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Article

Development of Interactive Based Educational Website "Belajar Zat" in Digital Era with Educaplay Integration

Dina Rahmawati[1*], Galih Eka Saputra[2], Aziza Karenina[3]

[1,2,3]IAIN Ponorogo, Indonesia

**Corresponding Address: dinarahmawati0844@gmail.com*

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ABSTRACT

Website is a promising innovation as an interactive learning media with a user-friendly design approach that can attract interest and make it easier for students to understand complex material. The research aims to develop an interactive-based website, named "Belajar Zat", integrated with the Educaplay platform, and test the validity of the website as an effective learning media. The method used in developing website products is research and development with the Borg and Gall method which is carried out until the fourth stage, namely research and data collection, product planning, product development, and product validation. Data collection is done qualitatively using validation results and analysis of relevant references. The results of the Belajar Zat website validation were declared very feasible by the validator, with 84% material expert validation very feasible, 100% technology expert value very feasible, 92.5% media expert value very feasible, 100% language expert value very feasible, and 95% design expert value very feasible. Based on the data obtained, the highest scores are technology, language, and design experts, while the lowest scores are material and media experts. The overall results obtained show that the Belajar Zat website is proven to be valid for use as an effective learning platform.

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INTRODUCTION

Education is a crucial need for all human beings and has a role in shaping the character, knowledge and skills of individuals. A good education can create new economic opportunities, improve the quality of life, and support social progress. The reality is that the quality of education in Indonesia is still very poor with problems of poor education management, lack of facilities and infrastructure, outdated thinking, poor teaching resources, and weak learning assessment standards. Education problems that occur contribute to the low quality of education in Indonesia (Tambunan & Siagian, 2022). Educational problems in Indonesia are a challenge for teachers to present a more interesting and effective learning experience, especially in

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science material which is often considered by students as relatively difficult material. An educator must be able to be creative and change the way they deliver lessons so that students are interested and want to listen to what the educator says by using media in the learning process (Sinaga & Sinaga, 2021).

The development of learning from the conventional era to the digital era has undergone significant transformations such as teaching methods, accessibility, and technology used to meet the needs of the times. Old ways of learning need evaluation and improvement because they are no longer relevant to the demands of the times, so that learners will not be left behind by the growing times. Old learning approaches, such as lectures and homework, are not effective in meeting the learning needs of students in the digital age and innovation in learning through technology and digital media is needed (Tambunan & Siagian, 2022). Learning in the digital era utilizes information technology to enhance the learning experience of learners. The rapid advancement of information technology has changed the way of learning and accessing information that allows learners to learn independently and flexibly. The main advantage of digital learning is the unlimited access to information. Learners are facilitated by the internet to find various learning resources in the form of articles, learning videos, and online courses so that learners can explore topics of interest in more depth, independently, and also flexibly.

One of the digital technology innovations that can be utilized as learning media is the website. Website learning media innovation is a form of implementation of technological sophistication that has a significant impact on the transformation of the world of education through the internet network. The use of website-based learning media can help the world of education combine online and face-to-face learning, so that students will get a new experience in the learning process. The learning process is more innovative, varied, and interactive, which can improve student achievement (Salsabila & Aslam, 2022).

Subjects that can apply web-based learning are science subjects, especially material about the characteristics of substances and changes in the form of a substance. Abstract concepts in substance and its characteristics require a learning approach that is easy to understand and can be applied directly in everyday life. Based on the observations of researchers, material about the characteristics of substances and changes in form if not visualized, then the concepts to be conveyed become abstract when delivered using conventional learning methods. Most teachers in schools only teach substance material and its characteristics by relying on verbal explanations, using textbooks, and not accompanied by interactive learning media. The way of delivering material that is less interesting by the teacher has an impact on the low interest of students and students' understanding of the material presented becomes less than optimal. The use of interactive web-based learning media offers many advantages in delivering material on the characteristics and changes in the form of a substance. The use of web-based learning media allows the educational process to become entertainment for students (eduatinment). The use of a web-based learning system that combines various media (multimedia) such as text, images, audio, video, animation, and digital books, teachers can present subject matter that is more interesting, not monotonous, and easier to convey to students (Imani et al., 2021).

The development of an interactive website is expected to be able to help students to understand the characteristics of substances and changes in the form of a substance, thus making learning activities provide a deep and enjoyable experience. Interactive website development is carried out by giving the name "Belajar Zat" which is integrated with the educaplay platform. Educaplay is a digital platform which provides a variety of interactive activities and tools that can be used in learning activities, such as crossword puzzles, quizzes, and memory games that are tailored to the material characteristics of substances and changes in form (Fernanda et al., 2024). The educaplay platform provides many benefits such as being easily accessible anytime and anywhere making it easier for students to learn. Educaplay can

also support collaborative activities, where students can play while learning. Research conducted by (Mykytka et al., 2022), showed that the use of the educaplay platform was able to increase motivation as well as students' interest in the material taught in the subject.

