

# Case-Based Reasoning (CBR) Method can Affect the Creative Problem Solving Skill (CPSS) Students Based on Regional Differences of School

Iksan Mukhlis and Gayatria Oktalina

*Economic Education Study Program, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229, Bandung, Indonesia  
gayatria\_oktalina@yahoo.com*

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**Abstract:** This study aims to compare the use with the method of case-based reasoning (CBR) towards creative problem-solving skills (CPSS) students based on regional differences within the school. This research is a study of experiments with a 2 x two factorial research design. Sample research amounted to 62 high-school students of Class XI IPS in SMAN 15 Bandung and SMAN 1 Parongpong. The two classes at each school are given the same treatment then given post test. The results showed there is the interaction between the use of CBR method and the regional differences within the school to the city and of the urban against the CPSS students depending upon the factors that influence such as self-reliance, social environment and learning conditions parental socio-economic.

## 1 INTRODUCTION

The problem in the learning process for students especially on economic subjects remains the actual problem. In general learning process still seems dominated by the role of the teacher who serves give or transmit knowledge in students. As if the substance through the learning delivered a final is a teacher and students should take it for granted without critical and creative thinking. Science seems to be something that happens in life that is understood by teachers, but the students do not perform the assimilation and transformation in himself so that science students accepted into just out-there knowledge is not in-here knowledge. Learning strategies should not only be limited to conveying material from teachers, but should be able to push the students doing something against the accepted interpretation of the outside so it can be an understanding in itself. Learning strategies which only gives human dignity have destroyed in the independence and capacity of their creative.

In this 21st century, students are expected to develop the ability to think creatively and the ability to solve the problem which is the highest intellectual skills (Dick, 2003) in which students can learn in any setting (Jonassen, 2000). A combination of both that ability known as creative problem solving (CPSS) i.e. a person's ability and finish issues with some thought

creatively. CPSS not just problem solving. The creative aspect is needed. Creativity is needed to find a variety of ideas in order to choose the optimal and best solution. In accordance with the opinion of Isaksen (1992), 'the CPS is not merely problem solving. The creative aspect to the CPS means the focus is on the new challenges facing us opportunities, dealing with unknown or ambiguous situations and productively managing the tension caused by gaps between your vision of the future reality and actual current reality'. Similar with the opinion stating that, 'This approach to problem solving is typically inefficient when the problem is too complex, ill understood, or ambiguous. In such a case, a creative approach to problem solving might be more appropriate'. With creative thinking someone would be able to solve problems not only common, but also able to see the different alternatives of solving that problem. Creative thinking ability is very important in solving the problem because it can increase the positive attitude a person so it's not easy to despair in resolving the problem.

The expectations about high value of creative problem solving skills that are not yet aligned with student achievement in schools in Indonesia. This is supported by empirical data obtained from test results to creative problem solving skills students in SMAN 15 Bandung and SMAN 1 Parongpong. Researchers

did a pre-research to students of class XII by giving a test on the material of international trade, and get the results of student data as follows:

Table 1: Average Value of Creative Problem Solving Skill Test Result.

Sekolah	Number of Students	Indicator of Creative Problem Solving Skill		
		(Fluency)	(Flexibility)	(Originality)
SMAN 15 Bandung	50 siswa	72	55	45
SMAN 1 Parongpong	50 siswa	68	60	38

Source: Pre-research Data

The above table 1 shows the information that creative problem solving skill students in both of school is still low for materials of international trade. Of these three indicators of creative problem solving skills of students above we can see that the indicator of flexibility (the ability provide the answer to the problem of more than one) and originality (the ability give an answer that is rare) is an indicator of the most low in achievement of creative problem solving skills of students. Students are able to solve the problem given smoothly (fluency) is seen with a value that is already above the KKM, but still lacking in providing completion or creative solutions are proven in table 1 shows low levels of flexibility and originality. Still the lack of ability of the students gave more than one answer or specific and different, students tend to give an answer that is common.

