The perception on mobile-based interactive learning media use in archiving course completion

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Article Info

ABSTRACT

This research analyzed the discriminant of different categories of successfully passing and remedial students based on the perception on mobile-based interactive archiving media. The research method employed quantitative approach with questionnaire instrument. The questionnaire was distributed to students attending Archiving class using interactive archiving media having been developed by the author previously. Data analysis involved prerequisite test analysis including validity and reliability tests. Data was then analyzed using discriminant analysis model with SPSS version 23 application software. The result of research showed that: i) There is a significant difference of perception on interactive media between successfully passing and remedial students; ii) Media originality variable is the one determining the significance of difference; and iii) Discrimination model has high accuracy, so that this research can be used for further research and development with similar theme and variable.

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1. INTRODUCTION

Education is an important aspect to state development. Education functions as the mechanism of system to educate the nation's generation. Education is the reference for assessing a state's progress. It also applies to Indonesia. Public (governmental) policy pays special attention to education development. However, the actual condition makes Indonesia in trouble. One of organizations conducting assessment or evaluation on students' academic ability in many countries is the organization for economic cooperation and development (OECD). OECD uses Program for International Student Assessment (PISA) system. This test is conducted on three basic academic areas: reading, mathematics, and science. Considering PISA's latest report, students' reading score in Indonesia is on 72nd position out of 78 states. Meanwhile, mathematic score is on 72nd and science score on 70th positions out of 78 states [1]. There are some educational standards determining the quality of education. It is called National Education Standard (*Standar Nasional Pendidikan/SNP*). The standard consists of content, process, graduate competence, education and teaching staff, infrastructure, management, funding, and education assessment.

Various problems are often encountered concerning such standard, in practice. The researchers conducted preliminary observation on vocational high school (*Sekolah Menengah Kejuruan/SMK*) in Surakarta region. The observation found that 24 students obtained mean class score test of 62.92 only (below minimum mastery criteria=75) and out of them only 11 have passed successfully, while the other 13 should

take remedial test. It indicates that there is a problem with process standard. There are many indicators observable to measure a successful learning process, one of which is learning media support [2]. Media also evidently can give positive stimulus in learning [3], [4].

This study tries to provide an overview of student learning outcomes when viewed from students' perceptions of mobile-based interactive media. Novelty in this study is the result of research that shows the variable of perception that really influences and can distinguish two categories of student learning outcomes. Therefore, the problem statements of research are: i) Is there a significant difference of the perception on mobile-based interactive learning media use between successfully passing and remedial students?; ii) If there is a significant difference, what factors do affect the difference of student's graduation related to the perception on mobile-based interactive learning media use?; iii) How appropriate is the result of case clarification from the discriminant model?

2. LITERATURE REVIEW

Multimedia is one of learning media to combine some elements of media represented in computer media. Interactive multimedia is a solution to facilitate the students to study the material better than monotonous textbooks or e-books. Interactive multimedia material of basic animation is developed based on the actual need [5], [6]. The actual problem indicates that students' comprehension level belongs to low category in the course, viewed from their learning outcome. It is because the learning material is presented in book-format reading material only. The presentation of material in reading text format only cannot provide real presentation on the basic animation material. Learning material will be understood difficultly if it is not coupled with visualization. It will have impact on the students' low learning outcome [7].

The word "multimedia" consists of two words: "multi" and "media"; *multi* derives from Latin noun meaning many, while media derives from Latin *medium* meaning media-tor or something used to express, to deliver, or to carry something [8], [9]. Considering the definitions of the two words multi and media, multimedia can be defined as a combination of such media as text, animation, image, and video, integrated into digital file with computer help, useful to deliver information or message [10], [11]. Multimedia consists of two types: linear and non-linear. Multimedia running linearly or chronologically is called linear multimedia (TV and film). However, the multimedia that can be controlled by users is called non-linear multimedia or interactive multimedia, for example: learning presentation in which the users can select the topics they want to study without waiting for all presentations shown [12].

Mobile learning (m-learning) is the one utilizing mobile technology. The vehicles may include personal digital assistant (PDA), cellular phone, laptop, and PC tablet. M-learning gives the users a freedom to access the learning content anywhere and anytime, without the need for visiting a certain place at certain time. The goal of mobile learning development is learning anywhere and anytime [13]. Considering the literature study, it can be summarized that mobile-based interactive learning media is the one integrating a variety of media such as text, animation, image, video into a digital file with computer help, useful to deliver information or message in the presence of reciprocal communication using mobile vehicles like laptop, smartphone, or others.

