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Development of Android Mobile Learning Media Integrated Islamic Content on Human Excretion System Material

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Abstract

This study aimed to produce android mobile learning media integrated with Islamic content in the Human Excretion System material that is feasible, valid and practical for students class VIII MTs students. The product is packaged in an Application Package File (.apk) format and developed using the ADDIE Research and Development model (Analysis, Design, Development, Implementation, and Evaluation) method. The application contains Objectives, Materials, Simulations, and Evaluations. Apps are rated by materials experts, media experts, and teachers. In addition, the product has gone through three stages of evaluation for students in class VIII junior high school students involving three students in a one-to-one trial, nine students in a small-scale trial, and 35 students in a field trial. The validity of the media shows that at 3.27, it can be classified as "very good", 3.42 for practicality results and categorized as "very good", and 3.24 for student responses and classified as "good".

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INTRODUCTION

Science learning contributes to technology development so that it becomes a basic science in technological development (Kusumawati et al., 2020). The use of learning media can solve science learning problems and improve students' digital literacy, both scientific, functional, and visual literacy (Asrizal et al., 2018).

Android-based mobile learning technology is very worthy of consideration for mobile learning media (Haryanto & Billah, 2020)this research aimed at producing a valid and practical glossary of Integrated Science. The Four-D (Define, Design, Develop and Disseminate. This medium is supported by the popularity of mobile devices, which have become the general public's choice (Liu et al., 2015), the increasing number of android ownership among students (Haryanto & Billah, 2020)this research aimed at producing a valid and practical glossary of Integrated Science. The Four-D (Define, Design, Develop and Disseminate, prospect of increasing the number every year.

Technological developments will have both negative and positive impacts (Syafi' AS., 2020). One of the negative impacts on technological development is that it can cause students to be lazy to study science because technology development can make people not pay attention to the consequences on global humanity, such as science without ethics which can cause environmental and psychological crises. Science in Islam is not separate from religious norms and ethics, but science develops along with the development of Islam (Sastria, 2014). Religion and science in Islam there is no separation; Islamic science aims to deliver a person to a deeper understanding of the secrets contained in the verses of Allah through the potential of reason to the fullest (Fakhri, 2010)there are four of science principles in Qur'an. Among of them are: istikhlaf, equilibrium, and taskhir principles. The concept of science and technology in Qur'an is also applicable and relevant to be applicated in learning process at Islamic education institution. But, there is still a problem in it, i.e. the problem of educational dichotomy. The problem can be solved by integration project in education. It can be elaborated in three issues: 1. Islamic science still refers to the source, namely the Qur'an and Hadith, not only guided by the ability of reason alone, the only reason is the reference. The findings will be contrary to religious teachings, resulting in being misused for things that deviate from the norm. And spiritual teachings (Matondang & Erdian, 2013).

Citizens must be technology literate to filter scientific information based on the sources and methods used (Nugraheni & Paidi, 2020). One of the positive impacts of technology-literate citizens is the use of Android-based mobile learning media to improve student learning outcomes (Cahyana et al., 2019; Hwang et al., 2013; Lubis & Ikhsan, 2015). The results of the study indicate that an Android-based mobile learning application will support education and increase motivation (Matlubah et al., 2016), and improve students' academic achievement (Hsu et al., 2020; Kocakoyun & Bicen, 2017). The use of android as a learning media also supports the effectiveness of interaction and communication between teachers and students in the teaching and learning process (Ngabekti et al., 2019)legibility and effectiveness of STEM Mobile Learning Package ecosystems on students' science and technology literacy using R & D research design. STEM Mobile Learning Package was validated by media experts and material experts. The level of legibility is measured by questionnaire through the results of a small-scale trial of a Biology student class. The effectiveness of the application was measured in wide-scale test for biology and natural science students. Data were analyzed using descriptive quantitative. The results showed the the validity on learning package from experts showed valid in 83,6%. Some revisions are needed especially on video aspect which will be better filled with not only text but also voice. Base on data collected from 47 students who have completely filled 12 statements in questionnaire, about 78,7% students stated they could understand the questions very well. Most of students (97,8%, which can facilitate the individual learning needs of students, and virtual learning can be carried in the anywhere and anytime, to improve learning outcomes. Student learning (Murcia et al., 2018). The science learning process using Android-based mobile learning media can support independent learning and learning in the classroom (Wibawa et al., 2020).

