Software Testing on The Learning of Islamic Education Media Based on Information Communication Technology Using Blackbox Testing

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Abstract

Learning Media is a set of tools that can be helpful and complementary to teachers or educators to achieve a good and righteous learning process with the learners. The development of the learning media based on Information Communication Technology is excellent in the technological era and the millennial period because it can motivate students to learn. Learning materials can be through images, video, text, and other media. The following research is conducting software testing on Islamic religious education learning media using the BlackBox testing approach. The purpose of the study is the implementation of BlackBox testing in media learning Islamic education software. The results obtained showed pretty good results with software testing accuracy of 90%. This research suggests that BlackBox testing is capable of measuring software quality.

Keywords: BlackBox, Learning Media, Islamic education, Software.

1. Introduction

Props or media are essential in learning because they are beneficial teachers and also Shiva. With the media, the learning process can be more productive, active, and even creative. Several presses can be held by the teachers in the management of the failure, which are electronic or non-electronic media. Electronic media is technological development, gaining a place and attention is big enough for teachers and students as well as a significant influence on education development. So, electronic media is a conducive medium for teachers and students in the technological era. Related research discusses information and communication technology (ICT) on the implementation of ICT-based learning. ICT learning is used to innovate in creating media studies that can help students understand, create innovations, inventions, and creativity in the fields of science, technology, and the arts [1]. In improving the competency of Islamic education, students can go through several stages of ICT-based learning and the improvement of core competencies [2]. ICT Learning Media can help in the learning process effectively. The learning process is the process of communication that must be realized through the activities of sending and exchanging messages or information by each lecturer and students. A letter or data can be in the form of knowledge, skills, skills, ideas, experiences, and so on. Through the communication process, messages or data can be absorbed and compromised by others. Related research shows that the use of ICT in education is felt more positive among students who use technology every day [3].

Teachers, as the learning process executor, must be able to design, use, and evaluate ICT learning media. The use of technology in the learning activities in the classroom has some advantages, as learners work faster and more comfortable and enjoyable because of the interaction between learners with images, voices, colors, videos, and something
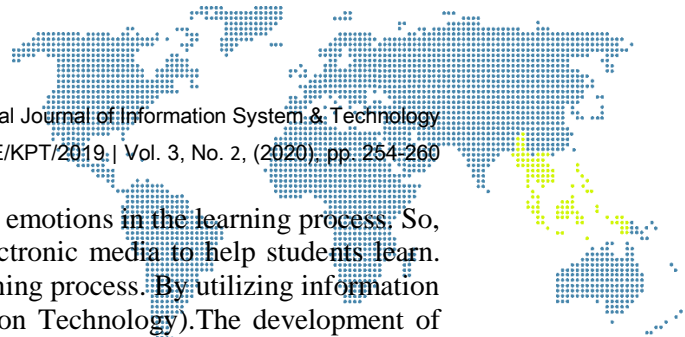
instant. Technology is capable of generating positive emotions in the learning process. So, a teacher should be creative in using magnetic, electronic media to help students learn. ICT-Based Learning Media is a tool used in the learning process. By utilizing information technology or ICT (Information And Communication Technology).The development of ICT includes developing an educational system, both from a basic and higher levels of education. Various ways and media have been introduced and used in the learning process. Teaching with the aim that more and more lecturers are giving creativity in teaching and can produce more meaningful learning will undoubtedly improve the quality of education [4]. Hybrid learning mechanisms are essential to improving the quality of learning media [5].

Information technology and communication as a medium in education and also tend to encourage the interest of students and also to give a lot of benefits to the process of disrespect. Therefore, in the presence of ICT media is expected to add ease in the learning process, so that the purpose of learning can be well-conceived. Macromedia Flash has advantages that are beneficial for teachers and students. As for the students, it can motivate or encourage the universal learning of students with the combination of audio, video, and also interesting pictures. Online learning and digital worlds, such as computers and digital cultural aspects, have entirely changed the way people think and behave. ICT-based Learning Media has a pattern on the planning and application of maturity. Although, in specific contexts, ICT plays a vital role in learning interactions between teachers and learners. Some approaches Like using a digital whiteboard, using digital devices for effective and efficient learning and teaching purposes [6]. Related research discusses the design and assessment of learning recommendations with a multi-disciplinary approach combining educational science, cognitive sciences, and computer science to develop a more accessible e-learning system [7].

