

# Book 1



ACER-N

ASEAN COMPARATIVE EDUCATION RESEARCH NETWORK CONFERENCE

## PROCEEDING

### ASEAN Comparative Education Research Network Conference [ACER-N 2016]

## The ASEAN Teachers : Towards Standardization of Quality and Qualifications

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(Sumatera Barat, Riau, Jambi and Kepulauan Riau)

In Collaboration With :  
Universitas Negeri Padang  
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STKIP PGRI Sumatera Barat



## Proceeding

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## PREFACE

We are pleased to present this collection of papers submitted to the 4<sup>th</sup> International Conference of ACERN, November 30, 2016 in Inna Muara Hotel, Padang – West Sumatra. This is the first ACERN conference held in West Sumatra. The conference was an open gate for us to start the information, experiences, researches as well collaboration between various academics and non-academics institutions worldwide. This expands our mutual knowledge and experiences. Kopertis Wilayah X (Sumatera Barat, Riau, Jambi dan Kepri)

The total of 300 papers from Indonesian, Malaysian and Brunei participants contributed to this proceeding and we also attached the abstract and biography from the keynote speakers within the proceeding. The proceeding also presents a wide variety of research on education from various subjects. The papers use various approaches and strategies for research in education. It will give us different perspectives and knowledge for the development of educational research.

A great team effort also became a big support to the successful of the conference and proceeding. We are grateful to have a hard working organizing committee as well as committed editors and board of experts who gave us the important inputs and reviews of this proceeding. We would like to express our great gratitude to all institution and universities that are Fakultas Pendidikan UKM, Universitas Negeri Padang, and STKIP PGRI Sumbar who organized this event and the proceeding publications. Finally, we also express our appreciation to Bank Syariah Mandiri, Bank Nagari, and Bank Tabungan Negara who supported this event. Thank you for all your contributions. We do hope that you experience a stimulating seminar and informative proceeding with many opportunities of future contacts, collaborative research and application.

**Dra. Skunda Diliarosta, MPd**

**Head of Organizing Committee**

Kopertis Wilayah X (Sumatera Barat, Riau, Jambi dan Kepri)

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## **DEVELOPMENT *HANDOUT* BASED ON CONSTRUCTIVISM IN THE LEARNING MATHEMATICAL AT FIFTH CLASS OF ELEMENTARY SCHOOL**

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### ***Abstract***

*Based on preliminary observations and interviews with teachers of Mathematics in elementary school, it is found that learning materials used by elementary school not facilitate students to construct their own knowledge. This research aims to develop teaching materials Based Constructivism for Elementary fifth grade students. Teaching materials are designed in this study is a handout. Handout generated using three models namely Cooperative learning, Problem Based and Direct. This study is a Research Development and Experiment. The validity of the learning is done through the validation of expert, while the practicalities implemented through trials in 9 SD in Padang Panjang. Data collected through the validation sheet and practicalities. Furthermore, the data processed using descriptive statistics and inferential statistics. Based on data analysis, obtained the findings of the study: (1) handouts Mathematics Based Constructivism to class V SD stated that the handout compiled included in the category of valid and can be used with a little revision ( 2) Handout developed included in the category of practice, it can be used by teachers and students without significant obstacles. The conclusion of this study is that the handout based on constructivisme generated at the high category on aspects of the content and structure. Furthermore, handouts produced has a high practicalities. The implication of this research is the need for a series of activities manufacture of teaching materials to facilitate student learning approaches and strengthening the use of Constructivism. Researchers recommend to the next researcher to conduct similar studies in different contexts and other elementary grade level.*

**Keywords:** *Handout, Constructivism, validity, practicality*

## 1. Introduction

Methods of teaching "record" and "preach" or chalk and talk still dominates mathematics learning in elementary school. As a result, some students have difficulties in understanding math concepts, because what is learned is abstract and not related to their experience of everyday. One cause of this problem is the lack of knowledge and ability of teachers to prepare, develop teaching materials, select and implement learning approaches that could attract students to learn mathematics. In addition, textbooks available in general also encourages teachers to teach mathematics in a "mechanistic" and "algorithmic".

Attention teachers in conventional learning pattern is more devoted to the delivery of content mastery. As a result, most students remained passive in the following study. They were unable or lacked the courage to communicate the ideas that they have. In each meeting, only one or two students who dared to ask questions or express opinions. The learning methods are implemented less meaningful and is generally understood as a mathematical concept only rote.

