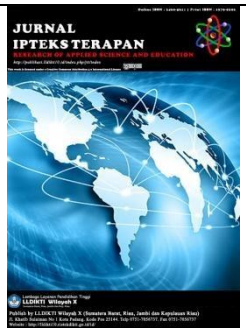

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DEVELOPMENT OF MOBILE-BASED INTERACTIVE LEARNING MEDIA FOR INTELLECTUAL DISABILITY STUDENT IN ISLAMIC RELIGIOUS LESSONS

Afdhil Hafid[1)], Iga Setia Utami*[2)]
[1]Universitas Islam Negeri Imam Bonjol Padang
[2]Universitas Negeri Padang, Padang
*Email: igasetiautami@fip.unp.ac.id

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Abstract

Technology can help students learn new skills and offer specialized learning support for those who require it, such as students with intellectual disability in special school. Intellectual disabilities are similar to a young toddler who can already discriminate good from bad (mumayyiz). When a child reaches the limit of understanding and is among those who must pray. The need to fulfill sharia commitments (taklif) is still placed on those with impairments. This research focuses on the creation of software that is both straightforward and efficient. Extreme Programming (XP) system by listening, which also helps students have a thorough comprehension of its main functions and outcomes.. By using good communication in XP (Ex, developers and users are able to decide which features are necessary for the software's use as well as how to discriminate between users, particularly those with intellectual disabilities. The results of the Black-Box Testing are show that all of the features performed as expected.

Keywords: Extreme Programming, Intellectual Disability, Pray

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INTRODUCTION

In 2005, the United Nations Children's Fund (UNICEF) estimated the number of children with disabilities under the age of 18 at 150 million. Estimates of the prevalence of children with special needs (people with disabilities) are quite diverse, this is seen from the definition and size of disability. Global Burden of Disease estimates the number of children aged 0–14 years with "moderate or severe disability" is 93 million (5.1%), with 13 million (0.7%) children experiencing severe difficulties (World Health Organization & The World Bank, 2011). While in Indonesia, compiled from Basic Health Research (Riskesdas / Riset Kesehatan Dasar) data in 2018, there were 3.3% of children aged between 5-17 years suffering from disabilities. Then, through a study of the Covid-19 Response Network of Disabled Persons Organizations, up to April 2020, there were 80.9% of people with disabilities, including children who were seriously affected by Covid-19 economically, socially, and healthily in Indonesia (Usnadibrata, 2020).

During the pandemic, the impact of school closures was caused by conditions and on the basis of considerations of government policies, which gave an even and varied effect on children and the impact in different forms. Children with special needs (people with disabilities), of course, face more severe challenges. In 2019, based on data conducted by the 2018 National Socio-Economic Survey (SUSENAS), it was found that approximately 140,000 children with special needs (with disabilities) in the age range 7-18 were not in school. Meanwhile, in the use of distance learning solutions not all children can afford it, especially children with disabilities. The tendency of children with disabilities does not get support, technological facilities, internet access, and learning materials as needed (UNICEF, 2020) (Usnadibrata, 2020)

The employment of technology in the post-COVID-19 pandemic era or the new norm has an impact on many facets of life, including the professional world of work, the economy, health, social environment, culture, politics, and a number of other crucial facets. The use of technology is a must that makes all people have to be ready to adapt and continue to live side by side with digital products under any conditions. The existence of technology, the internet and various facilities has become a medium that flows the flow of the continuity of the order of people's lives now and in the future. In the field of technology education, gadgets/mobile devices cannot be separated from important aspects of the educational process. Technology can help students learn new skills and offer specialized learning support for those who need it (Utami, Budi, Nurhastuti, & Hafid, 2021).

In fact, the epidemic has had a significant influence on education, particularly for kids and teachers who have expressed concerns about learning loss in online learning. Although this continues to be circumvented by observers and education practitioners with efforts to strengthen and utilize available and easy-to-apply technology, the impact has become a boomerang with the presence and condition of students who are very diverse. This trend is higher, especially for children with disabilities (children with special needs).The most relevant learning

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model at this time by utilizing technology in the learning process is electronic learning or e-learning. While the most dominant use of devices used by students who tend to be easier to obtain is using mobile devices (cellular). However, in its use, it often negates the existence of children with special needs (persons with disabilities) (Mubasir & Hardyanto, 2018) (Utami et al., 2021).

Although research indicates that mobile learning will have a profound impact on education and usage of mobile devices is increasing significantly, many institutions still find the design and development of mobile learning applications to be a challenging process. Finding ways to design application development environments that can support the integration of such technologies through user-friendly mobile interactive environments is one of the primary challenges. The difficulty is made even more difficult by the limits imposed by mobile platforms, which use touch-based interaction, have small screen sizes, and have a variety of usage circumstances (Khanghah & Halili, 2015). Children with intellectual disabilities struggle to focus and have limited gripping ability. Mobile media is an alternative form of media that can boost motivation and offer interactive learning tools to make studying new subjects easier and easier (Novayani, Ramadhani, & Hartono, 2021).

