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# Problems in Teaching English Tenses to Students of PGSD UNNES

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## Abstract

This study focused on the problems in teaching tenses to Primary School Teacher Education Department (PGSD), Faculty of Education, Semarang State University (UNNES). There were some of the problematic and confusing tenses such as simple tense and present perfect tense, present continuous and present simple, past simple and past continuous tense. This research used qualitative approach. It was conducted in PGSD Department, Faculty of Education, Semarang State University in 2015 by involving 120 students as the samples. The researcher used questionnaire, interview sheet, and test items as the instruments. The data were analyzed by using descriptive method. Besides that teaching grammar had been handled throughout this study with the data obtained from the written exams of the learners. Most frequently occurred errors were listed and they were analyzed in details. The findings revealed that the reasons for these errors mostly derived from mother tongue interference and lacked of adequate linguistic background. The other component of this article was to offer remedial teaching activities for foreign language learners to compensate the shortcomings.

Keywords: mistakes and errors, mother tongue interference, teaching tenses

## 1. INTRODUCTION

In an EFL teaching process, teaching structure or grammar is an important point that cannot be avoided. Based on various views from most EFL teachers, they agree that it is vital to teach grammar systematically and purposefully to teach grammar for EFL students to master the target language. Grammar, either directly or indirectly, is taught from the elementary education until the undergraduate studies for about 16 years in Indonesia. However, in fact that most students are not able to make correct sentences grammatically.

Generally speaking, in many schools in Indonesia, the teaching of grammar has been assumed as a highly structure based. In many cases, grammar is taught for its own way. The common way of teaching grammar is to give some rules or sentence patterns using a lot of technical terminology, explain about the exceptions to the sentence patterns, ask students to do many exercises that are often mechanical and monotonous. Even if the students get fairly good score in a grammar test, indeed there is no guarantee of the fact that the students would be able to speak and write in correctly. In this respect, Gokhale (2010) claims that in most cases, grammar should be taught as a means for students to make correct sentences. This should be the end of teaching grammar. The teaching of grammar or structure must help our students to create good utterances. The fact is different, that the teacher generally focuses on teaching the complicated rules of grammar and ignores the other important aspect of it, that is communicative aspect of English language.

Put other way, grammar which is composed of tenses is an indispensable part of a language and it constitutes the bone of the body language. Hence, they need to be learned or acquired by the learner either consciously or subconsciously. As it has a certain role in language teaching, the teachers of foreign language need to tackle with it within the teaching syllabus skilfully so that the learners can grasp it well.

Before talking about tenses in English it would be better to drop a few lines of grammar, in which tenses have a certain role. Grammar exists in languages and will be learned or acquired in a way. For the native speakers, according to Chomsky (1959), states that grammar is somewhere in the native speakers' brains and they can use to make sentences. The hypothesis that the course of language acquisition is determined by an innate faculty is known popularly. Chomsky maintains that language activity is an activity unique to human beings experience, so that learning a language involves mental processes. When it comes to foreign language learners the situation seems to be a bit different considering that they already know a language, mother tongue, and they will build a new one on it. So if a learner would like to approximate the competence of a native speaker, he should have some capacities such as the ability to distinguish grammatical from ungrammatical sentences. He should also be able to produce and understand an infinite number of grammatical sentences, and identify syntactically ambiguous sentences. Learning a language does not consist of only approximation to the native speaker, and the

learner may have slips, mistakes, false starts and a number ungrammatical behaviours.

Needless to say, Indonesian students have some difficulties in learning some tenses due to some reasons originated from their misunderstandings or misinterpretations of the lessons presented by the Indonesian teachers. Mother tongue interference can also be regarded as an important barrier that keeps the learners learning the newly confronted language. We always encounter with the misused sentences produced by the students such as,

"I have seen that film last year",  
"\*I am living in Surabaya",  
"\*I told him he is at home",  
"\*I am playing football on Sundays",  
"I was go to Jakarta last month",  
"I was knowing that you couldn't come",  
"I am understanding now" and so forth.

As a teacher of foreign language, what should be done is to make some remedial teaching on the misunderstood and fossilised concepts located in the students' minds. Hence, this study aims at presenting these misconceptions and problems arising in teaching some tenses. Before moving to the problems in teaching tenses to present some general information about grammar will help to clarify our issue in concern.

### **Teaching Grammar**

This is the real fact that teaching tenses is a part of teaching grammar of the language. Ur (1996) defines grammar is the study on how to put words together to make sentences correctly. Grammar is the study of the patterns and principle points which decide the formation and interpretation of words, phrases and sentences (Radford, 1998). According to Crystal (1992) grammar is the study of a systematic analysis of a language. Grammar is also traditionally divided into morphology and syntax.

We can say that grammar is abstract in the mind and it becomes concrete in the use. That is to say, it is something that is somewhere in the brain and turns out to be concrete in using. Moreover, it is the study of grammatical competence which means tacitly knowing about the grammar of a language. To introduce a technical term, we might say that native speakers have grammatical competence in their native language; by this we mean that they have tacit knowledge of their language. In other words, they are aware of how to form and interpret words, phrases and sentences in the language. So human beings have no conscious awareness of the psychological processes involved in speaking and understanding a language.

A grammar of a given language is descriptive adequate if it correctly describes whether any given string of words in a language is

or isn't grammatical, and also correctly describes what interpretations the relevant string has (Radford, 1997).

### **Problems In Teaching Tenses**

Tense is known as a matter of inflection that is the changing of the form of a main verb by adding a morpheme or not. It must be deep in mind that "*tense*" and "*time*" are not totally synonymous in English. The term "*tense*" refers to changing of a verb form, not to chronological time (Graver, 1986). In English, verbs are used to express the *aspect* (simple, progressive or perfect) of an action or event. To some linguists, structurally speaking, there are two main tenses; present and past. Future is included in the present. On the other hand, most of the linguists state that there are three tenses in English; present, past and future. There are several problems existing in the learning of the use of these forms because of the interference of the first language and existing distinctions in a different way.

The choice of verb form (simple, continuous, perfect) made by English speaker depends on many factors, and not on a rigid set of grammatical rules. For the foreign language learner it seems to be quite difficult to be able to use the language appropriately for the appropriate situations. As they haven't developed on the stressed points efficiently they fail to get the message across. Now, let's examine some of the tenses causing difficulties for learners to learn through the results obtained from the research.

## **2. METHOD OF INVESTIGATION**

### **Method**

The method used in this study is qualitative research based on document scanning which aims to figure out the commonly recurring errors in foreign language learners' written exams. Our aim here is not to analyze foreign language courses at PGSD UNNES but to evaluate the problems occurring during the teaching of grammar. It is not true that all lessons are conducted structurally, but while presenting the course it is inevitable to offer grammatical patterns. During this process, most of the foreign language teachers come across a lot of problems demotivating the lecturers.

### **Procedure**

I have been teaching English at PGSD UNNES for 11 years. Most of the learners at this department have low-level linguistic background because they claim that they could not get foreign language courses in their previous education appropriately. Therefore, when they confront with the course they usually have problems. In this study, I found out that certain error types were

made by PGSD UNNES students after analyzing hundreds of sentences produced by EFL learners' written exams. In order to obtain the related data, I took notes of the errors on the papers for one year.

### Participants

The participants of this study are the first-year students of PGSD UNNES. The written exams administered to the participants from the first year students consisted of the questions requiring the grammatical knowledge of the learners. The exams of approximately 120 students were scanned for one year in terms of the grammatical problems.

### Limitations

This study only deals with the errors occurring in written exams administered to the first-year students at PGSD Department of Semarang State University. The participants (120 students) are specifically chosen from the ones with different linguistic backgrounds who did not have any comprehensive language education before.

## 3. FINDINGS AND DISCUSSION

According to Harmer (2007:137) there are three groups of grammatical mistakes. Two of them are *slips* and *errors*. When it is a *slip*, students usually understand that they have made a mistake and are therefore able to correct themselves. On the other hand, *errors* require correction and explanation as learners do not have the language knowledge needed to correct these types of mistakes yet. Furthermore, the errors can stem from two factors: L1 interference and as part of language development. In errors caused by L1 interference, the students' knowledge of the framework in which their own language is used, causes problems in their L2 or FL production when unfamiliar structures appear in the sense that the students use the familiar structure from their L1. On the contrary, developmental errors are produced by all language acquirers and learners in a natural language proficiency process. As our concern in this study is to figure out the most frequently made errors by PGSD UNNES students, it is time to analyze them in detail. The following part specifically focuses on the errors occurring while teaching tenses.

### Problems in Teaching Present Continuous and Simple Present Tense

The students misuse the present continuous as they confuse it with the simple present tense. The reason behind this misuse and misconception is that they can't keep themselves away from mother tongue interference. Let's examine some of the typical mistakes that the students make while learning and practising present continuous and simple present tenses.

**Table 1.** Present Simple And Present Continuous Tenses

<i>Erroneous Form Made by PGSD UNNES Students</i>	<i>n</i>	<i>%</i>	<i>Mean</i>	<i>Correct Form</i>
1 *I am playing football every Sunday.	80	67		I play football every Sunday.
2 *They are living in Surabaya.	75	62.5		They live in Surabaya.
3 *I am not working on Saturdays.	90	75	66.58	I don't work on Saturdays.
4 *He isn't smoking.	60	50		He doesn't smoke.
5 *I am understanding you..	92	77		I understand you.
6 *I am not liking this lesson.	82	68		I don't like this lesson.

The mean score of 66.58 reveals that PGSD UNNES students usually confuse present continuous tense with the present simple tense. It can clearly be seen that the students utter the sentences as they are produced in their mother tongue. We, in colloquial Indonesian, usually state the sentence 2 as "They are living in Surabaya", or "I am not working on Saturdays" for the sentence 3. "I am not smoking" is also another case that is uttered in the structure of present continuous in Indonesian but refers to habitual activities of present simple. It should be reminded to the learners that the simple present, not the present continuous, should be used to express a present habitual action. Another issue to be considered is that the present continuous must be used for an action going on at the time of speaking.

Some of the PGSD UNNES students misuse some of the verbs denoting a state rather than an act. The verbs "understand, know, believe, like, love, mean, prefer, hear, see, belong, consist" and so on are used in the present continuous form rather than present simple tense. These verbs mustn't be used in the present continuous but the present simple. To eradicate this problem, the foreign language teacher should focus on errors and provide the students with more practice.

### Problems in Teaching Present Perfect and Simple Past Tense

To Richards (1979), both elementary and advanced English learner assume that the present perfect are problematic for them. The perfect in English is often interpreted as an optional alternative to the simple past tense; and this interpretation of its function tends to errors of tense usage. Faulty teaching of tense often leads to the difficulties with the present perfect tense. The basic uses of the perfect and simple past tense look similar in use. The Present Perfect Tense is one of the most problematic tenses for PGSD UNNES students. They find difficult in learning this tense correctly and to be able to use it

appropriately for the appropriate sentences because as they have difficulties in understanding it. Most of PGSD UNNES students are commonly confused with the simple past and present perfect one. It is complicated and difficult to differ between the present perfect and past simple.

As is mentioned above, the students usually confuse the present perfect tense with the past simple. However, they need to be reminded that the past tense should be used for an action completed in the past at a stated time. The students should also be told that past simple is provided with the specific time expressions such as, *yesterday*, *last night/year/week*, *ago*, *then*, etc. Let's examine some of the common mistakes of the students.

**Table 2.** Past Simple And Past Continuous Tenses

<i>Erroneous Form Made by PGSD UNNES Learners</i>	<i>n</i>	<i>%</i>	<i>Mean</i>	<i>Correct Form</i>
7 * I have seen him yesterday.	102	85		I saw him yesterday.
8 * A long time ago he has sold his car.	94	78	76.9	A long time ago he sold his car.
9 * He hasn't bought anything last week.	86	71.6	7	He didn't buy anything last week
* He hasn't died in the accident in 1989.	93	77.5		He didn't die in the accident in 1989.
* I lived in Surabaya since 1993.	87	72.5		I have lived in Surabaya since 1993.

Most of the students (76.93 mean) have also a tendency to use the past simple instead of the present perfect. Here are some of the other typical mistakes made by PGSD UNNES students. Let's have a look at them and figure out what they confuse with.

**Table 3.** Present Perfect And Other Tenses

<i>Erroneous Form Made by PGSD UNNES Learners</i>	<i>n</i>	<i>%</i>	<i>Mean</i>	<i>Correct Form</i>
1 *I am living in Surabaya since 1990.	89	74.2		I have lived in Surabaya since 1990.
2 *He is sleeping for two hours.	84	70		He has been sleeping for two hours.
*I can't play football because I broke my leg.	104	86.6	7	I can't play football because I have broken my leg.
*Did you read this book?	78	65	74.5	Have you read this book?
*Did you see my book? I can't find it.	85	70.8	3	Have you seen my book? I can't find it.
*It is the first time I met him.	91	75.8	3	It is the first time I have met him.
* It is the best film I ever saw.	95	79.1	7	It is the best film I have ever seen.

As it can be concluded through the examples and data (74.53 mean), the past simple is the only tense available in Indonesian and it replaces the present perfect for all cases. Present perfect is also confused with present continuous tense by the foreign language learners. A good English teacher should help the students to differentiate the past simple and present perfect supplying them with efficient practice teaching materials. Otherwise, students won't be able to comprehend the language and this will lead to lack of communicative competence.

### **Problems in Teaching Past Continuous and Simple Past Tense**

Past Continuous Tense is also another confused tense with the past simple. It is not as common as the other misused and confused tenses, but still some misconceptions and misinterpretation arise due to lack of practice and mainly mother tongue interference of the learners. In Indonesian we normally say "*Saya tahu bahwa kamu akan bertindak dengan cara ini*", which can be translated into English word-by-word with the past continuous tense, whereas the equivalent of the same sentence in English is "*I knew that you would act in this way*". Let's examine some of the sentences produced by the Indonesian learners involving basically mother tongue interference.

**Table 4.** Past Simple And Past Continuous Tense

<i>Erroneous Form Made by PGSD UNNES Learners</i>	<i>n</i>	<i>%</i>	<i>Mean</i>	<i>Correct Form</i>
1 * I was knowing that you wouldn't come.	88	73.3	3	I knew that you wouldn't come.
2 * She was working in a factory last year.	97	80.8	3	She worked in a factory last year.
3 * In 1989 we were living in Surabaya, *I was smoking ten	96	80	79.37	In 1989 we lived in Surabaya. I used to smoke ten
4 years ago. Now I don't	100	83.3	3	years ago. Now I don't smoke.

Past continuous tense is also confused with the past habitual actions that should be expressed with "*used to*" to reveal that something happened in the past for a while and not continue any more. The mean score (79.37) proves that the participants have problem in comprehending past continuous tense.

Another issue to be considered is that most of the students at the beginning of learning process confuse past simple tense by generalizing the past form of auxiliary "*be*" for the past simple tense. As it proceeds past simple in most of the coursebooks and syllabuses, most of the students attempt to use "*was*" or "*were*" for the all cases of the past simple. It is quite possible to confront such mistakes "*I was go to school*", "*He was study English yesterday*", "*I was do my homework last night*" and so forth.

What should be done, actually, is to practice on the related problematic tense as much as

the students get the message. It wouldn't be fair to consider that all the errors made by the students are originated only from the mother tongue, as the mother tongue interference. In order to help the students retain the problematic tense in the correct form, the teacher should have enough time within his teaching syllabus for error correction and remedial teaching. Needless to say, to teach a tense quickly without making any drills, repetitions or drills cause these misconceptions in language teaching.

The aim of this study has been to provide some general information about the problems that occur in language teaching, and present some suggestions to eradicate the common mistakes and errors arising in teaching and learning process. A good language teacher is the one who can observe the learners and figure out the problems while teaching tenses and present some solutions to diminish these problems. On the other hand, it should not be kept in mind that, as Brighton asserts (1994), errors will always be made, and have direct implications for remedial work because they are by their nature systematic infringements of the normal rules of the language. The teacher needs to plan his remedial treatment of them into syllabus for the coming weeks and months. The insight that errors are a natural and important part of the learning process itself, and do not all come from mother tongue interference, is very important.

Remedial teaching is a kind of teaching activity that should be done by the language teachers when the problems occur while teaching any kind of teaching point, especially the problematic tenses for the students. However good the teaching and however effective the learning, there will always be a place for remedial work of one kind or another because it is beyond the capacity of a human being to absorb perfectly and retain indefinitely everything he is presented with (Broughton et al, 1994). Hence, from one point of view every learner needs remedial teaching after the first lesson. It is unfortunately common to find a student who is quite incapable of using the present simple or present perfect at the end of a teaching session.

There are of course some reasons that necessitate doing remedial teaching. There are circumstances quite beyond the teacher's control which produce remedial situation. The syllabus, for example, is usually not within the control of most ordinary teachers. The difficulty is that the students get indigestion from doing too much of one thing all together, and that once a topic is finished, and it is only incidentally referred to and practised later.

Another important factor which can produce poor learning and a potential situation is the many choices of materials to teach from. They must be suitable for the age groups of the students and suitable for the part of the world they are to be

used in. Apart from the syllabus, the materials and the teacher, another potential source of trouble is the learner himself. Even with optimal conditions, there still is room for remedial work as there is no such thing as perfect learning. Clearly it is inevitable that learners do make errors.

It was a widespread belief until recently that contrastive analysis (comparing the learner's mother tongue with the target language) would predict the difficulties a learner would encounter and so enable the teacher to concentrate on them and avoid them. So it can be concluded that learners need remedial teaching when they don't understand the related tense well.

## 4. CONCLUSION

It is clear from this brief discussion that the learner brings with him one source of error: his mother tongue. Even more importantly, the learning process is the source of other errors. The most sensible course of action, with present knowledge, for the teacher is to reject the extreme positions. It shouldn't be considered that errors are wrong and must be avoided at all costs by very carefully. On the other hand, these incorrect forms are necessary, even vital, and should be actively planned into the teaching process. From the viewpoint it seems more useful and realistic to expose EFL students to a larger range of structure types in the first few weeks of an EFL course (Burt, 1975). They can also be used as a teaching material to present some tenses to attract the attention of the learners on. What is more, errors are natural outcome of learning.

## 5. REFERENCES

- Broughton, G et al. (1994). *Teaching English as a Foreign Language*. London: Routledge.
- Burt, K. M. (1975). *Error Analysis in Adult Classroom*. TESOL Quarterly: Vol.9, No.1 p.62
- Chomsky, N. (1959). *Review of Skinner's Verbal Behavior*. Language, 35: 26-58.
- Gokhale, Madhuri. (2010). Research Paper: "A Pragmatic Approach to the Teaching of Grammar in Indian Context". *EltWeekly*, Vol. 2 Issue 75 November <http://eltweekly.com> ISSN 0975-3036.
- Graver, B.D. (1986). *Advanced English Practice*. Oxford: Oxford University Press.
- Harmer, Jeremy. (2007). *The Practice of English Language Teaching*. 4th ed. Harlow: Longman/Pearson Education.
- Radford, A. (2003). *Syntax*. Cambridge: Cambridge University Press.

Richards, C.J. (1979). *Introducing Grammar the Perfect: An Exercise in Pedagogic.*

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# Interactive Read Aloud Strategy in The Optimization of the Children's Fairy Talecomprehension Skills

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## Abstract

Research objectives, are: 1). Knowing the comprehension skills of fairy tale after the implementation of the strategy of interactive read aloud, 2) analyzes the changes in the behavior of students after learning of a fairy tale with a strategy of interactive read aloud, 3). Knowing the learning implementation strategy with interactive read aloud in the optimization of the students' fairy tale comprehension skills. Sampling techniques in the research used random sampling by lot. The number of students who made the sample are 25 students. To obtain data and information relating to a matter which examined various ways is through observation, documentation, field notes and question form. Data analysis techniques used are analysis of Mix Methods qualitative and quantitative techniques. The results of the research are: children know fairy tale skills after the implementation of interactive read aloud strategy, by understanding reading, making predictions, making connections, summarizing, drawing conclusions with successful criteria; 2). Changes in student behavior after learning fairy tale with interactive read aloud strategy with excellent results, 3) .The implementation of learning with interactive read aloud strategy in the optimization of students' fairy tale skills can run very well and maximally. The conclusion of the research is the skill of fairy tale can be formed very well after the implementation of interactive read aloud strategy, the student behavior change can be formed well after the learning of fairy tale with interactive read aloud strategy, and the implementation of learning with interactive read aloud strategy can be done optimally with the teacher improve students' fairy tale skills. A suggestion in the study is that teachers should always introduce a fairy tale to the students to embedded good behavior.

Keywords: Skills, understanding, fairy tale, *interactive read aloud* strategy

## 1. PREFACE

### Background

The main communication tool for humans is the language. With language they can convey ideas, thoughts, and messages to others so that communication occurs. In order for communication to run properly, it is necessary to master the language skills. According to Tarigan (1994: 2) language skills (language arts, language skills), includes four aspects: listening skill, speaking skill, reading skill, and writing skill. When someone wants to obtain something either through writing or spoken must have the skills in the delivery so that can be understood by the recipient of the message.

Just like the delivery of messages that exist in children's fairy tales. Stories in the children's fairy tale have many philosophies and meanings that are modeled by messengers. The tale is an old literary form that tells an extraordinary event of fiction or delusion that is considered an impossible thing. Fairy tale is a form of traditional story or story that is delivered generously from ancestors who have a function to teach moral values and also as entertainment.

Tale is one of the materials that play a role in the formation of character for children. Emphasized by

(Unsriana, 2003) "through fairy tales, the child will easily understand the qualities, the figures, and the good and the bad". In line with the opinion of Sylvia Primulawati Soetantyo in her journal about "The Role of the Tale in the Formation of the Character of Elementary School Students" stated that the tale is an effective means to provide values education for children, because of the way of delivery that does not force the children to accept it. The characters in the story can set an example for children. The nature or character of the child is to have a tendency to imitate and identify with the person he or she admired.

Fairy tales are taught to early class students as listed in the Content Standards for Basic and Secondary Education Units contained in BSNP 2006. But not all children can understand the content or message when they read, or listen to fairy tales. Many children still struggle to understand and understand what is being said in the reading of fairy tales. Fairy tales are usually more often done by elementary teachers when doing learning activities. Primary school children will be increasingly interested to learn when their teachers tell stories or present a fairy tale containing the subject matter. From fairy tales given to children must be accompanied or applied appropriate methods in the delivery of fairy tales.



Research by Onofrey and Theurer (2007). shows that teachers are unsure about how to develop reading comprehension strategies for students. Students have difficulties in understanding reading, as they are not given enough training in implementing reading comprehension strategies. Dewitz, et al. (2009) also revealed that reading comprehension strategies are not taught clearly and explicitly to students. Many practice reading skills are given by students, but not reading comprehension skills.

The story that occurred at SDN Tawangmas 01 Semarang based on preliminary observation and interview from classroom teacher is found data that low grade children have difficulty when given the reading book containing the fairy tales. The children do not understand the content of the stories in the fairy tales book reading. When the teacher gives children fairy tales reading books, students are not interested to read the book, students cannot imagine about the messages that exist in the story, students do not understand to tell the characters contained on the reading material of fairy tales, students do not understand the role of the characters in the book reading fairy tales, students do not usually tell the setting or place of events of the characters are doing the activity. On the other hand events that occur are teachers also have difficulty in teaching reading fairy tale, so that students difficulty in understanding the reading of fairy tales. Teacher only provides exercises that require students to repeat complete information from the reading, but the teacher does not teach strategies for reading comprehension. Teacher provides less exploration activities in transferring stories of fairy tales. In the activity of reading the reading of the fairy tale seen the teacher rarely provide stimulation to students to be able to respond to the contents of the reading of fairy tales. This failure is also caused by a lack of training given to the students to proceed in the strategy of reading comprehension.

To overcome the problems that have been described above, it is needed a strategy of reading comprehension of fairy tales that can be easily understood by the children. The reading comprehension becomes a very important skill for students to have. Marman (1977) finds that students have no sensitivity to the importance of reading comprehension. This causes the student's failure to understand the reading itself, because information is only considered as a matter to be recorded, not understood.

To solve the problems that occur in the field requires support in developing teacher and student resources. For that researchers looking for the best solution using *interactive read aloud* teaching strategy. The goal of using *interactive read aloud*

teaching strategies is to develop students' reading comprehension skills. In addition, to provide support in developing the resources of teachers and students. The purpose of research are 1). Describe the skill of fairy tale after the implementation of *interactive read aloud* strategy, 2). Knowing the change of student behavior after following the learning of fairy tale with *interactive read aloud* strategy, 3). Describe the implementation of learning with *interactive read aloud* strategies to optimize students' fairy tale skills.

## 2. RESEARCH METHODS

### Population and Sample Research

Population in the research that is all the individual who made the subject of research who have one same characteristic. The population in the research is the first grade students are grade 3 SDN 01 Tawangmas Semarang. Sampling using a saturated sampling technique. A saturated sampling technique is a sampling technique when all members of the population are used as a sample (Sugiyono, 2015: 124). Therefore, many samples used in this study were as many as 25 students.

### Data collection technique

The data needed in the research is obtained by using several techniques, namely:

- 1) Observation Technique  
Observation is the activity of observing something without affecting and simultaneously recording for use as an analysis material. In that sense there are two things to note, namely: 1) Observation of everything, and 2) recording the data and symptoms caused.
- 2). Documentation Technique  
Documentation is a record of important events that have passed. Documentation can be any posts, images, or monumental works of a person.
- 3). Field Notes Technique  
The field notes include notes about the researcher's activities during the course of the lesson. This note contains important events in the learning activities.
- 4). Questionnaire Technique  
Questionnaire is a data collection technique that is done by giving a set of questions or written statement to the respondent to answer.