The problems described, exacerbated by the conditions of teaching materials (textbooks) is not conducive to the creation of a conducive learning atmosphere. Textbooks circulating generally not facilitate students to construct their own knowledge. The contents of the book more emphasis on the detailed description of a concept, then followed with a number of sample questions and practice questions. The description contained in textbooks tend to make students memorize, without understanding what they learn, since the material presented less related to the real world of students.

To address this issue, there should be efforts to develop learning tools based on cognitive theory, which includes the theory of constructivism. According to the theory of constructivism, thinking skills (reasoning), problem solving, and communication can be developed if the students do themselves, discover and construct knowledge that exists (Slavin, 1994). Constructivism is a notion that states that human knowledge is built by little by little, and the result is expanded through a limited context and not necessarily (Steffe, 1991). The essence of the constructivist theory is that students must discover and transform complex information into a different situation, and if desired the information belongs to them alone.

In a constructivist classroom, a teacher does not teach students how to solve problems, but presented problems and to encourage students to find their own way in solving the problem (Kamii, 1990). When students give answers, teachers try not to give an assessment of whether the answer is right or wrong. However, teachers encourage students to agree or disagree with the exchange of ideas that come to an agreement about what can make sense for students. With a constructivist approach, mathematical activity can be realized through the presentation of the problem, working in pairs, or in small groups and class discussions. So, learning the constructivist approach should be designed with problem-solving approach (problem solving), where teachers and students are bound in talks that have mathematical meaning.

Through this study, the math handout designed based constructivism. Based on observations and experience of researchers discussing with elementary school teachers in the city of Padang Panjang, obtained information and the fact that they have not skilled in developing devices based constructivist learning. Therefore, the results of this study are expected to be a model for mathematics teachers in preparing and organizing the learning of mathematics more meaningful.

To obtain handouts mathematics that allow students to practice thinking, reasoning, problem solving, and communication, need to be met at least three criteria: (1) validity, (2) the practicalities, and (3) effectiveness. Handout math-based constructivism as valid or reflect the



"state of the art knowledge" if these devices by specialist mathematics education and instructional design experts as feasible in terms of content and construction as well as the potential to improve outcomes and student motivation to learn mathematics. The device is said to have a high practicalities, if students and teachers can use it easily fits the criteria expected (no meaningful constraint). This study had not yet reached the stage of effectiveness.

## **2. Review Of Related Theory**

### **2.1. Mathematics Learning**

Herman (1998: 3) states that mathematical ideas, structures and relationships are arranged logically and are associated with abstract concepts. Mathematical truths are developed based on logical reasoning and use deductive proof.

In conjunction with the study of mathematics, Nikson quoted Muliyardi (2002: 3) argues that "Learning mathematics is an effort to help students to construct condition or mathematical principles on their own through a process of internalization, so the concept or principle was rebuilt".

Based on these descriptions can be concluded that the students' mathematics learning should be more activities to develop their knowledge. Mastery of the basic concepts are very important, because the math interrelated

### **2.2. The Development of Prototype**

In developing learning tools must consider the following criteria: (1) can be helpful for learning activities by individuals / groups, (2) can respond to the maximum, (3) containing the message potentially, (4) is able to provide learning opportunities that are of interest, (5) providing advice and guidance and feedback information about the level of learning progress achieved by students. It requires the pillars and dimensions as the support cause learning process effective and efficient. Results of the systems approach is expected to solve problems effectively and efficiently learning.

In connection with that, the model used in the development of elementary mathematics learning tools are Degeng Model (1994), which consists of eight steps as follows.

- a. Analysis Objectives and Characteristics of Field Studies
- b. Analysis of Learning Resources
- c. Analysis of Student Characteristics
- d. Setting Learning Goal and Learning Content
- e. Organizing Strategy establishes Matter
- f. Setting a Delivery Strategy Learning Materials
- g. Assign a Learning Management Strategy
- h. Development of Learning Outcomes Measurement Procedure

Hand-outs can help students to obtain contextual information about the concepts that will be studied.

### **2.3. Constructivisme Approach**

Constructivism emphasizes that the individual is actively preparing and construct knowledge and understanding (Brooks & Brooks: 2001). According to the constructivist view, the teacher is not simply to give information to the child's mind, but teachers should encourage children to explore their world, discover knowledge, reflect, and think critically. Teachers will not be able to provide all the knowledge in the minds of their own.

Constructivism also emphasizes the collaboration of children work together to identify and understand the lessons (Gauvain, 2001). Teacher who embraces a constructivist philosophy will not ask children just memorize information, but also gives them an opportunity to build knowledge and understanding of the subject matter individually or in collaboration with friends in groups.