Mobile-based interactive learning model can use such vehicles as learning CD [14], visual technology [15], social media [16], [17], and even virtual game that can be used interactively [18]. Those diverse media can improve students' basic ability of understanding the lesson [19], [20]. In further improvement, not only learning outcome but other abilities such as collaborating and communicating abilities can be improved and accommodated through mobile-based interactive media [21]–[23].

Perception is a process of finding or identifying object and objective event with five-sense help or in other words pertaining to the entry of message or information into human brain [24], [25]. So, it can be concluded that perception on android-based interactive media is a process of finding or identifying object and objective event with five-sense help in the learning by integrating such media as text, animation, image, video into digital file with computer help useful to deliver information or message in the presence of reciprocal communication using mobile vehicles like laptop, smartphone, or others. In this study, the researchers used instrument developed by previous researchers [26], [27] in assessing students' perception on media. The measurement is divided into four big subthemes: kinesthetic or ease of media operation, experience with media use, learning motivation, and originality.

3. RESEARCH METHOD

This research took place in schools throughout Surakarta City, Indonesia having implemented mobile-based archiving interactive learning media developed by the researchers. There are 12 schools having gotten this development of video. The research employed descriptive quantitative design. This survey research was conducted on October, 2020 and ended on December, 2020.

The population of research was all of 10th graders in Office Administration department having attended archiving course with mobile-based archiving interactive learning media. The population consisted of 1960 students, while the sample consisted of 50 students. The sample was taken from four indicators of independent variable and one indicator of dependent variable multiplied by 10. It is in line with Arikunto [28] stating that in multivariate research, sample size should several times (5-10 times) more than the number of variables to be studied. The sample was determined through random sampling technique.

Technique of collecting data used closed-ended questionnaire with a 4-point Likert scale. Validity test was conducted using Pearson's (Product moment) formula with criterion of r statistic>r table, while reliability test using Cronbach's alpha formula with criterion ≥0.60. Assumption test was carried out using Kolmogorov Smirnov's normality test with criterion >0.05 at tolerance level of 5%. Hypothesis testing was carried out using discriminant analysis to find out media perception variable that can actually determine the difference of archiving course score in the 10th grade between successfully passing and remedial students with SPSS version 23 software.

4.   RESULTS AND DISCUSSION
3.1. Result
3.1.1. Validity and reliability test

Validity test was conducted using product moment formula with SPSS 23 software help. The research's criterion requires r statistic>t table. The result of analysis shows r table of 0.374. The result of validity test indicates that out of 19 statement items, 16 fulfill the criterion of r statistic>r table, while the other 3 do not so. This result still can be used for hypothesis testing because each of variable indicators has statement representative to be responded to by respondents. Reliability test showed that the statement item revealed Cronbach's alpha of 0.904 or ≥0.60. It indicates that the questionnaire is feasible to distribute.

3.1.2. Discriminant analysis test

The first step of discriminant analysis is to identify the variable fulfilling the requirements to be analyzed in further stage. In this analysis step, the results of the processed data are used to identify variables that can be used and meet the requirements for analysis in the next step. The result of variable identification is shown in the Table 1. The table shows that X1 is media operation, X2 is experience with media use, X3 is learning motivation, and X4 is media originality. The variable is considered as fulfilling the requirement when significance value<0.05. Considering this, only X2 (experience with media use) does fulfill the requirements in further test, while the other variables do not so.

The next analysis is the determination of significance through eigenvalues. This analysis determined how much the contribution of independent factors can distinguish differences in student graduation. The determination of significance is presented in the Table 2. The table reveals that the difference of examination passing rate in archiving course for the 10th graders can be explained by media operation, learning motivation, and media originality factors by 86.6% and 13.4%, and the rest is affected by other factors.

Table 1. Test of equality of group means

	Wilk's Lambda	F	Sig
X1	0.682	22.366	0.000
X2	1.000	0.004	0.948
X3	0.890	5.954	0.018
X4	0.250	143.770	0.000

Table 2. Eigenvalues

Function	Canonical correlation
1	0.866

The third analysis is the determination of the discriminant variable. This analysis is used to identify variables that can really affect the discriminant model. The determination of discriminant variable is presented in the Table 3. From discriminant analysis test, it can be seen that only variable X4 (Perception on Media Originality) is significant with F statistic score of 143.770. After getting a variable that can really determine the difference in value, the next step is to determine the discriminant function. The function of discriminant is presented in the Table 4.