### Data analysis technique

Data analysis technique used is Mix Method analysis that is qualitative and quantitative analysis. In accordance with the opinions of Bogdan and Tylor (in Moleong, 2005: 4) qualitative data are data expressed in terms of words, sentences, and images. While quantitative form of numbers. Qualitative

research is to produce a qualitative technique that is through the stage of data reduction, presents a research procedure that produces descriptive data in the form of words written or spoken of the people and observed behavior. In the data reduction stage is by analyzing the overall data that occurs in the learning activities of fairy tale understanding, and then selected for detail each section. This is done to make it easier to understand when presented. Presentation of data by: detailed data presented in the form of tables or graphs, while withdrawal that is by studying data, interpreting, comparing and then take the conclusion

Qualitative research has five characteristics, namely (1) natural setting as direct data source and researcher as key instrument, (2) descriptive, (3) prefers process rather than result, (4) inductive data analysis, and (5) meaning is the main concern. Qualitative research is a research procedure that produces descriptive data in the form of written or oral words from people and behavior that can be observed in reading learning activities of children's fairy tale.

### 3. DISCUSSION

#### 1. The skill of fairy tale after the implementation of *interactive read aloud* strategy.

##### a. Understand the reading

The results obtained are students look good in understanding the reading. Readings that have been read can be understood and told in front of his friends. Just as students are able to retell the contents of the story of bawang putih and bawang merah, whether it includes characters, atmosphere, and character traits. Students understand to tell the characters contained in the fairy tales reading material, students understand the role of the characters in the fairy tale book, students can tell the setting or place of events of the characters in conducting activities.

##### b. Make predictions

Students look good at making predictions, students are able to make arguments according to fairy tale content, provide and answer questions related to the content of the story. Make estimates in small groups; identify predictions that matched the content of fairy tales. Actively students can express their predictions, enthusiastic to find the answers to each of the problems.

##### c. Make connections

Students look good at making connections from reading content, able to make connections between reading characters, story content, and the nature of the story. Able to imagine the messages in the story.

##### d. Summarize

Students make a summary of the reading. Completed with titles of books, publishers, year, city, story characters, stories coherent, and able to give the impression and message in the reading of fairy tales.

##### e. Taking conclusions

Students are able to make the conclusion of fairy tales, can respond to the content of fairy tales, students are able to parse their own sentences with a brief and clear sentence. Concluding remarks of creative students in accordance with the arguments of the students themselves, there is the initiative of the students to make their own sentences.

The material of fairy tale books taught to children is about folklore that occurs in an area, knowledge about the beauty of family togetherness, and in the surrounding environment. The title of fairy tales are:

1. Putri Ular
2. Si Kelingking
3. Putri Duyung
4. Batu Menangis
5. Mawar Merah
6. Putri Junjung Buih
7. Si Pitung
8. Bawang Putih Bawang Merah
9. Indahnya Bersyukur
10. Legenda Danau Lipan

#### 2. Changes in student behavior after learning fairy tale with *interactive read aloud* strategy

- 1) The children can sharpen his thinking and imagination
- 2) Has the power of concentration
- 3) Increase the vocabulary



**Picture 1.** Read together familiarize children to get close with friends

- 4) Create intimate atmosphere between teacher and friend
- 5) Have the capability
- 6) Increased in children's learning ability
- 7) Growing social feelings and socializing children
- 8) Grow interest in children's reading



**Picture 2.** Read together to familiarize students reading interest

- 9) Have a sense of empathy and sympathy
  - 10) Embedded mental attitude in accordance with the teachings of Islam
  - 11) Understanding commendable and disgraceful acts
  - 12) Children can live as social beings in society
  - 13) Have aesthetic and ethical abilities with criteria
  - 14) There is a change in the attitude of children to understand themselves and the environment
  - 15) Formed a noble character in accordance with aqidah islamiah
  - 16) Respect and care for others
- 3. Implementation of learning with interactive read aloud strategy in optimizing students' fairy tale skills**
- 1) Undertake a reading comprehension strategy
  - 2) Make a selection of books
  - 3) Review the book
  - 4) Introduce the book to students
  - 5) Involving students in activities before, during, and after reading
  - 6) Train students' skills in predicting fairy tales
  - 7) Train students in making connections
  - 8) Train students in making a summary
  - 9) Create and train pauses to perform activities during
  - 10) Mention, repeat, and implement reading comprehension strategies before, during, and after reading to students

- 11) Being a reading model for students
- 12) Show students gestures, expressions, and props during reading to make reading more lively
- 13) Involve students to connect and discuss reading content with experience and knowledge
- 14) Connect reading comprehension activities with other activities in the classroom through independent reading and writing
- 15) Familiarize students with respect and care for others

## 4. CONCLUSIONS

Based on the conclusion of the research is the skills of fairy tale understanding can be formed very well after the implementation of *interactive read aloud* strategy, the behavior change of students can be formed well after learning fairy tale with *interactive read aloud* strategy, and the implementation of learning with *interactive read aloud* strategy can be done optimally with teachers improving students' fairy tale skills.

## 5. REFERENCES

- Arsyad, Azhar. 2011. *Media Pembelajaran*. PT Raja Graindo Persada: Jakarta.
- Ceprano, M. A. (2010). *Examining the benefits of interactive read-alouds on young children's vocabulary development: Pre-Service teachers as researchers*. *Journal of Inquiry & Action in Education*, 3(2), 1-14.
- Crain, W. (2007). *Teori Perkembangan konsep dan aplikasi* edisi ketiga. Yogyakarta: Pustaka Belajar.
- Danandjaja, J. (1994). *Folklor Indonesia, ilmu gosip, dongeng, dan lain-lain* (cet. Keempat). Jakarta: PT. Pustaka Utama Grafiti.
- Daroah. (2013). *Meningkatkan kemampuan bahasa melalui metode bercerita dengan media audio visual di kelompok B1 RA Perwanida 02 Slawi*. Skripsi, Program Sarjana Universitas Negeri Semarang, Semarang
- Dewitz, P., Jones, J., & Leahy, S. (2009). *Comprehension strategy instruction in core reading programs*. *Reading Research Quarterly*, 44(2), 102-126.
- Danim, Sudarwan. 2010. *Media Komunikasi Pendidikan*. PT Bumi Angkasa: Jakarta..

- Hana, J. (2011). *Terapi kecerdasan anak dengan dongeng*. Yogyakarta: Berlian Media.
- Izzaty, Rita Eka dkk. 2013. *Perkembangan Peserta Didik*. UY Press: Yogyakarta.
- Isbell, R., Joseph, S., Liane, L., dan April, L. (2004). *The effects of storytelling and story reading on the oral language complexity and story comprehension of young children*. *Early Childhood Education journal*, vol. 32, no. 3.
- Jahja, Y. (2011). *Psikologi Perkembangan*. Jakarta: Prenada Media Grup.
- Lamuningtyas, Y.A. (2012). *Pemberian dongeng untuk meningkatkan kemampuan bahasa pada anak usia prasekolah*. Skripsi, Program Sarjana Universitas Muhammadiyah Malang, Malang.
- Muhajir, As'aril. 2011. *Ilmu Pendidikan Perspektif Kontekstual*. Ar-ruzz Media: Yogyakarta.
- Mulyono, Sri. 1982. *Wayang Asal-usul, Filsafat dan Masa depannya*. PT Gunung Agung: Jakarta.
- Siswoyo, Dwi dkk. 2013. *Ilmu Pendidikan*. UNY Press: Yogyakarta.
- Sugihartono dkk. 2013. *Psikology Pendidikan*. UNY Press: Yogyakarta.

# Development of *Graphical User Interface*-based Interactive Whiteboard Media

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## Abstract

The purpose of the research is to develop the *graphical user interface*-based interactive whiteboard media in the learning of the instruction of the manual book content in Indonesian subject for grade four students. The type of the research applied is *Research and Development* (R&D). Procedure used in this research is *waterfall* comprising *analysis, design, implementation, testing, and maintenance*. Population of the research is grade four students of SD Ngemplak Simongan 01 using saturation sampling, which means it is all grade four students in SD Ngemplak Simongan 01. The data collection methods used in this research is observation, test, questionnaire fulfilling and documentation. Data analysis methods used in this research are product data analysis, initial data analysis, t test, gain test, and descriptive data analysis. The research shows that interactive whiteboard media is appropriate to be used at media presentation component assessment about 100, material content component about 100 and linguistic component about 100. Interactive whiteboard media has impact on the learning outcome with average margin through t test around 7.68 and average gain around 0.34435 at moderate level. The students' activities scored 354 with average point around 70.8 at active category on the day 1 and scored 480 with point around 96 which is included in active category on day 2. The conclusion of the research is that *graphical user interface*-based interactive whiteboard media can be used effectively in the learning of Indonesian language in lesson of tools usage instruction and it improves the students' activeness.

Keywords: GUI; Media; Interactive Whiteboard

## 1. INTRODUCTION

Revision of Permendikbud number 24 on core competencies and basic competencies in Kurikulum 2013 which states that the purpose of the curriculum comprises 4 competencies: (1) spiritual competency, (2) social competency, (3) knowledge, and (4) skill. Those Competencies will be acquired through intracurricular, cocurricular and/or extracurricular activities. Indonesian language in the learning of Kurikulum 2013 plays dominant role, i.e. as tool to convey the lesson materials from all competency sources to the students.

In case of building the insights, theme development, and connecting one theme to another one in the other subject, Indonesian language can function as language of instruction in knowledge transfer (Mulyasa, 2016:7).

Indonesian language learning is contextual, so through Indonesian language learning, the students are habituated to present various competencies logically and systematically to improve the understanding of the communicated lesson materials. In the theme of "Selalu Berhemat Energi" (Always Saves Energy), subtheme "Manfaat Energi" (Benefits

of Energy) in Indonesian language content of grade four, the basic competency is "comparing manual book of two similar and different tools" in form of manual book of a tool making, reading the book, and communicating it to the other classmates before class (Permendikbud, 2016:55). According survey targeted on the primary school teachers on the discourse of *KurikZzzulum* 2013 revision on February 1-5 2013 in Jakarta, Bogor, Bekasi and Banten, about 75% of the teachers do not agree with the integration of Natural Science, Social Science, and Indonesian language subjects. This fact shows that the teachers are not ready nor certain about integrative thematic, though about 75% of teachers understand about integrative thematic as it has been applied to the initial grade (Hidayat, 2013:5-6).

The Indonesian language class content issue still exists in Primary Schools. Based on the data of the pre-investigation done Sekolah Dasar Ngemplak Simongan 01 through document and interview data from the Grade four teachers as the source, I got information that the students' knowledge about the lesson materials conveyed directly by the teachers through illustration is still not at most as they use ordinary whiteboard beside the text book. Whiteboard is one of the tools the existence of which is necessary

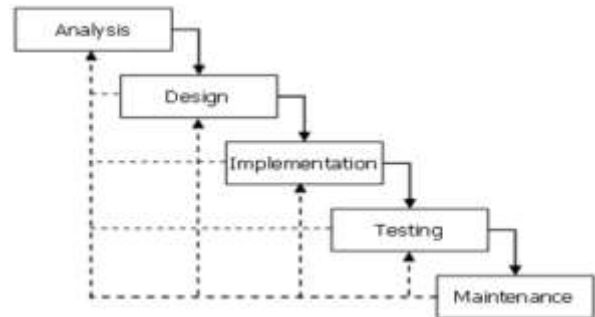
in the classroom during the learning process (Yuliarty, 2012:). The whiteboard is used by the teacher in the learning so that the students will look enthusiast and active in the initial learning. During 10.00-12.15 o'clock, however, the students' activeness starts lowering which is shown by the observation through field notes of the learning process in SD Ngemplak Simongan 01 made about 3 times on different days, after the first break time at 09.00 WIB there were only about 12 students raising their hands when the teacher asked questions, while 23 students did not. The beauty, the attractiveness, and the interactivity of a teaching tool is an instrument to avoid the students from boredom when attending the class and it is expected that the students will be motivated and eased to absorb the lesson materials (Fanny, 2013:1). Meanwhile, the Indonesian language learning outcome of the grade four students in SD Ngemplak Simongan 01 at the tool manual book lesson shows that with minimum mastery criteria at 70 as cognitive point 37.7% of 45 students got score under 70, while in the skill area, 20% of 45 got score under 65.

Based on the aforementioned explanation, I restrict my investigation on the usage of teaching tool to improve the grade four students' understanding about manual book which needs innovation and media development. Arda (2015:5) states that media can be defined as something that can be used to convey message, stimulate the students' initiatives and feelings to generate the students' motivation to study. The selection of teaching tool must be consistent with the learning materials and the students' ability. Therefore it is expected that the teaching tool will help the students catch the concept of the conveyed material; can create fun learning (Rahmah, 2014:2). The problem statement of this research in general is how effective, applicable and stimulating to the students' activeness the *graphical user interface*-based interactive whiteboard media is when being used in the learning of tool manual book of Indonesian language content carried out by grade four students. The objective of this study is to investigate the effectiveness, to assess the applicability, and to describe the students' activeness using graphical *user interface*-based interactive whiteboard media in the learning of tool manual book of Indonesian language content carried out by grade four students in SD Ngemplak Simongan 01 Semarang.

## 2. RESEARCH METHODS

This research is included in *Research and Development* (R&D). Sugiyono (2015:407) explains that the research and development is the research methods applied to produce specific products, and to assess the effectiveness of the product. The

development model used in this research is waterfall. Waterfall is the model developed to upgrade the software, to create software which improves systematically from one phase to the next one configured like waterfall (Bassil, 2012:2).



Picture 1. Waterfall Model

The procedure passed in the research comprises the necessity analysis, designing, creating, assessment, and maintenance. The research population in this research is all students at grade four in SD Ngemplak Simongan 01 by using saturation sampling in which all grade four students in SD Ngemplak Simongan 01 become the samples. The data collection methods applied in this research is product data analysis, initial data analysis, t test, gain test, and analysis of descriptive data.

## 3. RESULTS AND DISCUSSION

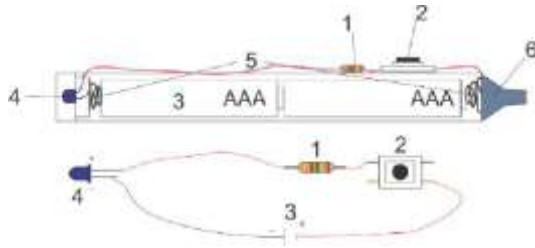
The research and development of graphical *user interface*-based interactive whiteboard media assessed several things comprising: (1) designation of the development of the interactive whiteboard media; (2) the end result of the development of interactive whiteboard media; (3) the result of the applicability, presentation, and linguistic analysis of the interactive whiteboard media by the experts; (4) the end result of the final data analysis comprising the effectiveness of interactive whiteboard media and the students' activeness when using interactive whiteboard media.

### 3.1. Development of Graphical User Interface-based Interactive Whiteboard Media

The interactive whiteboard consists of several components of the hardware consisting of infrared pen, Wii controller, and Bluetooth.

#### The design of Infrared Pen

Infrared Pen consists of unused board marker case, LED infrared, cable, iron spring, hand pressing switch, resistor, AAA 1,5 volt battery and hot glue. The tool used comprises solder, solder tin and hot glue tool. Figure 1 is Infrared Pen creation scheme when being set up into a system.



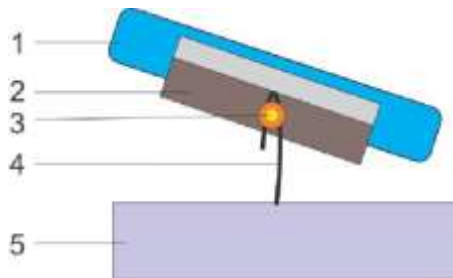
**Picture 2.** *Infrared Pen Scheme*

Remarks:

1. Resistor 15 Ohm 3 Volt
2. Hand Pressing Switch
3. AAA 1.5 Volt Battery
4. LED *Infrared* Vishay Type TSAL 6400
5. Spring wire for battery
6. Used board marker

### Design of Wii Controller stand

Wii controller stand consists of iron hangers, 4 inches-hard pipe tube, nut, bolt with the ring, and hollow iron bar (mild steel). The equipment that will be used consists of grinder, electric drill, and pliers to ease the making of iron hangers dent. Figure 2 is figure of the design of Wii controller stand.



**Picture 3.** *Example of Wii Controller Stand*

Remarks:

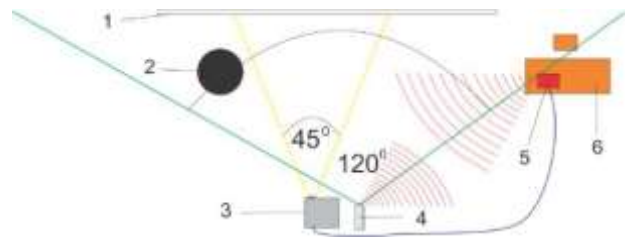
1. *Wii* Controller
2. Hollow iron (mild steel).
3. Nut, bolt and ring
4. Wire of hanger
5. 4 inches-hard pipe tube

### Integration of *Infrared pen*, *Wii* Controller, *Bluetooth* and *Laptop*

Interactive whiteboard can be used when all components are integrated. The integration process can be carried out using *Bluetooth* and software developed by third party, constituting *Pentabulous* which works as interpreter of the movement of the infrared pen using infrared sensor reader installed in *Wii* controller which then can work like mouse. *Wii* controller has main feature comprising infrared receiver in form of pix art camera that functions to

catch movement of the ray radiation generated by infrared LED. Another feature is *Bluetooth* connector integrated *Wii* controller that will be used to connect *Wii* controller to computer (Darmawan, 2010:8).

The material teaching was performed using the software for presentation from *Prezi*, so in order that the interactive whiteboard can be used properly, the position of *Wii* controller sensor must cover the area as much as 450 when adjusted to the factory condition. But the sensor reader was fixed in order to cover the wider area than the previous one, i.e. by inserting wide angle lenses in front of the sensor. And the coverage area developed into 3600. Therefore the *Wii* controller installation will not be constrained by the installation spot. Figure 3 illustrates interactive whiteboard integration scheme.



**Picture 4.** *Interactive Whiteboard Integration Scheme*

Remarks:

1. Conventional Whiteboard / projector screen
2. User
3. Projector
4. *Wii* controller
5. Laptop/ PC
6. User's desk and seat

### 3.2. The End Result of Applicability, Presentation and Linguistic Analysis of the *Graphical User Interface*-based Interactive Whiteboard Media by the Expert

*Graphical user interface*-based interactive whiteboard media has completed the process of applicability by media specialist, lesson material consultant, and the linguist through two phases. The validation result of graphical *user interface*-based interactive whiteboard media assessment is shown in Table 1.

**Table 1.** The Validation Result of Interactive Whiteboard Media Assessment

Assessed component	Score
Content applicability	4
Presentation	3
Total	7
Score	100
Criteria	Highly Applicable



Table 1 shows the result of the first phase of graphical *user interface*-based interactive whiteboard media applicability assessment consisting of two assessment components which gets positive response from the media specialist that scored 100 which means highly applicable.

Graphical *user interface*-based interactive whiteboard media passed the assessment phase 1, then continued to second phase of assessment comprising content, material, and linguistic components by the experts. The result of graphical *user interface*-based interactive whiteboard media assessment carried out by the media, material, and linguistic validator is shown in Table 2.

Based on table 2, we can see that the result of assessment made by the media consultant on graphical *user interface*-based interactive whiteboard media meets the criteria of Highly Applicable scored 100. Material expert gave score 100 which means Highly Applicable. The linguist gives point 100 for linguistic aspect which also means Highly Applicable. Therefore, graphical *user interface*-based interactive whiteboard media meets the Highly Applicable criteria.

Based on the explanation above, it can be concluded that graphical *user interface*-based interactive whiteboard media is applicable as teaching tool which is in line with the research carried out by Massimo Bosetti in 2011 titled Interactive whiteboards based on the Wii Mote: validation on the field. In the research Bosetti draws a conclusion that low cost in building the Interactive whiteboards tool makes 80% of 10 primary and secondary teachers feel assisted by the existence of Interactive whiteboards during the teaching.

**Table 2** Recapitulation of Media Applicability, Material, and Linguistic Assessment of Graphical *User Interface*-Based Interactive Whiteboard Media

Assessor	Component	Total	Score	Grade
Validator	Media	16	100	Highly
	Presentation			Applicable
	Material content	16	100	Highly
	Linguistic	12	100	Highly Applicable

### Effectiveness of Graphical *User Interface*-Based Interactive Whiteboard Media

The effectiveness rate of graphical *user interface*-based interactive whiteboard media is acquired from cognitive learning outcome through formative test comprising pretest and posttest. Average improvement assessment was made to find the improvement between the pretest and posttest points after doing calculation preciously using t-test. The

improvement of pretest and posttest scores is acquired through calculation using n-gain formula. The end result of the average improvement assessment based on pretest and posttest data is shown in Table 3.

Based on table 3 it is found out that the average improvement (gain) of pretest and posttest data is about 0.34435 with average margin about 6.38.

**Table 3.** Average Improvement Test (*Gain*)

Category	Score
<i>Gain</i> score	0.34435
Average <i>Pretest</i> Point	73.89
Average <i>Posttest</i> Point	80.27
Average Margin	6.38
Criteria	High

Based on the Figure 4 we can see that there is improvement of learning outcome shown by the score margin of formative tests comprising pretest dan posttest about 6.38. That average improvement shows that graphical *user interface*-based interactive whiteboard media is effectively applicable in the learning of Indonesian language in the part of tool manual book done by grade four students in SD Ngemplak Simongan 01 Semarang. Yusdianto (2012: 8) states that interactive whiteboard can save the lesson materials written on the whiteboard so the students will not feel anxious about losing their book notes or not remembering about lesson materials previously presented before the class.

### Students' Activities Using Media Graphical *User Interface*-Based Interactive Whiteboard Media

The students' activities can be found through observation sheet of the students' activities during the learning of Indonesian language in the lesson of tool manual book. The descriptive test shows that the students 'activities during the Session 1 scored 354 at point of 70.8 and it meets the active criterion and during the Session 2 scored 480 with average point about 96 and it meets the criteria of Highly Active. This is consistent with the research done by Sandra de Koster in 2014 titled "Interactivity with the interactive whiteboard in traditional and innovative primary schools: An exploratory study." The research shows the difference of interactions during the learning in two different schools. In one of schools that became research object then it was found that interactive whiteboard greatly supported the activities and interaction between the teacher and the students in which the learning material does not always meet the teacher's ideas. The most attractive finding is that the school becomes more innovatively conducts the learning as it provides multimedia which are helpful to the teachers who use it.



## 4. CONCLUSION

Based on the development of graphical *user interface*-based interactive whiteboard media for the learning Indonesian language in the lesson of tool manual book done by grade four students in SD Ngemplak Simongan 01 Semarang, the conclusion can be drawn that interactive whiteboard media is clarified as applicable by lesson material specialist, media expert, and linguist with the score of 100 for content applicability, presentation, and linguistic components.

Graphical *user interface*-based interactive whiteboard media for the learning Indonesian language in the lesson of tool manual book on the students' learning outcome using calculation of t-count about 7.68 is more than and t-table about 1.68 with average raise test about 0.34435, meets the criteria as High. The application of graphical *user interface*-based interactive whiteboard media for the learning Indonesian language in the lesson of tool manual book can raise the students' activeness in Session 1 with average point about 70.8 which meets the criteria of Active and the students' activeness in Session 2 with average point about 96 which meets the criteria of Highly Active.

## 5. References

- Arda. 2015. "Pengembangan Media Pembelajaran Interaktif Berbasis Komputer untuk Siswa SMP Kelas VIII". e-Jurnal Mitra Sains, 3(1): 69-77.
- Bassil, Youssef. 2012. "A Simulation Model for the Waterfall Software Development Life Cycle". International Journal of Engineering & Technology, 2(5): 2-7.
- Bosetti, Massimo. 2011. "Interactive whiteboards based on the WiiMote: validation on the field". International Conference on Interactive Collaborative Learning, 14(11): 269-273.
- Darmawan, Fariz. 2010. "Perancangan Interactive Whiteboard Menggunakan Aplikasi Wii Remote Dengan Pendekatan High Touch Design Process". Jurnal Institut Teknologi Sepuluh Nopember, 1(1): 1-10.
- Hidayat, Rais, dkk. 2013. "Survey Terhadap Guru-guru Sekolah Dasar Wacana Perubahan Kurikulum 2013". Rais of Journal, 8(2): 1-10.
- Koster, Sandra de. 2013. "Interactivity with the interactive whiteboard in traditional and innovative primary schools: An exploratory study". Australasian Journal of Educational Technology, 29(4): 480-495.
- Mulyasa, E.. 2016. Guru dalam Implementasi 2013. Bandung: Remaja Rosdakarya.
- Rahmah, Fia Jannatur. 2014. "Pengembangan Media Pembelajaran Multimedia Interaktif Pada Kompetensi Dasar Jurnal Penyesuaian Perusahaan Dagang Kelas X AK". Jurnal Mahasiswa Teknologi Pendidikan Unesa, 1(1): 1-9.
- Sugiyono. 2015. Metode Penelitian Pendidikan. Bandung: Alfabeta.
- Yuliarty, Popy. 2012. "Pengembangan Desain Produk Papan Tulis dengan Metode Quality Function Deployment (QFD)". Jurnal Ilmiah PASTI, VI(1): 1-13.
- Yusdianto, Andre. 2012. "Rancang Bangun Aplikasi Interactive Whiteboard Untuk Mendukung Pembelajaran Menggunakan Game Controlling". Journal of STMIK Surabaya, 1(1): 1-9.

