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ARTICLE

# The Practicality of Interactive Learning Media Based on Android Applications in the Concept of Human Respiratory System for High School

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**Abstract:** An important learning resource innovation in the millennial era is interactive learning media that can be accessed via smartphones. Development research that produces a practical Android learning media. This type of research was adapted from Tessmer's design, through initial preparation (preparation) and formative evaluation (formative evaluation). The practicality of the contents of 5 students of class XI MIPA 2 through individual tests. The subject of practicality is the expectation of 9 students of Class XI MIPA 2 through a small group test. Data obtained from research instruments consisted practicality of contents, and practicality of expectations. The technique of approving data uses approved sheets. Practicality based on the Akbar & Sriwiyana category (2010). This media obtained practicality of contents 88.00%, and practicality of expectations 96.30%, so that it was included in the category of very practical

**Keywords:** Based on Android, Development Research, Human Respiratory System, Interactive Learning Media, Practical

## 1. Preliminary

In the 21st century, innovation in education is becoming increasingly important to ensure that students have learning skills. Through the increasingly sophisticated digital era, teachers need to follow the current flow of technology. There is a need for innovative technology that facilitates learning. Media technology is needed by teachers and students as a learning innovation and overcomes the problem of differences in learning characteristics of different students and answers the challenges of teachers in the era of industrial revolution 4.0 education.

Learning in the 4.0 era makes information and knowledge accessible instantly, quickly and easily by anyone and at any time. Teachers as facilitators must be able to design creative learning innovations by developing available digital-based technology (Republika, 2019). The implementation of an independent curriculum encourages technological innovation in producing learning designs that can help students learning development independently.

An important learning resource innovation in the millennial era is interactive learning media that can be accessed through smartphones. The choice of interactive learning media development is because today's students are millennials who often use smartphones in their daily activities. This innovation in the use of smartphone devices can make it easier for students to learn. Learning media must be able to be used in all places, in bulk, and easily reproduced (Arsyad, 2011).

Android-based learning media is one of the learning innovations by utilizing smartphones. Android has the main goal of advancing smartphone innovation so that users are able to explore the advantages of Android in learning activities. The media is built interactively so as to produce mobile applications with learning innovations that

can increase efficiency in learning. Android-based interactive learning media is a solution that can be applied to beginner students.

This media development material is taken from the topic of high school level learning semester II on the material of the human respiratory system. The subject matter consists of the organs that make up the respiratory system and its mechanism of action. The human respiratory system is supported by organs with various forms and different physiological functions, so that they can be visualized through images and videos. Converting abstract objects into interactive (virtual) application media, makes it easy to see and learn in real terms.

Interactive learning media is a digital-based media product on an information technology system that presents audio, visual and audiovisual content by responding to user actions. According to Zuliana & Padli (2013), Android applications are able to support the application of media, such as audio, images, animation, and video. Android is an application that is free to develop. Programmers create new applications or modify existing applications using Android because of its open source nature, so the development of Android is becoming increasingly rapid (Huda, 2013).

The advantage of interactive learning media based on Android applications is that it contains material in the form of text, images and videos to understand abstract material. Making interactive learning media requires offline software with a supporting converter to create an Android application-based program that is operated on a smartphone. Therefore, the title of the research is " The Practicality of Interactive Learning Media Based on Android Applications on the Concept of the Human Respiratory System for High School Level Learners". The practicality of interactive learning media based on Android applications is in the form of an application called "Human Respiratory System".

## 2. Research Methods

The research method used was Development Research. The research consists of 2 stages, namely preliminary and formative evaluation. The preliminary stage includes the needs analysis stage and the development stage. Tessmer's (1993) model was used in the formative evaluation stage because the research objective was to produce a practical Android application-based interactive learning media. The research was conducted during one semester of the 2022/2023 academic year at SMAN 7 Banjarmasin.

The research subjects for the practicality test were students of class XI MIPA 2, 5 people for the individual stage and 9 people for the small group stage.