Conditions of low CPSS students it certainly should not be allowed to casually, as if left constantly, so it is feared will cause bad impact towards middle-school graduates who will be facing the world of work. This condition becomes one of the consequences of the use of methods that monotonous, which is not in keeping with the times. So the less capable of providing stimulus for students to be active in learning, students are just being passive subjects which should always be encouraged to learn. Therefore, teachers need to do strategies to solve those problems by using the method of learning based on the students because the learning process of the economy requires the existence of a real case in illustrations the application of the knowledge acquired, but in fact the learning in the classroom just make students become passive, whereas an effective learning process is a process that involves reflection and direct experience of the learner.

There are many methods that are currently based on the students. However, in this study the author will only examine two methods i.e., casebased reasoning (CBR). The method is the main paradigm of CBR in

automated reasoning and machine learning, so that students who do the reasoning can solve new problems with the way the notice its similarity with one or more problem solving of problems previous. Our understanding of learning from the experience of the model suggested is CBR (Kolodner, 1987; Schank, 1997) because it provides a good model of the processes and the representation of knowledge necessary to transfer learning (Kolodner, 1987).

## 2 LITERATUR REVIEW

### 2.1 Case Based Reasoning Method

CBR is a method used to resolve problems by utilizing the genesis of Genesis long as the solution of new cases by looking at the level of similarity. According CBR based on Ausubel's theory of meaning. Ausubel stated that learning must be meaningful, the material is studied diasimilasikan in non arbitrer and dealing with the knowledge that has been owned previously (Nielsen, 1980). CBR is included into the clump method in information processing (the information processing metodes). The learning process will go well if the subject matter or new information to adapt to cognitive structure of tang has been owned by someone. Discussion of CBR, heavily influenced by research in cognitive science. The research of CBR are based on a study of the history of human knowledge (Schank, 1977), particularly research on the role of memory in the knowledge.

CBR is grouped into two main types: CBR CBR for interpretive and problem solving (Kolodner, 1987). At CBR interpretive, an important aspect is arguing whether a new situation should be treated as before on the basis of equality and difference, whereas CBR for problem resolution, aimed at getting settlement new problem with doing adaptation to completion on previous cases. The methodology of problem solving CBR is based on memory, so one would imagine problems and settlement of the diingatnya as a starting point for resolving problems. An observation on CBR-based problem resolution, stating that the same problem will have the same resolution.

This study will use a CBR-based problem solving that can briefly described the steps as follows: (Mantaras, 2006)

- The taking back the appropriate cases from memory (this requires the giving of the index against the cases by adjusting its features);
- The selection of a group of cases that best;

- Select or determine the settlement;
- Evaluation of settlement (this is intended to convince in order not to repeat the wrong resolution);
- The latest case resolution Storage in a storage case/memory.

## 2.2 Creative Problem Solving Skill

Gagne confirms that the CPSS is the highest intellectual skills in which is a person's ability and finish issues with some thought creatively. Learning to solve problems are the most important skills in which students can learn in any setting (Jonassen, 2000). Creative thinking is able to create opportunities for students to generate a lot of ideas, which is very useful in complex problem solving. Many of the ideas that are inappropriate, stupid or useless, but capable of generating ideas helps a lot with different thinking necessary to solve complex problems in our world today. As we get from the past and see the future, creative problem-solving capabilities can provide the solution to the problems of the 21st century and citizens can learn to use in the community by teaching problem solving skills to students in class.

There are four elements in the CPS investigation (Isaksen and Treffinger, 2004): 1) understand the challenges; 2) generate ideas; 3) prepare action and 4) do the planning. And there's action, namely: stage eight 1) building opportunities; 2) exploring data; 3) frame the problem; 4) generate ideas; 5) develop solutions; 6) build acceptance; 7) design process; and 8) rate of duty. Stated that during the process of CPSS, constantly thinking is crucial to any solution. CPSS goals not only solve problems with CPSS creativity, but also requires the learners to think of creative ideas and innovative and for critical thinking to reflect the solution of the problem.

## 3 METHODOLOGY

Research design in this study uses 2 x 2 factorial design. As for the research variables, x is the learning method CBR as the independent variable and Y is the dependent variable as the CPSS. The table 2 below shows details of the factorial design has been drawn up:

Table 2: Factorial Design 2x2.