# Development of Snakes and Ladders as Teaching Tool in *Contextual Teaching and Learning* to Improve the Learning Outcome in Subject of Natural Science

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## Abstract

This research aimed to develop snakes and ladders learning media based on Contextual Teaching and Learning (CTL). This research used Research and Development (R&D) method based on Brog and Gall's theory. The result of the research in 5<sup>th</sup> grade of SDN Bringin 02 showed that snakes and ladders learning media based on CTL have certain characteristic that different from common snakes and ladders. This media is feasible to be used based on expert judgment because it has media feasibility value of 91,66% and material aspect equal to 84,37% with criteria is very feasible. The effectiveness of snakes and ladders learning media based on CTL is evaluated from the improvement of student learning result by using pretest and posstest value analysis. Learning outcomes in the cognitive domain were analyzed using the t-test showing  $t_{count} > t_{table}$  ( $12,041 > 2,032$ ). In addition, the N-gain test that showed an increase with medium category of 0.46.

Keywords: Contextual Teaching and Learning, Learning Outcomes, Snakes and ladders learning media

## 1. INTRODUCTION

Curriculum of primary and secondary education is obliged to contain the lessons of the subject of Natural Science. In School-Based Curriculum (BSNP, 2006) it is written that the learning of Natural Science is aimed at providing the students with the following competencies: (1) having faithfulness in God's greatness based on the existence, the beauty, and the regularity of the nature He creates, (2) developing the knowledge and acknowledgment of the useful and applicable concepts in Natural Science, (3) developing the curiosity, positive behavior, and the awareness of the interinfluencing relationship among Natural Science, environment, and the society, (4) developing the processing skill to study the neighborhood, to solve the problems, and to make decisions, (5) raising the awareness of participation to keep, maintain, and conserve the nature, (6) raising the awareness of valuing the environment and its orderliness as one of the God's creatures, getting provided with knowledge, concept and the skills of Natural Science as the foundation to continue their education to secondary school/Islamic secondary school.

Furthermore, it is mentioned that the learning of Natural Science should be conducted in *scientific inquiry* way to grow the thinking, working, and being scientific, as well as communication skill as key aspect of life skills. As stated by Cain and Evans (1990:) who classify the basic nature of Natural Science into 4, i.e. product, process, act, and technology. Therefore the learning of Natural Science in Primary School puts emphasis on delivering the direct learning experience by using and developing the processing skill and scientific

behavior. The teaching of subject of Natural Science is expected to be a tool for the students to learn about themselves and the surrounding environment, so that the students will make the good decision and take the right action when applying it in their daily life in order to make good impact on the environment in the future.

As stated by Piaget in the work of Suparwoto, et.al. (2007:84-86) that the students' cognitive development is classified into four phases, i.e. tahap sensorimotor, preoperational, concrete operational, and formal operational. Specifically, the primary students are in preoperational phase to the beginning of formal operational phase which shows that the primary students tend to think of the concrete things. Therefore when teaching Natural Science a teacher needs a teaching tool that attracts the students' attention and motivates them to learn as well as reminds them of the learnt knowledge and skills. Hamalik in the work of Arsyad (2013:2) states that teaching tool is the teacher's communication tool to make the teaching and learning process effective and one of the tool's function is to reach the learning goal. While Rudy Bretz in Sukiman (2012:44) classifies teaching tools based on its key elements, i.e., sounds, visual and movement. Thus, the usage of teaching tool in the learning should really notice its functions and purpose, i.e., to support the learning process.

The survey conducted by *Programme for International Student Assessment (PISA)* in 2015 shows that of 70 countries participating in the assessment, Indonesia is at rank 62 for science. Singapore is at rank 1 with average score 556. The score attained by Indonesian kids have *significant* margin against Singapore at average score attained, i.e., 403 (PISA, 2015:5). Eventhough Indonesian

position is at low rank, Indonesia places the better position when in 2012 showing that Indonesia placed the second lowest position of 65 countries participating in PISA. Indonesia was just a little better than Peru which placed the lowest position with score of science skill about 382. That score is at significant margin with Singapore which placed the top rank at score 580 (PISA, 2012:232).

As time goes by, the teachers start advancing their teaching quality. One of the efforts taken by the teacher of grade VI in SD Negeri Bringin 02 is by involving the students in learning by making learning group. Yet, the conducted learning still looks unpleasant. This condition is supported by the learning outcome in subject of Natural Science attained by the grade V students of SDN Bringin 02 which has low average. Viewed from the scores of Final-term Exam, of 35 students, only 18 (51.43%) meets the learning mastery criteria, while the other 17 (48.57%) doesn't, in other words their score is below LMC, it is 63. Such situation should be fixed in right way. The teacher has necessary role in solving the existing problem. The teacher is also expected to be able to design a fun learning of Natural Science, i.e., by creating a teaching tool which is able to set up the dynamic, spirited, and enthusiastic learning process. But in fact, teacher still can't meet the requirement due to several factors, such as limited time allocation and insufficient competency.

Such real situation drives me to develop a Natural Science teaching tool that will improve the students' learning outcome through *Contextual Teaching And Learning* (CTL)-based snakes and ladders in lesson of Earth and Universe. CTL is a learning concept helping the teachers relates the taught lesson to the real world. The key components of CTL are constructivism, asking questions, inquiry, learning community, modeling and authentic assessment (Trianto, 2007: 103-104). The visual snakes and ladders game is highly applicable to CTL as the usage of the picture as the model is designed as illustrated in real world. The usage of snakes and ladders will encourage the students to collaborate in a group, encourage the students to answer the questions of knowledge, as well as encourage the students' fairness when playing the game. This is relevant with the goal of the creation of the snakes and ladders game stated by Jamil (2016:154).

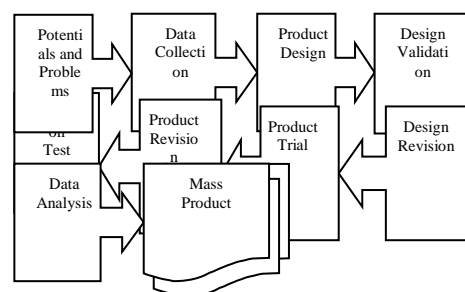
The relevant was conducted by Afandi titled "*Pengembangan Media Pembelajaran Ular Tangga Untuk Meningkatkan Motivasi Belajar Students And Hasil Belajar IPS Di Sekolah Dasar*" (The Development of Snakes and Ladders as Teaching Tool to Raise the Students' Learning Motivation and to Improve the Students' Learning Outcome in Subject of Mathematics in Primary School). The study shows that the usage of snakes and ladders game as teaching tool raises the students' learning

motivation to 66.7% from learning activeness and learning spirit aspects, while from the aspects of students' learning motivation interrelation it raises to 70%. Meanwhile, the students' learning outcome improves to 40% from 55% students attaining below LMC scores into 100% students meeting the LCM. Another relevant study was conducted by MZ titled "*Pengembangan Permainan Ular Tangga Untuk Kuis Mata Pelajaran Sains Sekolah Dasar*" (The development of Snakes and Ladders Game for Conducting Quiz in Subject of Science in Primary School). From the study a conclusion can be drawn that the snakes and ladders game product will involve the students in active learning, at least their sights and auditory are active, and re-explore the students' cognitive side and spirit of competition, i.e., through texts, pictures, and sound in order to attract their attention and then continue the game.

Based on the problem exposed above, then the objectives of the research are: 1) to assess the applicability of the snakes and ladders as teaching tool on the subject of Natural Science learning outcome particularly the lesson of Earth and Universe at grade V of primary school.

## 2. RESEARCH METHOD

This research I designed as *research and development* (R&D). Sugiyono (2015:407) states that "*metode penelitian and pengembangan adalah metode penelitian yang digunakan untuk menghasilkan produk tertentu and untuk menguji keefektifan produk tersebut supaya dapat berfungsi di masyarakat luas*" (research and development method is a research employed to produce a particular product and to assess the effectiveness of the product in order to be usable in common society). This research aims to develop and assess the effectiveness of a product, i.e., snakes and ladders game on the lesson of Earth and Universe. While the conducted research procedure is shown in the figure below.



**Picture 1.** Procedure Research and Development of CTL-based snakes and ladders game as Teaching Tool

The emerging potentials and problems were found in observation and interviews on the learning of Natural Science in grade V in SD Gugus Wijaya

Kusuma Semarang City, it is found that the students love playing and want learning by playing a game. The learning of Natural Science at grade V in SD Gugus Wijaya Kusuma Semarang City has been good enough by applying the contextual approach and demonstration method. In fact, however, the ongoing learning process seems to need a change in case of teaching tool usage, mainly the tool constituting a game. The data collection phases concerning the teaching tool creation in form of CTL-based snakes and ladders game are: (1) the initial data in form of observation and interview with the teacher of grade V students in SD Gugus Wijaya Kusuma Semarang City, (2) analyzing the lesson materials used to develop the CTL-based snakes and ladders game as teaching tool, i.e., Earth and Universe, (3) collecting the lesson material and the pictures related to the lesson of Earth and Universe, as well as (4) collecting the materials to create the research instruments, such as experts' assessment sheets as well as the questionnaire of the teacher and students' response.

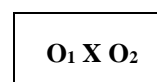
Product design creation of CTL-based snakes and ladders game as teaching tool is creating the tool design in form of a game adapted from the snakes and ladders game. CTL-based snakes and ladders game as teaching tool is designed using *corel draw*. When the product design finished created, the next phase is design assessment. CTL-based snakes and ladders game as teaching tool Product is assessed by the expert. The assessors are media practitioner and materials specialist. The purpose of CTL-based snakes and ladders game as teaching tool assessment is to find that this product can be tested and must be revised.

Revision is undertaken when there is a weakness based on the advice of the assessing media practitioner and materials specialist. The revision process is conducted repetitively until the product is certified as applicable by the experts. The CTL-based snakes and ladders game as teaching tool confirmed as applicable by the experts can be applied for small-scale trial. The revised CTL-based snakes and ladders game as teaching tool based on the suggestions of the experts is then experimented in small-scale experiment which involves 15 students from grade VB in SDN Wates 01. During the small-scale experiment, the students are asked to fulfill the questionnaire of readability on the CTL-based snakes and ladders game as teaching tool.

The fulfilled questionnaire then is then taken as consideration to make revision when there are some weaknesses found according to the small-scale experiment. The revised CTL-based snakes and ladders game subsequently is experimented in big-scale. The teaching tool test is conducted in the classroom of grade V SDN Bringin 02 on 35 students. The classroom selection of the population of grade V for the experiment was carried out in *cluster random sampling* method. In the teaching

tool testing, the learning was carried out in CTL approach as well as asking the teacher and the students to fulfill the survey responses so the data of the teacher's and students' responses to the usage of the CTL-based snakes and ladders game will be received.

The teaching tool testing will be conducted experimentally, i.e. pre-experimental model particularly *one group pretest-posttest design* according to Sugiyono (2015:110-111) in the following pattern:



**Picture 2.** Pattern of *One Group Pretest-Posttest Design* Model

Remarks:

$O_1$  = *pretest* score

$O_2$  = *posttest* score

This research was carried out in grade V SD in Gugus Wijaya Kusuma Semarang City with the taken research subjects in small-scale experiment amounted 15 students of grade VB SDN Wates 01 and the teaching tool experiment was conducted in the classroom of grade V SDN Bringin 02. The independent variable in this research is the treatment on the CTL-based snakes and ladders game as teaching tool in the lesson of Earth and Universe in grade V SD. While the dependent variable is the learning outcome usage treatment of CTL-based snakes and ladders game as teaching tool.

The data collection methods used in this research is: 1) documentation, 2) interviews, 3) questionnaire fulfillment, 4) test, and 5) observation. Data analysis undertaken in the research comprises instrument, product, and final data analyses. Instrument analysis means test instruments. That analysis consists of analysis of item of questions validity, difficulty level, distinguishing contents, and reliability of the questions.

Product analysis was carried out by determining the applicability of the developed tool, i.e., by asking the experts to make assessment. On the other side, the final data analysis was conducted by analyzing *pretest* and *posttest* scores. *Pretest* and *posttest* scores are analyzed using t-test and N-gain.

### 3. RESULTS AND DISSCUSSION

The product development of CTL-based snakes and ladders game as teaching tool is also adjusted to the cognitive development of the primary school students. Piaget in work of Suparwoto, et.al. (2007:84-86) students cognitive development is classified into four phases, i.e., sensorimotor, preoperational, concrete operational, and formal operational phases. Specifically, the

students of primary schools are between preoperational to the beginning of formal operational one which shows that the thinking aspect of the students of primary school tends to be concrete. In line with Bruner theory which explains that the students learn through 3 phases i.e., enactive, iconic and symbolic phases, in which the students learning phases starts from recognizing the things around them directly using their senses. This is supported by Edgar Dale's cone (Arsyad, 2013:14) which shows that it is easier to convey message using the concrete thing or personal experience than through words or more abstract and confusing symbols. The usage of the real picture consistent with their surroundings will ease the students to understand the lesson materials because based on Edgar Dale's cone, the students will more easily remember what they see than what they hear.

The development of the product of CTL-based snakes and ladders game as teaching tool is conducted to help the students improve the students learning output in the lesson of Earth and Universe in semester 2 of grade V. The improvement of students learning outcome can be conducted by creating the fun learning and involving the students directly. One way to create the fun learning is by playing a game. According to A. Husna M. (2009:145) Snakes and Ladders game is a game using dices to determine how many steps to be taken by the pawns on a plaid board. Development of CTL-based snakes and ladders game as teaching tool is adapted from the snakes and ladders game which according to Jamil (2016:154) will stimulate the students to directly be engaged in and to cooperate with within a group, habituate the students to answer the questions, and to stimulate the students' fair play while playing the game. By directly participating, the students' memory of the lesson materials they have learnt will stay longer. This supported by Vygotsky who puts emphasis on the social aspect in the students' learning though interaction within the group and states that the students build knowledge as the end result of the thinking and the activities of the students on their own. Through snakes and ladders game as a teaching tool, the students will be in the *zone of proximal development* in which this learning task is suitable with their development level. The presentation of the design and the components of the teaching tool as one of the assistance for the students in order to be able to develop the concept they have learnt. One of its examples is by using the information card and questions card to generate the students' curiosity and linking the information they have received. This is consistent with the *Scaffolding* phase stated by Vygotsky (Trianto, 2007:27) where the teacher play a role as assistance giver in compliance with the students development phase in order to be able to take over their own responsibility, in this case it is learning, and to

build their own knowledge. When the students are capable of building their own knowledge, the teacher will fish the students' involvement in making their own choices through observation of the human's act that can conserve the environment around the school which is integrated in the learning where the true assessment is conducted by the teacher.

Development of CTL-based snakes and ladders game as teaching tool can get the students more attracted to learn. It is because the learning atmosphere is more fun so that it helps the students improve their learning outcome. The development of the design of CTL-based snakes and ladders game as teaching tool aims to improve the students' learning outcome. In addition to focusing on its purpose, the teaching tool development applies the general principles of teaching tool making. Aqib (2013:52) states that the general principles of the teaching tool making are: 1) *Visible* : easy to see, 2) *Interesting* : attracts the attention, 3) *Simple*: sederhana, 4) *Useful* : useful to the students, *Accurate*: correct and effective, 6) *Legitimate*: valid and making sense, 6) *Structured* : well and respectively arranged.

The developed CTL-based snakes and ladders game as teaching tool consists of several parts i.e.,: (1) Board of snakes and ladders game; (2) questions card (Kanya); (3) Information Card (Kasi); (4) Manual Book; (5) Pin or pawns; and (6) Dice.

The applicability of the developed CTL-based snakes and ladders game as teaching tool is verified through the validation process conducted by the experts, both by media and materials specialists. The media specialist making assessment is H.A. Zaenal Abidin (lecturer in Department of PGSD/Primary Education FIP UNNES). While the lesson materials specialist making assessment is Sri Sulistyorini (lecturer in Department of PGSD/Primary Education FIP UNNES).

The assessment making aims to find out if the developed tool is applicable to support the learning process or inapplicable. Before the assessment starts, I consult with the specialist in advance. From the consultation, some advices were received concerning the development design of CTL-based snakes and ladders game as teaching tool. Among them is that putting more emphasis on indicator for the lesson materials in every session in the developed tool, the color used for font of the Information Card should be diverse. Also, Information Card and Questions Card should be made in color paper in order not to muddle the contents in the paper so that the students will be more attracted

From the media specialist's assessment on the development of CTL-based snakes and ladders game as teaching tool I accept percentage score 91.66% which means highly applicable. While from the lesson materials specialist I accept the

percentage score 84.37%, which means highly applicable. Based on both specialists' assessment, then the product of the developed CTL-based snakes and ladders game as teaching tool receives the average percentage score 88.02% and it is included in the category of highly applicable. While from the data of questionnaire response fulfilled by the teacher and the students on the small-scale experiment of the product, the percentage scores of response received are 90% and 91%, which means highly applicable. The calculation result of the tool applicability is shown in the chart below.



**Picture 3.** Chart of Tool Applicability Assessment

The effectiveness of the application of CTL-based snakes and ladders game as teaching tool is reflected in the students' cognitive learning comprising *pretest* and *posttest* scores. The *pretest* scores are attained from test conducted prior to the learning using CTL-based snakes and ladders game as teaching tool, while the *posttest* scores are attained from the test conducted after the learning conducted using CTL-based snakes and ladders game as teaching tool. The learning outcome improvement in the cognitive area is reflected in the raising score of the *pretest* and *posttest* using t-test which subsequently are re-tested using N-gain.

From the calculation of the normality test score before and after the application of CTL-based snakes and ladders game as teaching tool in the Natural Science learning, particularly lesson of Earth and Universe in grade V SDN Bringin 02, it is revealed that the significance rate is 0.157 (*pretest*) and 0.060 (*posttest*). The testing criteria on the data normality i.e., if the significance rate  $> 0.05$  then  $H_0$  is accepted and if the significance rate  $< 0.05$  then  $H_0$  is rejected. Each score of *Sig.* from *pretest* and *posttest* is more than 0.05 which means that  $H_0$  is accepted.  $H_0$  acceptance shows that the data before and after the application of CTL-based snakes and ladders game as teaching tool in the Natural Science learning particularly lesson of Earth and Universe grade V SDN Bringin 02 is normally distributed.

After revealed that the data is normally distributed, the next step taken is conducting the homogeneity test. The homogeneity testing criteria is when the significance rate  $> 0.05$  then the variant of the data group is confirmed as similar or

homogenous. From the calculation of homogeneity test of the data before and after the application of CTL-based snakes and ladders game as teaching tool it is revealed that significance rate  $> 0.05$  i.e., 0.086. therefore, from the calculation, I can draw a conclusion that the variant of the two data groups, i.e., *pretest* and *posttest* is similar or homogenous.

**Table 1.** T-test of Students Learning Outcome *Pretest* and *Posttest*

Criteria	score	
	Pretest	Posttest
Mean	62.62	80.1
Variants	109.60	60.00
T count	10.91	
Degree of independence	58	
T table	2.032	

CTL-based snakes and ladders game as teaching tool is confirmed as effective viewed from the significant average margin between *pretest* and *posttest* scores. During t-test there is hypothesis i.e.,  $H_0$  and  $H_a$ .  $H_0$  means there is not change of the students' learning outcome before and after the learning process applying CTL-based snakes and ladders game as teaching tool is conducted. While  $H_a$  means there is change of the students' learning outcome before and after the learning process applying CTL-based snakes and ladders game as teaching tool is conducted. On t-test,  $H_a$  is accepted when  $t_{\text{count}} \geq t_{\text{table}}$ . Based on the calculation it was found out that  $t_{\text{count}}$  score is 10.91 and  $t_{\text{table}}$  is 2.032, which means that  $t_{\text{count}}$  is bigger than  $t_{\text{table}}$ .  $H_a$  is accepted, it means, there is significant change of the students' learning outcome before and after the learning process applying CTL-based snakes and ladders game as teaching tool. While the t-test scores of cognitive learning outcome improvement is shown in Table 1.

Gain test is used to reveal average improvement of the learning outcome before and after applying CTL-based snakes and ladders game as teaching tool. The average improvement test scores (*gain*), i.e., *pretest* and *posttest* grade V students of SDN Bringin 02 is 0.47 and the average margin is 18.5. The result of gain-test of *pretest* and *posttest* scores is included in moderate category.

Based Table 2 below the conclusion can be drawn that the students' cognitive learning outcome before and after applying CTL-based snakes and ladders game as teaching tool experiences the significant improvement in moderate category. That result is in line with the study conducted by Muhlisin (2012:142) which explains that the development of CTL-based Natural Science learning tool is integrated, effective, and able to improve the students' learning outcome to 0.64% included in moderate category.

**Table 2.** Assessment of Average Improvement (Gain)

Category	Score
Average pretest	60.62
Average posttest	80.1
Average margin	18.5
Gain score	0.47
Criteria	Moderate

All principles in the CTL approach have been implemented at best during the learning process, except the principle of *questioning* and (*learning community*) that got some milestones. This was because the students are not used to working in grouping so when the students are given a problem to discuss about, not all the group members are actively involved in the discussion. In addition, the students are not used to expressing their opinion and the questions they found concerning the lesson materials they have learnt. During the learning process applying CTL-based snakes and ladders game as teaching tool, the method is used 4 times. In the beginning of the learning or in the first session, the students looks like having milestone in applying CTL-based snakes and ladders game as teaching tool as they are not get used to yet. In the next session, however, I did not see it anymore as they have understood the application of CTL-based snakes and ladders game as teaching tool better.

The simplicity in this research is analyzed based on the questionnaire response fulfilled by the students and teacher after applying CTL-based snakes and ladders game as teaching tool. The assessment result of the questionnaire response fulfilled by students after being experimented in the big group is that the percentage score attained is 89%. The assessment at the percentage score 89% means very practicable. While from the assessment result of the questionnaire response fulfilled by teacher, the percentage score attained is 91% which means very practicable. In addition, there is not any revision related to CTL-based snakes and ladders game as teaching tool.

Based on the questionnaire response fulfilled by the students and teacher, the big-scale product experiment, it attains the response rate 89% and 91% which means very practicable. The average assessment percentage score of both is above 82% and it means very practicable. Therefore from the attained assessment score, it can be concluded that CTL-based snakes and ladders game as teaching tool is highly applicable to the learning.

The study is in line with the study conducted by Muhlisin (2012:144) which explains that the

development of integrated CTL-based Natural Science learning tool is confirmed as practicable as most students (87.1%).give positive response.

## 4. CONCLUSION

Based on the results and discussion, we can make a conclusion that the *Contextual Teaching and Learning*-based snakes and ladders game as teaching tool developed in particular characteristics is applicable as a teaching tool and effectively improves Natural Science learning outcome, the lesson of Earth and Universe di grade V SD, as well as is confirmed as practicable based on the teacher and students' response that shows the positive response.

## 5. REFERENCE

- A. Husna M. 2009. *100+ Permainan Tradisional Indonesia Untuk Kreativitas, Ketangkasan, dan Keakraban*. Yogyakarta: Andi
- Afandi, R. 2015. Pengembangan Media Pembelajaran Ular Tangga Untuk Meningkatkan Motivasi Belajar Siswa Dan Hasil Belajar IPS Di Sekolah Dasar. *Jurnal Inovasi Pembelajaran*. 1(1): 77-89.
- Aqib, Z. 2013. *Model-model, Media dan Strategi Pembelajaran Kontekstual (Inovatif)*. Bandung: Yrama Widya.
- Arsyad, A. 2013. *Media Pembelajaran*. Jakarta: Rajawali Pres.
- BSNP. 2006. *Standar Isi Untuk Satuan Pendidikan Dasar dan Menengah*. Jakarta: Depdiknas.
- Cain, S.E. & Jack, M.E. 1993. *Sciencing: An Involvement Approach to Elementary Science*. Colombus: Merrill Publisher.
- Jamil, Sya'ban. 2016. *Permainan Cerdas dan Kreatif*. Jakarta: Penebar Plus.
- MZ, Yumarlin. 2013. Pengembangan Permainan Ular Tangga Untuk Kuis Mata Pelajaran Sains Sekolah Dasar. *Jurnal Teknik*. 3(1):75-84
- OECD. 2014. *Pisa 2012 Result in Focus: What 15-YearOlds Know and What They Can Do with What They Know*. Canada: OECD.
- OECD. 2016. *Pisa 2015 Result in Focus*. Canada: OECD.
- Sugiyono. 2015. *Metode Penelitian Pendidikan*. Bandung: Alfabeta.
- Sukiman. 2012. *Pengembangan Media Pembelajaran*. Yogyakarta: Pustaka Insani Madani.
- Suparwoto, dkk. 2007. *Psikologi Perkembangan*. Semarang.
- Trianto. 2007. *Model-model Pembelajaran Inovatif Berorientasi Konstruktivistik*. Jakarta: Prestasi Pustaka.

# Development of Traditional Mask Mold as Teaching Tool in Learning of Arts, Culture, and Craftsmanship

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## Abstract

Based on preliminary observation at SDN Kedungane 02 Semarang, learning media in art, culture, and craft lesson subject in the lesson of making a mask was still limited. It was necessary to develop a learning media which supporting the practice of making a mask. The type of research was Research and Development. The steps consist of potential and problem, data collection, product designing, design validation, design revision, small group product testing, product revision, large group product testing, product revision, and final product making. The main subject of this research was the students of grade V SDN Kedungpane 02 consists of 39 students. Technical collecting data used both test and non-test techniques. Data analysis technique used percentage descriptive statistic, validity test, reliability test, and N-gain. The results of the research showed: (1) the mask mould product design which was being developed was a traditional mask from Java Island and being adjusted to the level of student development, (2) the result of product feasibility assessment from material expert was 96,4% (very feasible) and media expert was 94,2% (very feasible), (3) the effectiveness of the media was being seen from the responses of students and teachers with the result belong to very good criteria, and there was an moderated improvement in pre test and post test result. Showed by the result of gain test value which was 0,52 and the average of performance assessment value was 88,36. The conclusion of this research was the traditional mask-mould media in the lesson of making a mask at class V of elementary school was feasible to be used and effective in improving the result of student art work.

