



PROCEEDINGS the 2017 INTERNATIONAL CONFERENCE ON RESEARCH IN EDUCATION

# Proceedings

INTERNATIONAL CONFERENCE ON RESEARCH IN EDUCATION

## ICRE 2017

*"Innovative Pedagogy in a Changing World"*



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FACULTY OF TEACHERS TRAINING AND EDUCATION  
**SANATA DHARMA UNIVERSITY**  
YOGYAKARTA - INDONESIA



OCTOBER 13<sup>th</sup> - 14<sup>th</sup>, 2017

ISBN 978-602-5607-27-1



9 786025 607271



SANATA DHARMA UNIVERSITY PRESS  
Jl. Affandi, (Gejayan) Mrican, Yogyakarta 55281  
Phone: (0274)513301; Ext.51513  
Web: [sdupress.usd.ac.id](http://sdupress.usd.ac.id); E-mail: [publisher@usd.ac.id](mailto:publisher@usd.ac.id)



Proceedings

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# THE 2017 INTERNATIONAL CONFERENCE ON RESEARCH IN EDUCATION

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Education  
Sanata Dharma University  
13<sup>th</sup>-14<sup>th</sup> October 2017

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Printed Book:  
**ISBN: 978-602-5607-27-1**  
EAN: 9-786025-607271

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First Edition, February 2018  
iv; 411 pages; 15,5 x 23 cm.  
Illustration & layout:  
FX Made Setianto

PUBLISHER:



SANATA DHARMA UNIVERSITY PRESS  
Lantai 1 Gedung Perpustakaan USD  
Jl. Affandi (Gejayan) Mrican,  
Yogyakarta 55281  
Telp. (0274) 513301, 515253;  
Ext.1527/1513; Fax (0274) 562383  
e-mail: [publisher@usd.ac.id](mailto:publisher@usd.ac.id)

SUPPORTED BY:

FACULTY OF TEACHERS TRAINING AND  
EDUCATION  
SANATA DHARMA UNIVERSITY  
Jl. Affandi, Mrican, Caturtunggal, Depok, Sleman,  
Yogyakarta 55281



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## **PREFACE**

### **Rohandi**

The Dean of Faculty of Teachers Training dan Education, Sanata Dharma University,  
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The International Conference on Research in Education (ICRE), with the theme of “Innovative Pedagogy in a Changing World“, aims at providing a global platform to discuss, discover creative solution, as well as share knowledge, experience and ideas from the results of the research. This Conference Proceedings contains the written versions of most of the contributions presented during the International Conference on Research in Education (ICRE). This conference took place at Sanata Dharma University<sup>3<sup>rd</sup></sup> campus, Paingan, Maguwoharjo, Sleman, D. I. Yogyakarta, Indonesia from 13 – 14 October 2017

This Conference provided a setting for discussing recent developments in a wide variety of topics on innovative pedagogy and provides opportunity for the practitioners, researchers, and policymakers to share topics related to the latest research, best practices in improving the quality of education in the future, and wider professional networking in national or international level.

We would like to thank all participants for their contributions to the Conference program and for their contributions to these Proceedings. Many thanks go as well to All Keynote Speakers, Steering Committee and Organizing Committee for the success of this conference and to all people who participated for the process of proofread of the contributed papers and in preparing this proceedings.



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# CHARACTERISTICS ANALYSIS OF LEARNING MODEL USING THE CONTEXT OF REFLECTIVE PEDAGOGY PARADIGM

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## **Abstract**

To get the right model, we need to know the learning model with what characteristics can be applied in class. Therefore, analyzing the characteristics of learning model that appropriate to be implemented in Elementary Statistics Course in Class A based on the context in Reflective Pedagogy Paradigm becomes the purpose of this research. This research was conducted from August to December 2016, which are 33 students who take Elementary Statistics course in Class A become the subjects. Data of the context were analyzed qualitatively which were collected through open questionnaire, directly interview, study program document, and SIA document. The findings of this research showed that based on the context, the learning models which can be implemented in Elementary Statistics course in Class A are learning models that have the following characteristics: Can be implemented in class which the students have heterogeneous capabilities and origin; Students can interact and cooperate with each other; Learning self-direction becomes the main thing; Real problem becomes a starting point in learning; The learning challenges students' knowledge, attitude and the students' competence through the problem; Can facilitate the success of problem-solving ability, communication, cooperation, and interpersonal skills; Students can construct their knowledge.

