The revisions carried out are light revisions of a technical nature only. Qualitative data in the form of criticism and suggestions obtained from three learning material experts shows that the material contained in the Science Adventurer learning media is appropriate, and the learning media meets the eligibility criteria. However, it is necessary to make slight improvements to the grammar of the quiz to maximize its use and benefits. The results of validation assessment data from material and learning media experts show that the educational game-based Science Adventurer learning media product has been declared valid with a percentage validity value of 93.3% from learning material experts and 88.5% from learning media experts.

Main Field Testing

The results of revising the educational game-based Science Adventurer learning media were then carried out in a field trial with one test class, and feedback was provided for operational revisions. The educational game-based Science Adventurer learning media was tested on class V students of MIN 04 Blitar between February and March 2024. The research was carried out using an experimental method, which divided the class into two groups: the experimental and the control.

The implementation of small group trials on the Science Adventurer learning media based on game education was carried out by randomly taking a sample of one-third of the eight-child population. This was done after considering the results of data analysis of pre-test and post-test scores at the trial stage for small groups, described in Figure 3.

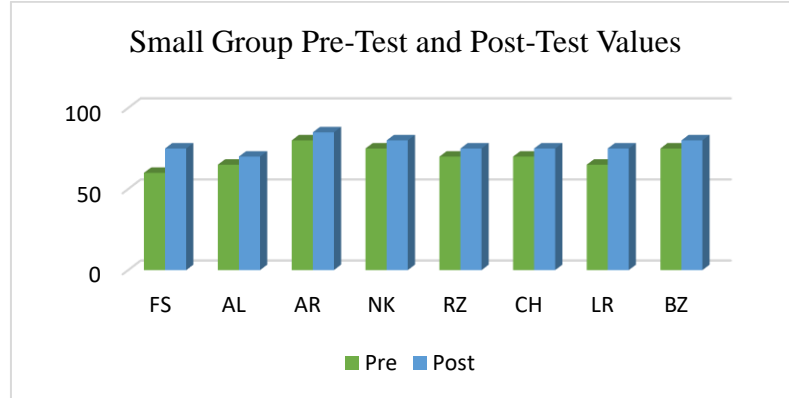**Small Group Pre-Test and Post-Test Values**

Figure 3 Small Group Pre-Test and Post-Test Values

The post-test scores in small groups showed a value greater than the pre-test, with learning completeness of 76.87%, so learning media can be feasible and effective for trials in large groups or field trials. However, learning media products still need to undergo a process of revision and improvement to maximize their functions and benefits.

Operational Product Revision

The educational game-based Science Adventurer learning media was revised after going through validation tests and trials in the test class and identifying its advantages and disadvantages. Initially, this media was simple. After revision, it became more complex. So, the complexity of the Science Adventurer learning media is more visible after the product revision.

Operational Field Testing

The results of the small group trial of the Science Adventurer learning media based on educational games showed a percentage of 76.87% learning completeness, with 83% of the learning media's effectiveness level falling into the "Valid" category. So, revisions must be made according to the direction of material expert validators and media experts to maximize learning media's benefits, uses, and functions.

Final Product Revision

The Science Adventurer learning media is based on educational games that have been revised and will be tested in large-scale groups or field trials. The results of the field trial of the educational game-based Science Adventurer learning media showed a 79.2% percentage of students' learning completeness with a 92% level of effectiveness of the learning media, which was included in the "Very Valid" category. So, the educational game-based Science Adventurer learning media does not need to be revised, and the media product can be declared very effective in overcoming the problem of declining student enthusiasm and learning motivation. This is further strengthened by the percentage of observations made by learning experts regarding the change in enthusiasm

and motivation for learning, with 95% in changes in enthusiasm for learning and 92% in changes in students' learning motivation, categorized as "Very Valid".

Dissemination and Implementation

In this case, reports on the results of R&D through scientific forums or the mass media are carried out through the publication of accredited scientific journals. The Science Adventurer learning media products based on educational games are widely distributed after going through quality control by experts.

Research and development of learning media was conducted to obtain the final result of effective Science Adventurer educational learning media to increase students' learning motivation. Learning media is developed using procedures that must be implemented sequentially in stages. Empirical data was obtained from interviews, observations, and documentation from class V MIN 04 Blitar. The questionnaire measures the validity level of learning media by giving validation questionnaires to 3 validators, including 1) learning material experts, 2) learning media design experts, and 3) learning experts. The quantitative data obtained was analyzed by calculating the percentage of assessments on the validation questionnaire.