Android-based mobile learning media need in the science learning process (Cahyana et al., 2018). In science learning, the development of learning media by utilizing the Android operating system has been successfully developed, including the human hearing system (Billah & Yazid, 2020), the human respiratory system (Pratama et al., 2020), the human digestive system (Juannita & Adhi, 2017), and human optical instrument systems (Sajidan et al., 2020).

This research on Android mobile learning

integrated with Islamic content was carried out at MTs Al Uswah Bergas, Semarang Regency. Madrasah Tsanawiyah, abbreviated as MTs is a formal education unit that provides education with the specificity of the Islamic religion. The vision of MTs Al Uswah is Faith, purity, discipline, and good character. Implementing the MTs curriculum must organize integrated learning (Kemenag, 2019); per the development of the 2013 curriculum, science learning at the junior high school level is carried on an integrated basis (Susilowati, 2014).

Based on the initial study of applying the human excretory system material on the play store, there is no application of the excretory system material that integrates with Islamic content. Based on observations at MTS Al Uswah Bergas, Semarang Regency, the supporting facilities for science learning are complete. Facilities for the learning process include classrooms, science laboratories, computer rooms, libraries, and school health units (UKS).

Based on interviews with the science teacher in class VIII MTs Al Uswah Bergas, the information obtained is the limited learning media available in the science laboratory, causing a lack of understanding of students. Teachers find it challenging to integrate verses of the Qur'an in the science learning process. Integrating religious values into the learning curriculum contributes to producing good students who can apply knowledge and skills under Islam (Susilowati, 2014).

Based on the results of distributing questionnaires to class VIII students at MTs Al Uswah Bergas about the analysis of the needs of android-based learning media, 38% agreed to develop android-based learning media, 29% disagreed, 21% strongly agreed, and 12% strongly disagreed.

Learning the human excretory system needs audio-visual aids and not only using writing. Digital-based media can be an alternative in online learning because students do not have teaching aids in their respective homes. The VIII grade science teacher at MTs Al Uswah Bergas still uses the conventional lecture method without learning media that attracts students. Based on the explanation above, this study aims to develop an Android mobile learning media integrated with Islamic content in human excretory system material that is feasible, valid and practical for students to use.

METHOD

This research is a Research and Development using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) (Sugiyono, 2019). The research only reached the development stage. This analysis phase was carried out by collecting observation data, interviewing science teachers, literature studies, and distributing questionnaires to students regarding the learning media used in the science learning process at MTs Al Uswah to determine the needs of students' learning media. The android mobile learning media product design phase includes determining essential competencies, indicators of competency achievement and learning mastery, developing and selecting learning materials, and testing instruments. The development stage consists of making flowcharts and storyboards, collecting data, developing android mobile learning media, and validating and revising the initial product. Furthermore, the product test using one-one, small-scale, and field trials.

Product assessment by three media experts, education practitioners, and materials. The data collected is product feasibility data based on expert judgments collected using a product feasibility questionnaire. Media experts assessed the product's practicality, while material experts were asked to evaluate the validity of the initial product. Finally, educational practitioners must assess validity and practicality. The assessment was carried out using a questionnaire to obtain qualitative data. Assessment of product development results was analyzed by converting the data. The product is declared valid and practically determined with a minimum value in the category of good enough. The assessment of the three experts is referred to as the feasibility data for the trial. The reference for changing the score to a scale of four is shown in Table 1.

Table 1. Assessment Criteria (Fakhriyah et al., 2019)

Interval score result of the assesment		Category
$X \geq M_i + 1{,}5\ SB_i$	$X \geq 3{,}25$	Very good
$M_i + 1{,}5\ SB_i > X \geq M_i$	$3{,}25 > X \geq 2{,}5$	Good
$M_i > X \geq M_i - 1{,}5\ SB_i$	$2{,}5 > X \geq 1{,}75$	Pretty good
$M_i - 1{,}5\ SB_i > X$	$1, 75 > X$	Not good

Information:
Mi : Overall average score
SBi : The standard deviation of the overall score
X : score obtained

The one-to-one trial phase involved three children, and the small-scale trial phase involved nine students while 35 students participated in the field trial. The students who took part in the problem were class VIII students at MTs Al Uswah Bergas, Semarang Regency. The test aims to determine the response of students to the learning media developed.

