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DEVELOPMENT OF WEBSITE-BASED LEARNING MEDIA FOR INTEGRATED ISLAMIC PHYSICS OLYMPIAD AT THE JUNIOR HIGH SCHOOL LEVEL

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Abstract: This study aimed to develop website-based learning media for the integrated Islamic Physics Olympiad at the junior high school level and to determine the feasibility of the media from experts and the practicality of the media. The learning media was developed based on the stages in this research, adopting from Borg & Gall's modifications by the researchers. The data collection instrument used in this research and development was a questionnaire. The development results of the website for integrated Islamic Physics Olympiad material at the junior high school level met the valid criteria. Based on the feasibility test, the average total score of the website media experts was 89.2%, the material expert validation of the website was 86.15%, as well as the validation of the Islamic integration expert of the website was 81.82%. In the practicality test, website-based learning media for the integrated Islamic Physics Olympiad at the junior high school level was considered very practical with a percentage of the individual trial (teachers) at 91.61% and small group trial (students) at 90.18%. From all aspects of validation and according to the feasibility and practicality criteria, it was categorized as "very feasible and practical."

Keywords: Website, Physics Olympiad, Islamic Integration

INTRODUCTION

The government is making efforts to prepare human resources with reliable abilities in the field of science, one of which is through Science Competitions. These competitions have several levels starting from elementary school (SD), junior high school (SMP), to senior high school (SMA). This activity becomes a periodic event every year under the auspices of the National Achievement Center of the Ministry of Education and Culture and the Ministry of Religious Affairs. This event serves as a platform for outstanding students at each level to compete in various branches of competitions. At the junior high school level, the branches of the Science Competition include Mathematics, Science, and Social Studies (IPS). One of the objectives of the Science Competition activities is to enhance the enthusiasm for the world of science while instilling a competitive, sportsmanlike, productive, and honest spirit in students at the junior high school/MTs level from an early age. Success in a competition reflects dedication to the learning process[1]. Many schools are motivated to improve and develop the quality of learning in mathematics, science, and social studies (IPS) to support this Science Competition. This has a positive impact and becomes a national movement aimed at enhancing the quality and standards of science education at the school level, from district to provincial levels, up to the national level[2].

For schools under the Ministry of Religious Affairs, two types of Science Competitions can be participated in: the National Science Competition (KSN) organized by the Ministry of Education and Culture, and the Madrasah Science Competition (KSM) held by the Ministry of Religious Affairs[3]. In the KSM event, students are required not only to understand science and technology but also to comprehend religious knowledge[4]. The Madrasah Science Competition provides students with the opportunity to compete in the field of science integrated with Islamic values. The advantage of the Madrasah Science Competition compared to other competitions lies in the integration of scientific values with Islamic values[5].The Madrasah Science Competition creates a competitive atmosphere that motivates students, schools, as well as districts/cities to excel in the field of science through their intelligence. The spirit of this competition encourages every school to enhance its learning programs to improve their quality. KSM participants are expected to be agents of change and represent the quality of education in their schools [6].

Guidance for high-achieving students is one of the mandatory activities organized by schools to enhance the academic achievements of the institution. Schools are required to stimulate and develop students' potential through guidance processes to prepare them for competition. However, one of the common challenges faced by schools is related to classroom learning issues. Based on observations at MTsN 1 Tulungagung, the lack of learning media in guiding students who are potential participants in the Madrasah Science Competition (KSM) was identified as a problem. KSM guidance teachers, especially within the Ministry of Religious Affairs, are required to master materials integrated with Islamic principles. However, these teachers face difficulties with the learning media used, which lacks literature covering material relevant to the Madrasah Science Competition (KSM), specifically integrating Islamic principles. Despite KSM starting in 2012, the media used by teachers is still limited to printed questions and discussions. Teachers have not yet

utilized modules or guidance books containing material related to KSM. Synchronous guidance is conducted by providing exercise questions and discussing them during guidance sessions at school. Guidance teachers only lecture in front of the class, while students passively observe the learning process. Guidance activities are solely focused on classroom activities, and teachers cannot monitor students' learning outcomes when they study independently.

The application of learning media aids in the learning process by conveying messages to students. To establish a good relationship between the message sender, in this case, the teacher, and the message receiver, learning media also plays a significant role. In the effort to achieve learning objectives, several factors can influence the attainment of these goals, including educators, students, the learning environment, teaching techniques, and also media[7]. There are several effects of providing learning media, such as stimulating the curiosity and interest of students. Additionally, media also provides motivation and triggers learning activities that affect students' psychology. In terms of delivering messages or instructional content, media can also be utilized and have high effectiveness in achieving these objectives. It is hoped that students will be able to understand lessons more engagingly[8].

