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Development of QR Code-Based Digital Learning Media *to* Improve Students' English Speaking Skill

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Abstract

This research is entitled Development of Digital Learning Media Based *qr code (quick response) to* improve the English Speaking Skills of English Language Education Study Program students FKIP Universitas Bengkulu. The population of this study is students in semester III (grades A and C) of the English language education study program FKIP UNIB. This is development research that produces digital learning media in academic speaking courses that use QR Code. There are a wide variety of QR shapes and colors used. The files included are videos, pdfs, and ms words. The development of this teaching material uses a model *ADDIE (Analysis, Design, Development, Implementation and Evaluation)* developed by Dick and Carrey in 1996. The teaching materials developed are designed based on the syllabus used in this course. There are seven themes in this teaching material which are carried out for 14 meetings.

Keywords: QR Code, learning media, digital

Introduction

The *speaking skills of* English education study program students are one of the most fundamental skills for English students who will become English teachers in the future. However, facts in the field show that the speaking skills of these students have not been so encouraging. This is detected from the empirical experience of researchers as lecturers of courses; conversation, public speaking and academic speaking. In this speaking context, students still have many errors in the use of words, structures and language rules, mispronunciation, intonation,

stress, limited vocabulary, *fluency and accuracy.* In addition, researchers also conducted an initial survey to ascertain the types of problems and the level of difficulty of students in speaking English.

In relation to the above problem, researchers try to develop a digital learning media using digital technology *QR code (quick response)* to assist students in mastering speaking skills. This technology was later referred to as *digital learning.*(Firmansyah et al. 2019) In education *digital learning,* Students are stimulated to think critically (*Critical)*, creative as well as good communication and cooperation in learning. With the existence of learning media that can be accessed on various *Platform Digital* referred to as *Learning Management System* which is very diverse in form and features, it is expected that students will always feel accompanied in the learning process. Students who have high learning ability (*High Level Thinking Skills / HOTS)* can quickly master learning while students with moderate, sufficient or less good learning abilities can repeat learning in parts that have not been understood with various menus such as *Rewind* Or *Stop* as much as desired.(Wahyuni and Puspasari 2017) Thus, the use of digital learning media is expected to be able to become a mainstay media for the achievement of the expected competencies.

Based on initial observations, it was found that, the use of digital media is not so commonly used in learning activities. Even though the use of this media is very helpful in accommodating the needs of learners in the technological era at this time (Marpaung and Psi 2017).

Digital technology today has many forms and forms, one of which is the use of *QR Codes* in every type of activity. This use is considered more effective than manual habits. For example in the implementation of absence, even according to approximate usage comparison *QR Codes* and manual timesheet activities have a ratio of 1:2.(Priyambodo, Usman, and Novamizanti 2020) In initial observations, it was found that lecturers used print media in the form of textbooks and handsout materials without any touch of digital media in teaching. Researchers assume that this is one of the triggers of low interest and speaking skills of students.

Based on the initial research investigation, the researchers assume that an effective, interactive and interesting digital media is needed to teach students so that they are motivated and learn independently outside the classroom.

Methodology

This research used research and development with ADDIE model (*Analysis, Design, Development and Implementation, Evaluation)* (Rayanto 2020). This research was conducted in English Education Study Program, Faculty of Teacher Training and Education, University of Bengkulu. The population of this study was 89 students. The sample of this study was 68 students from two classes. The instrument used in this study was a test. The data were analyzed quantitatively. The quantitative data were analyzed by using descriptive statistics. In addition, the effectiveness of the product can be seen from pre-test and post-test. The score was from the total number of correct answers divided by the number of questions then multiplied by 100%.

Findings and Discussion

Findings

1. Evaluation Phase

This stage is a follow-up to the results of the product feasibility test, namely by revising the product in accordance with the educator's suggestions in the comment column on the feasibility test questionnaire. At this evaluation stage, researchers evaluate whether the media they develop has been practical or not. The practicality of the media that researchers have developed can be seen by looking at the scores on lecturer and student response questionnaires. Through calculations, it is known that learning media with qrcode cards is categorized as very practical and is evidenced by the average score of 95% lecturers and 88% student responses. Through the test, it can also be seen that

learning media with qrcode cards make it easier for students and are effectively used in understanding learning.

a) The Effectiveness of Using QR Code Learning Media

The effectiveness test in this study began by calculating the mean of the control class and experimental class, along with the presentation of the resulting data:

12451 Calculation of the Pre Test mean of Experimental class students

Frekuensi	Pre Test	
	X	Fx
40	1	40
45	2	90
50	2	100
55	2	110
60	5	300
65	1	65
70	2	140
75	2	150
80	2	160
85	0	0
90	1	90
Total	20	1245