Keywords: art, culture, and craft; development; learning media; traditional maskmould

## 1. INTRODUCTION

High quality education absolutely is needed to build a civilized society in line with life philosophy of a nation, so the education should be organized since early stage, i.e. from the primary school. Based on Republic of Indonesia Act (20/2003) Chapter II Article 3 it is stated that national education serves to develop the skill, to build the high respect character of nation, with purpose to develop the students' potentials to become the faithful, God-fearing, having high morals, healthy, knowledgeable, skilled, creative, independent, democratic, and responsible human. According to Decree of Minister of Arts and Culture (65/ 2013), the learning process in a school is conducted interactively, inspirationally, enjoyably, thought-provokingly, and in the ways that motivate the students to actively participate, as well as provide the sufficient space for initiatives, creativity, and independence proper with students' talents, interest, and physical and psychological development. Therefore, the teachers play important role to create interactive learning process that will improve students' cognitive, affective, and psychomotor competencies.

The implementation of the primary and secondary education in Indonesia is regulated in the Law of Republic of Indonesia (20/2003) Chapter X comprising Article 36,37, and 38. Article 37 explains that the curriculum of primary and secondary education must contain, among them, arts

and culture. Arts, Culture, and Craftsmanship is one of the subjects taught in Primary School, as it gives the students the chances to get involved in appreciational and creational experiences to produce the products which the students find directly useful in their real life (Depdiknas, 2007:2). As stated by Susanto (2013:261) the subject of Arts, Culture, and Craftsmanship (SBK) basically is the cultural-based arts teaching the aspects of which comprise: fine arts, music, dancing, and craftsmanship. Subject of Arts, Culture, Craftsmanship in Primary School serves and aims to develop the behavior and skill in case of working and appreciating. Decree of Government of Republic of Indonesia (19/2005) on national standard of education, explains that the contents Arts, Culture, and Craftsmanship are not only included in one subject, because the culture itself, however, is not discussed separately, but integrated with the cultural-based arts.

One of the supporting research is the one conducted by Atip Nurharini in 2010 titled "*Membangun Moralitas Seni Melalui Pendidikan* (Building Art Morality through Education)". This study explains that subject of Arts is aimed at encouraging the students' emotional development from the early age. The good emotional development is related to their expressional life. The children should have self-confidence and give the shape to their feelings. Isn't it that without a feeling, life will be meaningless? To reach the goal, the curriculum of arts generally contain four key



components, including (1) development of senses, (2) media or language to make expression, (3) artistic practice, and (4) encouragement of imagination.

Based on the analysis made by *Pusat Kurikulum, Badan Penelitian and Pengembangan, Departemen Pendidikan Nasional (Depdiknas)* (Center of Curriculum Institute of Research and Development, Department of Education and Culture) published in *Naskah Akademik Kajian Kebijakan Kurikulum Mata Pelajaran Seni, Budaya dan Keterampilan* (Academic Scripts of Analysis of Policy on Subject of Arts, Culture, and Craftsmanship) in 2007 explain that there are some issues in case of learning arrangement of Arts, Culture, and Craftsmanship, due to the lack of the teachers whose academic background is Arts Teaching, hence it causes the different interpretations in the teaching of Arts, Culture, and Craftsmanship, therefore the learning of Arts, Culture, and Craftsmanship is less thought-provoking and less profound to the students. Hence, Department of Education and Culture makes analyses of the policies on the curriculum of subject of Art and Culture to optimize the learning of Arts, Culture, and Craftsmanship.

The analyses above are supported by the interviews with Mr. Sugino as form teacher of grade V in SDN Kedungpane 02 Semarang City, the learning of Arts, Culture, and Craftsmanship is in line with the standard of the educational process, but it is still suboptimum because of some unsupportive factors in the learning process. Among the factors are the learning methods applied by the teachers are still communal, the students' learning activities are still too few as the learning is still teacher-center which means that the learning is entirely handled by the teachers because the amount of the students can be said as many in a classroom, the suboptimum role of the teacher in the learning process because the employed teaching tools for the learning of Arts, Culture, and Craftsmanship are still too simple, i.e., limited on drawing expressive picture on a paper, then being holed on the right and left sides to be inserted with rubber, subsequently being tied to the students' ears; the learning sources for the subject of Arts, Culture, and Craftsmanship are still limited on the textbooks, the subject of Arts, Culture, and Craftsmanship particularly the lesson of making mask, the teaching tool is not sufficient so it has impact on grade V students of SD Negeri Kedungpane 02's poor skill in producing a work. This is shown by around 51.2% of students or 20 of 39 grade V students in SDN Kedungpane 02 still get bad or suboptimum marks in making artwork in form of mask, while the amount of students who master the lesson materials and the making of the mask is around 48.7% or 19 of 39 students.

Mask is one kind of artworks illustrating a character usually is used to cover the face, so the

wearing one acts as the figure or character just like the shape of the mask (Ayu Rini, 2012:9). Making mask as an artwork is one of the lesson materials of the subject of Arts, Culture, and Craftsmanship of grade V SDN Kedungpane 02 Semarang.

Based on the explanation above, I develop the traditional mask mold as teaching tool which is applicable to the students in line with the development of the primary school students. The mold of the traditional mask is designed like the mold of facial expression of each character of mask. The shape of the mask design which will be developed is the Javanese traditional mask. The mold of the traditional mask can be used as a tool to support mask making practice in the learning, Culture of Arts, and Craftsmanship so it will produce various masks, improve the teachers' skill in using the teaching tool, as well as improve the students' activeness, learning interest, and learning outcome.

According to Arsyad (2009:3) teaching tool as a tool used to convey the message or information in teaching and learning process so it will attract the students' attention and curiosity. Hamandi (2011:244-245) explains generally that the teaching tools consist visual, audio, and audio visual media, people, materials, tools, technique, and setting. Meanwhile according to Anitah (2009:6.16) visual media is a visible media comprising visual media which is projected and unprojected.

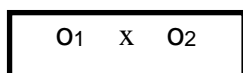
The research related to the problem solving is the study conducted by Averroes Imadudin in 2011 titled "Studi Tentang Penggunaan Media Pembelajaran Pada Mata Pelajaran Seni Rupa di MAN Kembangawit Kabupaten Madiun" (Study on Usage of Teaching Tool in the Subject of Fine Arts in MAN Kembangawit Kabupaten Madiun), containing data of various information concerning any tools used in the learning of fine arts based upon the basic competencies of appreciation and expression in grade X of MAN Kembangawit amounted 5 classrooms. The study shows that the teaching tool plays important part to attract the students' attention. To create the teaching tool, the teacher try to design the teaching tool on his own and give the students task to create on their own the teaching tool. The type of the applied media/tool consists of visual, environmental, and artistic dialog media. Teaching tool in the learning of the subject of fine arts in MAN Kembangawit is used by the teacher on his own and used by the students too, individually or in group.

The purpose of this research is to develop, to find the applicability, and to find the effectiveness of the mold of traditional mask in learning of subject of Arts, Culture, and Craftsmanship particularly the lesson of mask creation in grade V SDN Kedungpane 02 Semarang.

## 2. RESEARCH METHOD

The main subject of the research is grade V students of SDN Kedungpane 02, comprising 39 students. The sampling method applied in this research is *Saturation Sampling*, which means that all population members are the samples. The research variables are: (1) mold design of traditional mask in the subject of Arts, Culture, and Craftsmanship particularly the lesson of mask creation in grade V SDN Kedungpane 02 Semarang, (2) applicability of mold design of traditional mask in the subject of Arts, Culture, and Craftsmanship particularly the lesson of mask creation in grade V SDN Kedungpane 02 Semarang, and (3) effectiveness of mold design of traditional mask in the subject of Arts, Culture, and Craftsmanship particularly the lesson of mask creation in grade V SDN Kedungpane 02 Semarang.

The conducted research is a kind of research and development. This research applies adaptive development method reckoned by Sugiyono (2015:408). The research stages are: (1) potentials and issues; (2) data collection; (3) product design arrangement; (4) design validation; (5) design revision; (6) product testing in small-scale society; (7) product revision; (8) product testing in large-scale society; (9) product revision; (10) final making of product. While experiment design is the experiment design of *One-Group Pretest-Posttest Design* by Sugiyono (2015:110), the experiment design can be illustrated as follows:



Remarks:

O<sub>1</sub>= *pre-test* score (before using mold of traditional mask)

O<sub>2</sub>= *post-test* score (after using mold of traditional mask)

The data collection method applied are test (written test, performance test) and non test (documentation, interviews, observation, questionnaire). The data is analyzed using percentage descriptive, validity test, reliability test, exam difficulty level test, and N-gain.

## 3. RESULTS AND DISCUSSION

### Potentials and Issues

The potentials and problems consist of curriculum analysis, media analysis and user analysis. Curriculum analysis shows that the curriculum is school-based curriculum (KTSP) and time allocation provided by school for the subject of Arts, Culture, and Craftsmanship is 4 units per week. Media analysis shows that there is still a problem, i.e., The teacher has not developed the

attractive teaching tool in the learning of subject of Arts, Culture, and Craftsmanship. The teaching tools frequently used by the teacher are textbooks, pictures, and LCD consistent with the needs. The students more enthusiastically learn the subject of Arts, Culture, and Craftsmanship when they practise making an artwork. The teacher has tried to find the solution to the problem through demonstration, question and answer, and discussion, but still he finds a problem, i.e., the students cannot focus and concentrate longer on the learning because the students tend to get easily bored. It is supported by the grade V students' learning outcome for the subject of Arts, Culture, and Craftsmanship which is still poor in case of producing a work. The user analysis shows that primary school-age children enter the concrete operational stage.

The research supporting this explanation is the study conducted by Hilda Indriani, Made Putra, and I Ketut Aranda in 2016 titled "*Penerapan Character mask-assisted cooperative playing method untuk Mengembangkan Kemampuan Sosial*" (Application of Character Mask-Assisted Cooperative Playing Method to Develop the Social Skill). This research aims to find out the social skill improvement after applying character mask-assisted cooperative playing method, the subject is the kids of group B semester II in TK Kemala Bhayangkari I Denpasar during the school year 2015/2016. The research shows that the social skill improvement occurred through the cooperative playing method, i.e., from 65.35% which means moderate in cycle 1 into to 80.35% which means means high in cycle 2. The students' social skill improvement rate is 15%, so we can draw a conclusion that the application of character mask-assisted cooperative playing method can improve the children's social skill.

### Data Collection

In the stage of data collection concerning the making of mold of traditional mask as teaching tool, several data are prepared, such as: (1) initial data of necessity questionnaire of teacher and students; (2) interview with teacher of grade V SDN Kedungpane 02 Semarang City; (3) teaching planning and reporting documents such as lesson plans and syllabus; (4) the lesson materials used to create mold of traditional mask product i.e., the lesson of mask making

### Design of Mold of Traditional Mask Product Development

Design of mold of traditional mask product development is inspired from the fulfillment of questionnaire on teacher and students' needs. On the questionnaire on the students' needs, I distributed the questionnaire on needs to 39 grade V students in SDN Kedungpane 02 Semarang, and I distribute the questionnaire on needs to the teacher of grade V

SDN Kedungpane 02 Semarang, it is Mr. Sugino. The initial design of mold of traditional mask product shows that it has shape like the mold of each mask character's facial expression. Based on the theoretical analysis as stated by Anitah (2009:6) visual media is unprojectable, is a media which does not need projection tool such as photographic, graphic (two dimension media), and three dimension pictures.

Design of three dimension media in the learning of Arts, Culture, and Craftsmanship is also supported by the research conducted by Sumanto, Muhana Gipayana, and Rumidjan in 2015 titled "*Kerajinan Tangan Di Blitar Sebagai Sumber Belajar Seni Budaya dan Prakarya (SBdP) Sekolah Dasar*" (Handycrafts in Blitar as Learning Sources of Arts, Culture, and Craftsmanship), this research was conducted in *Home Industry* of handycrafts in Blitar and the research products are the handycrafts such as key hangers. Bags, drums, brooches, ketipungs, crown birdcage, maracas, creative bamboo, pottery, painting glass, wooden carved, wayang, and batik. The most models are three dimension and few are two dimension. Those use techniques of webbing, sewing, binding, flower arrangement, application, embroidery, batik, folding, butsir, twisting, rotating/spinning, mold/printing, screen-printing, painting, torah and lathe. The materials used are wood, coconut shell, leather, bamboo, plastics, and paper.

In this research, the shape of the developed mask design is the Javanese traditional mask. The thickness of the mold of traditional mask is 1 cm, its length is 26 cms, and its width is 20cms. The main materials used to make mold of traditional mask is *fiberglass*, while its complements are *matt*, resin, catalyst, and *wax (mold release)*. The mold of traditional mask is shaped in 3 different mask charaters designs from Java, i.e., Central Java, East Java, and West Java. The initial design subsequently is tested by media and material specialists to assess the applicability of the product. If it is confirmed as applicable, it can be then applied to the learning of Arts, Culture, and Craftsmanship at school.

### The Applicability of Mold of Traditional Mask Product

The product of development design of mold of traditional mask subsequently gets validated by media and materials specialists to assess the applicability of mold of traditional mask through questionnaire as instrument. The media specialist in this research is artistic craftsman, he is Drs.Suprpto, while the materials specialist is Dr. Deni Setiawan, S.Sn, M.Hum., from Department of Primary Education, Faculty of Education, Universitas Negeri Semarang.

**Table 1** Validation Summary of Development Design Applicability of Mold of Traditional Mask

No	Specialist	Score	Total Score	Percentage	Remarks
1.	Media (Drs.Suprpto)	49	52	94.2%	Highly Applicable
2.	Materials (Dr. Deni Setiawan, S.Sn, M.Hum.)	27	28	96.4%	Highly Applicable

Based on Table 1, it is clear that each assessor gives score >81% to the assessed aspects, which means that the developed mold of traditional mask is highly applicable to the learning of Arts, Culture, and Craftsmanship in primary school with revision, so the revision should be carried out in advance in line with the suggestion and comments given by the each assessor before continuing to the next step.

Revision for the design which should be conducted is based on the the suggestion and comments written on the validation/assessment sheets. The revision is conducted on the fourth indicator; it is minimizing the size of the mold because according to the media specialist, the size of the initial design is too big to be used by the primary school students. The revision statement is that the size of the mold of the traditional mask which previously is 26cms length, 20 cms wide, and 1 cm thick, then is minimized in length = 23 cm, width = 17 cm, and thickness = 0.5cm.

### Effectiveness of Mold of Traditional Mask as Teaching Tool

To find the effectiveness of mold of traditional mask as a teaching tool we can view it from: (1) students' and teacher's response to mold of traditional mask product, (2) *pre-test* and *post-test*, and (3) performance assessment on mask masking.

Students' responses are acquired from the fulfilled distributed questionnaire after doing. Experiment in small-scale society, i.e. on 3 primary schools, they are SDN Ngaliyan 05, SDN Jatibarang 01, and SDN Kedungpane 02 Semarang. On the experiment on the small-scale society, I conducted a little demonstration concerning mold of traditional mask as teaching tool and how to use it. Then, about 10 students from each scholl are given response questionnaire to give their responses on mold of traditional mask as media. While the experiment on large-scale society was conducted to 5 primary schools, i.e., SDN Ngaliyan 05, SDN Jatibarang 01, SDN Kedungpane 02, SDN Ngaliyan 02, and SDN Kedungpane 01 Semarang. In the experiment on large-scale society, the response questionnaires are redistributed to 150 students (SDN Ngaliyan 05 to 18 students, SDN Jatibarang 01 to 28 students, and SDN Kedungpane 01 to 34 students, SDN Ngaliyan

02 to 31 students, and SDN Kedungpane 02 to 39 students).after doing mask-making activities by using mold of traditional mask as a tool. This was undertaken to measure how effective the mold of traditional mask as a tool to improve the students' skills to create a work, especially the mask as an artwork.

Research which support this research conducted by Octavia RaditaAnggraini, RiniKristiantari, and I Komang Ngurah Wiyasa in 2015 titled "*Penerapan Metode Demonstrasi Melalui Kegiatan Pembuatan Topeng Karton Untuk Meningkatkan Kemampuan Motorik Halus Anak Kelompok B TK Prshanti Nilayam Kuta*" (Application of Demonstration Method through Cardboard Mask Making Activity to Improve the Children of Group B of TK Prshanti Nilayam Kuta's Fine Motor Skill ), which shows that the fine motor skill of the students of group B in TK Prshanti Nilayam Kuta in semester II after the demonstration method is applied in cardboard mask making activity improves. The result in cycle 1 around 42.96% which means poor improves to 83.53% in cycle II which means high. The fine motor skill improves after using cardboard mask making as the tool at rate 40.57%, it means that the demonstration method through cardboard mas making can improve the fine motor skills of the children of grup B TK Prshanti Nilayam Kuta Badung school year 2013/2014.

The assessment by teacher is received from the assessment questionnaire given to the classroom teacher to analyze the effectiveness of mold of traditional mask as a tool on the lesson of mask making. Experiment on small-scale societies to the students amounting 3 primary schools, i.e., SDN Ngaliyan 05, SDN Jatibarang 01, and SDN Kedungpane 02 Semarang. The assessment questionnaire that should be fulfilled by teacher in experiment on small-scale societies are given after the teacher sees, observes, and assess the demonstration of the mold of traditional mask and how to use it before the grade V students for the lesson of mask making. While the experiment on large-scale societies were conducted to the students in 5 primary schools, i.e., SDN Ngaliyan 05, SDN Jatibarang 01, SDN Kedungpane 02, SDN Ngaliyan 02, and SDN Kedungpane 01 Semarang. In the experiment on large-scale societies, the assessment questionnaire sheets are distributed again to 5 classroom teacher (SDN Ngaliyan 05 to 1 teacher, SDN Jatibarang 01 to 1 teacher, and SDN Kedungpane 01 to 1 teacher, SDN Ngaliyan 02 to 1 teacher, and SDN Kedungpane 02 to 1 teacher) after doing performance of mask making using. This was done to measure how effective the mold of traditional mask as a tool is to improve the students' skill in creating an artwork, particularly mask.

**Table 2** Summary of Questionnaire Response Fulfilled by Students and Teacher in the Experiment on Small-Scale Societies

Response	Collective Percentage	Remarks
Students	94.32%	Very Good
Teacher	89.95%	Very Good

Based on Table 2 summary of the questionnaire responses fulfilled by students and teacher in experiment on small-scale society shows that students and teacher gave the positive responses to the tested mold of traditional mask product. It is shown in the percentage of the students' responses about 94.32% (very good) and percentage of the teachers' responses about 89.95% (very good).

**Table 3** Summary of Questionnaire Response Fulfilled by Students and Teacher in the Experiment on Large-Scale Societies

Response	Collective Percentage	Remarks
Students	97.64%	Very Good
Teacher	91%	Very Good

Based on Table 3 summary of the questionnaire responses fulfilled by students and teacher in experiment on large-scale society shows that students and teacher gave the positive responses to the tested mold of traditional mask product. It is shown in the percentage of the students' responses about 97.64% (very good) and percentage of the teachers' responses about 91% (very good).

Analysis of average *pre-test* and *post-test* improvement is conducted to find the effectiveness of mold of traditional mask on grade V students in SDN Kedungpane 02 Semarang. Effectiveness of mold of traditional mask can be found from the margin and average inter-score raise before learning starts (*pre-test*) and after the learning finished (*post-test*). The average collective *pre-test* score in the learning of subject of Arts, Culture, and Craftmanship is 58.46, while average *post-test* score in the learning of subject of Arts, Culture, and Craftmanship is 80.33. While N-gain is 0.52, which means moderate.

**Table 4** Analysis of N-gain Test

Average <i>Pre-test</i>	Average <i>Post-test</i>	N-gain	Remarks
58.46	80.33	0,52	Moderate

Meanwhile, the data of performance assessment is acquired from performance on mask making assessment sheet in two sessions. The assessment was conducted on 39 grade V students

in SDN Kedungpane 02 using assessment sheets comprising 5 indicators, 4 describers. The maximum score for each indicator is 4. Assessment indicators consist of paper mixture making, pouring the paper mixture into the mold to be moulded, drying process, drawing traditional mask character, and mask coloring process. In the mask making performance assessment, the students' works got average score 88.76% and which means very good.

The research that supports the usage of the usable paper for the mask making in the learning of Arts, Culture, and Craftsmanship is the study conducted oleh Ketut Sudita in 2014 titled "*Pemanfaatan Barang Bekas Sebagai Bahan Pembuatan Barong Mini dalam Pembelajaran Seni Kerajinan Tangan*" (The Usage of the Used Things as Materials to Make Mini barong in the Learning of Handycraftsmanship). The research was conducted by 70 students of Department of Primary Education UNDIKSHA UPP Denpasar. The study shows that application of project-based learning will develop the students' creativities in creating the artwork in form of mini barong. The students' artworks can be said as good (scorerange is 70-95) and they get positive appreciation from the lecturers, the teachers, and primary school students living near the campus of Department of Primary Education UNDIKSHA UPP Denpasar.

## 4. CONCLUSION

Based on the data analysis and the discussion above, a conclusion can be drawn that the developed mold of traditional mask meets the criteria of very applicable category as confirmed by the media and materials specialists. The mold of traditional mask is effectively applied in the Learning Arts, Culture, and Craftsmanship, mainly the lesson of mask making proven by the students' responses reaching the percentage 94.32% and 97.64%, as well as the teachers' responses reaching the percentage 89.95% and 91%. The average pretest score raise from 58.46 into 80.33 and the average post-test score or has N-gain rate 0.52 as well as average score of performance assessment, i.e., 88.36. The mask making in the mask making performance in the learning of Arts, Culture, and Craftsmanship successfully exceeds the mastery learning.

The short conclusion we can draw is that the students, teachers, and school can find mold of traditional mask helpful. The research supported in study is the study conducted by Lowell Fiet in 2010 titled "*Mask-Making And Creative Intelligence In Transcultural Education*". The scholar is a professor in drama, theater, and performance fields in Universitas Puerto Rico, who has been making mask from the recycled materials for over twenty five years for theater and performing arts as education tools. That research focused on the

purpose the mask usage in the education field, i.e., First, emphasizing the need to change the normative, structured and perspective learning environment to make sure that classroom is an open space to express their minds and feeling as creatively as possible. second, the workshop instructs the teachers to exploit the surrounding materials and resources. Through observation and field work, the students, the teacher and the neighbours become living textbooks.

## 5. REFERENCES

- Anitah, Sri. 2010. *Media Pembelajaran*. Surakarta: Yuma Pustaka.
- Arsyad, Azhar. 2013. *Media Pembelajaran*. Jakarta: Rajawali Pers.
- Averroes Imadudin. 2011. Studi Tentang Penggunaan Media Pembelajaran Pada Mata Pelajaran Seni Rupa di MAN Kembangawit Kabupaten Madiun.
- Ayu Rini. 2012. *Kreasi Topeng Kertas*. Jakarta: Pustaka Mina.
- Depdiknas. 2007. Naskah Akademik Kajian Kebijakan Kurikulum Mata Pelajaran Seni Budaya dan Keterampilan.
- Fiet, Lowell. 2010. Mask-Making And Creative Intelligence In Transcultural Education. *Caribbean Quarterly*: Vol. 60 Issue 3 page 58-72.
- Hamdani. 2011. *Strategi Belajar Mengajar*. Bandung: Pustaka Setia.
- Hilda Indriani, Made Putra, dan I Ketut Ardana. 2016. Penerapan Metode Bermain Kooperatif Berbantuan Media Topeng Karakter untuk Mengembangkan Kemampuan Sosial. *EJournal PGPAUD*, 4 (2).
- Ketut Sudita. 2014. Pemanfaatan Barang Bekas Sebagai Bahan Pembuatan Barong Mini dalam Pembelajaran Seni Kerajinan Tangan. *Jurnal pendidikan dan Pengajaran*. Jilid 47: 2-3.
- Nurharini, Atip. 2010. Membangun Moralitas Seni Melalui Pendidikan (Building Art Morality through Education). *Jurnal Kependidikan Dasar*. Vol 1 (1).
- Octavia Radita Angraini, Rini Kristiantari, dan I Komang Ngurah Wiyasa. 2015. Penerapan Metode Demonstrasi Melalui Kegiatan Pembuatan Topeng Karton Untuk Meningkatkan Kemampuan Motorik Halus Anak Kelompok B Tk Prshanti Nilayam Kuta. *E-Journal PGPAUD*, 3 (1).
- Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia. 2013. Nomor 65 Tentang Proses Pembelajaran Pada Satuan Pendidikan.
- Peraturan Pemerintah Republik Indonesia. 2005. Nomor 19 Tentang Standar Nasional Pendidikan.
- Sugiyono. 2015. *Metode Penelitian Pendidikan*

- Pendekatan Kuantitatif, Kualitatif, dan R & D.*  
Bandung: Alfabeta.
- Sumanto, Muhana Gipayana, dan Rumidjan. 2015.  
Kerajinan Tangan Di Blitar Sebagai Sumber  
Belajar Seni Budaya dan Prakarya (SBdP)  
Sekolah Dasar. (Nomor 2: 111-123)
- Susanto, A. 2013. *Teori Belajar dan  
Pembelajaran.* Jakarta: Prenadamedia Group.
- UU RI Nomor 20 Tahun 2003 Bab II Pasal 3.

