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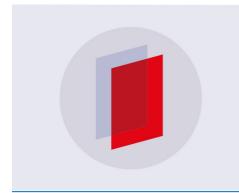
Development of blended learning based on Google Classroom with osing culture theme in mathematics learning

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Development of blended learning based on Google Classroom with osing culture theme in mathematics learning

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Abstract. Blended learning is a learning method that combines offline meetings with online material. The aim of this research is to develop a Blended Learning assisted Google Classroom in learning mathematics with the Osing culture theme for students in Banyuwangi that satisfying, valid, practical, and effective. Osing culture was chosen as a theme of learning aimed at preserving local culture in the society in Banyuwangi. This research uses a Plomp development model research design consisting of three phases, namely Preliminary Research, Prototyping Phase, and Assessment Phase. Blended Learning assisted-Google Classroom in this research was categorized as valid (3,85 out of 4,00) based on the assessment from the validator. Blended Learning assisted-Google Classroom in this research is categorized as practical (90,3%) based on observations of teacher activities and advice from practitioners. Blended Learning assisted-Google Classroom in this research is categorized as effective based on student test results (77.27%), observations of student activities (88,02%) and student response results (84,5%).

1. Introduction

Learning process is the essence of education that occurs at all levels of education. In planning of learning process, the teacher is required to be able in arranging and developing a learning tool [1]. Learning tool is a set of signs for teachers in doing the learning. The learning tool includes Syllabus, Learning Implementation Plans (RPP), Student Worksheets (LKS) and learning media.

The development of the learning process is absolutely necessary because of the changing of curriculum from the Education Unit Level Curriculum (KTSP) to the Curriculum 2013 (revised) which more emphasizes on students' thinking processes. If the learning tool is available, then a teacher will be able to carry out learning more systematically and directed. Learning tool also needs to be prepared in order to improve the quality of learning and the development of the teaching professionalism [2]. In addition, innovative learning tool can improve students' cognitive and psychomotor abilities [3], [4]. Innovative method can also improve students' critical thinking [5], [6]. In this case, the teacher must have the initiative, creative ability and technological capability in developing the learning tool, especially in preparing changes to the 21st century [7]–[10].

Based on the results of interviews with several teachers in Banyuwangi, the learning tool that was used was LKS which contains material and exercises that only giving a short information. This learning is in accordance with the theory of behaviorism whose learning process is still teacher-centered as the main source of knowledge. As the result, students tend to only memorize the steps or

learning material provided by the teacher. Therefore, it needs to be a student-centered learning approach, and it needs to able to develop reasoning and student learning motivation, one of which is Blended learning [11]–[13].

Blended learning or also called Hybrid Learning is a learning method that combines face-to-face (offline) meetings with material that is packaged online [14], [15]. The advantages of using Blended Learning are as follows: (1) Blended Learning is more effective than pure face-to-face learning or virtual classroom learning; (2) Blended Learning is more effective in improving student learning achievement; (3) Blended Learning increases communication activities between teachers and students, especially in online interactions; (4) Blended Learning enhances students' ability regarding the use of information technology; and (5) Blended Learning is able to reduce face-to-face costs [12], [13], [15]. A significant difference between students view in relation with blended learning environment as well as online and face to face learning environments was students have expressed that they learn more effectively in a blended learning environment. [16].

The success of Blended Learning in learning activities is supported with several results of educational research. Blended Learning is very suitable to use in this millennial era [17], [18]. It is able to increase students' knowledge to a higher level of thinking. By using Blended Learning, the management of material and class will be better, so that student learning outcomes will increase [19]. Blended Learning will be optimal if it is combined with pages that are easy to access by teachers and students, one example of blended learning is the use Google Classroom [20]. Blended learning has been growing in popularity as it has proved to be an effective approach for accommodating an increasingly diverse student population whilst adding value to the learning environment through incorporation of online teaching resources [21].

Google Classroom is an interface portal created by Google companies that can be used to compile and create online classes. The use of Google Classroom in learning does not need to be complicated in installation [22], [23]. Besides that, Google Classroom can be used free of charge by anyone, with an easy access and design either through a computer or smartphone with an internet network.

The application of learning with Blended Learning is closely related to thematic problems in everyday life [24]. The theme that can be raised and closely related to daily life in Banyuwangi is the theme of Cultural Diversity, one of which is Osing culture.