Software testing is fundamental in the era of information technology development. Related research discusses the automatic modeling of discrete manufacturing systems achievable with efficient identification algorithms that handle large and complex plants performing concurrent and repetitive tasks of the unknown Apriori [8]. Black Box Testing focuses on the specifications of functional software. The tester can be defines a set of input conditions and conducting testing on technical specifications program [9]. In conducting software testing necessary identification process needs of the application to be done testing [10]. There are several reasons for ICT-based learning issues, including lack of access to adequate resources and materials. Internet connection is the main thing in ICT-based learning. For successful implementation of ICT-based education is required the integration of technology in the classroom. This study discusses the learning testing of ICT-based Islamic education software using the BlackBox testing method.

2. Research Methodology

Testing is a critical element of software quality assurance and represents the fundamental review of specifications, design, and coding. Several rules that serve as test targets on the software are:
  a. Testing is the process of executing a program with the intent to find fault.
  b. A good test case is a test case with a high probability of discovering a single mistake.
  c. A successful test is a test that reveals all the mistakes that have never existed before.
  In the following studies, there are steps, such as in figure 1.
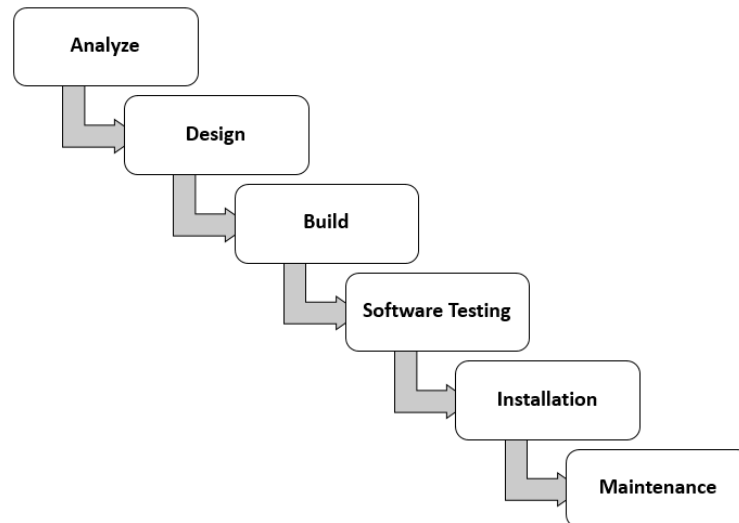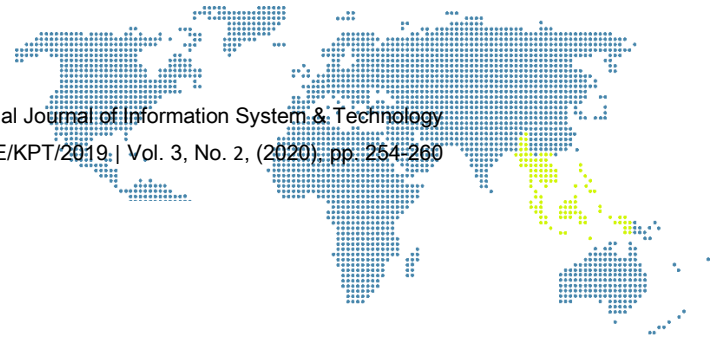
Figure 1. Software testing measures.

a) Analyze

Need analysis is a process for obtaining information, fashion, specifications about the software that users want. Clients and software makers are actively involved in the system needs review. Information from clients becomes a reference in conducting software design. The analysis of needs is one of the many essential activities in the process of software engineering. The most important thing is to understand the system problem fields that are running and the domain of the system solution to be created. It is necessary, analytical activity needed in every process in the life cycle of software development. In the process of engineering needs, analysis is done in every business.

Domain understanding, in this stage of engineering software, needs to know how the company's organization operates and what is the problem of the system that is running at the moment. Engineering should focus on what is the problem. Requirements collection, this stage is a stage for collecting the needs of the system to be built. Classification, in the previous stage of the needs group, is still unstructured. Therefore, the interrelated needs are grouped, both according to their use class and the type of need. The needs of these needs are organized into coherent groups. Engineering needs to separate the needs and desires of the user. conflict resolution, at this stage, is to find and complete the needs in which there is a conflict. Requirements checking analyzes a set of requirements from previous stages to verify and validate based on completeness, consistency, and real-life aspects. The main objective is to achieve an understanding of the nature of the issues and challenges that exist in it. The analysis of the needs begins with the specifications (services, attributes, properties, quality, constraints) of the solution system to be built. The usability of the analysis is to model real-world issues to be understandable. Real-world problems should be understood and learned so that the specifications of software requirements can be disclosed. The purpose of this activity is to know the scope of products (product space) and users who use it. A good analysis will reveal the essential things of the problem, and ignore the insignificance.