Previous research conducted by (Dewi & Sumarni, 2020), with the title " Efektivitas Penggunaan Media E-Learning Berbasis Website Terhadap Hasil Belajar Kognitif Peserta Didik." stated that website-based learning media is very effective to use and apply in the learning process. Because from the results of research conducted in the experimental class (using website-based e-learning media) recorded an average posttest score of 89.45, with learning completeness reaching a value of 91.66%. While in the control class (without e-learning media) recorded an average posttest score of 74.42 and learning completeness reached a value of 62.85%. The results of the study can be concluded that the use of website-based learning media in learning activities has proven effective in improving student learning outcomes.

Similar research was conducted by Rosyida and Hasanah (2021) with the title "Websites As Science Learning On Invertebrate Animals Materials At State Junior High School 1 Tegaldlimo Banyuwangi." The results showed that the use of website-based media was able to add students' motivation to the material being taught. The data obtained from the research obtained a fairly high response from students, namely in a small scale test of 94.28% and a large scale test of 92.00%, so that the website learning media was categorized as a very interesting media for students.

Based on the problems that have been described, the formulation of research problems is formed, namely (1) How is the validity of website-based science learning media on substance material and its characteristics? (2) How is the design and development of the Learning Substance educational website that is integrated with the educaplay platform for junior high school students?

METHODS

The research method used in the development of the Belajar Zat website is Research and Development with the Borg & Gall model. Borg & Gall model consists of four stages, namely research and data collection, product planning, product development and product validation. The research used descriptive qualitative analysis techniques. The stages that must be carried out in website development are first observation and gathering information to determine the material to be developed on the website. The second stage plans the development of website products to design the website layout. The third stage of website product development by designing the website as a whole. The fourth stage validates website products to expert validators regarding five aspects of validation, namely material experts, technology experts, design experts, media experts, and language experts. The validation data is processed in the form of numerical values with the highest validation score being 5 and the lowest validation score being 1, then the final score is calculated in the form of a percentage using the formula:

$$\text{Final Grade} = \frac{\text{Score obtained}}{\text{Maximum score}} \times 100\%$$

The scores that have been made in the form of percentages are then classified into very feasible, feasible, quite feasible, less feasible, and very less feasible criteria listed in table 1. The data that has been collected is put together and then discussed with relevant literature reviews as an illustration of the feasibility of developing the Belajar Zat website as a learning media in terms of material suitability, design, grammar, and appearance.

Table 1. Eligibility Interval Criteria

No	**Interval**	Category
1	81-100 %	Very feasible

2	61-80 %	Feasible
3	41-60 %	Decent enough
4	21-40 %	less feasible
5	0-20 %	Very less feasible

Source : (Fadilah et al., 2023)

RESULTS AND DISCUSSION

The results of the validation of the development of an interactive-based educational website "Belajar Zat" in the digital era with educaplay integration obtained from validators are presented in table 2:

Table 2. Validation Score Data

Aspects	**Skore**	Category
Material Expert	84 %	Very feasible
Technology and language experts	100 %	Very feasible
Media Expert	92, 5 %	Very feasible
Design Expert	95 %	Very feasible

Based on table 2, the validation value obtained from media experts is 84% and is categorized as very feasible. The validation value from technology experts and linguists is 100% and categorized as very feasible. The validation value from media experts is 92.5% and categorized as very feasible. The validation value of the design expert is 95% and is categorized as very feasible. The five validation results are categorized as very feasible because the validation value is in the interval 81-100%.

Table 3. validator Comments and Suggestions

Aspects	**Comments and Suggestions**
Material Expert	1. Learning objectives have not used ABCD (Audience, Behavior, Condition, Degree). 2. Revise the title of material: "Zat dan Karakteristiknya."

Belajar Zat website has a uniqueness that is different from existing learning websites. The Substance Learning Website is integrated with Educaplay educational games as a learning evaluation quiz so that it can be used as an innovation in website development as a learning medium. Belajar Zat website is equipped with features that function to facilitate website users. Features that exist in the Belajar Zat website are learning objectives features, discussion features and learning videos, student worksheet features, evaluation features, and bibliography features.

Based on the percentage values in Table 2, the highest values were obtained from technology experts, language experts, and design experts. The lowest data was obtained from material experts and media experts. Material expert validators provided criticisms and suggestions related to the development of the Belajar Zat website which are presented in table 3.

The validation of the Belajar Zat website by technology experts gets the highest score because it is easy to access by website users so that it can be used to find information presented on the website. Belajar Zat website that has speed and stability when accessed can be proven by increasing retention loyalty and satisfaction for website users. (Haan, 2020). The use of quality videos and images on the Belajar Zat website can provide assistance to users, especially students, to understand the material presented through quality images and videos (Wahyuni et al., 2022). The integration of the Belajar Zat website with online features in the form of Educaplay games can create innovative learning that supports teaching and learning activities. The integration of educaplay online features with the Belajar Zat website makes learning more

fun for students and can motivate students to learn (Dianita et al., 2024). The Belajar Zat website display can adjust to the layer of electronic devices such as cellphones, computers and laptops used and is compatible with various types of browsers (Sulistiani, 2018). A good website display has a uniform appearance when accessed using various types of browsers so that the website can function fully on any type of browser (Manhas, 2015). The difference in screen size resolution of electronic devices used, website users are required to adjust the size of the web accessed so that the website appearance is maximized. Responsiveness of web design is applied to display the website according to the screen of the device (Wijaya et al., 2022). The ease of navigation of the Belajar Zaat website can provide assistance for website users to explore the website. Website users are given information in the form of navigation buttons between pages so that it can make it easier to find information on the website (Sulistiani, 2018). Website navigation is required to organize a clear structural framework, so that website users can find out information when the website is accessed (Andrews, 2020).