One of the challenges in implementing learning is the limited interaction between teachers and students, which is confined to the school environment without feedback or interaction between teachers and students using digital media. Asynchronous coaching processes are only carried out by asking students to study the questions that will be discussed next as practice material. However, with the advancing digital world, teacher-student interaction can be facilitated using digital learning media. This limitation arises because the learning media available to teachers for coaching purposes is very limited, leading to student boredom. Therefore, interactive media is needed to keep students engaged.Hence, interactive learning media containing materials, questions, and discussions are essential to support teachers in guiding students to prepare for the Madrasah Science Competition (KSM). One of the digital learning media platforms is a website. The developed website contains materials in the form of text and instructional videos. It also includes interactive quiz questions that display the scores obtained by students, as well as discussions presented not only in text but also in video format. Learning media has evolved from traditional books to become audiovisual content available online through the internet[9].With various IT-based devices and platforms available, teachers and students can access them independently and receive online guidance. Many applications can be used without additional costs, including the use of blogs as learning media[10].

Learning using ICT (Information Communication and Technology) is a learning process that utilizes technological advancements, particularly the internet, as a means to access information and communicate[11].By leveraging the internet, websites are among the favorite media that students can access more easily and effectively[12]. One of the reasons websites are favored is their practicality, as they are not limited by time and place, allowing users to access them anytime and anywhere[13]. The implementation of website media has been proven to have many significant impacts. For instance, websites motivate students to learn[14], enhance students' cognitive abilities[15], improve learning outcomes[16], and increase students' learning independence[17]. The use of websites as a learning tool also serves to increase students' interest in learning[18]. This simultaneously provides a solution for physics teachers in carrying out the teaching process.One solution is to use web-based physics learning media that utilize internet connections[19]. The development of existing learning media is limited to subjects taught at various levels. Meanwhile, media covering Islamic-integrated physics Olympiads is still very minimal. Based on this, there is a need for the development of interactive learning media that provide materials, discussion of questions, and Islamic-integrated practice questions in digital form for junior high school-level physics Olympiads. These materials would include text discussions, videos, and interactive quizzes that can be accessed widely by guidance teachers and prospective participants of the Madrasah Science Competition (KSM). Therefore, the researcher proposes a study titled "Development of Website-Based Learning Media for Islamic-Integrated Physics Olympiad at the Junior High School Level" to assess the feasibility of website-based learning media covering junior high school-level physics Olympiad materials integrated with Islamic principles.

RESEARCH METHOD

This study fell into the category of Research and Development. It focused on developing a product and conducting feasibility testing on the product. The outcome of this research was a website serving as a learning media covering integrated Islamic Physics Olympiad materials for junior high school level, including Measurement, Energy, Motion and Force, Fluids, Vibrations, Waves and Sounds, Light and Optics, Matter and Heat, Electricity and Magnetism, Earth and Space Sciences. The research stages in this study were adopted from Borg & Gall with modifications by the researchers[20]. The stages in this research included needs analysis, media design, initial product development, product validation, initial product revision, limited product testing, product revision and evaluation, dissemination, and reporting. The

procedures and development in the research were as follows:

1. Needs Analysis

   The needs analysis stage was conducted by gathering information from the research subjects, namely MTs YTP KertosonoNganjuk, MTs Al-Ihsan KalikejambonJombang, and MTsN 1 Tulungagung. Based on observation results, it was found that teachers encountered difficulties in preparing learning media used in guiding prospective competition participants. During this analysis stage, deeper information regarding the needs of both students and teachers was gathered, and relevant literature was studied to design a product that meets those needs.

2. Media Design

   The media design, in the form of a website, was guided by literature studies. There were two aspects of the planning process: product design and product development. The aim of using the Website-based Learning Media for Integrated Islamic Physics Olympiad Materials at the Junior High School Level was to provide students with a deeper and clearer understanding through illustrations or presented information. The media also provided materials, problem discussions, and Islamic-integrated computer-based exercises. The developed website in this research was expected to serve as an alternative learning media accessible to both students and teachers without limitations of space and time.

   The subjects in this study consisted of subject matter experts, media experts, mentoring teachers, and participants of the Madrasah Science Competition (KSM). Data collection techniques involved questionnaires with both qualitative and quantitative data types. Qualitative data comprised field observation results in the form of feedback or opinions, while quantitative data included questionnaire score values. Hardware components such as laptops and software tools like Canva and Camtasia were needed for developing this interactive learning media. The outcome of the developed product was a learning media that combined text, images, audio, and animations in the form of a website.