The Osing Tribe is the natives of Banyuwangi which the majority of the population is in several sub-districts in Banyuwangi Regency. The Osing Tribe has Osing Language which is a direct derivative of Old Javanese Language [24], [25]. Osing Tribe art is very unique and contains many mystical elements such as the Balinese and Tengger Tribes. The main arts include Gandrung Banyuwangi, Patrol, Seblang, Angklung, Barong Dance, Kuntulan, Kendang Kempul, Janger, Jaranan, Jaran Kincak, Angklung Caruk and Jedor.

Therefore, the use of Osing Culture Theme is very appropriate when applied to junior high school students in Banyuwangi Regency. Besides being easy to understand, the theme will arise a sense of love for local wisdom, especially regarding Osing culture. So, it feels to be very necessary to be preserved [26]. In addition, according to the University of Jember Research Master Plan 2016-2020, Osing culture is one of 9 research topics that need to be preserved and researched by researchers in the University of Jember.

2. Method

The type of this research is a development research (Research & Development). Development Research in this study uses the Plomp development model. There are 3 stages or phases in the development, namely: (1) preliminary research, (2) prototyping phase, and (3) assessment phase. The reason of using the Plomp development model in this study is the systematic stages that are easy to understand in carrying out the development research process [27].

There are two types of data in this study, they are qualitative data and quantitative data. Qualitative data is the responses and improvement suggestions from validators, practitioners and students as well

as field notes [10]. While the quantitative data is obtained from the validation scores, observation scores and test scores [28].

These data are then grouped according to the 3 aspects that will be assessed, that is validity data, practicality data and effectiveness data of learning instrument. Validity data analysis is used to determine the level of validity of development learning tools. Qualitative data is converted into quantitative data by: (1) recapping the scores of all aspects of the validator, (2) calculating the average value of each aspect, (3) calculating the overall average of V_r, and (4) making conclusions about validity based on Table 1.

Table 1: Validity Criteria of Tool and Instrument

Interval	Validity
$1 \leq V_r < 2$	Invalid
$2 \leq V_r < 3$	Enough
$3 \leq V_r \leq 4$	Valid

V_r: the average of all validity scores

If the results of the analysis are found to be invalid in conclusions, then it needs a total revision and the re-validation process is carried out by experts and practitioners. If the results are sufficiently valid, then a small revision is required so it needs to be validated again and continued with trials. If the data is valid, then continued with trials.

Practicality data of tool is data that describes the implementation of learning using the learning tool. This data is obtained from teacher activity which observed through observation sheets. The learning tool is said to be practical if in the results of observations the teacher's activities are good conclusion and based on the results of interviews with practitioners do not change the tool as a whole.

The effectiveness of the tool is measured by three aspects, they are cognitive, psychomotor and affective aspects. Cognitive aspects based on student test results, psychomotor aspects based on the results of the average student activity and affective aspects based on the results of student responses.

3. Result and Discussion

The results of this research discuss the learning media and presentation of trial data. The following is presented in Figure 1 regarding the Google classroom view used in the study. There are three menus that are displayed on Google classroom including stream, classwork and people. The stream contains all material sorted by timeline. Classwork contains material, mathematics problems, questionnaires, pictures, videos and e-books. People contain everyone who joins the class, as well as media developers, teachers, assistants and students.

Figure 1: Leaning media assisted by Google classroom

Presentation of trial data contains data and validity analysis, practicality and effectiveness of learning media based on Google Classroom with Osing culture theme. The analysis of validity data is based on the results of learning media validation. The validation process is done by submitting the tools, assessment instruments and validation sheets to the expert validators. Besides giving an assessment, the validator also gives comments and suggestions for improvement on the developing product. The recapitulation of learning media validation is presented in Table 2.