b) Design

Test cases or also can be called a test case is a draft or a series of actions taken by the user to verify the specific features or functions of a software. Test case creation aims to ensure that a system can be appropriately executed according to the initial needs and able to respond when there is an invalid input. Test Case has several components such as test case ID, test case description, precondition, test step, expected result, actual result, and status. Test Case acts as a starting point in the implementation of a system test. This test case is usually known whether the system features are normal or not.
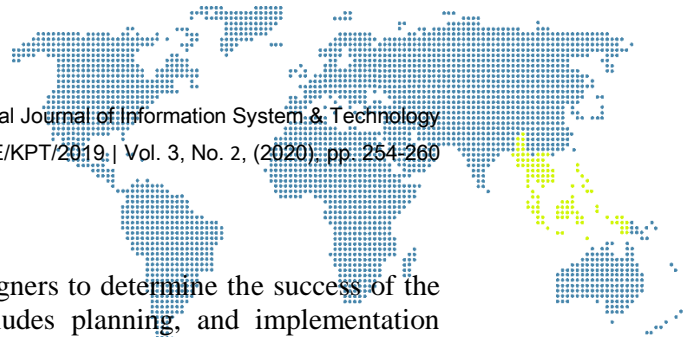
c) Build

The software test strategy makes it easy for designers to determine the success of the system that has been done. Software testing includes planning, and implementation actions should be well planned and how long the time, effort, and resources are needed as well as at the time of building the software.

d) Software Testing

Verification is the process of evaluating a system or component to define that the product has a phased development. Starting from the beginning of the validation is the process of evaluating a system or component. During or at the end of the event to define software testing indicates that the product complies with the specification requirements. Black Box Testing, or commonly known as functional testing, is the software testing method used to test the software without knowing the internal structure of the code or program. sIn this testing, the tester realized what to do by the program but did not know how to do it. Advantages of Black Box Testing are efficient for large code segments, and access code is not required separation between user and developer perspectives Black Box Testing Weakness is limited coverage because only a fraction of test scenarios are conducted, adn inefficient testing due to luck tester from the knowledge of internal software.

e) Installation

The next stage is the software installation after testing. Software testing is a process used to help identify the truth, completeness, and quality of the developed computer software. Software testing runs software in a simulated or real environment, using selected inputs in the prescribed manner.

f) Maintenance

Maintainability is a necessary effort to find and fix errors in the software. Maintainability is also referred to as system maintenance. Where after a software successfully developed and implemented, there will be various things that need to be repaired based on the results of the trial or evaluation. A well designed and developed software will quickly be revised if required. How far the software can be repaired is another factor to be aware of. Elements of maintainability in software development included in Product Operations is the ability of the software to change. Once the software has been successfully developed and implemented, there will be a variety of things to improve based on the results of the trial or evaluation. A well designed and developed software will easily be revised if needed. How far the software can be repaired is another factor to be aware of. One of the factors related to the software ability to undergo change is maintainability.

3. Results and Discussion

System testing is a comprehensive, integrated software testing program. Software is just a unit of the element of a more extensive computer-based system. Typically, the software is associated with other software and hardware. Detail testing parameters of the learning Media software Islamic education includes several things, such as in table 1. The testing scenario of media software learning Islamic culture consists of five scenes shown as in table 2.

Table 1. Test ID Details

Test Id	Description of Testing
PAI001	Testing on access to the main page on the Islamic Educational Learning program is underway.
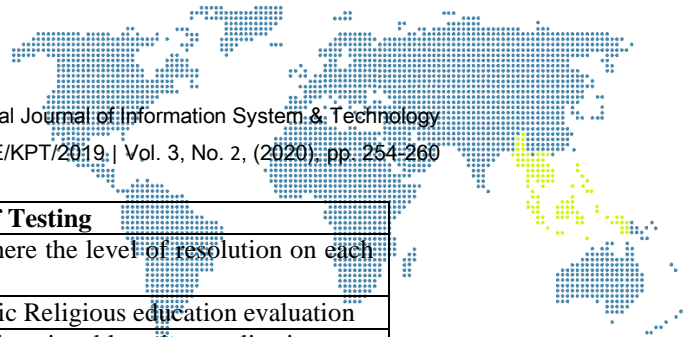
Test Id	Description of Testing
PAI002	Testing on access to material features where the level of resolution on each device has different characteristics
PAI003	Testing on access to the features of Islamic Religious education evaluation
PAI004	The user tests the output of the Islamic educational learning application.
PAI005	Testing at the level of access speed displays the data that users need on the Islamic learning media.

Table 2. Scenario Of Software Testing.