3. Initial Product Development

   The website design was developed to be user-friendly for both students and teachers. At this initial stage, effectiveness testing was not conducted, and the development remained hypothetical. The initial product development involved creating a Storyboard for learning media, which included a Home Page, Profile Page, Material Page, Learning Video Page, Games Page, and Education Article Page.

4. Product Validation

   The developed website product was tested by validators, comprising media and subject matter experts. The validators assessed the product based on quality criteria outlined by Akker et al., focusing on validation aspects including validity and practicality.[21].

5. Initial Product Revision

   The initial product revision stage involved improving the Website-based Learning Media for Integrated Islamic Physics Olympiad Materials based on the validation results.

6. Limited Testing

   At this stage, the learning media product was tested with a small group. Limited testing was conducted once using a Likert scale questionnaire, along with space for comments and suggestions. This testing was carried out at MTsN 1 Tulungagung to assess the practicality of the media according to mentoring teachers and prospective participants of the national madrasah physics competition.

7. Product Revision and Evaluation

   During this stage, evaluation and revision were carried out based on feedback from the test participants, including both teachers and students. Suggestions and feedback from this limited testing group were used as the basis for the final product refinement. Thus, it was expected that the resulting product would be effective and target the needs of both teachers and prospective national science competition participants. Further improvements were made at this stage to enhance the product.

8. Dissemination and Reporting

   This stage marked the final phase where the prepared product was disseminated and its results reported.

Data Collection Instruments

The data collection instruments to be used in this research and development are questionnaires covering (1) construct validity (content), (2) design validation, and (3) media practicality.

Data Analysis Technique

The feasibility and practicality of the developed media are assessed using a questionnaire instrument. Quantitative data analysis techniques for content validity and practicality validation involve calculating the mean values. The criteria for feasibility and practicality are specified in Tables 1 and 2.

Table1. Criteria for Product Feasibility Analysis Results

Average	Criteria
< 21%	Very Infeasible
21 - 40%	Infeasible

41 - 60%	Moderately Feasible
61 - 80%	Feasible
81 - 100%	Very Feasible

Table2. Criteria for Product Practicality Analysis Results

Average	Criteria
0-54%	Not Practical
55 - 64%	Less Practical
65 - 79%	Moderately Practical
80 - 89%	Practical
90 - 100%	Very Practical

For qualitative data obtained from comments from validation results and testing, the analysis involves revising the Website-based Learning Media for the Integrated Islamic Physics Olympiad at the Junior High School Level according to user feedback and suggestions. This process aims to obtain a website that is fully prepared and can be used according to the desired criteria.

RESULTS AND DISCUSSION

This study represents an effort to develop innovative learning media that integrates Junior High School-level Physics Olympiad material with Islamic values and aspects. In the increasingly evolving digital era, the use of websites as a learning platform has become more significant and relevant. This website-based learning media is designed with various interactive features to assist Junior High School students in comprehending physics concepts. The stages of research and development employed to create the Integrated Islamic Physics Olympiad Website for Junior High School Level are as follows:

1. Needs Analysis

   The initial step in the needs analysis involves gathering information from teachers acting as Olympiad mentors, who are from MTs YTP KertosonoNganjuk, MTs Al-Ihsan KalikejambonJombang, and MtsN 1 Tulungagung. Before commencing the data collection process, the researcher obtained research permission from the three schools as a preliminary step. All three schools agreed to and granted permission for the research. The initial data collection process involved interviews with teachers and school principals.

   Based on the interviews with teachers, it was found that the mentoring process generally involves providing students with practice questions through printed materials or files. Teachers do not use specific media containing interactive materials and content. Moreover, no simulated practice sessions are conducted during the mentoring process. Additionally, teachers encounter difficulties in preparing learning media used during the coaching process for prospective competition participants. The practice questions used by teachers are sourced from various internet resources. Learning materials related to physics topics used are still limited and primarily sourced from each student's worksheets.

2. Media Design

   Media design is carried out after obtaining an overview of the required media. In the planning process, there are two aspects to consider: product design and product development. The primary objective of using a website as a learning media for Junior High School Physics Olympiad material with an Islamic approach is to convey a deeper and clearer understanding to students through illustrations and available information. Additionally, this website provides lesson materials, problem discussions, and integrated problem-solving exercises based on Islamic principles using computer-based methods. It is hoped that the website developed in this research can serve as an alternative learning media accessible to both students and teachers without constraints of time and location.