# Interactive Multimedia Development in The Natural Science Learning Mainly Lesson of Transformation of Earth and Sky Topographies

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## Abstract

The purpose of this research is to develop interactive multimedia on science learning material change of earth appearance and sky in 4th grade Elementary school Klepu 04. This research type is Research and Development (R&D) using Waterfall model consisting of Analysis, Design, Implementation, Testing, and Maintenance. The results showed interactive multimedia is feasible to use. Based on the assessment of media experts, get an assessment of 88% (very feasible), material experts of 92%, (very feasible), and linguist of 92% (very feasible). In addition, the assessment of the practitioner's expertise on presentation, content, and linguistic components is 100%, 92%, 96% categories very feasible. Interactive multimedia is also effectively used in science learning based on difference test average by using t test obtained t count equal to 12,05 and t table equal to 1,67 and increase of average (Gain) equal to 0,57 with medium criterion. The used of interactive multimedia in science lesson material changes in the appearance of the earth and sky increases student activity at 1st meeting with percentage of 82,5% (very high) and student activity at 2nd meeting with percentage of 86,8% (very high). The conclusion of this research is interactive multimedia feasible to be used, effective to be used in learning, and increase student activity.

Keywords: Audio visual media; Mind mapping; Social studies.

## 1. INTRODUCTION

Education is the resource to improve the quality of human resources of a nation. One of the reason for being developed nation is the educated, intelligent, and respectful human resources. The statement is in line with Law of Republic of Indonesia(20/2003) on National Education System which states that education is conscious and well-planned efforts to manifest learning atmosphere and learning process so that the students actively develop their own potencies to have spiritual-religiosity, self-controlling, personality, intellegency, high moral, as well as the skills required by himself, public, nation, and the country-state. Decree of Minister of National Education (Permendiknas) (22/2006) on Standard of Contents for Primary and Secondary Shools which states that in the structure of curriculums for Primary/Islamic Primary Schools upon School-Based Curriculum, there are eight components of subjects which should be well mastered by the students. One of them is Natural Science. It is important to teach the student Natural Science as Natural Science has close relations to how to find out about the nature systematically, so that natural Science is not only about mastering a bunch of knowledge comprising the facts, concepts, or principles, but also through process of discovery and invention. (Depdiknas, 2007:8).

The Natural Science learning in Primary School in still has many problems. Based on the pre-research conducted to grade IV SDN Klepu 04 through observation, intertopographies, and documentation, I find some problems concerning

the implementation of Natural Science learning. From the data mentioned above, it was found out that the Natural Science teaching the teacher has not optimally provides the teaching tool. The teacher does not operate the teaching tools in innovative way. The teacher only uses tool such as the pictures contained in the student book. Those pictures are very limited, there are only a few pictures and they are in small size and in black and white. The students scrutinize the content of the learning materials more, so the students act passively.

The issues are strengthened with the pre-research through data of the students' learning outcome taken from the final exam of semester I average scores in the subject of Natural Science, which can be called very low. The determined minimum mastery criteria is 75. Of 22 students having average score 71.2 there are 11(50%) do not met minimum mastery criteria and 11 (50%) do.

Survey conducted by *Programme for International Student Assessment* (PISA) in 2015 shows that the field of science in Indonesia places rank 62 at score 403 out of 70 countries. While based on the survey conducted by *Trends International Mathematics and Science Study* (TIMSS) in 2015, Indonesia ranks 44 of 47 member countries at average score 397. Based on the fact above, I make analysis by conducting research on interactive multimedia development in the learning of Natural Science. Through this media, the students will be more interested in learning the lesson of transformation of earth and sky topographies. In the lesson of transformation of earth and sky topographies, there are some natural phenomena the students cannot see directly. Therefore the students need a liaison to visualize information. Multimedia

is the media covering several kinds of media to stimulate all senses within one learning activity. Multimedia is emphasized more on the usage of various ICT-based and computer-based media. Interactive multimedia can make the students learn actively with high motivation due to their interest in multimedia able to display text, pictures, audio, animations, and video (Darmawan, 2014:55).

The research encouraging the solution to this issue is the one conducted by I Made Prasetya Aryawan, A. A. Gede Agung, I Wyn Romi Sudhita in 2015 titled "*Pengembangan Multimedia Interaktif Dengan Model Waterfall pada Mata Pelajaran IPA Kelas VII*" (Development of Interactive Multimedia using Waterfall Model in the learning of Natural Science for Grade VII). This study elaborates media by employing the advance of technology as well as the facilities available at school, i.e., LCD. The considered-proper teaching tool is interactive multimedia because this media is attention-grabbing and attractive, so it will motivate the students to study Natural Science, get the students more enthusiastically learning hence they will attain the best learning outcome. Based on the applicability test conducted by the media and materials specialists, the interactive Multimedia is verified as applicable, and in the application testing, the students learning outcome raised after applying interactive multimedia compared to before use.

Another supporting study was conducted by Thongchai Kaewkiriya in 2013 titled *A Design And Development Of E- Learning Content For Multimedia Technology Using Multimedia Game*. This research was aimed at developing e-learning multimedia through a game. Game was used to make the learning more attractive as well as to give real-life role model using multimedia. Game in this research was created using Adobe flash CS5 with 2D animation.

Based on the facts mentioned above, the issues are analyzed through developmental research titled "*Pengembangan Multimedia Interaktif pada Pembelajaran IPA Materi Perubahan Kenampakan Bumi dan Langit Kelas IV SDN Klepu 04*" (Development of Interactive Multimedia during the Learning of Natural Science Mainly Lesson of Transformation of Earth and Sky Topographies to Grade IV Students in SDN Klepu 04). The purpose of this research is to develop the multimedia, to assess its applicability, to test its effectiveness, and to describe the students' activities during the learning applying interactive multimedia.

## 2. RESEARCH METHODS

This is Research and Development (R&D) study, with *waterfall* model comprising *Analysis, Design, Implementation, Testing, and Maintenance*. The main subject of this research is the grade IV students of SD Negeri Klepu 04, consisting of

21 student. The sampling method applied is *Saturation Sampling*, which means that all population members are used as samples. The research variables are interactive multimedia, Natural Science learning outcome, and the students' learning activities. While the data collection methods applied are test, questionnaires fulfillment, interview, observation, and documentation. The data analysis methods applied are product data analysis, initial data analysis, and final data analysis. The product data analysis is used to test the applicability of the developed media. The initial data analysis is used to find out if the collected data are normally or abnormally distributed. In this research, data normality test is conducted using *Liliefors*. While final data analysis is used to assess the effectiveness of the developed data, i.e., applying t-test and N-Gain.

## 3. RESULTS AND DISCUSSION

### Development of Interactive Multimedia

Interactive Multimedia is designed by combining media components comprising texts, picture, video, and animation with the navigation buttons so the teachers and the students will find them usable. The interactive multimedia's display is as follows: (1) opening page; (2) main menu; (3) additional menu; (4) guide menu; (5) lesson materials as submenu; (6); Standard of Competency and Basic Competencies menu; (7) lesson materials menu; (8) the display of the main lesson; (9) observation during learning; (10) mini dictionary and bibliography; (11) evaluation using *quiz game*; (12) evaluation scoring.

### Applicability Assessment of Interactive Multimedia

Media applicability assessment stage 1 covers three aspects, i.e., contents appropriateness comprising the suitability of the lesson materials with standards of competencies and basic competencies, its fitness with the developmental stage of the students, the logic and sequence of the lesson materials, and concept of lesson materials. The interactive multimedia passing the assessment part 1 subsequently must get through the assessment part 2 comprising the assessment of each media component. The result of the applicability assessment of the interactive multimedia for each component conducted by the specialist is shown below.



**Table 1** Validation Summary of Applicability Assessment of the Contents, Presentation, and Linguistics

Assessor	Component	Total Score	Percentage	Remarks
Valuator	Media	22	88%	Very Applicable
	Lesson Materials	23	92%	Very Applicable
	Language	23	92%	Very Applicable
Practitioners	Media	25	100%	Very Applicable
	Lesson Materials	23	92%	Very Applicable
	Language	24	96%	Very Applicable

Based on Table 1, it is revealed that in the assessment the percentage score of presentation applicability assessment validation is 88%, the percentage of applicable contents is 92%, and applicable language is 92%. On the whole, based on the validation, each component meets the criteria of very applicable. Meanwhile the assessment conducted by practitioner on the presentation, contents, and language parts, respectively, are 100%, 92%, and 96% which meet the criteria of very applicable. The empirical study supporting this research is the research conducted by Afdal Aria Gumilang in 2017 titled “*Pengembangan Multimedia Pembelajaran Interaktif Untuk Kelas V Sekolah Dasar Mata Pelajaran IPA Materi Pengenalan Struktur Bumi*” (Multimedia Development for Interactive Learning in the Natural Science Learning Applied to Grade V Students, for Lesson of Recognizing the Structure of Earth). Based on the assessment of each component conducted by media and materials specialists, the interactive multimedia is verified as very applicable, which means that the end product of the development in form of interactive multimedia meets the applicability criteria and can effectively applied to the learning of Natural Science particularly the lesson of Recognizing the Structure of Earth for grade V students of primary school in Semester 2. Another research strengthening this opinion was also conducted by Ulya Shoffa Hana in 2016 titled “*Pengembangan Multimedia Interaktif Mapel IPA untuk Siswa Kelas V Di SDN Kuwaron 1*” (Development of Interactive Multimedia for Learning of Natural Science Conducted by Grade V Di Students in SDN Kuwaron 1). The outcome of assessment conducted by media and material specialists shows that it meets the criteria of very applicable. Based on the testing conducted by field

Valuator, it is included in category of Good. Therefore the interactive multimedia to learn natural Science for grade V students of SDN Kuwaron 1 is applicable to be used as teaching tool.

### Effectiveness of Interactive Multimedia Application during the Natural Science Learning Particularly Lesson of the Transformation of Earth and Sky Topography

The students’ cognitive learning outcome is taken find the effectiveness of the interactive multimedia. The students’ learning outcome is found from the test score they get before the starting the learning using the interactive multimedia, i.e., pretest, and posttest after the learning which applies the interactive multimedia. The pretest and posttest scores are shown below.

**Table 2** Students’ *pretest* and *posttest* scores

Action	Average	Highest Score	Lowest Score	Amount of Mastering Students	Learning Mastery Percentage
Pretest	65	83	37	11	52.3%
Posttest	85	100	67	20	95.2%

Based on Table 2, the learning outcome of grade IV students of SD Negeri Klepu 04 after conducting *pretest* and *posttest* it is found out that the average pretest score is 65 and the average posttest score is 85. Based on the data above we find the improvement from pretest score into posttest score, i.e., 42.9%. the amount of students meeting the mastery learning raises from 11 or 52.5% in pretest into 20 or 95.2% in posttest so the learning outcome of grade IV students of SDN Klepu 04 changes from before into after applying interactive multimedia. Another empirical study supporting this research is the study conducted by Ni Kadek Ria Anggriani Dewi, I Nyoman Jampel, A.A. Gede Agung in 2015 titled “*Pengembangan Multimedia Pembelajaran Interaktif IPA Dengan Model Assure Untuk Siswa Kelas VII SMP 1 Sawan*” (Multimedia Development for Interactive Learning in the Natural Science Learning Applying the Assure Model for Grade VII Students of SMP 1 Sawan). The research finds that the design of interactive multimedia development creates flowchart and storyboard. Also, based on the calculation, average score of the learning outcome after using the media is higher (81) than before using the media (55.83). So, it is concluded that multimedia for interactive learning can effectively improve the learning outcome in the subject of Natural Science when applied to grade VII students of SMP Negeri 1Sawan during the even semester.

The collected *pretest* and *posttest* data are then tested for their normality, to find if the pretest and posttest scores are normally distributed or are not

and to determine the statistic analysis that will be conducted. The followings are the result of normality test using *Liliefors*.

**Table 3** Normality Test of Pretest and Posttest Scores

Action	L o	L t	$\alpha$	n	Remarks
Pretest	0.115	0.190	0.05	21	Ho accepted
Posttest	0.103	0.190	0.05	21	Ho accepted

Based on Table 3, Liliefors calculation result for pretest is 0.115 and Liliefors calculation result for posttest is 0.103.  $L_o$  pretest and posttest <  $L_t$  i.e., 0.190 so from the data above it can be concluded that pretest and posttest score are normally distributed. Then the next calculation will be conducted in statistic parametric technique.

I also conducted *t-test* to find the score margin of pretest and posttest. Here is the summary of calculation of the average margin of the scores the students make before and after using interactive multimedia.

**Table 4** T-test Assessment of Pretest and Posttest Scores

Data	A	Dk	$t_{\text{table}}$	$t_{\text{hitung}}$	Keterangan
Pretest	5%	40	2,021	12,0528	Ha diterima
Posttest					
Data	A	Dk	$t_{\text{count}}$	$t_{\text{table}}$	Remarks
Pretest	5%	40	2.201	12.0528	Ha accepted
Posttest					

Based on Table 4 above we can find that from the average margin between pretest and posttest scores we get  $t_{\text{count}} = 12.05$  or bigger than  $t_{\text{table}}$  (1.67). If  $t_{\text{count}} < t_{\text{table}}$ , then  $H_0$  is accepted and if  $t_{\text{count}} > t_{\text{table}}$ , then  $H_a$  is accepted. Based on the data above, it can be concluded that interactive multimedia is effectively used for learning Natural Science, particularly lesson of Transformation of Earth and Sky Topography to grade IV students in SD Negeri Klepu04.

From the empirical aspect, the study supporting this research is the one conducted by Gede Eka Pratama, Ign WayanSuwatra, Wayan Romi Sudhita, in 2014 titled “*Pengembangan Multimedia Pembelajaran Interaktif Mata Pelajaran Ilmu Pengetahuan Alam Kelas V SD Negeri 4 Peliatan*” (Multimedia Development for Interactive Learning in the Natural Science Learning for Grade V Students of SD Negeri 4 Peliatan). The value of  $t_{\text{table}}$  at significance rate 5% is 2.00. So the value of  $t_{\text{count}}$  is higher than  $t_{\text{table}}$ , so that  $H_0$  is rejected and  $H_1$  is accepted. It means that there is significant margin between the students’ learning outcome of Natural Science after using the media (81.67) which is better than the one before using the media. In

addition, it was the study conducted by Irlidiya in 2015 titled *The Development of Interactive Multimedia for First-grade Beginning Readers of Elementary School: An Innovative Learning Approach*, using t-test analysis by applying the statistic application, i.e. IBM SPSS 20 showing that there is a difference of the learning outcome between the classroom using the interactive multimedia and the classroom which does not.

Another supporting study is the one conducted by Dian Mustika Anggraeni and Muhammad Walid in 2016 titled *Developing Interactive Flash Media for Thematic Learning*. Based on that research,  $t_{\text{count}}$  (4.48) >  $t_{\text{table}}$  (1.860), then  $H_a$  is accepted and  $H_0$  is rejected. The conclusion is that there is a significant margin between initial score (pretest) and final score (posttest).

After the average margin of pretest and posttest is found through t-test, subsequently I tried to find the average improvement rate by calculating N-gain. Here is the summary of N-gain calculation.

**Table 5** Test of Average Raise (Gain)

Category	Score
N-Gain	0.575269
Average pretest	65
Average posttest	85
Average margin	20
Remarks	Moderate

Based on Table 5, it is found out that average improvement (*gain*) of pretest and posttest is 0.57 at average margin 20. The average improvement shows that the media for interactive multimedia is effectively used for the learning of Natural Science in part of Transformation of Earth and Sky Topography to grade IV students of SD Negeri Klepu 04. The raise of the learning outcome illustrated in pretest and posttest score before and after using interactive multimedia is presented in the following Line chart.



**Picture 1.** Improvement of Learning Outcome for using interactive multimedia

The effectiveness of interactive multimedia is also assessed based upon the questionnaire responses fulfilled by the teachers and the students.

The students' questionnaire responses consisting of 15 aspects are distributed to all grade IV students of IV SDN Klepu 04 amount of which is 21. The questionnaires are fulfilled by the students after being engaged in the learning using interactive multimedia. Here is the summary of questionnaire fulfilled by the teacher and students during the experiment.

**Table 6.** Summary of Questionnaire Fulfilled by the Teacher and Students

Respondents	Percentage	Remarks
Students	92.3%	Very Effective
Teacher	100%	Very Effective

Based on Table 6, it is found out that grade IV students of SDN Klepu 04 during the experiment of interactive multimedia in the learning of Natural Science in part of Transformation of Earth and Sky Topography, aspects 1, 2, 5, 10, and 15 attain the assessment percentage 100%. In addition, aspects 3, 6, attain the assessment percentage 95.2%. Meanwhile the aspects 4, 8, 12, 13, and 14 attain the assessment percentage 90.4%. While aspects 7 and 11 attain the assessment percentage 85.7% and aspect 9 attains the assessment percentage 71.4%. The teacher's questionnaire response is the questionnaire given to the teacher to assess the effectiveness of the interactive multimedia in the Natural Science learning. The questionnaire contains 15 questions completed with note column to give suggestions concerning interactive multimedia usage. The fulfilled Teacher's questionnaire attains score at percentage 100% for all aspects. The supporting research is the one conducted by R. Gita Ardhy Nugraha, in 2017 titled "*Pengembangan Media Interaktif Berbasis Adobe Flash CS4 Professional pada Pembelajaran Tematik untuk Siswa Kelas 2 SD*" (Development of *Adobe Flash CS4 Professional*-Based Interactive Media in the Thematic Learning for Grade 2 Students). The fulfilled questionnaire show the average attained scores 4.34 included in category of Excellent. In addition, the questionnaires fulfilled by 50 students on the experiment shows that the average attained score is 4.26 which means Excellent

#### Observation Outcome of Students' Activities

The outcome of observation of students' activities is attained from Students Activeness Observation Sheet. The observation was conducted within two sessions. The amount of the observed students is 36, consisting of 16 males and 20 females. The activities the students do influence their understanding of the delivered lesson materials during the learning. Therefore it will determine the

students' learning outcome. The mastery criteria for the students' collective activities are: excellent, if getting  $80\% \leq \text{score} < 100\%$ ; good, if getting  $60\% \leq \text{score} < 80\%$ , fair, if getting  $40\% \leq \text{score} < 60\%$ , and poor if getting  $20\% \leq \text{score} < 40\%$ . Here is the summary of the observation of the students' activeness during Session 1 and Session 2.

**Table 6** Summary of observation of students' activeness

Session	Total Score	Percentage	Remarks
1	587	81.5%	Excellent
2	639	88.75%	Excellent

Based on Table 6, it is found out that result of observation of students' activeness in Session gets score 587 or 81,5% which means Excellent. While the score of students' activeness in Session 2 is 639 or 88,75% which means Excellent.

The empirical study supporting this research is the one conducted by Susanto, Novi Ratna Dewi, Andin Irsadi in 2013 titled *Pengembangan Multimedia Interaktif dengan Education Game Pada Pembelajaran IPA Terpadu Tema Cahaya Untuk Siswa SMP/MTS* (Development of Interactive Multimedia applying Education Game in Learning of Integrated Natural Science for Secondary/Islamic Secondary School Students). This research conducted in MTS Nuril Huda Grobogan Regency developed interactive multimedia combined with education game inserted into interactive CD. The result was that the students put high interest because they were motivated in the learning..

## 4. CONCLUSION

The developed multimedia for interactive learning in the learning of Natural Science, part of Transformation of Earth and Sky Topography, based on the assessment carried out by media and material specialists, linguist, and practitioner, it is certified as applicable with the percentage of the following components: presentation (88%), lesson materials (92%), and linguistics (92%). While the assessment given by practitioner is as follows: presentation (100%), lesson materials (92%), and linguistic (96%). Based on the data above the assessment score on every component meets the criteria of very applicable, so the interactive multimedia is applicable to the learning of Natural Science. Interactive multimedia can effectively be used in the learning of Natural Science, particularly lesson of Transformation of Earth and Sky Topography shown by the margin of average pretest and posttest scores in following calculation:  $t_{\text{count}}$  (12.05) is bigger than  $t_{\text{table}}$  (1.67) as well as the average improvement rate of pretest and posttest is

0.57 or fair. The usage of interactive multimedia in the learning of Natural Science, particularly lesson of Transformation of Earth and Sky Topography successfully improves the students activeness to 82.5% in Session 1 which means Excellent and to 86.8% in Session 2 which means Excellent.

## 5. REFERENCE

- Aryawan, I Made Prasetya., Agung A.A Gede., dan Sudhita, I Wyn Romi. 2015. "Pengembangan Multimedia Interaktif Dengan Model Waterfall Pada Mata Pelajaran IPA Kelas VII" *Journal Edutech Universitas Pendidikan Ganesha*. 3 (1): 1-10.
- Darmawan, Deni. 2013. *Teknologi Pembelajaran*. Bandung: PT Remaja Rosdakarya.
- Daryanto. 2013. *Media Pembelajaran*. Yogyakarta: Gava Media
- Muhammad Naseer dan Gede Harsemadi. *Sistem Multimedia*. 2013. Yogyakarta: CV. Andi Offset.
- Dewi Ni Kadek Ria Anggriani., Jampel, I Nyoman., dan Agung A.A. Gede. 2015. "Pengembangan Multimedia Pembelajaran Interaktif IPA Dengan Model Assure Untuk Siswa Kelas VII SMP 1 Sawan". *E-Journal Edutech Universitas Ganesha*. 3(1): 1-11.
- Gumilang, Afdal Aria. 2017. "Pengembangan Multimedia Pembelajaran Interaktif untuk Kelas V Sekolah Dasar Mata Pelajaran IPA Materi Pengenalan Struktur Bumi". *EJournal Prodi Teknologi Pendidikan*. 6(2): 120-132.
- Hana, Ulya Shoffa. 2016. "Pengembangan Multimedia Interaktif Mapel IPA untuk Siswa Kelas V Di SDN Kuwaron 1". *E-Journal Prodi Teknologi Pendidikan*. 5(5): 54-61.
- Kaewkiriya, Thongchai. 2013. "A Design And Development Of E-Learning Content For Multimedia Technology Using Multimedia Game". *International Journal of Software Engineering & Applications (IJSEA)*. 4(6): 61-69.
- Permendikbud Nomor 21 tahun 2016 tentang Standar Isi untuk Satuan Pendidikan Dasar dan Menengah.
- Permendiknas Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional.
- Sugiyono. 2012. *Statistika untuk Penelitian*. Bandung: Alfabeta.
- \_\_\_\_\_. 2015. *Metode Penelitian & Pengembangan: Research and Development*. Bandung: Alfabeta.
- Pratama, I Gede Eka., Suwatra., Sudhita Romi. 2014. "Pengembangan Multimedia Pembelajaran Interaktif Mata Pelajaran Ilmu Pengetahuan Alam Kelas V SD Negeri 4 Peliatan". *E-Journal Edutech Universitas Pendidikan Ganesha*. 2(1): 1-10.

# The Correlations Between Students' Interest and Parental Guidance with Learning Outcome of Social Science

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## Abstract

This investigation was aimed at finding out the relations between students' interests and parents' guidance with grade V students of SD Gugus Melati of Semarang City's social science learning outcome. This is correlational study. The targeted population consisted of 145 grade V students of SD Gugus Melati of Semarang City, and proportional random sampling, I choose 43 students as samples. The data were collected through questionnaire fulfilling, interviews, and documentation. While I used students' interests questionnaire and parental guidance interview sheet as research instruments. I applied normality test and linearity test as the requirement analysis. And I applied simple linear regression analysis, multiple linear regression analysis, and coefficient of determination. The study shows that: (1) the relations between students' interests and social science learning, I got score:  $r_{total}$  is bigger than  $r_{table}$  ( $0.682 > 0.301$ )  $H_a$  is acceptable, (2) the relations between parents' guidance and social science learning outcome, I got score:  $r_{total}$  is bigger than  $r_{table}$  ( $0.819 > 0.301$ )  $H_a$  is acceptable, (3) out the relations between students' interests and parents' guidance with students' social science learning outcome I got score:  $r_{total}$  is bigger than  $r_{table}$  ( $0.739 > 0.301$ ), thus  $H_a$  is acceptable.

Keywords: Variation, Teaching, Interest, The Results, Learning

## 1. INTRODUCTION

Education is the need that must be met by human being in order to live his life well in the society. Parents play important role in their children's education and learning process as included in *Undang-Undang Nomor 20 Tahun 2003* Chapter IV Article 7 in which written, "*orang tua dari anak usia wajib belajar, berkewajiban memberikan pendidikan dasar kepada anaknya*" (Parents of the compulsory-education-age children are obliged to provide their children with the primary education). Parents, which usually comprise father and mother, have great responsibility for providing their children with the best education. The education in the home environment will be provisions for the children to grow and develop in the wider sphere i.e. school and society (Sisdiknas, 2003: 5).

The social science learning success is influenced a lot by several factors, i.e. the one inside the student (internal factors) and the one outside of the students (external factors). The major external factor is the family. The home environment is the initial learning environment because it is at home a child gets lessons and guidance. It is called the major sphere because a child spends most of his days at home. Therefore, the child accepts most lessons from home. Thus, it is obvious that the first and the most important people responsible for the children's welfare and education are their parents (Hasbullah, 2015: 38).

In addition to the home environment, the internal factor having impact on his learning outcome is his interest. Slameto (2010: 180) revealed that the internal factor having great impact

on the students' learning process is his own concern. Because if the provided learning materials do not meet the students' curiosity, they will not study and learn seriously as they are not attracted. On the contrary, if the learning materials can meet the students' interest and concern, they will learn them more easily as the interest and curiosity will increase their learning frequency. The stronger or the closer the relations are, the greater their interest will be (Djali, 2015: 121).