Constructivism Concept highlights the process and the formation of knowledge the dynamics of on self-learners in dealing with the environment sharply. On the basis of the study should be packed into a process of "constructing" and not receiving knowledge. In order for the process of constructing are underway optimal , it need facilities fit and relevant to student diversity, environmental conditions and the purpose of learning mathematics.

#### **2.4. Handout**

One of the teaching materials that can be used in teaching is a handout. Handouts can be printed teaching materials is very economical and practical. Economically and practically because handout only contain a summary or conclusion or part of the material is important so that student can immediately know the basics and important points on the material being studied by using handout.

The use of handouts in learning can have multiple functions. As stated by Steffen and Peter Ballstaedt in Prastowo (2013: 80) that functions handouts include:

Assist learners to be no need to take notes

- As a companion explanation educator
- As reference material
- To motivate students to study harder
- Reminder subjects the material being taught
- Giving feedback
- Assessing learning outcomes

The purpose of the manufacture and use of handouts for the lesson as proposed Prastowo (2013: 80) among others are:

- To facilitate and provide assistance or information as a handle learning materials for learners
- To enrich the knowledge of learners
- To support other teaching materials or explanation from the teacher

handout concept consisting of a summary and important things on a subject matter that should be applied in this handout assisted learning teaching materials or other learning media. It is very important for students so that students learn in depth the material being studied, also on handouts can not cover a certain subject matter.

#### **2.5. Conventional Learning**

Conventional learning is the informed-verify-practice. The observation of the researchers show that the learning done in class oriented stages of the opening-closing-presentation, Abraham and Renher (1986: 112). At this learning activities, teachers tend to use the lecture method with a little with questions and answers. Teachers trying to move or copy the knowledge that he had told the students. This situation tends to make students passive in receiving lessons from teachers.

### **3. The Method Of Research**

#### **3.1. Type of Research**

This type of research is a combination of research and development (developmental research) and experimental. The products produced in the form of learning tools. The research activities are divided into two stages, namely; (i) the stage of preparation of prototypes valid that aim to see the validity of the prototype, and (ii) the implementation phase, which aims to look at the practicalities of the resulting learning tool.

##### **Research Phase 1**

The focus of research in the first phase is produced prototype based learning constructivist valid in terms of content (content) and structure (construct). The steps are performed on the stage of preparation of the prototype valid are as follows; (i) analysis of needs, (ii) review of the literature, (iii) designing the prototype, (iv) validation of mathematics learning specialist, (v) revision, and (vi) evaluation of the prototype.

Validation activities focused to test the validity of the content and structure. Content validity refers to the suitability of the material in the curriculum, while the validity of the composition refers to the conformity of the composition of the prototype with the expected criteria, namely; the stages of prototype development models Degeng and constructivist learning approaches.

##### **Research Phase II**

Phase II of research activities is the implementation of a prototype that generated. The aim of research is focused on obtaining practical learning tool. The criteria used to assess the practicalities of learning tools is effectiveness and feasibility. effectiveness means, teachers and students can use the device is made, while the implementation aimed so that the device can be used by teachers to convey math topics in conditions of teaching and learning mathematics.

#### **3.2. Research Instrument**

The instrument used for data collection are as follows.

1. The validation, to collect data from the validation study.
2. Guidelines for the interview, is used to collect the opinion of students and teachers about handout.
3. The observation, to collect data on the practicalities of learning, especially effectiveness and feasibility of the prototype are arranged.

#### **3.3. Step of Prototype Design**

Stages of development of the instrument are:

##### **1. Validation Sheet**

Sheets validation required to obtain data regarding the validity of the tool is validation sheet hand-out, Steps in developing a validation sheet is as follows.

- a. Establishes the aspects that must be met by each tool to be compiled
- b. Drafted the instrument validation based on aspects that have been set
- c. Discussing the draft instruments that have been prepared with promoter
- d. Revise instrument validation.

##### **2. Interview Guide**

Interview guide contains aspects that will be the focus of the question, which aims to direct the researcher to obtain the information necessary to develop handout and obtain data practicalities of the resulting tools.

### 3. Observation Sheet

Observation sheet contains aspects that will be the focus of observation of the learning process for analyzing needs, and obtain data about the practicalities of the tools.

### 3.4. Technique of Data Analysis

The data obtained from classroom observation, interviews, and questionnaires were tabulated, described, and analyzed descriptively qualitative accordance with the established criteria. To analyze data on the validation of the tools is used the following criteria.