   Media design begins with the establishment of hosting and website domains. Hosting is a service that provides server space used to store and manage all files, data, and information required to run a website. Hosting is akin to renting a space on the internet where the website "resides," thus making it accessible to online users. Hosting provides the necessary technical infrastructure, including storage, bandwidth, and other server resources, enabling the website to be accessed online at all times. In this study, the hosting used is provided by Niagahoster. As for the domain, it is a unique address or name used to identify and access a website on the internet. The domain used in the study is studifisika.com.

   Based on the established hosting and domain, a website management account is obtained. The next step is to design the media using the website management account. This design is based on a storyboard. One aspect of the website layout is illustrated in Figure 1.

Figure 1. Customize Theme

3. Initial Product Development

The development of the website product is based on the storyboard outlined during the design phase. The creation of the storyboard serves to facilitate the researcher in developing the product. Based on the storyboard, the website appearance fulfilling the requirements of the created storyboard is determined. This setup is carried out in the Appearance settings.

4. Product Validation

The validation of the website product involves several important stages, including material expert validation, media expert validation, and Islamic integration validation.

a. The first stage involves material expert validation, which includes individuals possessing knowledge and expertise in the content or material presented on the website. Material validators examine content accuracy, information correctness, and understanding of the presented topics. Material expert validation aims to ensure that the information provided on the website is accurate, relevant, and comprehensive. Material experts evaluate whether the content aligns with the prevailing standards of knowledge in the field. In this study, material expert validation was conducted by Ms. Ambar Sari, M.Pd., who is a Physics Teaching lecturer at UIN Sayyid Ali Rahmatullah Tulungagung. Based on the material expert validator, a validation score of 86.15 was obtained.

b. The next validation is media expert validation, which involves individuals skilled in the media used on the website, such as images, videos, or graphics. Validators assess the visual and multimedia aspects of the website. This validation ensures that the use of media on the website conforms to design norms, aesthetics, and quality standards. Media experts examine whether visual elements support the intended message and whether they are well integrated into the overall display. Mr. GagukResbiantoro, S.Si., M.Pd., served as the media validator in this study and is a lecturer in Instructional Media Development at UIN Sayyid Ali Rahmatullah Tulungagung. The media expert validation score obtained was 89.2.

c. Integration expert validation is utilized to determine compatibility with material expert validation. This validation was conducted by Mr. M. Luqman Hakim Abbas, S.Si., M.Pd., who is a lecturer in Quranic Sciences at UIN Sayyid Ali Rahmatullah Tulungagung. The Islamic integration validation score obtained was 81.82.

5. Initial Revision

During the initial revision stage, the feedback provided by the material expert, media expert, and integration expert validators is considered, and adjustments are made accordingly. The improvements made can be observed in Figures 2 and 3, where revisions are made to the terminologies used on the website.