Variabel		Experimental Group	Control Group

Wilayah (A)	City	V	
	Urban	V	

## 4 RESULTS

H0:  $(\beta\alpha) m1 = (\beta\alpha) m2 = (\beta\alpha) m3 = 0$  (there is no interaction between the learning methods, regional differences against CPSS school students). Hypothesis testing using test two-ways Anova.

Table 3: Research Hypothesis Test Results.

Source	Sig.	Result
Corrected Model	.000	Significant
Intercept	.000	Significant
METHOD	.053	No Significant
REGION	.000	Significant
<b>METHOD * REGION</b>	<b>.012</b>	<b>Significant</b>

a. R Squared = .338 (Adjusted R Squared = .318)  
Source: the research hypothesis test results main effect and interaction effect SPSS (attachments).

The table 3 above shows that the significance of the interaction effect of 0.12 smaller than 0.05 means that H0 is rejected and there is interaction between the use of methods and regions against the CPSS students. Next to see the interactions between these two variables then the champion and the post hoc analysis to analyze each variable. Post hoc analysis showed that students using CBR method in areas of the city have a higher compared CPSS with students residing in the urban area.

Obtained findings that in the region the City give more effective impact in improving CPSS students compared to areas of the city. The learning achievements of students are influenced by several factors, both internal factors such as the physical factors, psychological factors, factors of fatigue as well as external factors such as family factors, factors of the home atmosphere, factors of the school environment, and community factors, as well as the factor approach to learning. Directly or indirectly the State of the environment, the atmosphere around the residence and the climate is very important in affecting learning achievement. This is supported by the opinion of Wechsler in that a child's achievements in learning the value always changes can occur on the basis of individual and situational factors. The quality of the environment it can hold a lot of stimulation that influenced the development of intelligence in terms

of the achievements of the children. Based on the results of a test of the hypothesis thus regional differences in the learning process can affect students' ability in handling the problem creatively.

As for things that become factors that differentiate the results obtained from the two methods that are affected by the region namely: 1) independence of learning; 2) social environmental conditions; 3) socio-economic status of parents. Self-reliance is a major key learning from the success of the implementation of both of these methods. The ability of the SDL must be owned by the individual primarily who follow education education. With the independence of individual learning may initiate study with or without the help of others; diagnose your own learning needs, formulating learning objectives; identify learning resources that can be used; choose and apply learning strategies, and evaluate the results of his studies, Eric Lowy (on Sumarmo:-). CBR method relies heavily on the independence of the students because it is in this method students are required to be active and independent. The teacher only as facilitators in the learning process so that students must construct its own findings that they get from a variety of sources and then formed into a new knowledge. In line with the research ever undertaken, with findings that collectively learning achievements PMP, Indonesian Language, SOCIAL SCIENCE, mathematics and SCIENCE are influenced positively by the level of intelligence of children, socio-economic status parents, parenting, and children's learning independence.

Therefore the method of CBR is more effective if applied in the region with the condition of students who have a high learning independence. Students with a high learning independence will have a habit of active learning, they can learn from any source without having to rely on the teacher and the school. Usually students with these conditions we encountered in the area of town where kids are familiar with ease in the U.S. source of learning and interacting with other advanced technologies. While the child in the area of the villages tend to be more passive and are unfamiliar with the technology so that when both are equally exposed to the conditions under which children should be prosecuted is actively utilizing the technology and learning resources besides textbooks then in the urban area will be more trouble.

The literacy abilities of children in urban areas lower than students in the city because of the environment around them live not accustom them to interact with technology that allows them to absorb

information from outside sources. In line with the results of the research which States that ' there is a linear effect among literacy ability against information achievement student learning. If information literacy ability is less then the achievements are also less. If information literacy ability is good, then a good achievement. '

The application of CBR method in needed a conducive social environment conditions, either in the school or community environment, as in the method of CBR students are required to be active and independent and able to find learning resources on its own without having to wait the teacher because the primary role of the teacher as a facilitator in this method. The environment must be able to be a learning resource for students. City and urban environmental conditions are very different. The school is located in the town tend to apply discipline in high school to the citizens, every citizen should obey school rules set either at school or in the classroom. Competition and the demands in the strict city make the motivation of students to compete to be the best is very high. However, for most urban schools have to adjust with the environment surrounding communities, because many children lacking parental support in school or kids with parental data collection low so they should work for the purposes of the school. So many kids who come too late. In addition the motivation of students at urban including low, because many who thought that finally they will return to work as their parents.