**Keywords:** reflective pedagogy paradigm, context, characteristics of learning model.

## **Introduction**

The learning process will be success if it is effective and efficient. To create an effective and efficient learning process, a teacher has to design a learning process that is suitable for students' condition and the purpose of the learning. One of the important thing in designing of the learning process is determining a model that can be applied without ignoring the important aspects of learning, those are the purpose of learning, the context of the students, and the topic of the subject.

Suparno (2014) said that we can choose an appropriate learning model through the context. Reflective Pedagogy Paradigm, with five elements: context, experience, reflection, action, and evaluation, is a paradigm that considers about the context in the learning process. The context in



RPP consists of four things, those are students' context (family, friends, origin); social, economic, political and cultural; the institutional environment of the school of learning center; the initial concept of students (value, understanding). Through this context, the teacher knows the life experience of the learner. In this way, the teacher can adapt the lesson in light of students' circumstances. Suparno (2014) said that context is very important because context can influence in determining experience and model that will be implemented in the learning process. If the learning process is suitable with the context then students can understand the subject easily. But before we determine the model, we need to know the learning model with what characteristics can be applied in class, and it can be analyzed through the context. Through context in Reflective Pedagogy Paradigm, the researcher will analyze the characteristics of learning model that appropriate to be implemented in Elementary Statistics Course in Class A.

## **Theoretical Construct**

### **A. Context in Reflective Pedagogy Paradigm (RPP)**

Suparno (2015) said RPP is a paradigm that has long been done in Jesuit education. The learning process using the Reflective Pedagogy Paradigm in one cycle consists of five stages. The three main stages in a PPR cycle are experience, reflection, and action. The other two stages are context and evaluation, done before and after the three main elements. The context is done before the three main stages are performed and it is the main component in the RPP's cycle that is done early in the cycle. Through this context, the teacher can create an atmosphere for learning that is suitable for the student's own life situation. According to Caruana (2014), "Context is the first principle which anchors the rest of the teaching and learning experiences of both learners and faculty." Suparno (2014) said that context will influence the choice of experience and also the learning

model that will be used. Context also can inform about students' background. Because of that, the context in RPP's cycle is very important.

There is some information in a context that needs to be explored. This information can be used for teacher in knowing the learning model with what characteristics can be applied. Suparno (2014) said that there is the information in RPP's context that must be known, those are student context (family, friends, origin), social, economic, political and cultural, the institutional environment where students study, the initial concept of students (value, understanding), and Indonesian Education context.

ICAJE in Caruana (2014) defines the context in RPP are students' life, socio-economic, political and cultural context, the institutional environment of the school of learning center, what the acquired concepts of students bring with them to the start of the learning process. Korth (2008) stated, "We as faculty need to understand the world of our students, including ways in which family, friends, social pressures, politics, economics, media and other realities." Based on the above opinions, it can be concluded that the context information that needs to be considered are:

1. Student's context

As the first step, teacher requires learning students' live. For example, the occupation of their parents, family, friends, or origin.

2. Social, economic, political and cultural

Caruana (2014) said that Societal and cultural beliefs and norms are patterns that perpetuate the values that bind together institutions and individuals. The political-ethical context explores the notions of the obligations of a democratic society and

the structural equalities and inequalities that are found in our past and current definitions of social roles.

3. The institutional environment of the school of learning center

The context that can be explored in the institutional environment of the school of learning center is about the vision of the institution or study program. Not just about the vision of the institution where students learn but can also be seen more narrowly related to the purpose of syllabic based goals of the learning and the learning outcomes.

4. The initial concept of students (value, understanding)

Student's understanding of the concept is needed for the teacher. Through this information, the teacher can know the deepening of student's concept and can decide the way to give the material.

## **B. Learning Model**

The learning model is a plan or pattern that can be used to make the curriculum (long-term learning plan), design learning materials, and guide learning in class or otherwise (Joyce and Weil, 1980: 1). Rusman (2012) said the teacher can choose a learning model that suitable and efficient for achieving the education purpose. Before we decide what the learning model that the teacher will use, there are some things that need to be considered, those are:

1. The purpose that will be achieved

The questions that can be proposed are what is the purpose of learning that to be achieved according to the competence, personality, social and the vocational

competence of students, how the complexity of the learning model that will be achieved, are they needed academic skills to achieve the purpose.

2. The topic or the subject matter

The questions that can be proposed are is the subject matter in the form of facts, concepts, laws or certain theories, do we need the precondition in learning the subject matter, are the sources available.

3. The students

The questions that can be proposed are does the learning model suitable with the level of development of students, does the learning model suitable with the interests, talents, conditions of the students, does the learning model suitable with the students' learning style.