RESULT AND DISCUSSION

The development of Android mobile learning integrated with Islamic content consists of a homepage display and a menu list. The home screen is the first view that appears when the media is running. In this view, the user asks to wait until he enters the application. The appearance of the homepage on the media can be seen in Figure 1 below.

Figure 1. The home screen on media

The menu list view is a view after the home screen, and several application menu buttons include the KD & IPK menu, Objectives, Materials, Simulation, and Evaluation. The menu list of media mobile learning can be seen in Figure 2 below.

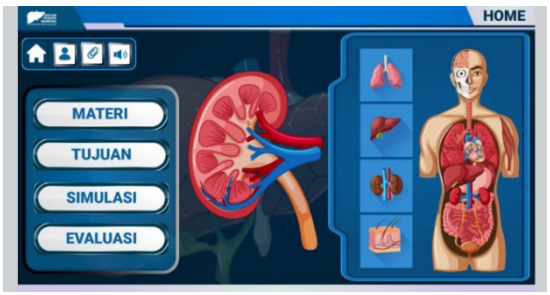

Figure 2. Menu list display on media

The KD & IPK menu explains basic competencies and indicators of competency achievement in science learning. The KD & IPK menu display can be seen in Figure 3 below.

Figure 3. Display of core competencies on media

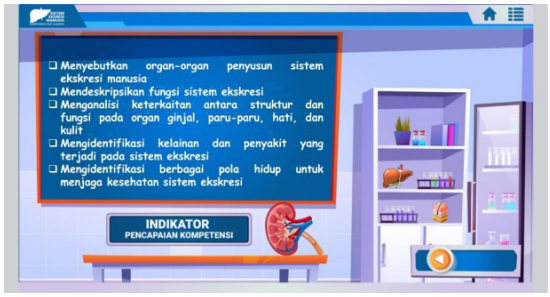

Figure 4. Display of Competency Achievement indicators on media

The Material menu contains a menu that includes a menu of kidney, lung, heart, liver, and excretory system organ disorders that integrates with Islamic content. The display of this material menu can be seen in Figure 5 below.

Figure 5. Display of material menu on android mobile learning media integrated with Islamic content.

The simulation menu contains two simulations, and the first is a simulation when people smoke, their lungs turn black, which indicates lung abnormalities. In the second simulation, when people drink alcohol, their kidneys turn black, suggesting a kidney disorder. The display of this simulation menu can be seen in Figure 6.

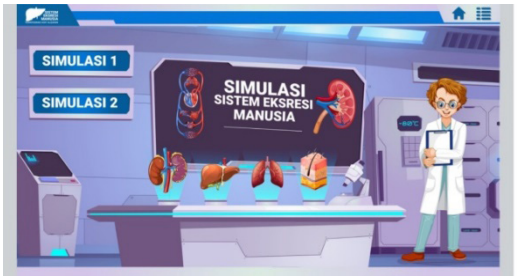

Figure 6. of Simulation menu display on media

The Evaluation menu displays ten items of science questions that integrate with Islamic content. The evaluation menu can see in Figure 7 below.

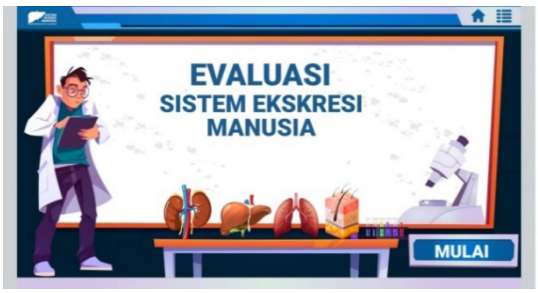

Figure 7. The evaluation menu display on media

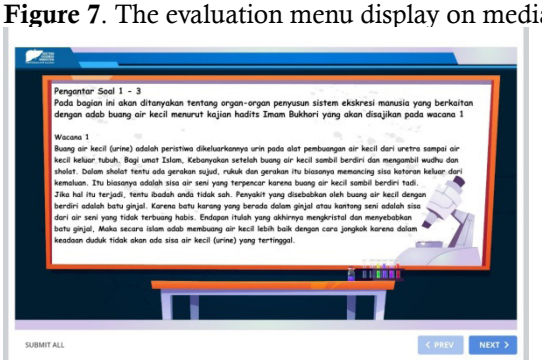

Figure 8. Evaluation display on media

Product validation is carried out by three experts who are material and media experts and educational practitioners. Practical aspects include content quality, presentation design, usability interaction, Accessibility, while the validity aspect is an appropriate alignment of learning objectives, feedback, adaptation, motivation, reusable. In addition, the researcher also received several suggestions for improving the Android mobile learning media product that was integrated with Islamic content that was developed. Scores and suggestions from the three experts were followed up to serve as a basis for eligibility for further trials. The results of the validation analysis from 3 experts regarding the Android mobile learning application integrated with Islamic content can be seen in Tables 2 and 3.