1. It is valid and the tool can be used without revision, if the percentage of 100% validation. Valid and tool can be used with minor revisions, if the percentage of the results of the validation is in the interval 81% - 99%.
2. Enough valid and the device can be used with considerable revision, if the percentage of the results of the validation is in the interval 61% -80%.
3. Do not valid, if the percentage of the results of the validation tools is less than 61%.

## 4. Findings and Analysis

### 4.1. Description of Results Development and Implementation Tools

Data from development of tools related to the validity and practicalities, and presented descriptively.

#### 4.1.1 Validity of Tools

Research focus at this stage is produced handout based constructivism learning to fifth grade elementary school students on the topic two-dimensional figure and three-dimensional figure that valid in terms of content and construct.

#### a. Analysis of requirement

##### 1) Interviews with 12 teacher math of Class V SD in Padang Panjang city.

Based on interviews obtained information that the teacher's perception of the nature of mathematics, and the interest of teachers to improve the quality of teaching is good enough. All the teachers interviewed also had positive views and thoughts on mathematics, because for these three aspects of more than 80% of teachers expressed positive views and thoughts, even though the experience of teachers in preparing and using a tool based constructivism learning is still not good. Not even a single teacher who is experienced in preparing hand-outs.

##### 2) Interviews with students

Interview data indicate that students have a positive view of mathematics. That means, they view that mathematics is a science that is important to learn and useful in solving everyday problems. For aspects feelings when learning mathematics students obtained information that they enjoy learning mathematics and have a great curiosity about mathematics. But they are less happy reading a textbook.

##### 3) Observe textbooks and tools used teachers

The results of observations of the textbooks shows that the types and kinds of text books that circulated in schools today are many and varied. Commonly used textbooks not fully support efforts to make students to be learn in the "find" a mathematical concept, explanation of concepts and practices still tend mechanistic, and lack the ability to train students to solve problems.

##### 4) Observe about learning mathematics



Observation of the mathematics is done in 3 pieces school that representing high, medium, and low groups . The results showed that teachers tend to teach activity than make students to be learn, give examples of problems, and then students practice solve problems similar to the sample questions provided by the teacher. Activities that train students to think, to reason in drawing conclusions, develop problem solving skills, and communication is very rarely done by the teacher.

### 5) Review of prototype

The Review was conducted in order to obtain suggestions for improvements to the draft prepared by the teacher, before being validated by experts. The Review tools be done through focuss group discussion (FGD) with the mentors, supervisors and teachers of the elementary school where test.

#### b. Design of Handout

#### c. Plan of prototype

Arrangement of prototype tools based on constructivism is done can be explained as follows:

#### 1) Analyze lessons of elementary math class V in first semester

The scope of the material is arranged is geometry, with the following material.

- a) Plane of rectangular
- b) Three-dimentional figure

#### 2) Conducting arrangement of tools

Workshop involves maths teachers from the elementary school where the experiment all three groups. The workshop includes discussions, group work, self-employment, and the presentation of the draft.

#### d. Validation

Validation involves 2 experts math learning. Here are described the results of expert validation of the math-based constructivism handout that had been developed.

The results of the expert validation of the hand-out based constructivism can be seen in Table 2 below.

Table 2. Hand-out Validation

No	Aspect	Validator 1	Validator 2	Validator 3	Jumlah Skor	Persentase
1	Format	11	10	10	31	86,1
2	Content	39	33	40	112	84,9
3	Language	17	16	17	50	83,3
Rata-rata						84,8

Based on Table 2 above it can be seen that the results of the assessment of the hand-out validator is in the category valid and can be used after a light revision on the advice validator. Revisions were made to hand-out is as follows: a) the use of the term, and b) the image size and color.

The bar chart of the results of validation hand-out can be seen in the graph below.

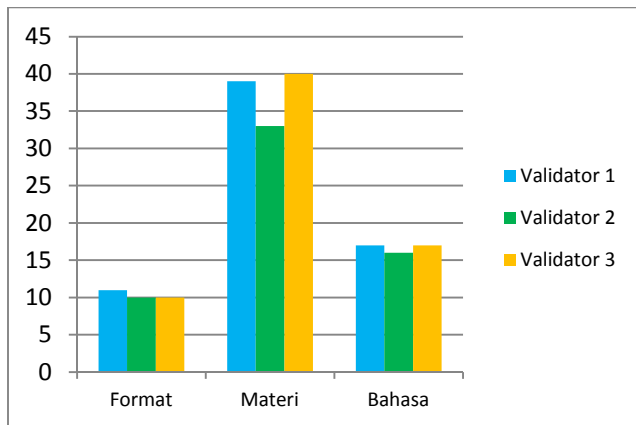


Figure1. Hand-out Validation

### 3.1.1. Practicality

Practicality prototype devices produced viewed through the test results at 9 SDN.