4. Non-technique

The questions that can be proposed are do we need another method to achieve the learning purpose, does the model have value effectiveness?

## **Methods**

This research was conducted from August to December 2016 with the number of subjects were 33 students who take Elementary Statistics course in Class A. The data, which were collected through open questionnaire, interview, observation, study program document and SIA document, are analyzed descriptively with the qualitative approach. Open questionnaire and directly interview is used to collect data about students' origin, students' major in senior high school and students' understanding of statistics. Vision of mathematics education study program and syllabus, subject's goal and the learning outcomes, are collected using study program

document while SIA document is used to collect social context data and students' GPA. The technique that is used for analyzing is interactive technique. According to Miles and Huberman (1984), this technique has three activities, those are data reduction, data display, and verification.

## **Findings and discussions**

The following presents the findings related to context and learning model's characteristics analysis in Elementary Statistics Course in Class A.

### **A. Context in RPP**

There is some information that can be explored in RPP to know the context, those are:

#### **1. Students' context**

The information that is explored in students' context consists of the origin and also the students' major in senior high school. The following is the data regarding students' origin:

<b>Table 1. Students' Origin</b>	
<b>Origin</b>	<b>Number of Students</b>
Special Region of Yogyakarta	6
Central Java	10
West Java	2
West Borneo	5
South Borneo	1
East Borneo	1
Bali	2
NTT	4
Bangka Belitung	1
Riau	1
South Lampung	1



From the data, we get information that 53% students come from Java, 20% come from Kalimantan, 6% come from Bali, 12% come from NTT, 3% come from Bangka Belitung and 6% come from Sumatera. It means 47% students do not understand Javanese. Therefore, the teacher must reduce Javanese using in teaching, so that the students can understand what teacher says. Besides, the data also give information that the students who learn Statistics in Class A originate from various regions.

The following data talk about students' major in senior high school.

**Table 2.** Students' Major in Senior High School

Major	Number of Student
IPA	34
IPS	1
Bahasa	0

From the data, it is known that 97% of students choose a science major. It means that most of the students have gained knowledge related to Statistics.

Based on students' contexts information, we can conclude that the class has students who come from the heterogeneous origin and most of them have already learned Statistics in Senior High School.

## 2. Social, economic, political and cultural

In this context, the researcher only collects social data. In extracting this context, information is obtained from observation and interview to lecturers who have taught them. The result shows that the students are less able to socialize with other friends. They tend to hang out with their close friends and chose their close friends to be discussion partner. During student mentoring, where the researcher as a companion lecturer, the researchers observed they tend to sit in groups. They do not want to mingle with others. Thus, among students in Class A are not familiar with each other.

### 3. Environmental institutions of the school of learning center

Suparno (2014) explains that this context includes learning situation, moral value, organization, curriculum, and the role play. But this article only explains about the organization (vision of mathematics education study program) and curriculum (syllabus regarding subject's goal and the learning outcomes).

The first information is the vision of mathematics education study program. The vision is to become a superior and professional study program in producing competent and humane mathematics teachers, conducting research and dedication that provides solutions to mathematics education problems. It means that this study program has a purpose to create professional mathematics teacher. To be a professional teacher, students not only know about the material but also have to understand the concept and have the ability to explain the material.

The second is learning goals and the learning outcomes of elementary statistics. Based on learning design the learning outcomes of this subject are:

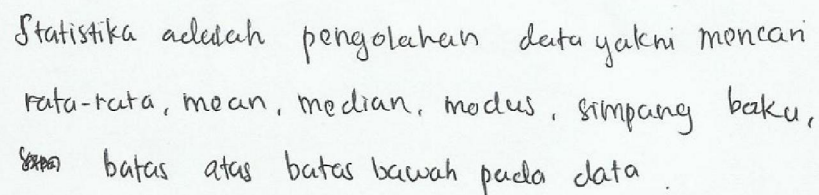
- a. Mastering materials, structures, concepts and mindsets of elementary statistics to teach mathematics learning in schools and to follow the development of elementary statistics.
- b. Applying the concept of elementary statistics materials to facilitate the development of potential learners through effective and empathetic communication.

We can conclude that there are two learning outcomes for descriptive statistics there are students master the concept of statistics for teaching in senior high school and students can apply the concept in real problems.

The goals of the elementary statistics especially the descriptive statistics are students can identify the descriptive statistics problem and inferential statistics, identify the correct measure based on the data, do the correct calculation about measure of location and measure of variability, define the difference and the meaning of measure of location and measure of variability, and present the data incorrect table, diagram or graphics.