Based on the table, Fx and N results are obtained to find the average value (*mean)*. The formula used to find the average value is:

Pretest mean : X = $\sum \frac{Fx}{N}$ = = 62.25$\frac{1245}{20}$

902 Pre-test ability of experimental class students

X	X^2	X	X^2
Frequency	Pre Test	7.75	X
Fx	40	1	40
45	2	90	50
2	100	55	2

110	60	5	300
65	1	65	70
2	140	75	2
150	80	2	160
85	0	0	90
1	90	Sum	20
1245	3600	-2.25	5.0625
X	X2	X	X2
Frequency	Pre Test	7.75	X
Fx	40	1	40
45	2	90	50
2	100	55	2
110	60	5	300
65	1	65	70
2	140	75	2
150	80	2	160
85	0	0	90

Next it is put into frequency tabulation, with an average mean of 62.25. The standard deviation calculation is as follows:

SD = $\sqrt{\frac{\sum X2}{N}}$ = = = = 12.9879 = 13$\sqrt{\frac{3373,75}{20}}\sqrt{168,6857}$

Next set the upper, middle and lower groups by entering into the formula as follows:

⟶ Top / High

M + I.SD = 62.25 +13 = 75.25

⟶ Middle/medium

M + I.SD = 62.25 - 13 = 49.25

⟶ Bottom / Low

23 Frequency of pretest learning outcomes of Academic Speaking III class students

1	90	Sum	20	1245
3600	-2.25	5.0625	X	X2
X	X2	Frequency	Pre Test	7.75
X	Fx	40	1	40
45			50	2

From the analysis above, it can be concluded that in Academic speaking III A, there are 3 students in the upper/high group (15%), 14 students in the middle/medium group, and 3 students in the lower/lower group (15%).

a. Academic speaking class 3 B (control class)

. Then it is entered into the frequency tabulation, to find the average mean. The tabulation of the calculation is as follows:

Fx4 Calculation of the mean pretest of control class students

100	55	
	110	60
5	300	65
1	65	70
2	140	75
2	150	80
2	160	85
0	0	90
50	1	50
55	1	55
60	1	60
65	1	90
Sum	20	1245
3600	-2.25	5.0625
X	X2	X
X2	Frequency	Pre Test

7.75	X	Fx

Based on the table, Fx and N results are obtained to find the average value (mean). The formula used to find the average value is:

Pretest mean = : X = = = 58$\sum \frac{Fx}{N} \frac{1160}{20}$

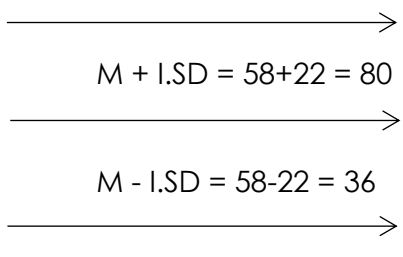
705 Pre-test ability of experimental class students (3 B)

40	1	40	45
85	7225	50	2
75	5625	17	289
100	55	-23	110
60	5	300	65
1	65	70	2
140	75	2	150
80	2	160	85
0	0	90	50
1	50	55	1
55	60	1	60
65	1	90	Sum
20	1245	3600	-2.25
5.0625	X	X2	X
X2	Frequency	Pre Test	7.75
X	Fx	12	144
30	40	1	40
45	85	7225	50
2	75	5625	17
289	100	55	-23
110	60	5	300
65	1	65	70

Further it is put into frequency tabulation, with an average mean of 58. The standard deviation calculation is as follows:

SD = $\sqrt{\frac{\sum X2}{N}}$ = = = 21,988 = 22$\sqrt{\frac{9670}{20}}\sqrt{483,5}$

Next set the upper, middle and lower groups by entering into the formula as follows:



16 Frequency of student pretest learning outcomes 3 A

2	140	75	2	150
80	2	160	85	0
0	90	50	1	50
55	1	55	60	1
	60		65	1

From the analysis above, it can be concluded that in semester 3 A, there were 3 students in the upper/high group (15%), 12 students in the middle/medium group, and 3 students in the lower/lower group (25%).