Based on the field study and the interviews with the teacher of the grade five in SDN Gugus Melati on the factors having impact on grade five students' learning outcome in SDN Gugus Melati, the parents have not provided their children with the best guidance, particularly in relation to the school lessons as well as the students' learning outcome in social science subjects is not optimum as shown in the suboptimum averaged final score of social science in the odd semester. This was caused by insufficient learning guidance provided by their parents. Parents' occupations and education degrees will have impact on the way they educate their children. The learning guidance will also have impact on the children's learning outcome. Therefore, the parents must actively guide their children when studying at home in order that the children's learning process will run optimally as well as creating the best learning outcome.

## 2. METHODS OF RESEARCH

The investigation applied the quantitative approach through correlative study. Suharsimi Arikunto (2010: 4) defines correlative study as the research made to investigate the intensity of the

relation between two or more variables, without making changes, putting the additions or manipulating the existing data. This investigation has two independent variables and one dependent variable. The independent variables are the students' concern and the parental guidance. While the dependent one is the social science learning outcome.

The target population of the research is 145 grade five students of SDN Gugus Melati Kota Semarang. I took 30% of the target population as samples, which is equal to 43.5 rounded off into 43. I applied proportional random sampling as the sampling method.

The data collection techniques used in this research is questionnaire fulfilling, interview, and documentation. The instruments used in this research are questionnaires on the students' interests, questionnaires on the parental guidance, and interview questions on the parental guidance. The prerequisites testing used in this research are normality test and linearity test. Through the prerequisites testing, we can find out that the data are distributed normally and linearly.

The final data analysis/hypotheses testing of this research use simple correlation analysis, double correlation analysis, and coefficient of determination using SPSS version 21. Hypotheses of this research are the followings.

Ha: There is positive and significant relation between students' concern and grade five students of SDN Gugus Melati Kota Semarang's learning outcome of social science subject.

Ha : There is positive and significant relation between parental guidance and grade five students of SDN Gugus Melati Kota Semarang's learning outcome of social science.

Ha: There is positive and significant relation between students' concern and parental guidance and grade five students of SDN Gugus Melati Kota Semarang's learning outcome of social science subject.

### 3. THE RESULTS AND THE EXPLANATION

#### Descriptive Statistic Analysis

Variable of students' interest in this research uses five indicators: (1) attraction, (2) joyfulness, (3) attention, (4) participation, and (5) enthusiasm/awareness. The following is the conclusion of the research analysis of students' interest:

**Table 1** Distribution of the Answers to Questionnaire on Students' Interest

Scale	Grade	Frequency	Percentage	Average
121 – 148	Very High	40	93%	133.3
93 – 120	High	3	7%	
65 – 92	Quite High	0	0%	
37 – 64	Less High	0	0%	
Total		43	100%	Very High

Variable of parental guidance in this research uses six indicators: (1) guiding the best way to learn and study, (2) determining time to study, (3) helping solve the learning problems, (4) providing the learning facilities, (5) giving motivations to study, and (6) building the learning habits. The following is the conclusion of the research analysis of parental guidance:

**Table 1** Distribution of the Answers to Questionnaire on Parental guidance

Scale	Grade	Frequency	Percentage	Average
131 – 160	Excellent (A)	27	63%	133
101 – 130	Good (B)	15	35%	
71 – 100	Fair (C)	1	2%	
41 – 70	Poor (D)	0	0%	
Total		43	100%	Excellent

Of the Variable of grade five students of SDN Gugus Melati Kota Semarang's learning outcome of social science subject, the followings are the categorization of the Mid-even semester test marks in 2016/2017 Academic Year.

**Table 3** Score of Social Science Subject Learning Outcome

Scale	Grade	Frequency	Percentage	Average
80-100	Excellent (A+)	37	86%	82,9
70 – 79	Very Good (A)	6	14%	
60 – 69	Good (B)	0	0%	
50 – 59	Fair (C)	0	0%	
0 – 49	Poor (D)	0	0%	Excellent
Total		43	100%	

## Initial Data Analysis / Prerequisite Test

### 1. Normality Test

Normality test is used to analyze if data in each analyzed variable is distributed normally or abnormally (Sugiyono, 2013: 241). The testing process uses One Sample Kolmogrov-Smirnov Test formula SPSS version 21. Data are described as normally distributed when the significance score  $> 0.05$  (Priyatno, 2016: 42).

**Table 4** Result of Normality Test

Variable	Sig, K-S	Sig Score (5%)	Remarks
Students' Interest (X <sub>1</sub> )	0.200	0.05	Normal
Parental guidance (X <sub>2</sub> )	0.200	0.05	Normal
Social Science Learning Outcome (Y)	0.200	0.05	Normal

According to the table above, the three have Kolmogrov-Smirnov Test significance score  $> 0.05$  therefore we can draw a conclusion that the research data are normally distributed.

### 2. Linearity Test

The purpose of linearity test is to find out if the acquired data are linear or unlinear (Sugiyono, 2013: 265). Linearity test is calculated using SPSS version 21 by using Test for Linearity. Two variables can be said as having linear relations when the significance score on Deviation from Linearity is more than 0.05.

**Tabel 5** Result of Linearity Test

Variable	Sig, Linearity	Sig Deviation from Linearity	Sig. Score (5%)	Remarks
(X <sub>1</sub> ) (Y)	0.000	0.974	5%	Linear
(X <sub>2</sub> ) (Y)	0.000	0.121	5%	Linear

According to the table above, the two relations have score of Deviation from Linearity as much as more than 0.05. Then we can say that the two variables have linear the relation.

## Final Data Analysis / Hypothesis Test

### 1. Relation between Students' Interest and Social Science Learning Outcome

Based on the result of the hypothesis test and Product Moment correlation, it was found out that  $r_{\text{count}}$  is 0.682 and  $r_{\text{table}}$  is 0.301 and significance score is  $0.000 < 0.005$ . This shows that  $r_{\text{count}} < r_{\text{table}}$ , which means that there is positive and significant relation between

students' interest and social science learning outcome of the students, and it is included in level of strong relation. The calculation of the determination coefficient is 46.5%. This means that the contribution of the students' interest to the social science learning outcome about 46.5% and 53.5% is influenced by another factor which was not investigated in this research.

Based on the calculation of the correlation and determination coefficient previously explained, I made a conclusion the students' interest has positive and significant relation with social science learning outcome. The students' interest must be generated and developed. In addition, the interest in learning is not an existing thing but it is something that must be generated as the interest is not something that was meant to but it must be fought for. This is as stated by Djamarah (2011:166) who explains that interest basically is acceptance of a relation between self and something outside the self. The stronger and closer the relation is, the more the interest will be.

The research shows that the students' interest is one of the factors having impact on the social science learning outcome, hence students' interest and social science learning outcome are the interrelated variables.

### 2. Relation between Parental Guidance and Social Science Learning Outcome

Based on the result of the hypothesis test and Product Moment correlation, it was found out that  $r_{\text{count}}$  is 0.819 and  $r_{\text{table}}$  is 0.301 and significance score is  $0.000 < 0.005$ . This shows that  $r_{\text{count}} > r_{\text{table}}$ , which means that there is positive and significant relation between parental guidance and social science learning outcome of the students, and it is included in level of very strong relation. The calculation of the determination coefficient is 67.1%. This means that the contribution of the parental guidance to the social science learning outcome about 67.1% and 32.9% is influenced by another factor which was not investigated in this research. Based on the calculation of the correlation and determination coefficient previously explained, I made a conclusion the parental guidance has positive and significant relation with students' social science learning outcome. Due to parental guidance provided by the parents to their children at home, the children will be motivated to study which will have direct impact on social science learning outcome acquired by the students. This is in line with Yasa's statement (2014: 49); the role of parents in guiding their children at home is to provide mentoring. Direct mentoring means helping their children understand the learning

materials, to help their children do the homework assigned by the teacher.

The research shows that parental guidance is one factor that has great impact on the social science learning outcome. Hence parental guidance and social science learning outcome are the interrelated variables.

### 3. Relation between Students' Interest and Parental Guidance Social Science Learning Outcome

Based on the result of the hypothesis test using double correlation analysis, it was found out that  $r_{\text{count}}$  is 0.739 and  $r_{\text{table}}$  is 0.301 and significance score is  $0.000 < 0.005$ . This shows that  $r_{\text{count}} > r_{\text{table}}$ , which means that there is positive and significant relation between students' interest and parental guidance with students' social science learning outcome, and it is included in level of strong relation. The calculation of the determination coefficient is 54.5%. This means that the contribution of the students' interest and parental guidance to the social science learning outcome about 54.5% dan 45.5% is influenced by another factor which was not investigated in this research.

Based on the calculation of the correlation and determination coefficient previously explained, I made a conclusion the students' interest and parental guidance has positive and significant relation with students' social science learning outcome. There are several factors having impact on the learning outcome. Students' interest is the internal factor, while the parental guidance is the external factor. This is in line with the opinion of Wasliman (Susanto, 2013: 12) who stated that the learning outcome achieved by the students is the end result of interaction between various impacting factors, either internal factors deriving from inside the student himself or the external factor deriving from outside of the students' selves.

## 4. CONCLUSION

Based on the research and its exposition, the conclusion can be drawn as follows: (1) there is positive and significant relation between students' interest and social science learning outcome. It is proven by the correlation score about 0.682 and it is included in level of strong relation; (2) the parental guidance has positive and significant relation with students' social science learning outcome. It is proven by the correlation score about 0.819 and it is included in level of very strong relation; (3) there is positive and significant relation between students' interest and parental guidance with students' social science learning outcome. Score of correlation coefficient is 0.739 and it is included in level of strong relation.

## 5. REFERENCES

- Arikunto, Suharsimi. 2010. *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.
- Arikunto, Suharsimi. 2013. *Manajemen Penelitian*. Jakarta: Rineka Cipta.
- Djaali. 2015. *Psikologi Pendidikan*. Jakarta: Bumi Aksara.
- Djamarah, S. B. dan Zain, A. 2014. *Strategi Belajar Mengajar*. Jakarta: Rineka Cipta.
- Hasbullah. 2015. *Dasar-dasar Ilmu Pendidikan*. Jakarta: PT Raja Grafindo Persada.
- Priyatno, D. 2016. *SPSS Handbook Analisis Data, Olah Data, & Penyelesaian Kasus-kasus Statistik*. Yogyakarta: MediaKom.
- Slameto. 2010. *Belajar dan Faktor-Faktor yang Mempengaruhinya*. Jakarta: Rineka Cipta.
- Sugiyono. 2015. *Statistika untuk Penelitian*. Bandung: Alfabeta.
- Sugiyono. 2013. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Susanto, A. 2013. *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Prenada media Group.
- Undang-Undang Republik Indonesia Nomor 20 Tahun 2003.
- Yasa, Gede Sedana. 2014. *Bimbingan Belajar*. Yogyakarta



# Effectiveness Of Van Hiele Theory-Based STAD Method To Mathematics Learning Outcome

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## Abstract

This study was being underlied by Mathematics learning outcomes of the second grade of SDN Gugus Gajah Mada which is low. This study was intended to know the effectiveness of STAD model based from van hiele theory towards mathematics subject learning achievement of the 2nd grade students of Elementary Schools (SD) Cluster Gajah Mada Wonogiri. To achieve this objective, this research used quasi experimental research with the type of nonequivalent control group design. The subjects of this study were the 2nd grade students of SD Cluster Gajah Mada Wonogiri. They were sampled by using cluster random sampling. As the data were collected, they were analyzed by using one tailed proportion test, namely z test, t test, gain test and N -gain. The t test shows the comparison of count = 2.98 > ttable = 1.68 which meant that Ho is reject, while Ha is accept. The results showed that the mathematics learning achievement of the 2nd grade students of SD Cluster Gajah Mda Wonogiri who achieved the treatment of STAD model based from van hiele theory achieved the passing grade (KKM) score, and STAD model based from van hiele theory than TPS.

Keywords: STAD; Van Hiele Theory; effectiveness; mathematics.

## 1. INTRODUCTION

Curriculum for Primary School/Islamic Primary School contains the subjects designed to develop the competencies in order to meet the the school necessities to provide the students with various critical thinking skills. In the Decree of Minister of Education (No.22/2006) on Standard of Content for Primary and Secondary Schools, it is stated that subject of Mathematics needs to be provided to all the students beginning from primary school to provide the students with logical, analytic, systematic, critical, and creative thinking as well as the collaboration skill. Those competencies are needed in order that the students will get, process, and use information to survive in the always changing, uncertain, and competitive life.

The problem of the poor learning outcome of the students in the implementation of Mathematics learning is supported by the data of the initial test result of the subject of Mathematics. From the acquired data of the initial test result, overall, of 198 students, 39 (19.7%) meet Minimum Mastery Criteria, and the remaining 159 (80.3 %) have not met Minimum Mastery Criteria. The determined Minimum Mastery Criteria is 75. The initial test conducted aimed to find out the students' initial ability in the subject of Mathematics for the lessons in Semester I. The initial test conducted to the students consists of 6 questions, i.e. C1 to C6 questions (remembering, understanding, applying, analyzing, evaluating, and creating or making) in cognitive area according to Bloom Taxonomy.

The poor Mathematics learning outcome of the students until today should be fixed in order that the education in Indonesia gets better. With many types of learning models, theories of learning, and the

existing approachesm the teacher should apply it in his/her teaching. One of the applicable learning methods to solve the issue is Student Team Achievement Division (STAD). A learning method will be helpful when supported with a theory of learning,

One of theories supporting the Mathematics learning is Van Hiele Theory. Van Hiele Theory is a theory of Mathematics which talks about the lesson of geometry.

The research concerning the effectiveness of *Student Team Achievement Division* is supported by the study conducted by Oktavianti (2014: 96-102) showing that the application of cooperative learning mainly mass media-guided and mass media-assisted-based STAD dan *Snowball Drilling* will improve the students' activeness and achievement on subject of Social Science of grade III students in SD Tumpangkrasak 2 District of Jati Kudus Regency. Another study supporting the effectiveness of *Student Team Achievement Division* method is the one conducted by Hastuti (2017: 133-143) showing that there is a type of cooperative learning method called *Student Teams Achievement Division* (STAD) able to improve the discussion skill in subject of Indonesian language of grade IV students in SDN 01 Adirejo.

Based on the fact above, then the research question of the research in general is: Does Van Hiele theory-based STAD effectively raise the Mathematics learning outcome of the grade II students in SDN Gugus Gajah Mada Wonogiri?

The objective of this experimental research in general is to find the effectiveness of Van Hiele theory-based STAD to Mathematics learning outcome of the grade II students in SDN Gugus Gajah Mada Wonogiri.

## 2. RESEARCH METHODS

Design applied in this research is quasi experimental design in nonequivalent control group design. This type of experimental design is the development of true experimental design, which is difficult to apply. It is called quasi experimental as is this design, I could not control all external variables that influence the process of the experiment (Sugiyono, 2015: 116). The target population of this research is the grade II students of SDN Gugus Gajah Mada Wonogiri i.e. 198 students.

The sampling method applied in this research is cluster random sampling, and I chose two samples of the target population, i.e. one experimental group and one control group. The two samples are grade II B students of SDN 1 Gedong i.e. 23 students as experimental classroom, provided with STAD method and grade II students of SDN 3 Gemawang, i.e. 22 students as control classroom, provided with TPS method. Independent variable (X) in this research is STAD method (variable X1) and NHT as control classroom (variable X2). The dependent variable (variable Y) in this research is Mathematics learning outcome. This research uses several data collection methods, i.e., Documentation, interview, observation and test. Instruments needed in this research are quantitative instrument (test) to measure the learning outcome. The learning outcome data then got analyzed using the learning completeness test using one party proportional test, the effectiveness test using right party t-test and learning outcome raise test using N-Gain.

## 3. RESULTS AND DISCUSSION

The research end results comprise the pre-research data analysis, initial data analysis, and final data analysis. Pre-research data analysis was conducted to find out the early situation of the target population by doing data analysis, i.e. normality test and homogeneity test. The pre-research data is then presented in the following table:

**Table 1.** Pre-Research Data

Class	N	Average	Deviation Standard	Best Mark	Poorest Mark
SD N I Gedong A	25	70	20.31	95	15
SD N I Gedong B	23	42.65	18.55	90	25
SD N Gedong III	11	42	15.03	65	25
SD N Gedong IV	20	39.65	15.24	65	20
SD N Gedong V	13	46.53	11.25	65	30
SDN Gemawang I	18	39.72	20.96	85	20
SDN Gemawang II	10	35	14.52	55	15

SDN Gemawang	22	42.5	18.62	95	20
SD N Pondok I	29	44.5	18.38	75	15
SD N Pondok II	14	30	13.15	60	15
SD N Pondok IV	9	22..22	9.71	45	15

Normality test is used to find if the samples are normally distributed or not. The normality testing on the pre-research data against the population uses Lilliefors test because  $N < 30$ . Criteria of the testing is that if  $L_{count} < L_{table}$ , then it can be said that the data are normally distributed. The normality test result of pre-research data can be seen as follows.

**Table 2.** Normality Test of Pre-Research Data

No.	Class	L Count	L Table	Test Decision	Criteria
1.	SD N I Gedong A	0.06	0.17	Ho Accepted	Normally Distributed
2.	SD N I Gedong B	0.06	0.19	Ho Accepted	Normally Distributed
3.	SD N Gedong III	0.03	0.24	Ho Accepted	Normally Distributed
4.	SD N Gedong IV	0.001	0.19	Ho Accepted	Normally Distributed
5.	SD N Gedong V	0.005	0.23	Ho Accepted	Normally Distributed
6.	SDN Gemawang I	0.05	0.22	Ho Accepted	Normally Distributed
7.	SDN Gemawang II	0.05	0.25	Ho Accepted	Normally Distributed
8.	SDN Gemawang III	0.08	0.19	Ho Accepted	Normally Distributed
9.	SD N Pondok I	0.05	0.17	Ho Accepted	Normally Distributed
10.	SD N Pondok II	0.05	0.22	Ho Accepted	Normally Distributed
11.	SD N Pondok IV	0.09	0.27	Ho Accepted	Normally Distributed

Homogeneity test was conducted to find out if the population has the similar or different variants in order to get assumption that the homogenous or heterogeneous population has nearly equal ability in case of absorbing Mathematics lessons. The homogeneity test in this research uses the Barlett method. The testing criterion is if  $\chi^2_{count} < \chi^2_{table}$ , then we can say that the data are homogeneous. The homogeneity test result of the pre-research data are presented as follow.

**Table 3.** Homogeneity test Pre-Research Data

No.	Class	$\chi^2$ Count	$\chi^2$ Table	Test Decision	Criteria
1.	SD N I	13.69	18.3	Ho	Homogenous

	Gedong A	Accepted
2.	SD N I Gedong B	
3.	SD N Gedong III	
4.	SD N Gedong IV	
5.	SD N Gedong V	
6.	Gemawang I SDN	
7.	Gemawang II SDN	
8.	Gemawang III SD N	
9.	Pondok I SD N	
10.	Pondok II SD N	
11.	Pondok IV SD N	

After conducting the pre-research data testing, then pretest is conducted with 10 essay-type questions. The pretest result is shown as follows.

**Table 6.** Initial Data of Research

Class	N	Best Mark	Poorest Mark
Experimental	22	76	41
Control	21	76	30

The normality test is used to find out if the employed data is distributed normally or abnormally. Because the amount of the samples in this research is less than 30, the formula which should be used is Liliefors test. Normality testing of the initial data of the research (pretest) against the samples (grade II students of SDN I Gedong 2B , SDN III Gemawang).

**Table 7.** Normality Test of the Initial Data of Research

No.	Class	Amount of Students	Deviation Standard	Average	L counttable	L	Criteria
1.	Experimental	22	59.09	10.37	0.11	0.19	Normally Distributed
2.	Control	21	56.14	9.74	0.11	0.19	Normally Distributed

Homogeneity test is conducted to find if the data variants from the analyzed samples are homogeneous or heterogeneous. The employed homogeneity test is F-test to test homogeneity of the variants of the two independent samples.

**Table 8.** Homogeneity Test of Initial Data of Research

No.	Class	F <sub>count</sub>	F <sub>table</sub>	Test Decision	Criteria
1.	Experimental	1.13	2.1	Ho Accepted	Homogenous
2.	Control				

After conducting initial data testing of the research, then the treatment was carried out for four sessions in the experimental classroom using Van Hiele Theory-based STAD and in the control classroom using TPS method. Subsequently, posttest is conducted using the similar questions with the ones in the pretest as the instrument, i.e. 10 essay questions. The posttest result is as follows.

**Tabel 10.** Final Data of Research

Class	N	Best Mark	Poorest Mark
Experimental	22	89	76
Control	21	83	61

Normality test is used to find if the employed data comprise the normally distributed data or not. As the samples amount of this research is less than 30, then the employed formula is Liliefors test. Normality testing on the final data of the research against the samples (grade II students of SDN I Gedong 2B , SDN III Gemawang).

**Table 11.** Normality Test of Final Data of Research

No.	Class	Amount of Students	Deviation Standard	Average	L counttable	L	Criteria
1.	Experimental	22	81.81	4.81	0.175	0.19	Normally Distributed
2.	Control	21	77.61	4.39	0.165	0.19	Normally Distributed

The homogeneity test was conducted to find if the data variants of the analyzed samples are homogenous or not. The conducted homogeneity test is F-test because it is used to test the homogeneity of variants of the two independent samples. The result of the homogeneity test is shown as follows.

**Table 12.** Uji Homogenitas Data Akhir Penelitian

No.	Class	F <sub>count</sub>	F <sub>table</sub>	Test Decision	Criteria
1	Experimenta l	1.19	2.1	Ho Accepte d	homogenu s
2	Control				

Hypothesis test is used to verify the acceptability of the proposed hypothesis. Hypothesis testing in this research consists of hypothesis 1 and hypothesis 2 tests. Every hypothesis testing consists of the learning mastery test using the one party proportion test, effectiveness test using right tailed t-test, and the learning outcome progress test using N-Gain.

### (1) Hypothesis 1 Test

The learning mastery test aims to reveal if the test result using Van Hiele theory-based STAD method will help to meet the Minimum

Mastery Criteria. The learning mastery indicator is individual mastery achievement and collective mastery. The individual mastery is based on the Minimum Mastery Criteria, i.e. 75. While the collective mastery criterion according to Djamarah (2010:101) is the percentage of the students meeting the minimum collective mastery, i.e. 75% or more, of the amount of the students engaged in the learning process.

**Table 13.** Test of Learning Mastery

School	Amount of Student	Percentage	$Z_{count}$	$Z_{table}$	Remarks
SD N I Gedong 2B	22	100%	2.70	1.64	Collectively Mastering

Based on the table above, we can see that in the experimental classroom, it is acquired:  $z_{count}=2.70$ .  $z_{table}$  of one tailed proportion test at the significance rate 0.05 equal 1.64. In the experimental classroom,  $z_{count} > z_{table}$ , it was shown that the experimental classroom meets the learning mastery criteria about 75% or more.

## (2) Hypothesis Test 2

Test of learning effectiveness was conducted to find the more effective learning method between Van Hiele theory-based STAD in the classroom

**Table 14.** Test of Learning Effectiveness

No.	Class	N	Average	T count	T table	Criteria
1.	Experimental	22	81.81	2.98	1.68	Ho rejected
2.	Control	21	77.61			

Based on the test analysis, it is acquired  $t_{count} = 2.98$  and  $t_{table} = 1.68$  with  $dk = n1 + n2 - 2 = 22 + 21 - 2 = 41$  and the significance rate at 0.05. As  $t_{count} > t_{table}$ , then the conclusion can be drawn that  $H_0$  is rejected and  $H_a$  is accepted. This analysis shows that the Mathematics learning outcome of grade 2B students of SDN I Gedong applying STAD is better than the control classroom, i.e. grade 2 students of SDN III Gemawang applying TPS method.

### a. Assessment of learning Outcome Improvement

Gain assessment is used to find the effectiveness of Van Hiele theory-based STAD and TPS methods. Gain is the proper method to analyze the results of *pretest* and *posttest*, and is a better indicator to show the effectiveness rate

of the treatment and posttest result. The applied gain is normalized gain (*N-gain*).

**Table 15.** *N-Gain* Assessment in Experimental Classroom and Control Classroom

No.	Classroom	Amount of Students	Average		Individual N-Gain	Average Classroom N-Gain	Criteria
			Pretest	Posttest			
1.	Experimental	22	59.09	81.8	12.02	0.54	Moderate
2.	Control	21	56.14	77.61	9.99	0.47	Moderate

To support the learning outcome improvement using N-Gain then N-Gain homogeneity then right tailed t-test. The result of homogeneity test is shown below.

**Table 16.** Homogeneity Test of *N-Gain* Point Experimental Classroom and Control Classroom

No.	Class	$F_{count}$	$F_{table}$	Test Decision	Criteria
1.	Experimental	1.04	2.1	Ho Rejected	Homogenous
2.	Control				

## 2. Control

Then the margin test of average N-Gain point using right tailed t-test and the results is presented below.

**Table 18.** Assessment of Learning Effectiveness of *N-Gain* point in Experimental Classroom and Control Classroom

No.	Class	N	Average	T count	T table	Criteria
1.	Experimental	22	0.546	2.22	1.68	Ho rejected
2.	Control	21	0.476			

Based on the assessment of hypothesis 2 using z-test, t test and N-Gain test it can be concluded that Van Hiele theory-based STAD is more effective than NHT in control classroom.