The content practicality data was obtained through the content practicality test assessment sheet by giving a score of 1 (not practical), 2 (less practical), 3 (practical), and 4 (very practical). Expectation practicality data was obtained from through the expectation practicality assessment sheet by responding Yes (if agreed) or No (if disagreed).

The practicality analysis technique used the formula from Akbar & Sriwiyana (2010):

$$\boldsymbol{Vp = \frac{TSEp}{S-max} x\ 100\%}$$

Description:

Vp : Validity of practicality
TSEp : Total empirical score of practicality
S-max : Maximum expected score

Then adjusted to the practicality category 75.00% - 100% (very practical), 50.00% -< 75.00% (practical), 25.00% - < 50.00% (less practical), and 00.00% - < 25.00% (not practical).

## 3. Results and Discussion

The interactive learning media created is an Android application that contains Biology material about the respiratory system in humans whose contents are adjusted to learning objectives based on Basic Competencies in independent curriculum. The Android application is made with Microsoft Office Power Point because it is made with a simple icon display, in operation it can combine sound, image, animation and video files on learning materials. Microsoft Office Power Point also has supporting software (WTPPT Converter and Gen APK Shell) to create APK-formatted Android applications. The learning material contained in the Android-based interactive learning media contains the structure and function of respiratory organs, mechanisms, air volume, and disorders or abnormalities of the human respiratory system.

The preparation of the Draft (Storyboard) which is used as the initial design of the media contains media display points. The main design contains the main menu, in the form of instructions for use or how to use the application, KI, KD, learning objectives, material, evaluation questions, summaries, references, and developer profiles. The supporting design will be made to load the main media in the form of images and animations, as well as supporting media in the form of video and audio with a layout on each sub-matter to be


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organised and consistent. The operational design of the media contains the layout of the start menu and exit the application on the main page, the arrow menu to the next page, and the menu back to the main menu, as well as other supporting menus.

After completing the media development stage, then proceed with the formative evaluation stage. This stage begins with conducting a self-evaluation, to recheck the media before it is validated by collecting information about the development of interactive learning media based on Android applications from relevant literature studies (books or the internet). Based on the results of checking the media that has been made, errors or deficiencies in terms of content, material, and media structure are corrected. Furthermore, the media formative evaluation stage enters the expert test stage to assess the validity of the media.


Figure 1. Interactive Learning Media Initial Display

### 3.1. Practicality of Interactive Learning Media Content Based on Android Application

The individual assessment stage is to assess the practicality of the media content that is validated and improved according to the validator's suggestions. Aspects assessed by students in the form of appearance and presentation of material on the media and added suggestions. A summary of the results of the individual test by 5 students is presented in the table 1.

Table 1. Average percentage of practicality results of interactive learning media content

| No | Aspects | Percentages (%) |
|---|---|---|
| 1. | Interactive learning media display | 89,00 |
| 2. | Presentation of interactive learning media material | 87,00 |
| | Average | 88,00 |
| | Category | very practical |

*Source: Data processed by researchers, 2022*

Based on the table this media is in the very practical category. Has an average result of 88.00%. The suggestions and input given by students are presented in the table below:

Table 2. Recapitulation of Follow-up of Learners' Suggestions

| Things to Revise | Before | Revision Result |
|---|---|---|
| Media Display | • Use light and soft colors because most students will be very interested when they see it. | • Display colors are adjusted for contrast and sharpness |
| Presentation of Material | • The steps are very good but look more complicated when executed.<br>• Add a little summary at the end and a short description | • Several main menu buttons have been added on several pages<br>• Material summary page has been added |

According to Hafiz (2013) the results of the assessment by media users determine the practicality of the media developed. The practicality of the media is based on the opinions of teachers and students that the media is easy to use. Learning media is called practical if it is easy to use (Hestari, et al. 2016).