4. Students' concepts (value, understanding)

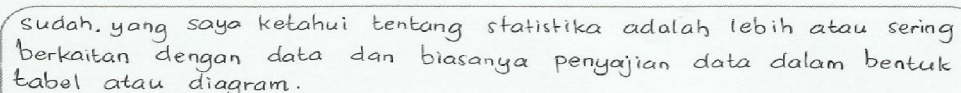
Suparno (2014) explained that the context which can be found in students' concept are all scores, knowledge, and early concept that students have before learning process. In this article, the author only explains about students' Statistics knowledge and GPA score. Based on the students' major, we get information that most of the students have already got Statistics in Senior High School. Questionnaire and directly interview are the instruments that are used for knowing their Statistics knowledge. These are their answer:

A photograph of a handwritten note on a light blue background. The text is written in Indonesian and describes statistics as data processing, listing measures like mean, median, mode, standard deviation, and upper/lower limits.

Statistika adalah pengolahan data yakni mencari rata-rata, mean, median, modus, simpang baku, ~~dan~~ batas atas batas bawah pada data.

**Figure 1.** Students' Answer 1

Student says statistics is data processing that finds mean, median, mode, and standard deviation.

A photograph of a handwritten note on a light blue background. The text is written in Indonesian and states that the student knows statistics as something often related to data and usually presented in table or diagram form.

sudah yang saya ketahui tentang statistika adalah lebih atau sering berkaitan dengan data dan biasanya penyajian data dalam bentuk tabel atau diagram.

**Figure 2.** Students' Answer 2

The other student says that statistics is related to data and usually the data is presented in table or diagram. According to the questionnaire, almost 100% students said that Statistics is data processing to find the value of the mean, median, mode, variance, standard deviation, and how to present the data on the table or diagram. Based on the interview, students do not understand about what the meaning of the values if it is connected to students, and why they present the data on the table. These results show that students do not understand what statistics is. When the researcher asks about the meaning of the values, they cannot answer correctly.

Based on their Statistics knowledge, the teacher can design the lessons by giving questions words as "why", "what does it mean" not "what it is", "how much it is " or "how to present it" to improve their knowledge about descriptive statistics. Through these questions, the lesson is more emphasized to the terms' meaning in Statistics that are linked to students' life and explanation of where the formula originated. The introduction of terms, calculations - calculations, and explanations of how to present the data in the diagram are not the focus of the lessons. Such that the role of the teacher in this lesson is to be a facilitator in assisting students in constructing their knowledge. Besides the concepts of students, in this context author also seeks their GPA score. Based on data that obtained from SIA document, the students' GPA is as follows:

**Table 3.** Students' GPA

<b>GPA</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Average</b>	<b>Variance</b>
GPA < 2.50	8	22.86%	2.77	0.22
$2.50 \leq \text{GPA} < 3.00$	17	48.57%		
$\text{GPA} \geq 3.00$	10	28.57%		

Based on the average, it is found that the students' ability is good. While viewed from the variance, the ability of students in class A is said to be heterogeneous. Some of them are below average and some are above average.

## B. The Characteristics of Learning Model based on Context

Based on the above context, the following results are obtained:

**Table 4.** Characteristics of Class

Context	Results	Characteristics of Class
Students' context: • Origin • Major in Senior High School	<ul style="list-style-type: none"> <li>• Students come from various regions: 53% come from Java, 20% come from Kalimantan, 6% come from Bali, 12% come from NTT, 3% come from Bangka Belitung and 6% come from Sumatera.</li> <li>• 97% of students choose science as their major when they are in senior high school</li> </ul>	<ul style="list-style-type: none"> <li>• Students come from different provinces</li> <li>• Students already learned about statistics in senior high school</li> </ul>
Social, economic and cultural	Students tend to be in groups, not mingling with others.	Students are less sociable with friends who are not so close.
The environment where students learn: • The vision of study program • Goal of the learning • Learning outcomes	<ul style="list-style-type: none"> <li>• The vision of the Mathematics Education Study Program is to create professional mathematics teacher</li> <li>• The learning outcomes of descriptive statistics are students master the concept of descriptive statistics for teaching in senior high school and students can apply the concept to real problems</li> <li>• The goals of descriptive statistics learning are:               <ul style="list-style-type: none"> <li>• Competence Students can identify the descriptive statistics problem and inferential statistics,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Students are expected to become professional teacher</li> <li>• Students master the concept and can apply it in real problem</li> <li>• Students are able to be fair, caring and able to cooperate with other students</li> <li>• Students have responsibility, perseverance,</li> </ul>