1. Post-test results

The post-test is also known as the final test (*al-Imtihan al-Niha'*iy). The final test is carried out at the end of the learning that has been learned or after students are given treatment with the aim of finding out whether all important subject matter can be mastered by students or not, in other words the final test is used to measure the final results of students in English language learning. The content of the final test is the main lessons that have been taught to students. The final test is usually made the same as the questions in the initial test (*pretest*). The results of the post test on student learning outcomes carried out are as follows:

a. Experimental class Learning media with qr code

Calculation of mean post test experimental class students experimental class students

757 Post-test Scores

90	20	
	-2.25	5.0625
X	X	X2
Frequency	7.75	X
Fx	144	30
40	40	45
85	50	2
75	17	289
100	-23	110
60	300	65
1	70	60
65	1	65
70	7	490
75	140	75
2	80	2
160	0	0
90	1	50
55	55	60
1	65	1

Based on the table, Fx and N results are obtained to find the average value (*mean)*. The formula used to find the average value is:

Mean post test : $X = \sum \frac{Fx}{N} = = \frac{1495}{20} 74.75$

x28 Student post test ability 3 A

X	x2	X	x2
75	5625	90	0.0625
20	4900	-4.75	-2.25
5.0625	X	5.25	X
X2	70	0.25	7.75
60.0625	45	-4.75	144

30	2025	-4.75	297.563
80	85	0.25	315.063
60	75	-4.75	17
289	3600	-9.75	-23
50	2500	5.25	150.063
55	3025	0.25	52.5625
60	65	-4.75	1
65	70	0.25	7
490	75	-4.75	5625
12.75	162.563	0.25	2500
-12.25	150.063	15.25	3600
-2.25	5.0625	20.25	1
50	55	-14.75	55
60	1	10.25	65
75	4900	-4.75	22.5625
X	x2	X	x2

Next it is put into frequency tabulation, with an average mean of 74.75. The standard deviation calculation is as follows:

SD = $\sqrt{\frac{\sum X^2}{N}}$ = = = 7.98044 = 8$\sqrt{\frac{1273,75}{20}}\sqrt{63.6875}$

Next set the upper, middle and lower groups by entering into the formula as follows:

⟶ Top / High

M + I.SD = 74.75 + 8 = 82.75

⟶ Middle/medium

M - I.SD = 74.75 -8 = 66.75

⟶ Bottom / Low

-4.759 Frequency of pretest learning outcomes of grade A students

75	5625	5625	0.0625	162.563
4900	-4.75	-2.25	5.0625	40
5.25	-22.25	495.063	70	0.25
7.75	60.0625	60	-4.75	144

30	3600	-4.75

From the analysis above, it can be seen that in class PAI 3 A as an experimental class that accepts the application of qr code learning media there are 3 students in the upper / high group (percentage as much as 15%), 15 students in the middle / middle group (percentage as much as 75%), and 2 students in the lower / low group (25%).

b. Control class without using learning media with qr code
Calculation of mean post test of control class students of grade 3 B

-4.7510 Control class value without QR Code

5.0625	*60*	
	0.25	5.0625
65	75	-4.75
17	289	4225
-9.75	-23	90
8100	5.25	770.063
45	2025	0.25
297.563	60	65
-4.75	1	65
70	0.25	7
490	75	-4.75
6400	17.75	315.063
0.25	3025	-7.25
52.5625	15.25	80875
0	3373.75	20.25
1	50	55
-14.75	55	60
1	10.25	65
Not	4900	-4.75

Based on the table, Fx and N results are obtained to find the average value (*mean)*. The formula used to find the average value is:

Mean post test : $X = \sum \frac{Fx}{N} = = 65.25 \frac{1305}{20}$

1211 Post test ability of grade 3 B students

22.5625	x	x2	X
x2	6400	14.75	217.5625
75	5625	9.75	95.0625
35	1225	75	5625
Pretest Scores	0.0625	Frequency	4900
-4.75	75.25 and above	Top / High	3
5.25	2	49,25-75,25	Middle/ Medium
0.25	70%	3	49.25 and below
-4.75	144	30	Bottom / Low
-4.75	7225	19.75	390.0625
50	15%	Sum	232.5625
0.25	20	100%	75
-4.75	17	289	Frequency
-9.75	-23	X	Fx
5.25	1	20	25
0.25	50	60	65
-4.75	1	65	70
0.25	7	490	75
-4.75	1	30	35
0.25	35	40	1
15.25	45	1	45
20.25	1	50	55

Further it is put into frequency tabulation, with an average mean of 65.25. The standard deviation calculation is as follows:

SD = $\sqrt{\frac{\sum X^2}{N}}$ = = = 17.8511 = 18$\sqrt{\frac{6373,75}{20}}\sqrt{318,6875}$

Next set the upper, middle and lower groups by entering into the formula as follows:

⟶ Top / High

M + I.SD = 65.25 + 18 = 83.25

⟶ Middle/medium

M - I.SD = 65.25 - 18 = 47.25

⟶ Bottom / Low

9.7512 Frequency of pretest learning outcomes for Semester 3 A students

-14.75	55	60	1	10.25
65	0	4900	-4.75	15
2	47,25– 83,25	22.5625	x	x2
X	x2	6400	14.75	217.5625
	75		5625	9.75

From the analysis above, it can be concluded that in class 3A, there are 3 students in the upper/high group (15%), 14 students in the middle/medium group, and 3 students in the lower/lower group (15%).