Human nature is as a creature who wants to be religious. Therefore, religious education and a religious environment need to be provided for humans (Irawan, 2020). It is outlined in the *fiqh* literature that Islamic community organizations have a duty to uphold the rights of people with disabilities. From a *fiqh* perspective, groups with disabilities are still expected to perform sharia responsibilities (*taklif*) as long as their minds are still capable of functioning normally. Allah makes worship simple for people. In the Qur'an, at-Taghabun verse 16 which reads: "Have faith in Allah as much as you can". Disability groups who experience obstacles in carrying out their worship obligations can still get perfection in carrying out, to the best of their ability. The sources of knowledge that can be accessed by groups of individuals with disabilities tend to be overlooked at the moment. This remains a barrier, and there is still limited access to knowledge based on worship traditions (Unibraw, Perhimpunan Pengembangan Pesantren dan Masyarakat (P3M), & Pusat Studi dan Layanan Disabilitas (PSLD), 2018).

Children with disabilities are different from children in general. A child with intellectual disabilities is part of the disabled. Children with intellectual disabilities (mental retardation) have a tendency to be less concerned about the environment, both within the family and the surrounding environment. Society generally recognizes intellectual disabilities as mental retardation or idiots. According to Kustawan, intellectual disabilities children are children who have intelligence whose significance is below average and is accompanied by an inability to adjust behaviour that appears during development. He also said that intellectual disabilities children have academic problems so that learning services require modifications according to their needs (Kustawan, 2016).

JURNAL IPTEKS TERAPAN
Research of Applied Science and Education V17.i2 (414-421)

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RESEARCH METHODS

This research refers to the development of software that is simple and effective in development, namely the Agile Method as a traditional methodology. Referring to Pressman's opinion, Extreme Programming (XP) is one of the software development methods included in Agile Software Development (Pressman, 2010). XP has five values which are the foundation, namely:

1. Communication
   Effective communication in XP requires a role between developers and users in determining what features are needed and the usefulness of the software.
2. Simplicity
   To achieve simplicity, XP restricts developers only design immediate needs compared to future needs, making it easier to implement in programming. If the design needs to be changed, refactoring can be done.
3. Feedback
   Feedback comes from 3 (three) sources, namely implementation software itself, users, and other members of the software team. Feedback is seen from the implementation of the output, function, and use case characteristics.
4. Courage
   Practices carried out in XP emphasize discipline. The XP development team must have discipline in designing current requirements, recognizing future requirements that may change drastically, making it possible to change code design and implementation.
5. Respect
   Each development team has values that must be instilled and appreciated by fellow members as well as between stakeholders and these members.

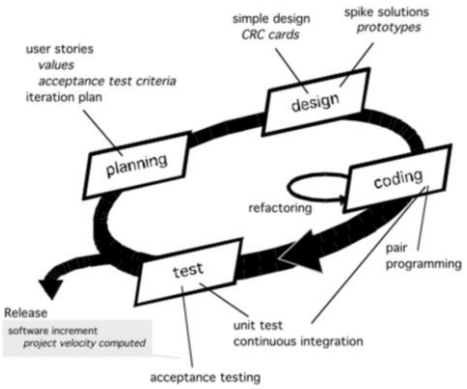

Figure 1. Extreme Programming (XP) Process
(source: Pressman, 2010)

XP uses an object-oriented approach as a development paradigm and includes a set of rules. In XP, there are four activity frameworks: Planning, Design, Coding and Testing. The planning stage is done by creating a user stories that describe the output, features and functionality of the software created. This stage begins with the technical team users may comprehend the business context for an XP system through listening, which also gives them a clear understanding of the key features, functionality, and expected results. Afterwards, design, XP supports refactoring where system software modified in such a way by changing the structure of the code and simplifying the code. Pair programming is one of the essential concepts for coding activities. To build a code in a tale, XP advises two people to collaborate. Testing is done by

JURNAL IPTEKS TERAPAN
Research of Applied Science and Education V17.i2 (414-421)

ISSN : 1979-9292

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testing code on unit testing. In XP there is also an acceptance test or so-called customer test. This test is carried out by the customer who focuses on the features and functions of the system as a whole. This acceptance test comes from user stories that have been implemented (Pressman, 2010) (Ependi & Widayati, 2013).