Context	Results	Characteristics of Class
	<p>identify the correct measure based on the data, do the correct calculation of measure of location and measure of variability, define the difference and the meaning of measure of location and measure of variability, and present the data incorrect table, diagram or graphics.</p> <ul style="list-style-type: none"> <li>• Compassion Students are able to be fair, caring and able to cooperate with others</li> <li>• Conscience Students have responsibility, perseverance, thoroughness, and curiosity</li> </ul>	thoroughness, and curiosity
<p>Students' concept:</p> <ul style="list-style-type: none"> <li>• Students' knowledge</li> <li>• GPA score</li> </ul>	<ul style="list-style-type: none"> <li>• Students do not understand what statistics is and do not understand the meaning of the central tendency measures and statistical dispersion measures but they can calculate the value of central tendency measures and statistical dispersion measures correctly.</li> <li>• The average of student's GPA is 2.77 with variance value is 0.22.</li> </ul>	<ul style="list-style-type: none"> <li>• Students have not understood the concept well, but they have already known how to calculate and found the values in descriptive statistics well.</li> <li>• The ability of students in the classroom is good with a fairly heterogeneous ability.</li> </ul>

Based on the results above, we can analyze the characteristics of learning model that are needed in Elementary Statistics course in Class A, those are:

**Table 5.** Characteristics of Learning Model that are Needed

Characteristics of Class	Characteristics of Learning Model that are Needed
<ul style="list-style-type: none"> <li>• Students come from different provinces</li> <li>• The ability of students in the classroom is good with a fairly heterogeneous</li> </ul>	<ul style="list-style-type: none"> <li>• Can be implemented in class which the students have heterogeneous capabilities and origin.</li> </ul>

Characteristics of Class	Characteristics of Learning Model that are Needed
<p>ability.</p> <p>Students are less sociable with friends who are not so close.</p> <ul style="list-style-type: none"> <li>• Students are expected to become professional teacher</li> <li>• Students master the concept and can apply it in real problem</li> <li>• Students are able to be fair, caring and able to cooperate with other students</li> <li>• Students have responsibility, perseverance, thoroughness, and curiosity</li> <li>• Students already learned about statistics in senior high school</li> <li>• Students have not understood the concept well, but they have already known how to calculate and found the values in descriptive statistics well.</li> </ul>	<ul style="list-style-type: none"> <li>• Students can interact and cooperate with each other.</li> <li>• Learning self-direction becomes the main thing.</li> <li>• Real problem becomes a starting point in learning.</li> <li>• The learning challenges students' knowledge, attitude and the students' competence through the problem.</li> <li>• Can facilitate the success of problem solving ability, communication, cooperation, and interpersonal skills.</li> <li>• Students can construct their knowledge.</li> </ul>

Based on the context, it can be concluded that the learning models that can be implemented in Elementary Statistics (especially in descriptive statistics) in Class A are learning models that have the following characteristics:

- Can be implemented in class which the students have heterogeneous capabilities and origin;
- Students can interact and cooperate with each other;
- Learning self-direction becomes the main thing;
- Real problem becomes a starting point in learning;
- The learning challenges students' knowledge, attitude and the students' competence through the problem;
- Can facilitate the success of problem solving ability, communication, cooperation, and interpersonal skills; Students can construct their knowledge.

## Conclusion

Based on the context, it can be concluded that the learning models which can be implemented in Elementary Statistics course (especially in descriptive statistics) in Class A are learning models that have the following characteristics:

1. Can be implemented in class which the students have heterogeneous capabilities and origin;
2. Students can interact and cooperate with each other;
3. Learning self-direction becomes the main thing;
4. Real problem becomes a starting point in learning;
5. The learning challenges students' knowledge, attitude and the students' competence through the problem;
6. Can facilitate the success of problem solving ability, communication, cooperation, and interpersonal skills;
7. Students can construct their knowledge.

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## Documentation



Figure 1: The International Conference on Research in Education 2017



Figure 2: Opening of The Conference by Traditional Dance



Figure 3: Welcome Speech from Vice Rector 1 Sanata Dharma University



Figure 4: First Day Conference



Figure 5: Conference's Speakers and Committee



Figure 6: The Participants of The Conference





Figure 7: Activities in The Parallel Classes



Figure 8: Activities in The Parallel Classes



Figure 9: Preparation of The Second Day Conference



Figure 10 : ICRE's Keynote Speakers





IFigure 11: Second Day Conference



Figure 12: Second Day Conference



Figure 13: Second Day Conference



Figure 14: Second Day Conference