This interactive learning media displays audio, images, animations and videos on several sub topics. Hilmi (2016) states that the use of images makes students interested in order to increase their interest and attention in learning. If interest and attention increase, then students will fully concentrate on the learning material. Learners suggested that the suitability of colour proportions needs to be improved by using light and soft colours, because most learners will be very interested if they see them. The use of colour is meant to give a certain vibration in the delivery of the message (vibration in a design).


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Interactive learning media is easy to use and easy to understand, so it gets a good response from learners. The media should be adaptable to learners' learning styles (auditory and visual). Learners give suggestions for the stages are very good but look more complicated when run, and need to add a little summary at the end and a brief description. According to Hidayat (2017), the first consideration for choosing learning media is the ease of media access. On some pages, the main menu button has been added to make it easier to use, and at the end of the page a summary of the material is also added. Furthermore, the practicality assessment of expectations was carried out through the small group stage.

### 3.2. Practicality of Interactive Learning Media Expectations

This stage is to determine the practicality of expectations, the test subjects at this stage are 9 students of class XI MIPA 2 SMAN 7 Banjarmasin with the category of mastery of high, medium, and low Biology material. Students' assessment of the practicality of expectations of interactive learning media based on Android applications which contains four aspects of assessment, namely concepts, reference materials, motivation, and media design. The four aspects are further divided into 24 indicators consisting of positive and negative statements. The following table shows the percentage of the response results of 9 students of class XI MIPA 2 to the practicality of the expectations of interactive learning media based on Android applications:

Table 3. Average percentage of practicality results of interactive learning media expectations

| No. | Respondent Name | Average |
|---|---|---|
| 1. | Student 1 | 95,83 |
| 2. | Student 2 | 100,00 |
| 3. | Student 3 | 100,00 |
| 4. | Student 4 | 95,83 |
| 5. | Student 5 | 91,67 |
| 6. | Student 6 | 95,83 |
| 7. | Student 7 | 100,00 |
| 8. | Student 8 | 91,67 |
| 9. | Student 9 | 95,83 |
| | Average | 96,30 |
| | Category | Very Practical |

*Source: Data processed by researchers, 2022*

Based on the table above, this media is categorised as very practical (96.30%), so that the application can be used to understand human respiratory system material. In accordance with the statement of Jusniar, et al. (2014), the criteria for media practicality are met if the aspects proposed in the response sheet meet the criteria of 50% positive response from students. The media design is attractive and easy to understand, based on the suitability of the validity percentage results of 94.56% (very valid), and the individual test results of 88.00% (very practical). Primasari, et al. (2014) learning media that are varied, interesting, fun, and memorable, can make it easier for students to understand learning materials.

The practicality of the expectations of interactive learning media development results is easy to understand and remember, can facilitate learning, encourage interest in learning and make learning more fun. Interactive learning media based on Android applications that are made not only contain writing, but there is a design in the form of explanatory images. Asyhar (2011) states that the media needs to contain clarity, structure, and suitability of background colours.

This learning media is in accordance with the demands of the independent curriculum and is easily understood by students, so it is used as supporting learning material and adding learning references. In addition, the media display uses attractive colours and contrasting text. Images, animations and videos that are interesting and informative are contained in this interactive teaching media to motivate students to learn. The use of media in teaching and learning activities increases the desire, interest and motivation of students to learn, as well as providing psychological influence. Factors that influence learners' responses are the learning process, the level of individual experience, and personality values (Hidayati, 2013).

## 4. Conclusion

The practicality of the media is divided into two, namely the practicality of content and the practicality of expectations, with the results of each test of 88.00% and 96.30%. The percentage results of media practicality are included in the very practical category, so it is feasible and can be used by high school students in understanding the material of the human respiratory system.

In order to develop innovation in research on the development of interactive learning media based on Android applications, for the next researcher it is good to be able to make using different concepts, and this research is only up to the small group test, it is hoped that the next researcher can continue research on


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interactive learning media based on Android applications from this practical development to the field test stage.

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