Linguists give a very decent validation value to the Belajar Zat website in the use and grammar in accordance with Indonesian language rules. Writing content on the Belajar Zat website that is in accordance with good and correct Indonesian language rules can be interpreted as the use of appropriate language diversity (Pattiwael et al., 2019). The Belajar Zat website presents the content of the material using simple language, so that students are facilitated to understand the subject matter taught by the teacher (Wahyuni et al., 2022).

The simple layout and appearance of the Belajar Zat website received very feasible validation results given by design expert validators because it does not cause boredom for users (Fadilah et al., 2023). Consistency of website interface design Belajar Zat uses appropriate color composition, consistency of graphic layout, ease of content to read, graphics used to reinforce content, proper arrangement of animation places, animation content used to reinforce website content, and the formation of an overall harmonious pattern (Sulistiani, 2018). User interaction with the website is determined by the interface design on the website (Hamzah et al., 2013). Website designers can interact with website users through the interface system. The form of interaction between website designers and website users can be through words and visual images consisting of icons, graphic layouts, colors, shapes, sounds, and controls (Abboud, 2020). The use of clear navigation icons on the Belajar Zat website can develop effective and efficient learning, and facilitate the development of student and teacher creativity (Fadilah et al., 2023)

The validation results obtained from the validator show that the material validation value gets the lowest score of 84% which is included in the very feasible category. Material validation gets the lowest score because the depth of the material is lacking. The material discussed in the Belajar Zat website is too shallow so that it does not provide enough information for students to understand learning concepts in depth. As a result, learners will have difficulty in applying the knowledge gained to real situations and broader contexts (Oktafiyani & Karlimah, 2021). The material presented on the Belajar Zat website should involve a problem-based approach. That way learners are not only given information, but also a challenge that encourages them to think critically and find solutions. The website could be supplemented with a constructive feedback feature, so that learners after completing a quiz or evaluation task get an explanation of their mistakes and how to correct them. Good feedback will in turn improve learners' motivation and learning outcomes as it increases self-efficacy and self-regulation (Atikah and Amelia, 2024).

The validation results on the media assessment showed the second lowest result of 92.5% which was categorized as very feasible. Media validation gets the lowest score because the Belajar Zat website needs a more user-friendly design. The impact of the Belajar Zat website media design that is less user-friendly allows difficulty in accessing content if the display is too complicated. To make the Belajar Zat website user-friendly, it can adopt a more

minimalist design by reducing unnecessary visual elements. Then the website will provide more focus on the learning content presented to students. A minimalist design can prevent learners from confusion so that they can easily find information from the website.

The disadvantage of the Belajar Zat website is the lack of clarity in the learning objectives included. The learning objectives formulated have not followed the ABCD (Audience, Behavior, Condition, and Degree) writing rules. The ABCD approach helps in formulating learning objectives that are more specific and measurable. The lack of clarity in the formulated learning objectives results in students being confused and not knowing the learning material being studied. Improving the writing of the learning objectives of the Belajar Zat website can increase the effectiveness and also the motivation of students to be active in learning activities. Material expert validators provide suggestions for improving learning objectives in accordance with ABCD standards. The differences in the writing of learning objectives in the feature learning objective Belajar Zat website before and after revision are presented in Figure 1 and Figure 2.

Figure 1. learning objective features before revision

Figure 2. learning objective features before revision

Another shortcoming of the Belajar Zat website that needs improvement is the sub-title of the website. The use of the term "material" can cause confusion because in chemistry terms it has a specific and different meaning compared to its use in a general context. The word "material" in chemistry has a meaning that refers to the substance of objects that have mass and volume. In a broader learning context "material" is often used to describe learning content. Inaccurate word choice can cause confusion for learners so the material expert validator suggested eliminating the word "material" in the sub-title of the website. The differences in the writing of sub-title in the discussion features and learning videos Belajar Zat website before and after revision are presented in Figure 3 and Figure 4.

Figure 3. Sub-title in discussion features and learning videos before revision

Figure 4. Sub-title in discussion features and learning videos after revision

CONCLUSION

Based on the results of research and discussion, the highest validation value is obtained from technology experts 100%, language experts 100% and design experts 95%. The lowest validation value data is 84% material experts and 92.5% media experts. The Belajar Zat website requires the development of appropriate learning objectives and media designed in a user friendly manner to be effective in conveying substance material and its characteristics.

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