Test Id	Input	Expected Results	Results Obtained
PAI001	The user runs the Islamic Education Learning Media application by clicking on the use that is ready to run.	Islamic Religious Education learning application can run according to the existing prototype.	Appropriate
PAI002	Users are testing media applications learning Islamic education using existing devices with different resolutions.	The user performs a test on the application using an existing device with a different resolution.	Appropriate
PAI003	The user conducts tests on the evaluation of Islamic Education learning media by carrying out each evaluation question.	Media Applications Learning Islamic education can produce maximum learning evaluation.	Appropriate
PAI004	The user checks the output application in the Islamic Education learning application by including the evaluation item and access to the learning materials data.	Media Applications Learning Islamic education can detect each input and able to produce output according to the needs of the user.	Inappropriate
PAI005	Users run the Islamic Education Learning media application by running simultaneously with other application businesses.	Media Applications Learning Islamic education can execute with a fast time and have the right level of accuracy.	Appropriate

The appearance of the Islamic Religious Education Learning Application program is shown in Figure 2 and Figure 3. The media Application Program Learning Islamic Education can only be run in a Windows operating system. Users can run the executable file from the application program already provided.

Figure 2. Main Page

Figure 3. Evaluation

The purpose of testing measures quality. It's impossible to manage something that can't be seen or evaluated. Effective testing is the initial need to achieve effective quality management. The quality of the system is all a concern for managers. Good quality management means, first and foremost, an introduction to quality management responsibilities. Provision for an effective testing process and precise product quality measurements on a running base are the things that each manager must see as a personal responsibility. The understanding that the responsibility of testing is an inherent part of each manager's work is an important step. Testing is not a responsibility that can be achieved through interest or desire or support. Direct management action is required and expected. Table 3 shows the test results of a prepared scenario.

Table 3. Hasil Pengujian

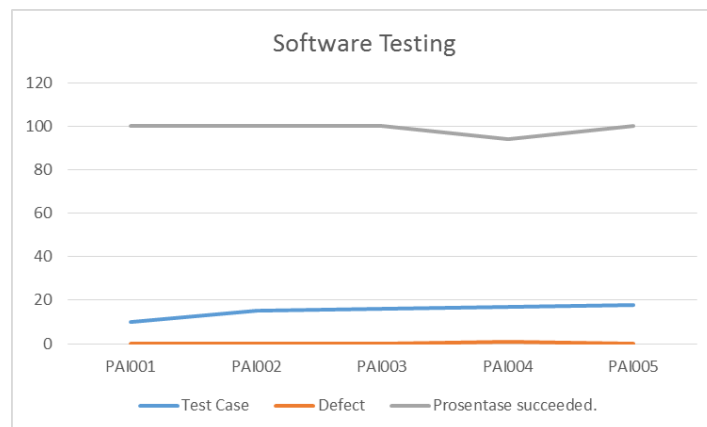| Scenario Test Id	Jumlah Pengujian	Sofware Defect	Prosentase Keberhasilan
PAI001	10	0	100
PAI002	15	0	100
PAI003	16	0	100
PAI004	17	1	94
PAI005	18	0	100

Figure 4. The Result of Software testing

The test scenario on Test Id PAI001 of ten times the test showed that there was no failure rate. The Test ID PAI002 conducted a test of 15 times indicating that there was no failure rate. The Test Id PAI0003 indicates that there is no failure rate. Test Id PAI0004 shows that there is one time failure rate because the media application software learning Islamic education is still a feature lacking in essay. The Test Id PAI0005 indicates that there is no failure rate.
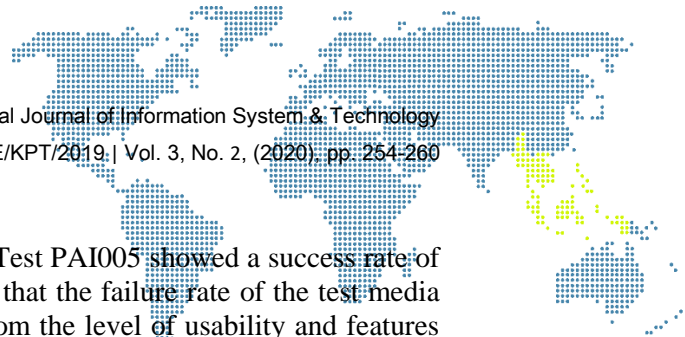
4. Conclusion

Testing scenarios in Test Id PAI001 up to test Id Test PAI005 showed a success rate of 98% and a failure of 2%. From many trials showed that the failure rate of the test media software learning Islamic education is influenced from the level of usability and features in the menu evaluation quiz which still there is weakness of the essay feature. Recommendations that can be taken from testing BlackBox testing show that good software can be determined from the level of efficiency and effectiveness of software testing with pre-defined features.

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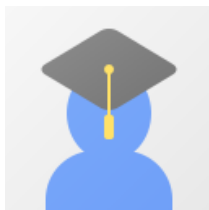
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