ANALYSIS OF STUDENTS' MATHEMATICS LEARNING INDEPENDENCE THROUGH ANNIBUKU'S ANDROID-BASED EBOOK IN THE DIGITAL ERA

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Abstract

The digital era has many changes in human life. There are many conveniences that we get in this era, for example that's learning and teaching activities. Information and applications that exist and easily obtained in this digital era can be used as learning media, one of which is electronic books. However, in achieving the learning objectives there is an important attitude by students, namely learning independence. The author's purpose of doing this research is to find out how the general description of the independence of learning mathematics for high school students through Annibuku Android-Based Electronic Books in the Digital Era. The research method of the author did in this study is descriptive quantitative analysis with the help of SPSS. The research subjects in this study were 38 students of class X at SKB Cimahi City. Meanwhile, the results of this study indicate that the attitude of the mathematics learning independence of class X students at SKB Cimahi City is quite good which indicates that electronic books can help students learn independence in this digital era.

Keywords: Learning Independence, E-Book, Annibuku Android Application

Abstrak

Era digital banyak membawa perubahan di kehidupan manusia. Banyak kemudahan yang kita dapatkan di era ini, salah satu contohnya pada kegiatan belajar dan mengajar. Informasi dan aplikasi yang ada dan mudah didapatkan era digital ini dapat menjadi media pembelajaran, salah satunya buku elektronik. Namun, dalam mencapai tujuan pembelajaran ada sikap yang penting dimiliki oleh siswa yaitu kemandirian belajar. Tujuan penulis melakukan penelitian ini adalah ingin mengetahui bagaimana gambaran secara umum kemandirian belajar matematika siswa melalui Buku Elektronik Berbasis Android Annibuku di Era Digital. Metode penelitian yang dilakukan penulis dalam penelitian ini yaitu analisis kuantitatif deskriptif dengan bantuan SPSS. Subjek penelitian yang dilakukan dalam penelitian ini adalah siswa kelas X di SKB Kota Cimahi sebanyak 38 orang. Adapun, hasil dari penelitian ini menunjukkan sikap kemandirian belajar matematik siswa kelas X di SKB Kota Cimahi tergolong baik yang menandakan bahwa buku elektronik dapat membantu kemandirian belajar siswa di era digital ini.

Kata kunci: Kemandirian Belajar, E-Book, Aplikasi Android Annibuku

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INTRODUCTION

Education in the digital age entails incorporating information and communication technology into all subjects. With the development of digital era education, it allows students to get abundant knowledge quickly and easily. In order to meet the challenges of education in the digital age, teachers and students in the twenty-first century must be able to communicate and adapt to the times, in this case the advancement of technology. Besides that, with the continued development of the era, it is directly proportional to the development of problems that require solutions with high-level thinking. The problems faced are globalization, economic growth,

and international competition, environmental, cultural, and political issues. These complex problems make it very important to develop skills and knowledge to succeed in the 21st century.

Learning activities are carried out using android-based learning media called "Buku Sekolah Elektronik Annibuku.com," where citizens can learn anywhere using the android-based application. Online learning has several advantages (Kuntarto, 2017), including the following: (1) Learners can learn anywhere, anytime, and in any situation; (2) learning can be done without face-to-face interaction between tutors and learners; and (3) learners can still learn even if they are located far away from the tutor. Based on current conditions, research on the use of android-based application-based learning media on the learning independence of learning citizens is very necessary to do. In this study, the learning method used was android-based learning. With the use of media, we can improve the achievement and motivation of learning citizens. The existence of learning media will make the learning process more interesting, for example, in terms of appearance combined with several images or animations. The attractiveness of the physical appearance greatly affects the learning process; the more attractive the media display, the more motivated the learning citizens are to learn, so that it affects the learning outcomes of learning citizens (Resiani: 2015). Beauty, attractiveness, and interactivity in a learning medium are means of keeping learning citizens interested in participating in lessons, and the biggest effect is expected to be that learning citizens can be motivated and find it easier to accept the subject matter (Fanny: 2013).

Supianti (2016) suggests that the characteristics of learning independence are as follows: (1) individuals design their own learning according to the needs or goals of the individual concerned; (2) individuals choose strategies and implement their learning designs; and (3) individuals monitor their own learning progress, evaluate their learning outcomes, and compare with certain standards. Learning independence has several indicators (Sumarmo, 2010), namely: (1) having initiative and intrinsic learning motivation; (2) having the habit of diagnosing learning needs; (3) being able to set learning goals or targets; (4) being able to monitor, organize, and control learning; (5) viewing difficulties as challenges; (6) being able to utilize and seek relevant sources; (7) being able to select and apply learning strategies; and (8) being able to evaluate the learning process and results. Based on this description, learning independence from Learning Citizens is very necessary because learning independence is one of the important components in achieving good learning outcomes. Apart from that, learning independence is also very necessary, especially in the current conditions where all Learning Citizens are required to study at home until the COVID-19 pandemic ends and Indonesia is declared safe. One example of learning media that can be concretized by utilizing technological developments in the field of tutoring is android-based learning media.