Table 2: The recapitulation of learning media validation

No	Indicator	Validator V$_1$	Validator V$_2$	Mean
Format				
1	Attractive design and in accordance with the contents	4	4	4
2	The media format is clear and coherent	4	4	4
Content				
3	Work instructions are written completely and clearly	4	4	4
4	In accordance with the Blended Learning model syntax	4	4	4
5	Activity materials help the students build understanding independently	4	4	4
6	Emphasizing the mastery of concepts	4	3	3,5
7	Material in accordance with the theme of Osing culture	4	4	4
Language				
8	Use of language that is easy to understand	3	4	3,5
9	Use of communicative language	3	4	3,5
10	Use of standard writing rules and in accordance with the Perfected Spelling System (PSS)	4	4	4
Total score		38	39	38,5
Average		3,8	3,9	3,85

Based on the analysis of validity data in table 2, the average of validation total score of learning media is 3.85. So the prototype of developed learning media in this research satisfied valid criteria.

Furthermore, observation of teacher model activities was carried out for three courses. Based on the recapitulation of observational data on teacher activity, it was obtained an average of total score of teacher observation is 2.71 and the percentage of the average score of teacher observation results is 90.3%, then the percentage score satisfied good in criteria. In addition, according to the results of the interview, practitioners were only giving suggestions for improvements that do not change the device as a whole. So from that description can be said that the developed learning media in this research satisfied the practical criteria. The recapitulation of observations of teacher activities is presented in Table 3.

Table 3: Recapitulation of Teacher Activities Observations

Phase	Indicator	Score I	Score II	Score III	Mean	Percentage (%)
Preliminary	Preliminary learning activities	2	3	3	2,67	89,0
	Apperception	2	2	3	2,33	77,7
	Student Group formation	3	3	3	3	100,0
Main	Presentation of Problems	2	3	3	2,67	89,0
	Group Discussion Guidance	2	3	3	2,67	89,0
	Discussion of Problems	2	2	3	2,33	77,7
	Conclusion Withdrawal	3	3	3	3	100,0
Ending	Ending learning activities	3	3	3	3	100,0
	Mean	2,37	2,75	3	2,71	
	Percetage (%)	79,2	91,7	100		90,3

The analysis of effectiveness data is divided into three parts, based on the test results, observations of student activities and the results of student responses. The test was held at the fourth meeting after the trial for almost three times. The test value data is used to determine students' cognitive abilities after participating in learning using the Blended Learning model that has been developed by researchers. Out of the 22 students who took the test, 17 students got scores greater than the standard that had been determined (score 75 from a maximum score of 100) and the rest did not satisfying. So the percentage of completeness in classical cognitive ability is 77.27%.

Observation of student activities was carried out by two observers during three meetings. Observation results of student activities is one of the data supporting effectiveness reviewed of psychomotor students. Overall, the average score obtained from observations of student activities was 3.52 and the average percentage of scores from observations of student activities was 88.02%. So based on student activity criteria, the average score satisfies the criteria of very active. Recapitulation observations of student activities presented in table 4.

Table 4: Recapitulation observations student activities

| Phase | Indicator | Score | | | | | | Mean | Percentage (%) |
| | | I | | II | | III | | | |
		O_1	O_2	O_1	O_2	O_1	O_2		
Preliminary	Observing the learning objectives	4	2	4	3	4	4	3,50	87,5
	Approve on the definition of prerequisite material	3	3	4	3	3	4	3,33	83,3
	Group	3	4	3	4	3	4	3,50	87,5
Main	Collecting information from problems	4	4	4	3	4	3	3,67	91,7
	Discuss to solve problems	4	4	3	4	4	4	3,83	95,8
	Discuss problems with the teacher	3	3	2	3	3	4	3,00	75,0
	Report and draw conclusions	3	4	4	4	4	3	3,67	91,7
Ending	Observing the next activity instructions	3	4	4	4	4	3	3,67	91,7
Mean		3,38	3,50	3,50	3,50	3,63	3,63	3,52	
Percentage (%)		84,4	87,5	87,5	87,5	90,6	90,6		88,02

The effectiveness of learning reviewed from affective aspect is obtained from the results of student response questionnaires. The student response questionnaire sheet is filled by 22 students. The student response score is then recapitulated and analysed. Overall, the average percentage of each question was 84.5% answering "yes" and 15.5% answering "no". This indicates that students are interested and give a positive attitude to the learning based on Google Classroom-assisted Blended Learning. In other studies, the respondents agreed that GSuite classroom is recommended, because it can facilitate

students in the learning process and facilitate the teacher in evaluating student learning outcomes [29]. Recapitulation of student responses presented in Table 5.