The gaps of provision facilities in the city and in urban also caused that to happen. In the city's myriad public facilities that support the learning process of the child so that the child can be explore the knowledge they get at school. Many of the learning resources provided the City Government to support education. For example the only place les and courses are mushrooming in the city. While on urban still rarely let alone in a far from urban cities. This finding is supported by the findings of Arends (2012) which States that ' influential study facilities are directly against the achievements of learning subjects of economy. '

The next reason why CBR more effectively applied in the schools of the city, because of the status of social economy of the parents of students who were in the area of the city is usually more well established compared to parents of students residing in the urban area. CBR method requires the independence of students in learning, to foster independence while students should be facilitated with a complete learning resource that not only comes from the school. Usually parents with social economy will be

more concerned with the education of his children so that they will attempt to provide the best facilities to support education children. While parents with low social status have low concern also to education of children, even if they have a high concern to their children they are not able to provide the best facilities to support education his son because of the limitations of cost and economic demands. When parental support in the form of the granting of facilities and infrastructure, information on the importance of learning, and the attention of the parents on the child affects the child's motivation and interest in learning. The existence of the interest and motivation that will certainly affect the accomplishment of learning achieved.

The influence of socioeconomic status, intelligence parents, parenting, and children learn independence against the achievements of elementary school students ' learning. ' shows that there is a relationship between economic and social condition of parent motivation learning with achievement learning students on the lesson of geography '. The above findings are reinforced by research that has been done in the field of Economics conducted and the results show that, ' there is significant influence between the conditions of parental economic and social learning motivation of students with the learning achievements of students on economic subjects '. A child who gets noticed by parents in their learning achievements learning better than children who do not get noticed by parents in education (Azizah, 2009).

On the basis of the findings obtained during the research authors, parents with higher socioeconomic status have high hopes against the success of children at school and they often give an appreciation of the intellectual development of the child. They are also capable of being a great model in speaking and reading activities. Parents often read together, supply a praise to children when the children read a book on its own initiative, bringing children to the bookstore and visit the library and they became the model for the child with more often make use of spare time to read. Meanwhile, older people with low socioeconomic status often give a negative example in talking, especially when they fight because of financial limitations. They also rarely praising children when the children read, even the parents have low expectation of success against school children so that they do not want to get involved to help the children's homework or other school assignments. The result of the next child to be not Excel in school and this adds to the pressure of the family when the parents were called to the school to

guarantee the failure of the education of the child. It appears that families with low socioeconomic status experience high stress.

These findings are supported by some previous studies done by earlier Research that support the results of this research are Wood (2003:4) stated that CBR method fosters active learning, improve reasoning, develop skills analysis/problem-solving and attitude displayed in her future practice. While based on the results of earlier research by Worrell and Profetto (2007) and Wood (2003) CPSS students can be developed by using the method of learning CBR in learning process. Bable to gather and assess relevant information, using ideas to misinterpret an effective conclusion by giving reasons and solutions, open thinking and able to communicate effectively with others in figuring out solutions to complex problems.

## 5 CONCLUSIONS

There is a difference ability of the CPSS learners between a group of learners who are in the territory of the city and the urban area. The ability of the CPSS is influenced by regional differences of school learners. On learners who attended the city tend to have higher CPSS ability compared to students who attend school in urban areas due to the factor-factor gap between the two areas as environmental conditions social learning, independence, and socio-economic conditions of the parents. There is an interaction between the learning method of CBR on the different schools against CPSS ability learners. This means that the third variables are inter-related to the third factor influenced by supporters who have been mentioned above.

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