The development of learning media is based on several considerations: a) it can be used as an independent learning media for learning citizens both at school and outside school; b) it can be used by tutors as a learning media in the teaching and learning process. Based on the foregoing, the researcher is very interested in learning more about the Analysis of Student Learning Independence in Mathematics Through Annibuku Android-Based Electronic Books in the Digital Era in Mathematics Subjects at SKB Cimahi City.

METHODS

Research Location
This research will be conducted in SKB Cimahi City.

Observed Changes

The changes observed in this study are learning residents of class X package C SKB Cimahi City.

Model Used

This type of research is field research, namely direct observation of the object under study in order to obtain relevant data. The method to be used in this research is to use quantitative analysis research method, which uses in-depth data analysis in the form of numbers.

Research Design

Researchers made a questionnaire to determine the learning independence of learning citizens in using android-based learning applications. The results were analyzed descriptively.

Data Collection Technique

In this study, data collection techniques will be used, namely a questionnaire sheet. Questionnaires are made based on indicators of learning independence in learning citizens.

Data Analysis Technique

1. Learning Independence Scale Instrument Test.

The questionnaire instrument before being tested will be carried out a series of tests, namely validity and reliability. The following analysis and criteria are used, among others:

a. Validity Analysis

The validity test used is the validity test of each statement item correlated with the total score. The validity of statement items is a measure that shows the level of validity or validity of an instrument. The steps to test validity (Riduwan, 2003):

Calculating the correlation price of each item with the Pearson Product Moment formula as follows:

$$r_{count} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Description:
r_count   : Correlation coefficient between variables X and Y
N   : Number of data samples
X   : Total score of a question item
Y   : Student score on all question items

b. Reliability Analysis

This reliability test uses the Alpha Cronbach formula which is assisted by the SPSS v.20 program. The following is the Alpha Cronbach formula (Arikunto, 2006), namely:

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_1^2}\right]$$

Description:
r_{11} : instrument reliability
k : number of questions
σ_b^2 : number of questions
σ_1^2 : total variance

2. Data Analysis Technique for Learning Independence Scale

The data obtained from the administration of the learning independence scale of learning citizens, then analyzed to determine the learning independence of learning citizens. The analysis was carried out with the help of Microsoft Office Excel 2010. The steps are as follows:

a. Make a score table of the results of the independence scale of learning citizens of class X package C at SKB Cimahi City.
b. Calculating the scale score of math learning independence with the help of Microsoft Office Excel 2010. On this scale, there are statements that are very positive and statements that are very negative. A very positive statement gets the highest score of 5, and a very negative statement gets the lowest score of 1.

The results of the data in the form of interval data are then summed up to get a total score. After that, it is converted into a percentage with the formula:

$$\frac{Total\ Score}{score\ maksimum\ ideal} \times 100\%$$

In determining the tendency of the variables, the categorization is carried out based on the *Ideal Mean* and *Ideal Standard Deviation* according to Mardapi (Desiverlina, 2015) which is obtained by the formula:

$$Mean\ Ideal\ (M_i) = \frac{1}{2} \times (highest\ score + lowest\ score)$$

$$Standart\ Deviation\ Ideal\ (SD_i) = \frac{1}{6} \times (highest\ score - lowest\ score)$$

The level of variable tendency is categorized into three types with the following conditions :

$x \geq (Mi + SDi)$: high
$(Mi + SDi) > x \geq (Mi - SDi)$: average
$x < (Mi - SDi)$: low

RESULTS AND DISCUSSION

The questionnaire instrument was first validated by a team of experts who are experienced in the field of psychology and counseling guidance, in this case one of the teachers at SMA Negeri 1 Pangandaran who has earned a Master's degree in Guidance and Counseling, namely Father Anggi Azzi Purnama, M.Pd, and then tested on class XI students at SMA Negeri 1 Beber.