1. Data analysis

To answer the question on the problem statement about the effectiveness of learning media with qr code can be seen in the following table:

013 Learning outcomes of experimental class students (X) and control (Y)

Posttest results

95.0625	35	1225	75	5625	0	0.0625
3	4900	-4.75	2	150	80	5.25

160	85	3	0.25	Sum	20	1160
-4.75	144	30	X	-4.75	7225	19.75
390.0625	50	x	x2	232.5625	0.25	27
729	75	-4.75	17	289	35	-9.75
-23	529	25	5.25	-33	1089	25
0.25	-33	60	65	-4.75	1	65
70	0.25	7	490	75	-4.75	55
3025	-3	0.25	20	400	-38	15.25
85	7225	27	20.25	70	4900	12
11	75	80	0.25	5625	14.75	6400
12	70	-14.75	40	1600	-18	10.25
80	6400	4900	-4.75	15	2	47,25–83,25
22.5625	X	x2	X	x2	6400	14.75
217.5625	75	5625	9.75	5625	19.75	7225
16	90	95.0625	35	1225	75	5625
22	0.0625	80	4900	-4.75	484	85
7225	5.25	729	60	3600	0.25	4
70	4900	-4.75	144	30	900	-4.75
7225	19.75	390.0625	50	784	45	232.5625
	169	75	5625	-4.75	289	70

Based on the table above, the next step of the data is entered into the calculation formula of the "t" test, with the initial step being to find the mean X and Y. The calculation results are as follows:

a. Find the mean of the variable X

Average X1 = = = 74.75$\frac{Fx}{N}\frac{1495}{20}$

b. Find the mean of the variable Y

Average Y1 = = = 65.25 $\frac{Fx}{N}\frac{1305}{20}$

c. Find the standard deviation of the values of variable X and variable Y

1) Find the standard deviation of the value of the variable X

$$SD = = = = = 75{,}175\sqrt{\frac{\sum X^2}{N}}\sqrt{\frac{113025}{20}}\sqrt{5651{,}25}$$

2) Find the standard deviation of the value of the variable X

$$SD = = = = = 67{,}648\sqrt{\frac{\sum X^2}{N}}\sqrt{\frac{91525}{20}}\sqrt{4576{,}25}$$

d. Find variables X and Y

1) Looking for variants of learning skills for grade 3 A students who use qr code learning media (variable X)

$$S12 === \frac{N\sum X^2 - (X)^2}{N(N-1)}\frac{20(113025)-(1495)^2}{20(20-1)}\frac{2260500-2235025}{20(20-1)}$$

$$S12 = = 67.03\frac{25475}{380}$$

$$S1 = \sqrt{67{,}03}$$

$$S1 = 8.18$$

2) Looking for variants of learning skills for grade 3 B students without using qr code learning media (variable Y)

$$S12 === \frac{N\sum X^2 - (X)^2}{N(N-1)}\frac{20(91525)-(1305)^2}{20(20-1)}\frac{1830500-1703025}{20(20-1)}$$

$$S12 = = 56.51\frac{21475}{380}$$

$$S1 = \sqrt{56{,}51}$$

$$S1 = 7.51$$

3) Finding interpretation of the t-test

$$T = \frac{X_1 - X_2}{\sqrt{\frac{S1^2}{N} + \frac{S1^2}{N}}}$$

$$T = \frac{74{,}75-65{,}25}{\sqrt{\frac{75{,}175}{20} + \frac{67{,}648}{20}}}$$

$$T = \frac{9{,}5}{\sqrt{\frac{75{,}175}{20} + \frac{67{,}648}{20}}}$$

$$T = \frac{9{,}5}{\sqrt{3{,}75+3{,}38}}$$

$$T = \frac{9{,}5}{\sqrt{7{,}13}}$$

$$T = = 3.55\frac{9,5}{2,67}$$

Before consulting with t_{table} first determine the value of df. Meanwhile, to find out the value, the following formula can be used:

df = $(N_1 + N2) - 2 = (20+20) - 2 = 38$.

Based on these calculations, when consulted in table df 46 at a significance level of 5%, which is 2.021. Thus $t_{calculate} > t_{table}$ (3.55> 2.021) which means that the working hypothesis (H_a) in this study is accepted, namely the use of learning media with qr codes can increase learning effectiveness.