The assessment results from learning material experts show a percentage of 93.84%, which shows that the Science Adventurer educational learning media has entered the criteria for being very suitable for use based on matching the eligibility criteria table. However, a review needs to be done to improve learning media products by examining the input provided by validators regarding quiz language to simplify it for elementary school-level students. This is done with consideration so that the learning media can run optimally.

The assessment results from learning experts show a percentage of 93.84%, which shows that the Science Adventurer educational learning media has entered the criteria for being very suitable for use based on matching the eligibility criteria table. However, a review needs to be carried out to improve learning media products by examining input and suggestions regarding the use of language in quizzes so that they are more simplified. This is done with consideration so that the function of the learning media can run optimally.

The assessment results from learning media experts show a percentage of 96.19%, which shows that the Science Adventurer educational learning media has entered the criteria for being very suitable for use based on matching the eligibility criteria table. However, it is necessary to review and improve the learning media product by examining the input and suggestions provided by media expert validators regarding simplifying the language in the quizzes in the learning media so that students easily understand them. Apart from that, the validator also provides future views on the book creator media, which is used as a means for writing Science Adventurer game guides, as a digital learning media in schools that have implemented digital learning methods with the consideration that learning activities can run more meaningfully.

A t-test was conducted to determine the effect of developing the Science Adventurer game media on students' learning motivation. The t-test was carried out to determine the average differences between the two samples. Meanwhile, the data that will be tested is post-test data from small groups and field trial groups, with a significance level of 0.05

Table 1 T-test Results

Independent Sample Test					
	p-value	*t-crit*	*lower*	*upper*	*Sig*
One Tail	2,28455E-12	2,30600			Sig. 0.000
Two Tail	4,5691E-12	1,859548038	74,62297	79,1270	Sig. 0.000
One Tail	2,59717E-17	2,14479			Sig. 0.000
Two Tail	5,19434E-17	1,761310136	76,47014	82,1012	Sig. 0.01

The results of the t-test analysis based on Table 1 show a significance level of 0.000<0.05 with tcount<ttable. These results show that Ha is accepted and H0 is refused, so the tiny group significantly differs from the field trial group. Deterioration of learning motivation is a problem that cannot be underestimated because an individual will always work towards a better life (Astuti et al., 2022; Ibrahim et al., 2017; Zebua, 2021). Maslow, as quoted by A. Acquah (2021), suggests that individuals have five levels of basic needs, which are then used as guidelines in studying human motivation, such as 1) Physiological needs (Devianti et al., 2020) concerning biological functions in humans, such as the need for clothing, food, shelter, physical health, etc.; 2) Safety and Security Needs (Amalia & Yulianingsih, 2020) includes security guarantees, protection from the dangers and threats of war, hunger, unfair treatment, etc.; 3) Social Needs (Sari et al., 2023) includes the need for love, recognition, loyalty, and cooperation; 4) Egoistic Needs (Danandjaya, 2020) includes the need to be appreciated for achievements, abilities, position or status, and so on; 5) Self-actualization Needs (Effendi, 2020) It covers the need to develop one's potential, maximum self-development, creativity, and self-expression. Looking at the five levels of basic needs that each individual has, the results of developing Science Adventurer's educational learning media have fulfilled three basic individual needs. The Science Adventurer educational learning media concept with group games has fulfilled students' need for cooperation, while the rewards given to students who complete quizzes and challenges have fulfilled individual needs to be appreciated for their achievements. Furthermore, quizzes and challenges that use a problem-based learning approach by raising problems from everyday life will help students fulfill their self-actualization needs by developing their potential through creativity and freedom to express themselves (Baden, 2007; Endrawan & Aliriad, 2023; Ferdiansyah et al., 2023; Hsbollah & Hassan, 2022).