Tabel 1. Indicators and Questionnaire Statements

No	Indicators	Questions
1.	Not dependent on others	I study on my own accord
2.		I ask the teacher about unknown assignments by myself
3.		I ask the teacher if I feel unclear about the learning material.
4.		Every time I am given an assignment by the teacher, I complete it by myself.
5.		I look for the answers to the questions given by the teacher myself
6.	Have self-confidence	I believe that I can do the problems without asking for help from friends.
7.		I feel challenged to be able to solve the problems given by the teacher
8.		I believe in my own ability to do the assignment
9.		I dare to defend my opinion during group discussions
10.		I have aspirations to succeed in the future
11.	Disciplined behavior	I listen well to the teacher when explaining the material
12.		I do not do things that violate the rules
13.		I collect the assignments given by the teacher on time
14.		I obey the rules in class and at school.
15.		I am afraid to break the existing rules
16.	Have a sense of responsibility	I immediately do the assignment if there is an assignment from the teacher
17.		I try to do the assignment until I succeed
18.		I try to be persistent in the learning process
19.		I dare to take responsibility for the answers to the assignments given by the teacher
20.		I try to be serious in completing the assignments given by the teacher.
21.	Behave based on own initiative	I study on my own without being ordered by my parents
22.		I have the willingness to try to practice difficult problems
23.		If I don't understand the material, I will ask the teacher.
24.		I have the desire to study by myself diligently
25.		I have the desire to get good learning results
26.	Exercise self-control	I make a study schedule and try to stick to it
27.		I feel the need to read books to support the material presented by the teacher so that my knowledge increases.
28.		In learning, I have a target/goal that I want to achieve
29.		I look for solutions when there are difficulties in group discussions
30.		I look for solutions to get rid of laziness in studying.

Based on the results of the expert validation above, the researchers revised some of the questionnaire statements to make them easier to understand. Then the researchers conducted reliability and validity tests with the following data results :

a. Reliability Analysis

This reliability test uses the Alpha Cronbach formula which is assisted by the SPSS v.20 program. The following is the Alpha Cronbach formula [2], namely:

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_1^2}\right]$$

Description:

r_{11} = instrument reliability
k = number of questions
σ_b^2 = sum of the variances of the items (questions)
σ_1^2 = total variance

Based on calculations using the SPSS 20 program, the reliability of the results of the learning independence questionnaire is 0.974, which has a very high interpretation.

Tabel 2

**Reliability Results of Learning Independence
Instrument Test Reliability Statistics**

Cronbach's Alpha	N of Items
,974	30

Based on the results of the table above, it shows that the questionnaire instrument for learning independence is declared reliable.

Tabel 3

Learning Independence Instrument Test Results

No	R_{count}	R_{table}	Desc	No	R_{count}	R_{tabel}	Desc	No	R_{count}	R_{table}	Desc
1	0.777		Valid	11	0.830		Valid	21	0.712		Valid
2	0.555		Valid	12	0.756		Unvalid	22	0.642		Unvalid
3	0.700		Valid	13	0.731		Valid	23	0.602		Unvalid
4	0.964		Valid	14	0.574		Valid	24	0.634	0.974	Valid
5	0.545	0.974	Valid	15	0.621	0.974	Valid	25	0.794		Unvalid
6	0.618		Valid	16	0.523		Valid	26	0.848		Valid
7	0.471		Valid	17	0.655		Valid	27	0.488		Valid
8	0.357		Valid	18	0.675		VAlid	28	0.608		Valid
9	0.672		Valid	19	0.696		Valid	29	0.780		Valid
10	0,389		Valid	20	0,572		Vallid	30	0,720		Valid

Based on the table above, it was found that 30 of the statements in the questionnaire instrument were declared valid, so the researcher used all 30 statements as research instruments. Then, researchers used the Android-based Annibuku E-Book to do research with SKB students in class X over the course of three meetings. They also gave students a questionnaire to find out how they felt about learning on their own with the Annibuku E-Book.

Based on the results of the data obtained from the questionnaire that has been made, the following are the results of descriptive statistics of student learning independence of students learning through the android-based Annibuku electronic book.

Tabel 4
Descriptive Statistics of Student Learning Independence

	N	Minimum	Maximum	Mean	Std. Deviation
Total	29	83	148	120.31	14.644
Valid N (listwise)	29				

The results of the recapitulation of the categorization scale of mathematics learning independence of class X students at SKB Cimahi City are as follows:

Tabel 5.
Recapitulation of Student Algebra Learning Interest Scale

Score	Category	Frequency	%
$x < 104.67$	Low	3	10,344%
$104.67 \leq x < 126.3$	Average	18	62.07%
$x \geq 126.3$	High	8	27,59%

Based on the results obtained, it can be seen that students' learning independence is still spread out in the medium category at 62.07%. There are still some students in SKB Cimahi City's class X who fall into the low and high categories. Based on the table above, the learning independence of students in the lowest category is calculated at the smallest percentage, namely 10.344%. The main concern, however, is increasing students' learning independence so that they can be more independent in their learning.

CONCLUSION

The mathematics learning independence of grade X students through Annibuku android-based electronic books at SKB Cimahi City is still classified as moderate. This is a concern for further research in making interactive math electronic books that can improve students' learning independence abilities.

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