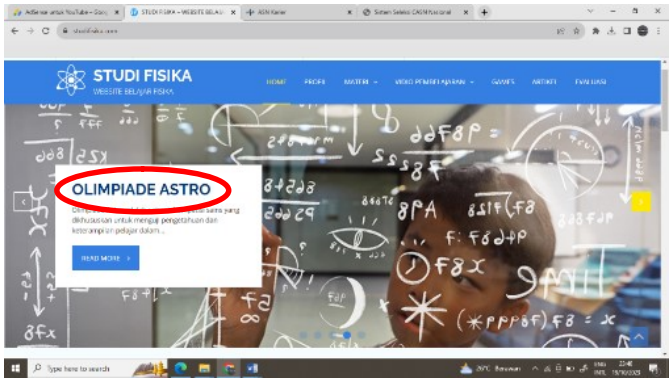

Figure 2. Initial Home Page View

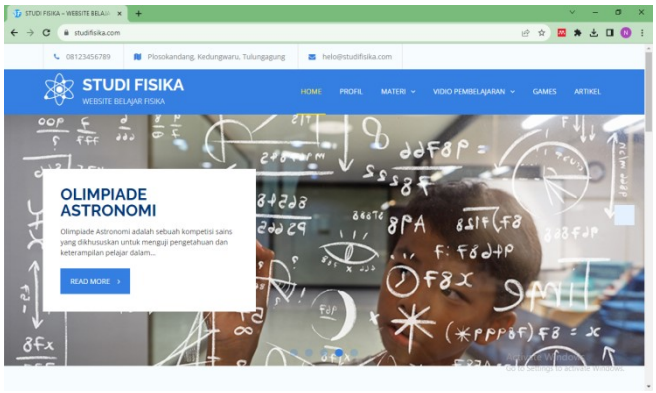

Figure 3. Final Home Page View

6. Limited Trial Testing

The results of the limited trial testing were conducted at MTsN 1 Tulungagung by assessing the practicality according to teachers and students who had participated in the Olympiad coaching activities. The limited trial involved 12 teachers and 17 student participants of the Olympiad. Based on the data analysis, the practicality score according to teachers was 91.61%, and the practicality score according to students was 90.18% for the Website-Based Learning Media for Junior High School Physics Olympiad Material Integrated with Islam. Additionally, feedback obtained from this limited trial included: (1) It is advisable to use simpler language to explain physics theories and directly convey the essence of the theories so that students can understand the purpose of the theory more quickly. (2) Each material explanation should be accompanied by example problems related to the material so that students understand the usefulness of the formulas presented in each material for solving problems. (3) Funny memes should be added to the website's images to keep students engaged and enthusiastic. (4) Instructions on how to use the games on the website should be added, along with related materials.

7. Product Revision and Evaluation

During this stage, evaluation and revision are conducted based on feedback from trial participants, both teachers and students. Suggestions and input from the limited trial group are used as the basis for final product refinement.

8. Dissemination and Reporting

The final stage of this research involves dissemination and reporting. Dissemination activities include organizing an FGD Product Exposition event and inviting Ms. Ike Lusi MeilinaS.Pd. from the University of Jember as an expert in instructional media development. To access the developed website, common web browsers such as Google Chrome, Firefox, Microsoft Edge, and others can be used, or through the link:https://studifisika.com

The product exposition event is conducted online using Google Meet and attended by 90 participants. The activity poster and documentation are shown in Figures 5-6.

Figure 5. Poster for FGD Product Exposition Event

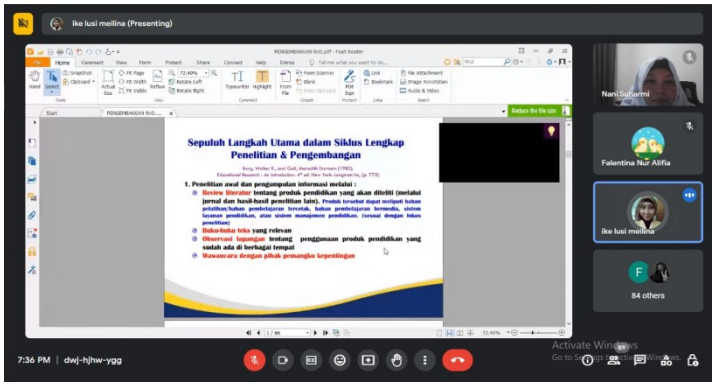

Figure 6. Documentation of the Implementation of FGD Product Exposition

Data Feasibility and Practicality of Website Media

Based on the development stages of the media as outlined, the feasibility of the research on "Development of Website-Based Learning Media for Junior High School Level Physics Olympiad Material Integrated with Islamic Values" is demonstrated by the following table:

Table 5. Website Media Feasibility

Validation	Value (%)	Description
Material Expert Validation	86,15	Very Feasible
Media Expert Validation	89,2	Very Feasible
Islamic Integration Validation	81,82	Very Feasible

Table 6. Kepraktisan Media

Practicality	Value (%)	Description
Teachers	91,61	Very Practical
Students	90,18	Very Practical

Based on Table 5, the website-based learning media for the Junior High School-level Physics Olympiad integrated with Islamic values is deemed Very Feasible. This is consistent with the development of website media as a suitable physics learning medium[18],[22]. According to Table 6, the website-based learning media for the Junior High School-level Physics Olympiad integrated with Islamic values is declared Very Practical, aligning with the development of other website-based physics learning media[23],[24].

CONCLUSION

The conclusion of the research "Development of Website-Based Learning Media for Junior High School Level Physics Olympiad Material Integrated with Islamic Values" is as follows: 1) The research and development steps of the website-based learning media for Junior High School-level Physics Olympiad integrated with Islamic values include needs analysis, media design, initial product development, product validation, initial product revision, limited testing, revision and evaluation, dissemination and reporting, 2) The results of developing the website-based learning media for Junior High School-level Physics Olympiad integrated with Islamic values meet the criteria for validity. The average total value of website media experts is 89.2%, material expert validation is 86.15%, and Islamic integration expert validation is 81.82%. In the practicality test, the website-based learning media for the Junior High School-level Physics Olympiad integrated with Islamic values is considered very practical, with individual trial percentages (teachers) at 91.61% and small group trials (students) at 90.18%. Considering all validation

aspects and meeting the feasibility criteria, it can be categorized as "very feasible and practical."

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