The conducted study shows that the application of Van Hiele theory-based STAD method in Mathematics learning will improve the students' learning outcome. The STAD is chosen because of its strengths in the learning process, i.e. the students cooperate to reach the goal by giving high respect to the group norms, the students actively help and motivate for mutual success, actively plays a role as peer teacher to improve the collective success, inter-students interaction is in line with their skill improvement in expressing opinion, improve the individual and group skills, uncompetitive, and do not keep the revenge (Shoimin, 2014:189).

The research is also supported by another research previously conducted, i.e. the study conducted by Subrata (2016: 72-78), showing that the learning of Natural science applying cooperative method mainly STAD type can increase the students' activeness in the learning. The students' activeness in cooperative learning mainly STAD type can improve the students' learning outcome. The research conducted by Maharani (2013: 1-6) shows that the students' learning outcome after answering the questions in the lesson of breadth and volume of pyramid and prism in the classroom applying character-building-based STAD method assisted by learning CDs reach the learning mastery. And the students' learning outcome in the classroom applying character-building-based STAD method assisted by learning CDs is better than the students in the classroom applying CTL method in solving the problem of counting breadth and volume of pyramid and prism at grade VIII SMP Negeri 1 Lasem.

The research conducted by Yilmaz and Koparan (2016: 129-141) shows that the students' marks before applying Van Hiele theory-based STAD method was still poor. After the application of Van Hiele theory-based STAD method, however, there is a significant change of marks. It can be concluded that the application of Van Hiele theory-based STAD method will improve the students' and the teachers' skill. Another research conducted by Suharjati (2016: 64-69) is also relevant with this research, which shows that the application of cooperative method mainly STAD type will improve the students ability to identify the characters of the polyhedrons. The research conducted by Novianti (2013: 272-276) the he study result that STAD method has impact on learning of Mathematics compared to conventional method. The research conducted by Safrina (2014: 9-20) states that the improvement of ability to solve the problem of geometry using the Van Hiele theory-based cooperative learning is better than conventional learning.

The research conducted by Al-Ebous (2016: 87-98) shows that the application of Van Hiele theory on the learning of concept geometry. The research conducted by Amrina (2013: 42-51) states that the learning outcome of geometry in the classroom applying Van Hiele theory is better than kelas learning outcome of geometry in the classroom applying conventional learning.

#### 4. CONCLUSION

Based the conducted researches, a conclusion can be drawn that Mathematics learning outcome of the grade II students of SDN Gugus Gajah Mada Wonogiri that applied Van Hiele theory-based STAD can help the student meet Learning Mastery Criteria, Van Hiele theory-based STAD is more

effective than TPS method, the students' activeness in experimental and control classrooms after applying Van Hiele theory-based STAD and TPS method improves, and the teachers' activeness in experimental and control classrooms after applying Van Hiele theory-based STAD and TPS method improves too.

#### 5. REFERENCES

- Al-ebous, Tahani. 2016. Effect of the Van Hiele Model in Geometric Concepts Acquisition: The Attitudes towards Geometry and Learning Transfer Effect of the First Three Grades Students in Jordan. *Journal International Education Studies*. Volume 9, Nomor 4, 87-98.
- Amrina, Rusyda. 2013. Pengaruh Teori Belajar Van Hiele Terhadap Hasil Belajar Geometri Siswa Kelas VII SMP. *Jurnal Pendidikan Matematika*. Volume 1, Nomor 1, 42-51.
- Hastuti, Eka Fitri. 2017. Penerapan Model Pembelajaran Kooperatif Tipe STAD untuk Meningkatkan Kemampuan Berpendapat. *Jurnal Pesona*. Volume 3, Nomor 2, 133-143.
- Maharani, Yosela Septi. 2013. Keefektifan Model Student Teams-Achievement Division Berbantuan CD Terhadap Kemampuan Pemecahan Masalah. *Jurnal Pendidikan Matematika UNNES*. Volume 2, Nomor 3, 1-6.
- Novianti, Idha. 2013. Experimentation Cooperative Learning Student Team Achievement Division (STAD) Type Viewed From Learning Motivation. *Asian Journal of Education and e-Learning*. Volume 1, Nomor 5, 272-276.
- Oktavianti, Ika. 2014. Penerapan Cooperative Learning Tipe STAD dan Snowball Drilling Untuk Meningkatkan Keaktifan dan Prestasi Belajar IPS. *Jurnal Refleksi Edukatika*. Volume 4, Nomor 2, 96-102.
- Peraturan Menteri Pendidikan Nasional Republik Indonesia No. 22 tahun 2006 Tentang Standar Kompetensi dan Kompetensi Dasar Tingkat SD/MI.
- Safrina, Kusnul. 2014. Peningkatan Kemampuan Pemecahan Masalah Geometri melalui Pembelajaran Kooperatif Berbasis Teori Van Hiele. *Jurnal Didaktik Matematika*. Volume 1, Nomor 1, 9-20.
- Subrata. 2016. Penerapan Pembelajaran Kooperatif Tipe STAD pada Materi Listrik Statis untuk Meningkatkan Aktivitas dan Hasil Belajar Peserta Didik. *Jurnal Penelitian Pembelajaran Fisika*. Volume 7, Nomor 1, 72-78.
- Sugiyono. 2015. *Metode Penelitian Pendidikan*. Bandung: Alfabeta

Suharjati. 2016. Penggunaan Model STAD Dalam Proses Pembelajaran Materi Ajar Sifat Bangun. *Jurnal Penelitian Pendidikan Indonesia* (JPPI). Volume 1, Nomor 2, 64-69.

Undang-Undang Republik Indonesia No. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional.

Yilmaz, Gul Kaleli dan Timur Koparan. 2016. The Effect of Designed Geometry Teaching Lesson to the Candidate Teachers' Van Hiele Geometric Thinking Level. *Journal of Education and Training Studies*. Volume 4, Nomor 1, 129-141.

# The Impact of *Mind Mapping* On Grade Five Students' Social Science Learning Outcome

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## Abstract

The background of this research is the low of Social Science learning result of student because teachers have not applied the learning model in accordance with the regulation. This research aims to know the excellences of Mind Mapping learning model, know the difference learning result of control class and experiment class, test the effect of Mind Mapping learning model on Social Studies learning result. This research type is quasi experiment with Nonequivalent Control Group Design. Population in this research is SD Gugus Mahesa Jenar Ambarawa, Kabupaten Semarang. The sampling technique used is probability sampling with cluster sampling technique, it's selected SD N Lodayong 03 as experiment class, and SD N Lodayong 02 as control class. Mind Mapping learning model as the treatment that given in the experimental class, while the control class used Direct Instruction learning model. Learning result data was analyzed by independent sample t-test. Significance value  $> 0,05$  so that  $H_1$  is accepted, and  $t_{table}$  is bigger than  $t_{count}$  ( $14,152 > 1,672$ ) so there is a average difference learning result between experimental class and control class. In addition, the average pretest of the experimental class is 33, and the control class is 39. While the average posttest of the experimental class is 76, and the control class is 45. Thus, the increased of students' learning result in the experimental class is more than the control class. So, it can be concluded that Mind Mapping learning model is more excellent than Direct Instruction learning model, there are differences in Social Science learning result on experimental class and control class, and mind mapping learning model has an effect on increasing Social Science learning result at 5<sup>th</sup> grade SD Gugus Mahesa Jenar.

Keywords: Learning Result, Social Science, Mind Mapping Learning Model

## 1. INTRODUCTION

Law on the National Education System (No. 20/2003) article 1 states that education is conscious and planned system to create learning atmosphere and learning process in order that the students will active develop their self-potentials in order to have spiritual power, self-control capability, personality, intelligence, good character, and skills needed by him, the people, the nation-state. The education run in all education degrees as pointed out in Law on the National Education System (No. 20/2003) article 3 stating that "the education seeks to develop the skill and build the national character which is dignified to develop the students' potentials in order to have faithfulness to and fear of God, good character, be healthy, knowledgeable, skillful, creative, independent, and be democratic and responsible citizen".

Based on the recent fact, the quality of Indonesia education is declining shown by international rating placing the education in Indonesia at the low rank. Based on the data released by *United Nations Educational, Scientific and Cultural Organization* (UNESCO), the education in Indonesia ranked 10 of 14 developing countries. The lowering education in can be viewed from the poor learning outcome of the students. Learning outcome is the changes taking place on the students, either related to cognitive, affective, and psychomotor aspects as the end result of the learning activities (Susanto. 2013:5).

One of the subjects having low learning outcome is Social Science. Social Science is the learning program the *objected* to educate the students in order to be capable of recognizing and analyzing an issue or a problem from various points of view comprehensively (Supardan. 2015:16). In recent times there are some issues found on the Social Science learning in Primary Schools. The main issue frequently found concerning the Social Science learning is the one on the process standard. Based on Academic manuscript of the Policy Analysis of Curriculum of Social Science subject in 2007, there were still many issues found. Those issues are the ones on the content of curriculum documents, mainly on the Standard of Competencies (SK) and Basic Competencies (KD). In addition to the issue on curriculum documents, the issues concerning the curriculum implementation mainly suboptimum syllabus and lesson plans preparation, unbalanced structure of programs between time allocation and the number of Basic Competencies, one way learning, monotonous classroom-based assessment, as well as low quality teachers.

Consistent with Instruction of Minister of Education and Culture of Republic of Indonesia No. 65 in 2013 Chapter V on the assessment of learning process and outcome, the assessment of learning process applies the *authentic assessment* which assesses the students' readiness, learning process and outcome completely. The integratedness of the assessment of the three components will illustrate the students' capacities, the learning styles, and learning acquisitions or even will have instructional

effect and nurturant effect of the learning. In SD Gugus Mahesa Jenar, however, the competency of the Social Science subject is measured only based on the cognitive area.

The issues concerning the Social Science learning are supported by pre-research data taken by the researchers in SD Gugus Mahesa Jenar, Ambarawa District, Semarang Regency. Based on the observations and interviews in SD Negeri Lodoyong 03, Ambarawa District, Semarang Regency, the teacher has not applied the learning models complying with the regulations, i.e. problem-based, inquiry-based, project-based, and discovery-based learning. The communication taking place in the Social Science learning tends to be the one-way one so that the students tend to get bored and easily distracted. That fact is supported by the data of grade five students' Social Science learning outcome in SD Negeri Lodoyong 03 which shows that the average points for the Mid-Term test of the subject can be categorized as low, at the average point about 63.08. in addition, the fact is proven by the data which shows that most of the Grade V students in SD Negeri Lodoyong 03 Ambarawa District, do not meet the Minimum Mastery Criteria determined by the school. Of 26 students, there are 23 students (88.46%) getting the marks below the Minimum Mastery Criteria i.e. 70, while the remaining 3 (11.54%) got above Minimum Mastery Criteria points.

Based on the fact above, the purpose of the research is to create a learning innovation by applying an innovative learning in the Social Science learning to find out the impact of *Mind Mapping* on the Social Science learning in lesson of the combat to defend the national independence. *Mind Map* is the creative and effective way of note taking which literally will map the minds (Buzan, 2013:4). By applying the *Mind Mapping*, the students will actively be involved in drawing the *mind map* which later will be used to learn the materials they have acquired.

The relevant research with this research is the research made by Yunita Anggraeni and Drs. Soeprajitno, M.Pd. (Vol. 01 No. 01 in 2014) titled "*Pengaruh Penerapan Metode Mind Mapping terhadap Hasil Belajar Siswa pada Mata Pelajaran IPS Materi Pokok Perjuangan Melawan Penjajah dan Pergerakan Nasional Indonesia Kelas V SDN Janti 1 Waru-Sidoarjo*" (the Impact of the Application of Mind Mapping Method on the Students Learning Outcome on Social Science Subject in the Lesson of The Fight against the Colonialist and Indonesian National Movement by learnt by the Grade V Students in SDN Janti 1 Waru-Sidoarjo. The result of t-test acquired from *posttest* is that  $t_{count}$  2,790 is bigger that  $t_{table}$  about 1,671. From the data mentioned before, a conclusion can be drawn that there is significant difference between the learning outcome of the experimental

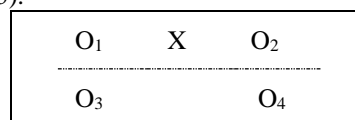
group applying *Mind Mapping* and controlled group applying the lecture method.

The study conducted by S O Adodo Ph.D. (Vol. 4 No. 6 in 2013) titled "*Effect of Mind-Mapping as a Self-Regulated Learning Strategy on Students' Achievement in Basic Science and Technology*" "*The study showed that mind-mapping strategy as a SRL, helped to improve students' performance in Basic Science and Technology (BST) and should be employed in the classroom as a better approach to teach BST as its potency is very clear in this study at improving learners' critical thinking and creative skills*",.

Based on the background explanation above, I will analyze it through the experimental research titled "*Pengaruh Model Pembelajaran Mind Mapping terhadap Hasil Belajar IPS Siswa Kelas V SD Gugus Mahesa Jenar Kecamatan Ambarawa Kabupaten Semarang*" (the Impact of the Application of Mind Mapping Method on the Grade V Students Learning Outcome on Social Science Subject in V SD Gugus Mahesa Jenar District of Ambarawa Semarang Regency).

## 2. RESEARCH METHODS

This *research* is *quasi experiment* using *nonequivalent control group design*. Experimental study is a research method which tries to find the relations between certain variable with another variable in a strictly controlled setting (Sugiyono, 2010:115).



**Picture 1.** Research Design *Nonequivalent Control Group Design*

The target opulation of this research is all primary schools in Gugus Mahesa Jenar District of Ambarawa, *Semarang* Regency. The sampling method used is *probability sampling* particularly cluster random sampling, I choose SD N Lodoyong 03 with 26 students as sample of experimental classroomroom, and SD N Lodoyong 02 with 32 students as sample of control classroomroom.

Variables of this research comprise of independent and dependent variables. The independent variables in this *research* are *Mind Mapping*, while the dependent variable is the learning outcome the lesson of Indonesian War for Independence in Social Science subject. The research data are collected observation, test, and documentation.



### 3. RESULT AND DISCUSSION

The purpose of the research is to find out the impact of the application of *Mind Mapping* on grade V students' Social Science learning outcome. The learning outcome analyzed in this study consists of affective, cognitive, and psychomotor learning outcomes. The following is the table of the affective and psychomotor learning outcomes in control and experimental classrooms.

**Table 1.** Students' Affective Learning Outcome

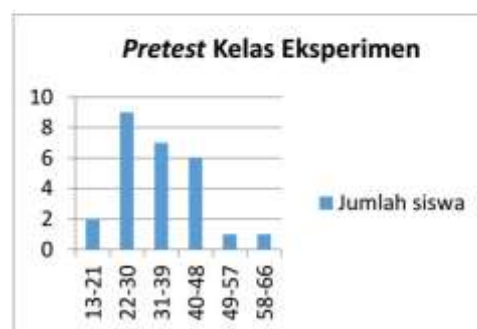
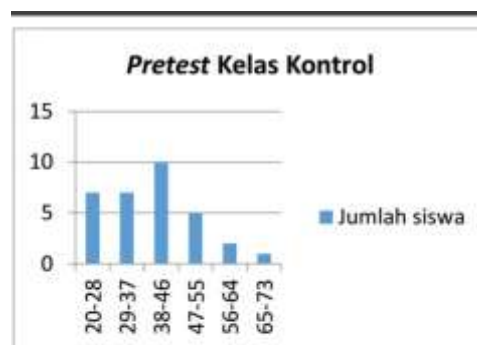
No.	Point	Control classroom	Experimental classroom
1.	A (Excellent)	12	9
2.	B (Good)	10	9
3.	C (Fair)	6	6
4.	D (Poor)	4	2
Total		32	26

**Table 2.** Students' Psychomotor Learning Outcome

No.	Point	Control classroom	Experimental classroom
1.	A (Excellent)	12	12
2.	B (Good)	12	9
3.	C (Fair)	8	4
4.	D (Poor)	-	2
Total		32	26

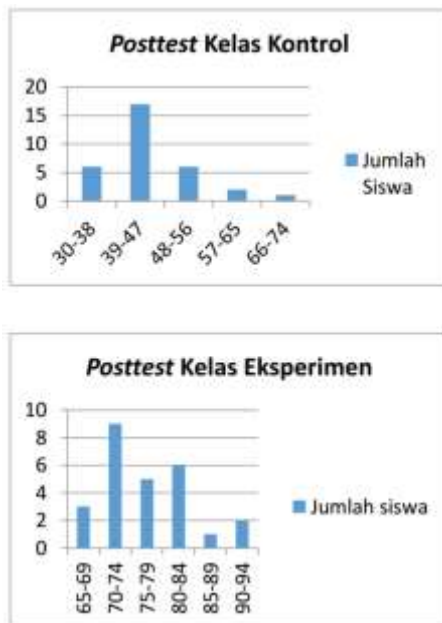
Based on the learning outcome data above, the students' manner and skill in control and experimental classrooms are good at average because most students' affective and psychomotor learning outcome are included in good and excellent categories..

The assessment of the students' cognitive learning outcome is acquired from the result of *pretest* and *posttest* conducted in both experimental and control classrooms. *Pretest* is the initial test taken to find out the students initial knowledge. The average result point of pretest in control classroom is 39.07, while the average pretest mark of the experimental classroom is 33.41. The following is the result of the pretest in control and experimental classrooms.



The similarity test was made using SPSS 24 and it is found the acquired  $t_{\text{count}}$  is -1857 with P-value around 0.069. P-value is bigger than  $\alpha = 0.05$ . That point then was compared to  $t_{\text{table}}$  point with  $df = n_1 + n_2 - 2 = 58 - 2 = 56$ . With  $df = 56$ , and if the margin of error is 5% and the accuracy rate is 95%, then  $t_{\text{table}} = 1.672$ . The point of  $t_{\text{count}}$  is less than  $t_{\text{table}}$ ,  $(-1857 < 1.672)$  so that  $H_0$  is accepted and  $H_1$  is rejected. It means that at the accuracy rate 95% a conclusion can be drawn that there is not any difference on the average initial knowledge between both experimental and control classrooms on the lesson of Indonesian War for Independence before the treatment on learning process was conducted.

*Posttest* is the initial test conducted to assess the students' initial knowledge. The average posttest result of the control classroom is about 44.68, while the average posttest result of the experimental classroom is about 76.19. The following is the result of the pretest in experimental and control classrooms.



Based on the above data, then the average posttest margin of the experimental and control classrooms are 31.51. The average posttest result of control classroom is lower than that of the experimental classroom. The datum is normally and homogenously distributed, and then the average posttest margin test between both experimental and control classrooms are conducted.

The *average* margin test then is processed using SPSS 24 and the result acquired is that  $t_{\text{count}}$  point acquired was 14.252 with *P-value* around 0.000. *P-value* is more than  $\alpha = 0.05$ . That value is then compared to  $t_{\text{table}}$  value with  $df = n_1 + n_2 - 2 = 58 - 2 = 56$ . With  $df = 56$ , and if the determined margin of error is 5% and the accuracy rate is 95%, then  $t_{\text{table}} = 1.672$ .

Value of  $t_{\text{count}}$  is less than  $t_{\text{table}}$ , ( $14.252 > 1.672$ ) so that  $H_1$  is accepted and  $H_0$  is rejected. It means that at the accuracy rate 95% a conclusion can be drawn that there is a difference on the average advance knowledge between both *control* and experimental classrooms on the lesson of Indonesian War for Independence after the treatment on learning process was conducted.

From the pretest result of cognitive learning in the experimental classroom mean value acquired is 33.41 while the *mean pretest* of the control classroom is 39.07. The initial condition was relatively similar on the both samples *before* getting treatment in the learning process, that the both class have low average pretest marks. From the posttest marks as the result of the cognitive learning in the experimental classroom, the mean acquired was 76.19 while *mean posttest* acquired from the control classroom is 44.68. The average learning outcome of both samples experiences improvement. The average raise in control classroom, however, is lower than that of the experimental classroom.

Based on the data of the average pretest and posttest results of both experimental and control classrooms, it is found out that Mind Mapping learning model has positive impact on the improvement of the students' *Social* science learning outcome, particularly the lesson of Indonesian War for Independence. It is supported by N-Gain calculation which shows the difference of the students' knowledge raise between experimental and control classrooms. In the control classroom, N N-Gain is 0.10 which is included in low group. Therefore, the improvement rate of the students' learning outcome in control classroom is low. While in the experimental classroom N-Gain is 0.64 which is included in the moderate rate (Lestari dan Yudhanegara. 2015:235). Therefore, in the experimental classroom there is the improvement on the students' ability which is higher than that in the control classroom in case of understanding the lesson of Indonesian War for Independence in social Science subject.

The result of the research is consistent with the prior study conducted by the previous researcher concerning the Mind Mapping as learning model. Among them is the experimental research conducted by Muhammad Chomsi Imaduddin and Unggul Haryanto Nur Utomo (Vol. IX No. 1 in 2012) titled "*Efektivitas Metode Mind Mapping untuk Meningkatkan Prestasi Belajar Fisika pada Siswa Kelas VIII*" (Effectiveness of Mind Mapping Method to Improve Learning Achievement of Physics Subject on Grade Eight Students). From the t-test analysis i.e. paired sample t-test on the experimented group, it was found out that mind mapping method has positive impact on the learning improvement on Physics subject. From the t-test analysis, it is acquired:  $t$  value = -11.006 with  $p = 0.000$  ( $p < 0.01$ ), which means highly significant. From the t-test analysis i.e. paired sample t-test on the control classroom, it is found out that conventional method does not give positive impact on the improvement of the learning outcome of Physics subject. From the t-test analysis, it is acquired:  $t$  value -1.941 with  $p = 0.070$  ( $p > 0.05$ ), which means insignificant. It can be concluded that *Mind Mapping* method is effective in case of improving the students' learning outcome.

The *research* conducted by Ratih Shintia Devi, Margaretha Sri Yuliariatiningsih, and Tita Mulyati (Vol. 3 No. 2 in 2015) titled "*Efektivitas Metode Mind Mapping terhadap Peningkatan Pemahaman Konsep Siswa pada Mata Pelajaran IPA*" (The Effectiveness of Mind Mapping Method to the Improvement of the Students' Understanding of Concept on the natural Science Subject). The study shows that the improvement of the understanding of Natural Science concept of the students who are taught using the Mind Mapping method is better than that of the students who are taught using the conventional method.

The study conducted by Made Widiari, A.A Gd. Agung, dan I Nym. Jampel (Vol. 2 No. 1 in 2014) titled “*Pengaruh Metode Pembelajaran Mind Mapping dan Ekspositori terhadap Hasil Belajar Matematika di SD Gugus IX Kecamatan Buleleng*” (The Impact of the Mind Mapping and Expository Methods on the Mathematics Learning Outcome in SD Gugus IX District of Buleleng). Based on that study, there is significant difference in case of Mathematics learning outcome inter-students group who apply Mind Mapping and Expository methods. The difference is observable from  $t_{count} > t_{table}$  ( $3.89 > 1.68$ ). the research shows that the *Mind Mapping* method has positive impact on the Mathematics learning outcome than the Expository method.

Another study undertaken by Ni Putu Styah Prahita, I Nyoman Jampel, and I Gede Sudatha (Vol. 2 No. 1 released in 2014) titled “*Pengaruh Penerapan Model Pembelajaran Mind Mapping terhadap Hasil Belajar IPA pada Siswa Kelas IV*” (Impact of the Application of Mind Mapping Method on Grade IV Students’ Natural Science Learning Outcome). From the t-test calculation data, the result is acquired as follows  $t_{count} = 3.87$  ;  $t_{table} = 2.076$  which shows that  $t_{count} > t_{table}$ . Based on the data above the conclusion can be drawn that the significant difference of the Natural Science learning outcome between the students experiencing the Mind Mapping method and the students experiencing the conventional method at grade IV in Yehembang Village Gugus IV Diponegoro District of Mendoyo in Academic Year of 2013/2014.

The study carried out by Ying Liu, Guoqing Zhao, Guozhen Ma, dan Yuwei Bo (Volume 2 No 1 released in 2014), titled “*The Effect of Mind Mapping on Teaching Learning; A Meta-Analysis*”. In the research, it is mentioned “*The Meta-Analysis shows that mind mapping has positive effect on teaching and learning and country, usage, subject and achievement can influence the results.*” It means that meta-analysis shows that *Mind Mapping* has positive impact on the learning process so that it will influence the learning outcome and achievement.

#### 4. CONCLUSION

*Mind Mapping* method is better than Direct Learning method when applied in the Social Science learning, the *lesson* of Indonesian War for Independence.

There is difference in case of cognitive learning outcome of grade V students who experience *Mind Mapping* method from the control classroom that applies *Direct Instruction* on Social Science subject, particularly the lesson of the Indonesian War for Independence in SD Gugus Mahesa Jenar District of Ambarawa, Semarang Regency. It was also shown by the average pretest mark of the experimental classroom about 33.42 raising into 68.19. While in the control classroom, the average pretest mark

about 39.09 raises not too high into 44.69. It was also shown from the t-test which shows that  $t_{count} > t_{table}$ . It is that  $t_{count}$  (8.275)  $>$   $t_{table}$  (0.000) at margin of error about 5 % or at accuracy rate about 95% which means that there is difference in case of cognitive learning outcome in control classroom from the experimented one.

The impact the Mind Mapping method on the learning outcome in Social Science subject of grade V students in SD Gugus Mahesa Jenar shows the positive result. It is shown by the N-Gain test which reveals that the learning outcome of the experimental classroom raises to the fair level with N-Gain rate about 0.64. from the statement above, we can say that the learning process applying Mind Mapping method has significant impact on the raise of learning outcome in Social Science subject, particularly the lesson of Indonesian War for Independence.