Table 3. Variable entered/removed

| Step | Entered | Wilks' Lambda | | | | | Exact F | | | |
		Statistic	df1	df2	df3	Statistic	df1	df2	Sig
1	X4	0.250	1	1	48.000	143.770	1	48.000	0.00

Table 4. Canonical discriminant function coefficient

	Function 1
X4	0.626
(Constant)	-9.834

Considering the data shown in Table 4, the discriminant function obtained as in (1).

$$Z \text{ score} = -9.834 + 0.626 \, X4 \qquad (1)$$

Where:
X4=Media originality

Furthermore, the next step is to determine the coefficient of the function. These results can determine the discriminant model formula that was successfully created. Table 5 shows the classification function coefficient. The function for remedial respondents based on perception on interactive media as in (2) and the function for the successfully passing respondents based on perception on interactive media as in (3).

Table 5. Classification function coefficient

| | Y | |
	0	1
X4	4.652	7.017
(Constant)	-30.777	-63.616

Fisher's linear discriminant functions

$$Z \text{ score} = -30.777 + 4.8.52 X4 \qquad (2)$$

$$Z \text{ score} = -63.616 + 7.017 X4 \qquad (3)$$

The last analysis is to determine the validation of discriminant analysis. This is based on the formula or discriminant model that is formed. The assessment of discriminant analysis validation is presented in Table 6. From original section, it can be seen that respondents are on remedial category in preliminary data and following the clarification of discriminant function, they remain to be on satisfied category (19 respondents). There is one respondent in preliminary data belonging to remedial category then switches to passing category. Similar condition occurs in the successfully passing category, three respondents switch to remedial category following the clarification using function. Considering this, the accurate prediction of model as in (4).

Table 6. Classification results

| Result | | Y | Predicted group membership | | Total |
			0	1	
Original	Count	0	19	1	20
		1	3	27	30
	%	0	95.0	5.0	100.0
		1	10.0	90.0	100.0
Cross-validated[b]	Count	0	19	1	20
		1	3	27	30
	%	0	95.0	5.0	100.0
		1	10.0	90.0	100.0

$$\frac{19+27}{50} = 0.92 \text{ or } 92\% \qquad (4)$$

The discriminant model is feasible to use for discriminant analysis or valid to use in this research because the high accuracy rate is obtained, 93%. Considering the evidence indicating that discriminant function has high prediction accuracy, the discriminant function can be used to predict the case. Whether a respondent or a student belongs to passing or remedial category can be viewed from the interactive learning media used.

3.2. Discussion

The significant difference of learning outcome in archiving course between successfully passing and remedial students is affected by their perception on mobile-based interactive archiving media. This finding is in line with previous studies finding that the use of media can affect a students' learning ability [14], [18], [29]. Students' perception on media can also be an important foundation for teachers or instructors to implement the media corresponding to students' need [27], [30]–[32].

Considering the result of research, only one variable of students' perception on media can actually affect the difference of category, media originality. This media originality media consists of students' real consciousness of learning, relevance to daily life, and new knowledge obtained through media. This is in line with some previous studies finding that media should be developed based on necessity and should have novelty indicating that the media is made with finishing or perfecting action [7], [26], [27], [29].

Considering the result of research, the accuracy of discriminant model in this research is 92%. It indicates that the model applied is very compatible and accurate, so that this study can be a reference for further development. The general conclusion from the findings can be generalized to each relationship. The results of the study stated that the originality of the media was a determining factor for the variables that could distinguish two groups of students. This shows that media originality can be the main focus in developing further research. The discriminant model that is formed also shows the right fit model.

In the future, these results will become a reference in the development of further media so that they are made more specific in certain indicators. This research confirms and proves that media use can affect learning outcome. Additionally, this study will reveal indicator of media perception that can actually distinguish the successfully passing students from the remedial ones in archiving course.

5.   CONCLUSION

The conclusion that can be drawn from result of research and discussion are: i) There is a significant difference between successfully passing and remedial students, viewed from their perception on interactive media; ii) Media originality variable is the one determining the significance of difference; and iii) The discrimination model in this research has high accuracy, so that it can be used for further research and development with similar theme and variable. These results indicate that the perception of mobile-based interactive media, especially on the focus indicator of media originality, is a determinant in efforts to improve student learning outcomes in archival subjects. The researcher hopes that this research will become the basis for further research, especially in improving learning outcomes in relation to mobile-based interactive media. This study also requires further research so that the results can be proven experimentally.

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