#### a. Testing and Implementation Tools

The prototype device has been validated and revised exercised limited to nine elementary schools in the city of Padang Panjang.

#### b. Classroom Observations

Based on classroom observations were carried out can be seen that in terms of legibility, students can use the Hand-out without undue difficulty. Furthermore, it also can be seen that the device used to help students learn individually or in groups. By using a prototype device that generated mathematical activity can be realized through the presentation of the problem, working in small groups and class discussions.

Ease of use handout is also evidenced by the lack of questions that arise from the students during the learning activities. That is the language that is used in questions and tasks listed in the handout easy to understand the students, so it does not need a lot of guidance from the teacher. Based on observations, in general the "performance" of teachers in implementing the learning using the constructivist-based handout pretty good.

#### c. Interview result

To obtain more complete data on the practicalities of the device that has been arranged, conducted interviews with students.

## 4.2. Analysis

### 4.2.1. Validation of Handout

Based on data from the validation results obtained expert hand-outs that are arranged in categories including valid., Both in terms of format (constructs), content, and language, and can be used with a mild revision of the advice, The study's findings indicate that the Hand-outs are generated for topics Bangun Datar and Build Space composed have been valid and meets the requirements of good teaching materials.

### 4.2.2. Practicality

In general discussion of the practicalities of the resulting data can be as described below.

- a. Students are easy to use Hand-out, it can be seen from the lack of questions students when learning. The condition also indicates that a language easily understood by students.
- b. Students are assisted in learning to use hand-out based constructivist, both when studying individual or group.
- c. Teaching materials are produced is also able to facilitate students' learning according to their interests, and arouse their creativity in solving the problems given in the handout.
- C. Students also become accustomed to communicate their ideas through group discussions, and presentation of the group,
- D. Teachers also stated that they felt helped and are happy to use devices based on constructivism in teaching.

## **5. Conclusion and Suggestion**

### **5.1. Conclusion**

The finding of research comes up to two conclusions, those are:

- a. Handout produced has a valid and meets the requirements of good teaching materials.
- b. Handout produced has good practicalities

### **5.2. Suggestion**

- a. Elementary school teachers need to use handouts that have been developed based on constructivism.
- b. Elementary school teachers should be able to develop a learning tool similar to other mathematical topics.
- c. Elementary school teachers are expected through the forum Teachers Working Group (KKG) may revise the devices that have been produced, mainly to adjust the level of difficulty about, and the number of problems with the allocation of time to complete.

## **References**

- Arends, Richard. I. (1998). *Learning to Teach* ( Fourth Edition ). Singapore: Mc Graw – Hill.
- Brooks, J.G & Brooks, M. G. (2001). *In Search of Understanding: The Case for Constructivist Classroom*, Upper Saddle River, NJ:Merrill.
- Corebima,dkk. (2002). *Pelatihan Terintegrasi Berbasis Kompetensi Pembelajaran Kooperatif*. Jakarta: Depdiknas.
- Degeng, IN. S. (1994). *Strategi Pembelajaran: Kajian Teori dan Aplikasi*. Jurnal Sumber Belajar, Januari. 1 (1), (17-31).
- Gauvain, M. (2001). *The Social Context of Cognitif Development*. New York: Guilford.
- Herman Hudojo. 1988. *Mengajar Belajar Matematika*. Jakarta: Depdikbud.
- Kamii, C. (1990), *Teaching and Learning Mathematics in the 1990s Yearbook*, Resto, Virginia: NCTM.
- Muliyardi. 2002. *Strategi Pembelajaran Matematika*. Padang: UNP
- Prastowo, Andi. 2013. *Pengembangan Bahan Ajar Tematik*. Diva PRESS. Yogyakarta.
- Slavin, R.E. (1994). *Cooperative Learning: Theory, Research, and Practice*. Boston: Allyn and Bacon.
- Steffe, Leslie P. (1991). The constructivist teaching experiment: Illustration and implication, In Glasersfeld, E.v, *Radical Constructivism in Mathematics Education* (pp.177-194). Nederland: Kluwer Academic Publishers