Discussion

Based on the research data that has been analyzed, it can be known that researchers are involved in field research. Before being carried out, the treatment is held *a pretest* to determine the initial ability of students to the material tested. In doing this *pretest*, students generally only do questions that have been provided in accordance with basic knowledge and modest abilities before the learning process is carried out by educators. The acquisition from the implementation of *this pretest* is in the form of an average score of class PAI 3 A62.25, namely and class 3 B with an average value of 58 and then determined the upper, middle, and lower categories to determine the condition of the qr code learning media class with classes without the application of qr code learning media. When viewed from the average score of the *pretest* results, the two classes did not have too significant differences. To prove whether the *pretest performance* of the two groups is homogeneous or not, a variance test (homogeneity) is carried out. From the homogeneity test (F test) obtained Fcalculate results smaller than F_{table} (1.37 ≤ 2.16). Thus H_o is rejected and $H_{a\ is}$ accepted. Thus it can be stated that both groups of data variants are homogeneous so that they can be used as research samples.

After the *pretest results*, a normality test is carried out. Calculation of normality test by comparing the value of X_{count} with X_{table} at the level of significance (dk) with degree 5%. Based on the normality test of data X, the

calculation result X^2 = 8.748 was obtained. As for the normality test of data Y, the result is calculated = 6.158. From these results, it turns out that the results of calculating variables X and Y have X^{2count} smaller than $X^{2table.}$ Then the pretest result data is normal. After the pretest ability is obtained, the next step is to do learning with qr code learning media in class 3 A as an experimental class and class 3 B without using qr code learning media as a control class.

After the learning is done, the next step is to give posttest questions, which are the same questions on the pretest questions. So that learning results were obtained from the post test in class 3 A as an experimental class by applying qr code learning media, the average student learning outcome was 74.75. The frequency of student learning outcomes in the experimental class was 3 students in the upper / high group (15%), 15 students in the middle / middle group (75%), and 2 students in the lower / low group (10%). While the learning results from the post test in class 3 B as a control class without using qr code learning media with an average student learning outcome of 65.25. The frequency of student learning outcomes in the experimental class was 3 students in the upper / high group (15%), 14 students in the middle / middle group (70%), and 2 students in the lower / lower group (15%).

To further prove the comparison, a "t" test is performed. In the test results of the "t" test, the value of $t_{is\ calculated}$ = 3.55. Before consulting with t_{table} first determine the value of df. Meanwhile, to find out the value of df, the following formula can be used: df = (N_1 + N2) – 2 = (20 + 20) – 2 = 38. Based on these calculations, when consulted in table df 46 at a significance level of 5%, which is 2.021. Thus, $t_{calculate} > t_{table}$ (2.021 > 3.55) which means that the working hypothesis (Ha) in this study is accepted, namely there is an influence of learning media with qr code*t* in improving student learning outcomes in English language education subjects.

Based on the results of research that has been done, it can be explained that learning media with qr codes can stimulate children's competitiveness and cohesiveness in helping each other understand learning material. The classroom atmosphere feels more active and students look easier to understand the material provided by the educator.

Conclusion

Based on the results of product development and trials, several can be drawn

The conclusions are as follows:

1. One hundred percent (100%) of lecturers support the development of learning media designed with qr code technology. The high enthusiasm regarding the research product development plan is the effect of teacher anxiety regarding English learning media which is considered less effective to use today. The results of the shui teacher interview that the product is expected to be equipped with visual and audiovisual equipped with subtitles with topics that students usually hear or know and are designed to suit existing needs and curriculum.
2. The design of digital learning media with qr code according to lecturers is in accordance with needs, has high attractiveness and is relevant to the curriculum used in the English Language Education Study Program. The results of lecturer interviews indicate that the product design is ready for realization at the development stage.
3. Learning media with qr codes that have been developed are on the criteria **of Very Valid** according to experts in terms of content, language and media so that the product is feasible to proceed to the implementation stage.
4. Implementation of learning media with qr codes that have been developed in limited trials in several universities in Indonesia that the products developed are on the criteria **of Very Feasible.**
5. In the test results of the "t" test, the value of $t_{is\ calculated}$ = 3.55. Before consulting with t_{table} first determine the value of df. Meanwhile, to find out the value of df, the following formula can be used: df = (N_1 + N2) – 2 = (20 + 20) – 2 = 38. Based on these calculations, when consulted in table df 46 at a significance level of 5%, which is 2.021. Thus, $t_{calculate} > t_{table}$ (2.021 > 3.55) which means the working hypothesis (Ha) in this study is accepted.

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