Table 5: Recapitulation of student responses

No.	Questionnaire Questions	Answer		Percentage (%)	
		Yes	No	Yes	No
1.	Are you happy during the lesson?	20	2	90,9	9,1
2.	Do you love the way teachers teach?	17	5	77,3	22,7
3.	Do you like learning in the classroom?	18	4	81,8	18,2
4.	Are you happy to express your opinion to your friends?	16	5	72,7	27,3
5.	Do you like to respond the friends' group opinion?	19	3	86,4	13,6
6.	Do you have more opportunities to discuss with friends in solving problems?	20	2	90,9	9,1
7.	Do you have more opportunities to express opinions?	17	5	77,3	22,7
8.	Do you understand the language used in the media?	19	3	86,4	13,6
9.	Do you like the theme of culture used?	21	1	95,5	4,5
10.	Do you agree that this learning is taught for other material?	19	3	86,4	13,6
	Mean	18,6	3,4		
	Percentage (%)	84,5	15,5		

In other similar research, the results prove that majority of the students are satisfied with the Google Classroom's tool that were introduced in the class where all ratios are above averages [30]. Based on the results of these studies, the average value of the 5 assessment categories reaches 4.35 out of 5. In particular, comparative performance is good in the areas of ease of access, perceived usefulness, communication and interaction, instruction delivery and students' satisfaction towards the Google Classroom's learning activities [22]. Previously, the data showed that Google Classroom increased student participation and learning and improved classroom dynamics [31]. It also revealed concerns around pace and user experience. This data was used to construct a framework to evaluate of the use of online platforms; it identifies four concepts (pace, ease of access, collaboration and student voice/agency) that explore the usefulness of other online learning platforms, as well as pedagogical practice. In addition, in another blended learning study assisted by Moodle software also showed the results of the average student learning achievement score of 3.16 of 4.0, the average value for learning motivation was 3.21 of 4.0 and the average value for collaboration and communication during the learning process was 3.19 of 4.0 [32]. This shows that broadly, based on the results of the above research, the application of technology-assisted blended learning is very practical and effective.

Some of the obstacles that were found at the time of the study were the lack of readiness of teaching teachers in the classroom in applying the Google Classroom assisted blended learning model. The next obstacle is that not all schools can implement this learning model because there are still some schools that have inadequate facilities. Furthermore, the last obstacle is that the use of gadgets tends to be misused when there is minimal supervision by teachers, because it allows there are some students who use their gadgets for other activities outside of learning.

Some of the contributions of the implementation of Google Classroom-assisted Blended Learning include the learning process being very flexible because it can be done anywhere and anytime [20]. The application of blended learning allows students to hold discussions outside of lesson hours if there is material that has not been understood. Students also have the freedom to learn material from various teaching materials because teaching materials are not in the form of books but in the form of soft files stored online. While for teachers, the application of technology-assisted blended learning can accelerate teachers in the process of evaluating student learning outcomes.

The application of Google Classroom-assisted blended learning aims to introduce students and teachers that the learning process will be more interesting and enjoyable with the use of technology.

Entering the digital era like now where everything is required to be effective and practical, the use of this Google Classroom can help solve problems that cannot be solved by conventional learning processes. This is in line with the curriculum 2013 (revised) that requires every learning process to utilize technology. Entering the era of industrial revolution 4.0, students are now required to be able to take advantage of existing technological advancements and continue to develop these technologies through the latest innovations. For that research in the future, the process of disseminating the results of the blended learning model allows introducing Google classroom learning media so that this learning media can be used widely by all agencies and schools in Banyuwangi, East Java, Indonesia.

4. Conclusion

Based on the results of the research, the conclusions obtained were: (1) Blended Learning assisted-Google Classroom in this research was categorized as valid based on the assessment from the validator; (2) Blended Learning assisted-Google Classroom in this research is categorized as practical based on observations of teacher activities and advice from practitioners; and (3) Blended Learning assisted-Google Classroom in this research is categorized as effective based on student test results, observations of student activities and student response results.

Development suggestions from this research include: (1) Blended Learning assisted-Google Classroom still needs to be tested in other schools with various conditions to obtain better quality learning; and (2) This research is carried out in 3 phases, that is the preliminary research, prototyping phase and assessment phase. To know how effective the application of learning is and the differences with other learning, it is necessary to continue with other studies such as experimental research or applied to class action research.

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