Table 2. Results of Validation Analysis of Android mobile learning applications integrated with Islamic content.

Aspect	Criteria	Validator	Value	Description
Validity	Learning goal alignment	Subject expert	3,00	Good
		Practitioner	3,38	Very Good
	Feedback and adaptation	Subject expert	3,50	Very Good
		Practitioner	3,50	Very Good
	Motivation	Subject expert	3,25	Very Good
		Practitioner	3,25	Very Good
	Reusability	Subject expert	3,00	Good
		Practitioner	3,25	Very Good
Average			3,27	Very Good

Table 3. Results of Practicality Analysis of Android mobile learning applications integrated with Islamic content.

Aspect	Criteria	Validator	Value	Description
Practicality	Content quality	Media expert	3,50	Very Good
		Practitioner	3,50	Very Good
	Presentation design	Media expert	3,50	Very Good
		Practitioner	3,50	Very Good
	Interaction usability	Media expert	3,33	Very Good
		Practitioner	3,50	Very Good
	Accessibility	Media expert	2,83	Good
		Practitioner	3,67	Very Good
Average			3,42	Very Good

As shown in Table 2, the assessment results show that the product validity score is 3.27 and is included in the "very good" category. Mean-

while, the practicality aspect got a score of 3.42 and was categorized as "very good" as presented in Table 3. Therefore, the learning media product of the Android mobile learning application integrated with Islamic content developed was declared valid and practical because it exceeded the minimum score of " Pretty Good"

Media experts suggest that: (1) Animations are made more attractive and adapted to the content; (2) the developer periodically evaluates and updates the application so that it is always up-to-date; (3) The type of font needs to be adjusted to the layout content.

On the other hand, the material expert also stated that: science material is integrated with Islamic content plus, before evaluation, students are given several examples of case studies so that when students begin to know about the variety of questions given, they can be placed in each session after giving the material), (3) the evaluation value is delivered so that students know the extent of understanding the concept.

After testing the validity and practicality, the product is tested on students. This stage aims to obtain empirical evidence about user responses. Three students participated in the one-on-one trial, nine students participated in the small-scale trial, and 35 students participated in the field trial. The three stages of testing are carried out sequentially. At this stage, students are asked to download the application, install, run, and open each page independently. Each was given a questionnaire containing ten questions about the product. The result in the one-to-one trial stage is 3.14, for 3.29 is the small group trial stage, and the field trial stage is 3.30. The three trials resulted in an average of 3.24, which was classified in the "good" category.

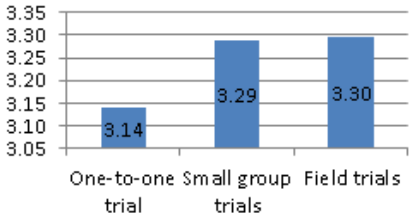

Figure 9. The average score of students' responses on the product

Positive responses from students indicate that this product: (1) can be used for independent study, (2) the media is easy to use, (3) the media can be easily understood, (4) there are exciting animations.

The advantages of the Android mobile learning application are integrated Islamic content, flexible learning media, and easily accessible anytime and anywhere to use as an alternative in Android-based online learning. In addition, the Android mobile learning application integrates Islamic content accompanied by images and videos. The weakness lies in the lack of sample questions and practice questions for deepening the material for students.

CONCLUSION

This study resulted in an Android mobile learning media integrated with Islamic content for class VIII MTs students. The validity of the media showed that at 3.27, it could be classified as "very good", 3.42 for practicality, and categorized as "very good", and 3.24 for student responses and classified as "good". The product can be run independently online or offline, packaged in the Application Package File (.apk) format. In addition, this application includes learning objectives, materials, simulations, and evaluations.

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