The Science Adventurer educational learning media product that had been developed was then tested on class V MIN 04 Blitar students, with a total of 22 students. The results of testing learning media products in small groups showed a percentage of 83% with the condition "Good". Furthermore, the learning media product was revised

according to direction and input from expert validators so that at the second trial stage or field trial, the Science Adventurer educational media product could achieve an effective percentage score of 92% with the predicate "Very Good". Research and development results show that the Science Adventurer learning media product based on educational games can effectively increase the learning motivation of class V students at MIN 04 Blitar. Quizzes and challenges with the concept of puzzle questions contained in learning media will subconsciously create a sense of enthusiasm and curiosity, impacting the emergence of learning motivation in students. The final results of Science Adventurer learning media are in Figure 4.
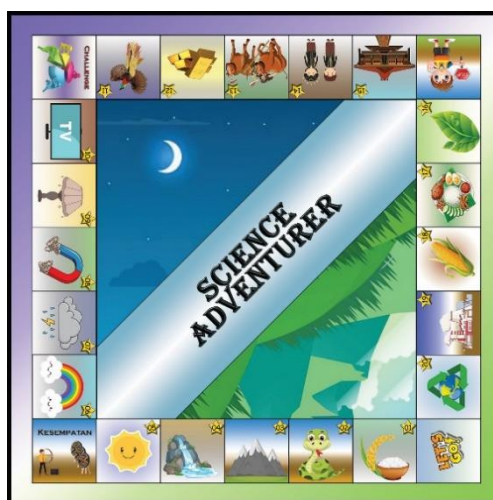

Figure 4 Science Adventurer Game Media Board

The use of Science Adventurer learning media takes the concept of Monopoly and puzzle games played by a maximum of four groups. The Science Adventurer learning media has a quiz box, and challenges students must complete in groups. The Science Adventurer media game is played by throwing dice to determine the steps taken, then completing each clue in each box to collect rewards according to the code and question level. Solving clues carried out in groups is carried out with the aim of training students' activeness and cooperative attitudes. Meanwhile, challenges are given with the aim of training students' self-confidence.

The learning media used as a tool to increase students' learning motivation is the Science Adventurer learning media, derived from a modification of the Monopoly Smart Games (MSG) learning media (Fajar & Habibbulloh, 2021) By changing the material and concept of the game. Science Adventurer learning media was selected by replacing chance cards, property cards, and play money with quiz, challenge, and reward cards. This component change aims to stimulate students' enthusiasm, which can revive their motivation. Apart from that, learning media is also equipped with a guidebook as an e-book containing tutorials and short material as a teacher reference, with schools that will apply digital learning methods.

Problem-based learning as a basis for developing learning media provides its plus value because the media can help students develop their abilities through the daily problems they face (Davidson & Major, 2014). The background to the choice of this method was to stimulate activeness, critical thinking, and creative and innovative attitudes in students (Almulla, 2020). Problem-based learning (PBL) can stimulate students' motivation through problem-solving activities that use examples of problems around them or in everyday life (Chen, 2021). Raising real-world problems that align with students' experiences can stimulate curiosity so that later, they will continue to dig for information to solve them, and their potential can be well realized.

The Problem-Based Learning (PBL) learning model can be applied in an educational game, which will make learning more meaningful (Astari et al., 2018; Hadi et al., 2022; Satwika et al., 2018). The use of learning media is also considered to be able to revive motivation to learn (Graham, 2020). Students who had declined by inviting students to learn through natural conditions and the surrounding environment (Lah et al., 2024). Apart from that, the condition of students who quickly get bored with the lecture method, some children are still not fluent in reading (Agoestanto et al., 2024). It makes the process of delivering learning material feel slow. So, Science Adventurer learning media based on educational games is appropriate for learning while playing. Apart from that, the choice of media also aligns with religious teachings in disseminating knowledge with wisdom (Mubarak & Halid, 2020). So, educators who act as teachers, as well as educators who act as motivators and facilitators, are responsible for creating meaningful learning.

D. Conclusion

This study aims to develop Science Adventurer learning media and improve the motivation of grade 5 elementary school students to learn IPAS. The validation results of material, media, and learning experts, respectively, were 94%, 96%, and 94%, which showed very valid qualifications, so the Science Adventurer Educational Game learning media can be considered very suitable. In addition, the Science Adventurer Educational Game learning media based on learning experts dramatically increases the motivation to learn science. This Science Adventurer learning media product based on educational games can still be developed further in the future with much more mature planning, such as (1) optimizing media components with digital e-book references, (2) maximizing fresher designs, (3) changing the concept of media that attracts students' interest with the development of science and technology, (4) applying learning media to different materials.

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