The Black-Box Testing approach is used in this study's functional testing methodology. The Black-Box Testing approach is based on the features or actions that the program must exhibit. Black-Box Testing seeks to identify the capabilities of the program as well as user requirements and flaws in its features. The evaluation method for Black-Box Testing that creates a table of requirements for the built-in software features (Syahidi, Asyikin, Sania, & Subandi, 2021).

RESULTS AND DISCUSSION

Result

1. Planning

Learning with mobile devices presents a number of challenges, including how to digitize existing curriculum and teaching materials and how to create quality content that is both mobile device- and teaching-method-friendly. Observations at the State Special School 1 in Padang City and direct conversations with Islamic religious teachers revealed that children with intellectual disabilities possess skills that are comparable to those of young children. Through effective communication in XP that is carried out between developers and users in determining what features are needed in the use of the software as well as distinguishing characteristics, especially for users with intellectual disabilities.

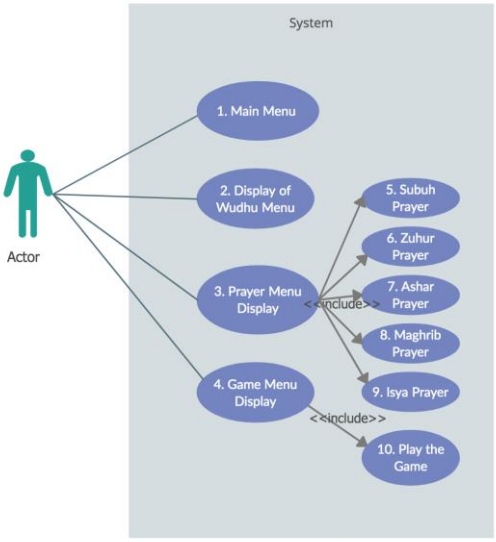

Figure 2. Use Case Diagram

2. Design

Applications created to connect with children by using their personalities. Additionally, the program uses children's voices and slow-intoned reads. In order to develop memory and comprehension in the process of habituation in applying the *fiqh* of worship in issue, namely, *wudhu* and prayer, consistency in the usage of the application is expected to be beneficial.

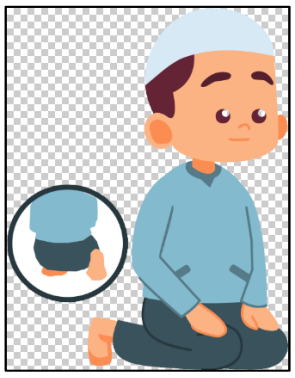

Figure 3. Design Characterization

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Applications created to connect with children by using their personalities. Additionally, the program.

Figure 4. Audio-Visual Design Application Layout

3. Coding

Construct 3 engine, as well as additional programs like Corel Draw X7, Photoshop CS6, JDK, and JRE, are used in the creation of applications. With the free license of the game engine Construct 3, it is simple to create applications without having a thorough understanding of coding. Excellent for those who wish to learn how to create games or applications from scratch.

4. Testing

The implementation of the system on Android devices is first simulated in the virtual device manager in the system design module. Through the design process, testing of the system can be carried out to display the actual state of the device. The implementation of application testing is presented in the following table.

Tabel 1. Black Box Testings

No	Use Case	Test Type	Test Code
1	Splash Screen Display	*Black box*	Test - 01
2	Main Menu Display	*Black box*	Test - 02
3	Display of *Wudhu* Menu	*Black box*	Test - 03
4	Prayer Menu Display	*Black box*	Test - 04
5	Game Menu Display	*Black box*	Test - 05

According to the outcomes of the Black-Box Testing (see table 1), none of the functionalities failed to operate as intended. However, there are some suggestions for improvements for future applications. Among them is the accuracy

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of reading and presentation that is suitable for each child's character. In addition, control over the application to make it more interactive needs to be done for many needs.

Discussions

Intellectual disabilities is the same as a child but who can already distinguish between good and bad (*mumayyiz*). The law is permissible as long as it fulfil the conditions for carrying out worship which includes knowledge of the conditions, pillars and things that invalidate prayer, as well as understanding the law related to congregational prayer. When a child reaches the limit of understanding while he is among those who are required to pray, then it is valid when he becomes an imam because of what 'Amr bin Salāmah RA narrated. He said: "I became a priest at the time of the Apostle while I was 7 years old". Islam does not teach those people to make these limitations as shortcomings, but rather as a ladder for the achievement of a high degree. From the *fiqhiyyah* point of view, persons with disabilities are still burdened with the obligation to carry out sharia obligations (*taklīf*) as long as their minds are still able to work well.

CONCLUSION

The prototype of the application can already run on Android devices and has gone through a trial process using a software testing instrument, namely black box testing. Based on the results of testing the Ayo Sholat application which refers to case testing using the black box testing method, it can be concluded that there are no process errors and functionally has been running as expected.

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