#### 5. REFERENCES

- Adodo, S O. 2013. Effect of Mind Mapping as a Self-Regulated Learning Strategy on Students’ Achievement in Basic Science and Technology. *Mediterranean Journal of Social Sciences*. Vol. 4 No. 6
- Anggraeni, Yunita, dan Soeprajitno. 2014. Pengaruh Penerapan Metode Mind Mapping terhadap Hasil Belajar Siswa pada Mata Pelajaran IPS Materi Pokok Perjuangan Melawan Penjajah dan Pergerakan Nasional Indonesia Kelas V SDN Janti 1 Waru-Sidoarjo. Volume 01 Nomor 01.
- Buzan, Tony. 2013. *Buku Pintar Mind Map*. Jakarta: PT Gramedia Pustaka Utama.
- Devi, dkk. 2015. Efektivitas Metode Mind Mapping Terhadap Peningkatan Pemahaman Konsep Siswa pada Mata Pelajaran IPA. *Antologi UPI*. Volume 3 Edisi No. 2.
- Lestari, Karunia Eka dan Mokhammad Ridwan Yudhanegara. 2015. *Penelitian Pendidikan Matematika*. Bandung: PT Refika Aditama.
- Liu Ying, dkk. 2014. The Effect of Mind Mapping on Teaching and Learning; A Meta-Analysis *Standard Journal of Education and Essay*. Vol. 2 No. 1.
- Prahita, dkk. 2014. Pengaruh Penerapan Model Pembelajaran Mind Mapping terhadap Hasil Belajar IPA pada Siswa Kelas IV. *e-Journal MIMBAR PGSD Universitas Pendidikan Ganesha Jurusan PGSD*. Vol. 2 No. 1.
- Sugiyono. 2010. *Metode Penelitian Pendidikan*. Bandung: Alfabeta.
- Supardan, Dadang. 2015. *Pembelajaran Ilmu Pengetahuan Sosial*. Jakarta: Bumi Aksara.
- Susanto, Ahmad. 2013. *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Prenada Media Group.

Widiari, dkk. 2014. Pengaruh Metode Pembelajaran Mind Mapping dan Ekspositori terhadap Hasil Belajar Matematika di SD

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# The Impact of PJBL (*Project Based Learning*) Model On Grade Iv Students' Arts, Culture, and Crafrtshmanship Learning Outcomes

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## Abstract

The research aimed to examine the effect of PJBL model (Project Based Learning) on learning outcome at SBdP at the fourth grade student of SDN Jepang 05 Kudus. The design of the research was quasi-experimental with noquivalent control group design. The population of the research was fourth grade student of SDN Jepang 05 Kudus 2016/2017. The sample collection techniques used Nonprobability Sampling with saturated sampling technique. The amount of the sample were 25 students for experiment class and 23 students the control class. The data collection techniques used test, observation, and documentation. The data analysis employed: normality test, homogeneity, average difference test and N-Gain test. The results of the research showed that t test obtained t calculation of 0.000 < 0,05 so that Ha accepted and Ho rejected. This indicates that used PjBL model has significant influence on student activity and learning outcome at SBdP which has been also proven through the control class gain index of 0.399 (Medium), and the experimental class gain index of 0.701 (High). Student activity of experiment class was higher than control class. The research concluded that the use of Project Based Learning model gave a significant difference of influence on the activity and the student's learning outcome on the material making the leaf bone craft in SBdP learning.

Keywords: PjBL Model; SBdP Learning; The leaf bone craft; Elementary School.

## 1. INTRODUCTION

The learning referring to Kurikulum 2013 for all primary and secondary schools is implemented based on *scientific approach* comprising 5 steps, i.e.,: (1) observing; (2) questioning; (3) collecting information; (4) associating; and (5) communicating. This statement is included in *Permendikbud Nomor 81 A Tahun 2013 Lampiran IV* (Decree of Minister of Education and Culture: 81A/2013 Appendix IV).

*Undang-Undang Nomor 20 Tahun 2003* (Republic of Indonesia Act: 20/2003) Chapter X Article 37 denotes that one of the compulsory contents of the curriculum for primary and secondary schools is the subject of arts and culture. Arts, Culture, and Craftsmanship, as ordered in *PP No. 32 Tahun 2013* (Government Regulation: 32/2013), replacing of *PP No. 19 Tahun 2005* (Government Regulation: 19/2005) on National Standards of Education which explains clearly about the contents modification of arts, culture, and craftsmanship which does not only cover one subject, as the culture itself basically covers various life aspects. The subject of arts and culture in primary education contextually is taught concretely, completely, and comprehensively which covers all students' developmental aspects including fine arts, music, dancing, and craftsmanship through thematic approach.

The subject of Arts and Culture is the learning activities presenting esthetic, artistic, and creative artworks rooted on norms, values, attitudes, and products of the nation's arts and culture. The learning of arts in primary and secondary schools

aims to raise the awareness of arts and esthetics in conception, appreciation, presentation, and psychological-educative domain to develop the students' personalities positively. Arts and Culture teaching in primary school is intended to build the students' conation, creativities, ethical, and esthetical (Setiawan, *dkk*, 2017:5).

The real fact going on in a number of primary schools shows that the learning of arts is still conducted top-down. This kind of approach creates one-way communication. This kind of learning process makes the students' creativities and independence not develop normally.

Based on the field study on content standards implementation Arts, Culture, and Craftsmanship, I found a fact that the primary schools in common do not employ the specific teacher to teach Arts, Culture, and Craftsmanship, including SDN Jepang 05 Kudus in which the subject of Arts, Culture, and Craftsmanship has been taught by classroom teacher, so the implementation of Arts, Culture, and Craftsmanship learning does not meet the quality requirement for content standards as expected because the teaching teachers' pedagogical competency is insufficient. This certainly will have significant impact on the students' learning outcome in the subject of Arts, Culture, and Craftsmanship as shown clearly in the scores they attain after Mid-term Exam I taken by grade IVA and IVB students of SDN Jepang 05 Kudus in school year 2016/2017. The lowest average collective scores attained by the grade IVA students are those of Mathematics and Arts, Culture, and Craftsmanship (76.5). The lowest average Mid-term collective test scores attained by the grade IVB students are those of Social Science

and Arts, Culture, and Craftsmanship (77.6). It means that the students in the two grade IVs have the lower average score for the subject of Arts, Culture, and Craftsmanship than that for the other subjects..

Based on the introductive study through interview with grade IV teachers, I found a fact that the learning of Arts, Culture, and Craftsmanship in SDN Jepang 05 Kudus still does not run at best. The schedule of learning activities for the contents of Arts, Culture, and Craftsmanship, as revealed by the classroom teacher, is still limited in drawing pictures and singing activities. One of the unpracticed lesson materials is creating the handicrafts. Fine arts, particularly handicrafts creation should be taught to the students as the enrichment of the arts teaching materials. As this kind of fine arts will stimulate the students' creative skill on esthetic side, so it can develop their conative competency. Furthermore the teaching teacher has not used the available things around as the tool to enhance the students' creativity in the classroom. The advance indication for this is that the students' enthusiasm to get involved actively in the classroom learning of Arts, Culture, and Craftsmanship will tend to increase. It is because they can practice and apply directly the artisanship lesson they have learnt in classroom to then be applied in their daily life.

Creating fine artworks, basically, is a process of idea building and fine arts media processing to manifest the new shapes and illustrations. To construct ideas, the students need to be involved in various activities, such as drawing pictures, making observations, note-taking, creating sketches, and investigating the other pictures and shapes. In addition, the students should also be involved in the observation process on the personal issues, social phenomena, universal topics, fantasies, and imagination. The fine arts criticisms learning means introducing and get them practicing using fine arts terms and phrases to describe and to give comments on fine artworks such as those concerning the tactile, spatial, and kinesthetic aspects. The arts criticism learning also encourages the ability to understand the meanings of the visual symbols, shapes, and metaphors (Atip Nurharini, 2013:108).

The development and enrichment of the arts learning materials should be conducted by classroom teacher to improve students' Arts, Culture, and Craftsmanship learning outcome. Therefore, the teacher must try to apply the appropriate, attractive, and innovative learning method which will give the students the chances to interact with the teacher, to cooperate with their friends, to share their opinions, as well as to be able to remember all the learnt concepts. The teacher play major role as facilitator, supervisor, and feedback giver. The thematic integrative learning of the subject of Arts, Culture, and Craftsmanship can

be implemented by applying *Project Based Learning* (PjBL).

PjBL Model is the teaching and learning strategy to engage the students in a beneficial project to solve the people in the neighborhood's problem. The students are coached to *problem solver* by making analysis on an issue, and then they make exploration, collect information, making interpretation, and making assessment during executing the project related to the investigated issue. This kind of learning enables the students to enhance their creativities in case of designing and executing project which can be used to solve the existing issue. Project-based learning is based on the theory of constructivism and constitutes *student centered learning*. The learning process through *Project Based Learning* allows teacher to "learn from students" and "learn with students" (Sani, 2015:172).

Hosnan (2016:325) furthermore reveals the phases of the implementation of *Project Based Learning* comprising: a). project determination, b). designing project completion steps, c). schedule arrangement of project execution, d). project accomplishment facilitated and monitored by the teacher, e). report making project output presentation/publication, f). evaluation of project output and process.

In addition to the application of the appropriate model for be Arts, Culture, and Craftsmanship learning method, the media utilization is also important as the media of communication service during the delivery of the learning materials to the students. The content of the basic competency 4.14 is creating the handicrafts in form of accessories using various materials and techniques. Therefore, I would create handicrafts from the leaf skeleton. The created leaf blade handicraft can be in form of key hanger, made of soursop or sugar apple leaves boiled with natriumhydroxide (NaOH). The usage of different materials from the common key hanger materials is expected to attract the students' attention and interest, to boost the students' creativities and learning outcome in Arts, Culture, and Craftsmanship class.

Based on the explanation above, finally I was moved to conduct a further experimental research on the impact of PjBL (*Project Based Learning*) Model on the students Arts, Culture, and Craftsmanship learning output particularly the lesson of handicrafts from leaf skeleton for grade IV students of SDN Jepang 05 Kudus.

## 2. RESEARCH METHODS

This investigation applies *Quasi Experimental Design* which has control group, but it cannot fully function to control the external variables affecting the execution of the

experiment. The design type applied is *Nonequivalent Control Group Design*. The research Population is all grade IV students of SDN Jepang 05 Kudus. The research samples class IVA (23 students) as control classroom and class IVB (25 students) as experimental classroom.

The dependent variable in this research is the application of *PjBL* model. The dependent variable is Arts, Culture, and Craftsmanship learning particularly lesson of creating handicrafts using leaf skeleton comprising the students learning activities and output. The data are collected through: test, observation and documentation. The written tests are conducted in form of *pretest* and *posttest* to reveal the students initial knowledge and the result of the treatment conducted in the Arts, Culture, and Craftsmanship learning. Observation is used to observe the students learning activities during Arts, Culture, and Craftsmanship learning in the lesson of creating handicrafts from leaf skeleton. Documentation using photos and videos is conducted to get the supporting data for the research products.

The instrument testing is conducted before starting the research. The data output are tested and then validity test, reliability test, test item difficulty analysis, and differentiability checking are conducted. From the instrument testing, the test item is regarded as valid if  $r_{\text{count}} > r_{\text{table}}$ , with  $r_{\text{table}} = 0.396$ . Formula of the reliability testing for the multiple-choice question items is *SPSS 16.0*-assisted *KR 20 (Kuder Richadson)* formula, and then the reliability coefficient is checked Guilford classification. The item difficulty level can be found through index of difficulty formula in which the difficulty index 0.0 shows that the question is too difficult, while index score (1.0) shows that the question is too easy. The question differentiability is called discrimination index at range 0.0 to 1.00. the amount of questions able to be used for the research evaluation is 25, after conducting all the testing mentioned before.

Data analysis uses pretest scores for initial data analysis and posttest scores for final data analysis. The data analysis techniques applied are normality test and homogeneity test, using *SPSS 16.0* program. The data is stated as normal if the significance rate  $> 0.05$  and if significance rate  $< 0.05$  then the data is regarded as abnormal. Data is regarded as homogenous if its significance rate  $> 0.05$  and data is regarded as inhomogeneous if significance rate  $< 0.05$ . Final data analysis is conducted using *N-gain* test and t test. *N-gain* test result can be acquired through formula: (Sudjana, 2005:239)

$$N\text{-gain} = \frac{x \text{ posttest} - x \text{ pretest}}{\text{skor maksimal} - x \text{ pretest}}$$

*N-gain* achievement criteria: 0.00-0.29 (low), 0.30-0.69 (moderate), 0.70-1.00 (high). Meanwhile, t-test is calculated using the following formula:

$$t \text{ hitung} = \frac{x_1 - x_2}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \text{ dengan varians} \\ \text{totalnya yaitu } s^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

The faster testing can be conducted by *SPSS Versi 16.0*-assisted *Independent Sample Test* (t test) to find if it has significant impact on the learning output of creating handicrafts from leaf skeleton included in Arts, Culture, and Craftsmanship by applying *PjBL* Model. Testing criteria:  $H_0$  is accepted if significance rate  $> 0.05$  and  $H_0$  is rejected if significance rate  $< 0.05$ .

### 3. RESULTS AND DISCUSSION

#### 1. Pretest Data

**Table 1.** *Pretest* Scores Data in Control Classroom and Experimental Classroom

Control Classroom			Experimental Classroom		
Interval	F	Percentage	Interval	F	Percentage
3-6	2	8.70%	5-8	5	20%
7-10	7	30.44%	9-12	8	32%
11-14	12	52.16%	13-16	10	40%
15-18	2	8.70%	17-20	2	8%
Highest	16		Highest	18	
Lowest	3		Lowest	5	
Average	10.91		Average	11.92	

*Pretest* contains 25 questions in the highest score in control classroom is 16 and the lowest score is 3 as well as the average score is 10.91. While, the highest score in experimental classroom 18 and the lowest score is 5 as well as the average score is 11.92.

#### 2. Data of Students Activeness

*Treatment* is conducted four times in control classroom and experimental classroom. The students' activeness in experimental classroom shows the higher rate than that in the control classroom. This is shown by the observation that reveals comparison of the students' learning activeness score in control classroom (IVA) and experimental classroom (IVB) during the session I-IV that rises significantly. From the conclusion of the collected observation data, in fact, the raise of students learning activeness in experimental classroom is higher than control classroom although the two classrooms experience a number of learning activeness rises.

### 3. Posttest Data

**Table 2.** Posttest Scores Data in Control Classroom and Experimental Classroom

Control Classroom			Experimental Classroom		
Interval	F	Percentage	Interval	F	Percentage
8-11	2	8.70%	14-16	3	12%
12-15	7	30.43%	17-19	4	16%
16-19	9	39.13%	20-22	10	40%
20-23	5	21.74%	23-25	8	32%
Highest	23		Highest	25	
Lowest	8		Lowest	14	
Average	16.22		Average	20.72	

*Posttest* is conducted to assess the impact result both in control classroom and experimental classroom after completing four times-treatment. The lowest score in control classroom is 8 and the highest score is 23 as well as the average score is 16.22. The lowest score in experimental classroom is 14 and the highest score is 25 as well as the average score is 20.72.

Before, I conduct normality test and homogeneity on, and the result is that significance rate of experimental classroom and control classroom for both Kolmogorov-Smirnov and Shapiro-Wilk columns, significance rate of. The two classrooms  $> 0.05$  so *pretest* scores data of control classroom and experimental classroom can be stated as normally distributed.

**Table 3.** Normality Test for *Pretest* Data of Control Classroom and Experimental Classroom

Investigated Group		Kolmogorov-Smirnov		Shapiro-Wilk	
		Statistic	df	Statistic	df
Pretest	Experimental Group	.170	25	.062	25
	Control Group	.140	23	.200	23
	Group			.959	23

*Pretest* homogeneity test score is  $0.399 > 0.05$  which shows that it is homogenous data, and the conclusion able to be drawn is that the two classrooms are in the nearly similar condition, so the control classroom is treated using the direct teaching method and the experimental classroom is treated using *PjBL* model in 4 sessions.

**Table 4.** Homogeneity Test for *Pretest* Data

Levene Statistic	df1	df2	Sig
.725	1	46	.399

Data *posttest* has also been tested for its normality and homogeneity, the result shows that significance rate of both control classroom and experimental classroom for both Kolmogorov-Smirnov and Shapiro-Wilk columns  $> 0.05$  so the *posttest* data of both control classroom and experimental classroom are distributed normally.

**Table 5.** Normality Test for *Posttest* Data

Investigated Group		Kolmogorov-Smirnov		Shapiro-Wilk	
		Statistic	df	Statistic	df
Pretest	Experimental Group	.149	25	.161	25
	Control Group	.108	23	.200	23
	Group			.980	23

Homogeneity testing for *posttest* data is found from the students learning outcome in both control classroom and experimental classroom which shows that it is homogenous at significance rate  $0.190 > 0.05$ .

**Table 6.** Homogeneity Test for *Posttest* Data

Levene Statistic	df1	df2	Sig
1.770	1	46	.190

Based on SPSS calculation for t test, the result is as follows:

**Table 7.** Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					
				F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Posttest	Equality variances assumed	1.770	.190	4.56	.000	4.503	.987	2.516	6.490
	Equality variances not assumed			40.938	.000	4.503	.999	2.486	6.519
				4.509					

The significance rate (2-tailed) is  $0.000 < 0.05$ . It means that  $H_0$  is accepted and  $H_a$  is rejected. So the application of the *PjBL* model has significantly different impact on the students' activeness learning outcome in Arts, Culture, and Craftsmanship learning, particularly the lesson of creating handicrafts from the leaf skeleton between experimental classroom (*PjBL* model) and control classroom (direct teaching). From the *N-Gain* assessment results, we can find that the gain index of control classroom is 0.399 (Fair), while the gain index of experimental classroom is 0.701 (High).



**Table 8.** *N-Gain* Assessment Result

No.	Classroom	Score of Average Point		N-Gain	Remarks
		Pretest	Posttest		
1.	Control	10.91	16.22	0.399	Fair
2.	Experimental	11.92	20.72	0.701	High

The investigation on the application of PjBL Model during Arts, Culture, and Craftsmanship learning above undoubtedly has given us the real illustration of the significant impact on the grade IV students learning activities and output in SDN Jepang 05 Kudus. This is strengthened by several studies previously conducted, such as by Jagantara, *et.al/* (2014) in which they state that: (1) found significant difference on students Biology learning output between those learning in project-based learning (PjBL) model from those learning in direct teaching model; (2) found significant difference of students Biology learning output for the student group in case of visual, auditory, and kinesthetic learning style between those learning in project-based learning model from those learning in direct teaching model.

The study conducted by Susilowati, *et.al.* (2013) draws the similar conclusion, that project-based learning has significant impact on students learning output in lesson of Human Digestion System. Meanwhile Ambarwati, *et.al.* (2015) explain that the impact GQM-based PjBL Model on the students' mathematical communication skill and self-confidence is effective, and it is shown by this fact: (1) the students' mathematical communication skill and self-confidence in experimental classroom meets individual and collective learning mastery criteria, (2) the students' mathematical communication skill and self-confidence in experimental classroom is higher than that in control classroom and the impact of the students' self-confidence on their mathematical communication (41.5%). That significant impact is shown by Andana, *et.al.* (2014) who states that project-based learning has significant impact on grade IV students Natural Science learning output in Gugus V Kecamatan Tegallalang.

Kaldi, *et al.* (2009) in his findings strengthens my opinion that the students will take benefit from project-based learning in acquiring knowledge and collective work in craftsmanship content, and conventional teaching is less beneficial to the students than learning through personal experience. So do Cakici & Turkmen (2013) who shows that the children academic achievement rises significantly through the project-based activities, although their response to the knowledge and science remains.

#### 4. CONCLUSION

The application of *PjBL* Model to Arts, Culture, and Craftsmanship learning in classroom IVB SDN Jepang 05 Kudus as experimental classroom emphasize the practical activities. The practice done is creating handicrafts from leaf skeleton comprising key hanger. In the phase of project determination, I applied the teaching material of creating leaf handicrafts from skeleton. In the phase of designing, I set up the learning purpose and steps into lesson plans completed with the schedule of the investigation implementation. In the phase of facilitation and monitoring, the delivery of the learning materials is conducted in fur sessions. The teacher explains about the definition, function, tool, materials, and the shape of the handicrafts made from the leaf skeleton as well as the way to create it. The teacher also demonstrate the steps to create the handicrafts from leaf skeleton either through Guru tutorial video or direct practice, stating from process of boiling, rubbing, coloring, and giving comments on the practice that the students do. In the phase of guiding, the students with their groups in their own creativities realize the practice under the teacher's monitoring and instruction. The successfully-made product subsequently is presented before class to publish. Meanwhile, the teacher also makes evaluation on the process or product of the project implemented by the students. The learning in grade IV as control classroom is centered on the teacher who explains the learning materials and is listened. The learning takes place verbally and merely visually and the students do not do direct practice, creating various handicrafts from the leaf skeletons.

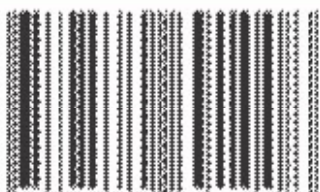
Based on the observation on the students' activities in Arts, Culture, and Craftsmanship learning through the application of PjBL Model in experimental classroom, I found a fact: a). the students look more enthusiast and more prepared to focus on Arts, Culture, and Craftsmanship learning, b). the students have questioning skill and higher self-confidence to express their opinion as well as are more confident to their works before the class present, c). discussion runs in two-way, d). the students perform the good cooperative manner in group, e). the students can design the decorative items well and can produce the handicrafts from the leaf skeleton. The other benefits taken from the application of *PjBL* Model in experimental classroom are: 1). Being able to improve the students' problem-solving skill; 2). Making the students more actively find a solution to problem; 3). Giving the students the real experience to organize a project, to manage time, and to manage the available resources such as tools and materials to complete the task; 4). Engaging the students in the information collection learning and applying it in real life. Arts, Culture, and Craftsmanship learning with creating the handicrafts from leaf skeleton as learning material in fact can improve the

students' learning activities in both control classroom and experimental classroom. The improvement of students learning activities in experimental classroom, however, is much more significant than the improvement in control classroom. From the experimental research through application of *Project Based Learning* (PjBL) Model on its impact on the grade IV students learning outcomes in SDN 05 Jepang in which the class IVA playing role as control classroom and class IVB playing role as control classroom, I can draw a conclusion that *Project Based Learning* (PjBL) model has significant impact on the students' learning outcome during Arts, Culture, and Craftsmanship learning with creating the handicrafts from leaf skeleton as learning material in class IV in SDN 05 Kudus.

The improvement of Arts, Culture, and Craftsmanship learning is based in the assessment result of t-test and N-gain test which shows the emergence of its impact on the grade IV students learning outcome improvement in Arts, Culture, and Craftsmanship learning with creating the handicrafts from leaf skeleton as learning material.

## 5. REFERENCES

- Andana, M.E., Raga, G., & Sudang, D.W. 2014. "Pengaruh Model Pembelajaran Berbasis Proyek terhadap Hasil Belajar IPA Siswa Kelas IV SD di Gugus V Kecamatan Tegallalang". *Jurnal Mimbar PGSD* Universitas Pendidikan Ganesha. 2 (1).
- Ambarwati, R., Dwijanto, & Hendikawati, P. 2015. "Keefektifan Model Project Based Learning Berbasis GQM terhadap Kemampuan Komunikasi Matematis dan Percaya Diri Siswa Kelas VII". *Jurnal Pendidikan Matematika* Universitas Negeri Semarang. 4(2): 181-186.
- Cakici, Y., dan Turkmen, N. 2013. "An Investigation of the Effect of ProjectBased Learning Approach on Children's Achievement and Attitude in Science". *Journal of Science and Technology*. 2(2): 9-17.
- Hosnan, M. 2016. *Pendekatan Saintifik dan Kontektual dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia.
- Jagantara, I.M.W., Adnyana, P.B., & Widiyanti, N.L.P.M. 2014. "Pengaruh Model Pembelajaran Berbasis Proyek (Project Based Learning) terhadap Hasil Belajar Biologi Ditinjau dari Gaya Belajar Siswa". *Jurnal Program Pasca Sarjana* Universitas Pendidikan Ganesha. Vol 4.
- Kaldi, S., Filippatou, D., Govaris, C. 2011. "Project-based learning in primary schools: Effects on pupils' learning and attitudes". *Journal of Education*. 39(1): 35-47.
- Nurharini, Atip. 2013. "Application the Investigation Group Method to Improve Students Competence Standard in Arts Appreciation on the Subject of Visual Arts for Students of PGSD Unnes". Fakultas Ilmu Pendidikan, Universitas Negeri Semarang. *Jurnal Penelitian Pendidikan* Vol. 30 Nomor 2 tahun 2013.
- Peraturan Pemerintah Republik Indonesia Nomor 32 tahun 2013 tentang Standar Nasional Kependidikan. Jakarta: Presiden Republik Indonesia
- Permendikbud Nomor 81 A Tahun 2013 Lampiran IV
- Sani, R.A. 2015. *Pembelajaran Saintifik untuk Implementasi Kurikulum 2013*. Jakarta: Bumi Aksara
- Setiawan, D., Purwanti, E., Sumilah., Sutaryono. 2017. *Pengetahuan Seni dan Gambar Ekspresi di Sekolah Dasar*. Yogyakarta: AG PUBLISHER
- Sudjana. 2005. *Metode Statistika*. Bandung: Tarsito
- Susilowati, I., Iswari, R.S., & Sukaesih, S. 2013. "Pengaruh Pembelajaran Berbasis Proyek Terhadap Hasil Belajar Siswa Materi Sistem Pencernaan Manusia". *Jurnal Pendidikan Biologi* Universitas Negeri Semarang. 2(1): 83-90
- Undang-Undang RI Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. Jakarta: Depdiknas.



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