

THE 'REOP' ARCHITECTURE TO IMPROVE STUDENTS LEARNING CAPACITY

Edna Maria, Febriyant Jalu Prakosa, Christiana, Monica Ganeip Pertiwi

ednamaria4781@gmail.com, febriyantjalu@gmail.com

PPs. MMP Universitas Kristen Satya Wacana

Abstract

This paper reviewing about a model of teaching by scientific approach as an effort of educator to increase the students learning capacity. The leading role of education is to increase the capacity of students in terms of personality, the development of social, and academic learning. A lot of models of teaching which has been developed and applied to reach the goal. The models of teaching is able to affect the pattern of students learning. This model emphasizing child-centered learning with a flange on the model scientific research that can train students to develop hypothesis and the reasons in causality. The students are stimulated to conduct research and investigation with guidance from the teacher. A structure in this model have phases such as Research Elaborate Order and Publish (REOP) that can run in a series of teaching. The first phase, Research, explore the richness of the concept of students. The second phase, Elaborate, students with the teacher confirm the findings of a concept with empirical evidence. The third phase, Order, students discuss the results of confirmation with a friend. The fourth phase, Publish, students communicating the results of its research to others. Writer find result that students stimulated to active and independent in their learning. This model helps them identify conceptual problems and getting them to devise ways to solve problems. A model of teaching scientific research has educational dimension which is to make discoverer have some humility but with high integrity.

Keyword : *Reop, Models of Teaching, Learning Capacity*

Introduction

Education has played an important role in people's lives. Therefore, many developments toward teaching and learning process had been made throughout the history of education, especially in Indonesia. The proof of development of education in Indonesia can be seen through the changing of national curriculum in Indonesia. Since Indonesia's independence in 1945, there had been several curriculum changes such as in 1947, 1952, 1964, 1968, 1975, 1984, 1994, 1999, 2004, 2006, and the latest is 2013. Curriculum itself is considered as a tool to reach the goals of education and also as the guidance to the implementation of education. Thus, the changes of curriculum in Indonesia can be regarded as an attempt in searching for the most ideal education model to be implemented in Indonesia.

As for curriculum itself is seen as the tools to reach educational goals of a certain nation, then, curriculum has to be applicable in any circumstances and also has to follow the changing of times. For that reason, the changing curriculum was made along with the changing of teaching method and approach (in order to adapt to the country's recent condition and development). During the development of education in Indonesia, several different teaching-learning methods and approach were implemented. The most popular method was teacher-centered learning.

Teacher-centered learning is a one-sided learning process where the teacher's role is as the main source of information. According to Hadi (2007), many learners who are produced from this method are passive and not truly creative. Learners here may also be dependent learners who lack of courage or vision to learn by themselves or to conduct their own research. This might implicitly imply that the educators who apply teacher-centered learning method are barely creative themselves, because they only make use of lecturing technique in their teaching-learning process. As stated by Hadi (2007), even though some alterations had been made into this learning method, such as by combining lecturing technique with discussion and tasks, the maximum learning outcomes still cannot be achieved.

Subsequently, a teaching-learning process that can involve learners actively is needed in order to attain the best learning outcomes, to encourage learners to develop their own ways of learning, and to push learners to conduct their own research someday. Then, many educators feel the necessity to move toward student-centered learning method. In this method, learners are required to engage enthusiastically and actively in doing their tasks and class discussions. In addition to that, the main role of educators is also changing from the main source of information into learners' facilitator here in this method. As a result, learners will be accustomed not only to develop their own ways of learning, but also to obtain the ability to carry out their own study later on.

Related to student-centered learning, current curriculum used in Indonesia (curriculum 2013) put scientific approach to practice; here, scientific approach requires the students to follow several steps, such as *mengamati* (observing), *menanya* (questioning), *menalar* (reasoning), *mencoba* (attempting), *membentuk jejaring* (framing networks), and *mengkomunikasikan* (communicating). Through this scientific approach of curriculum 2013, learners are pushed to think more critically and learn more independently. In that case, any learning method in relation to scientific approach could go together smoothly in this new curriculum.

One specific learning method that shares similarities with the concept of this 2013 curriculum is REOP (Research, Elaborate, Order, and Publish). REOP is a learning architecture that was developed from student-centered method consists of four correlated scientific steps that could help learners to construct their new habit of research-based learning. By performing this method, learners are believed to be ready to face and solve any problem smartly and also to process any information through scientific research. Besides, if learners are accustomed to conduct this method, learners will also be accustomed to think and process all ideas and facts scientifically. As a result, a new habit is constructed. As mentioned before, the goal of this method is to build a new scientific habit to the individual who are accustomed to do it.

Optimistically, if REOP is applied in the era of this 2013 curriculum, many Indonesians, especially learners, will be comfortable with a new way of thinking scientifically and critically. Then, up to date REOP could be considered as a revolutionary replacement for the obsolete teacher-centered learning.

Method and Literature Review

The method used in this paper is a qualitative approach. We do exploration of activities in order to understand and explain about problems in this paper. A gathering of various data and information is done with the technique of the study of the literature and data sources.

The authors examine the concept of learning that applies to the teaching model with a scientific approach. The previous study findings supported the notion that active techniques do aid in increasing learning as in-class activities led to higher overall scores while lecture led to the lowest overall scores. The hypothesis about lecture that would be most effective on knowledge level questions was not supported. In fact, the lecture method was actually least effective as correct scores on knowledge level assessments were significantly lower than both comprehension and application. Active teaching can be an added bonus for teachers who are managing students with different learning styles.

According to Joyce, Weil, & Calhoun(2009), there are four important things that need to be considered in determining an effective teaching model by considering learners' way of thinking and environmental education, among other things: 1) The term constructivism becomes an important term when the teacher wants to unload notion of effective teaching models. Plato and Aristotle developed a theory about the purpose of constructing knowledge and how to perform it. Other experts who initiated the theory are John Dewey and Lev Vygotsky. The main idea of these ideas are in the process of learning, the brain store

information, its process, and the change of previous conceptions. Learning is not just a process of absorbing information, ideas, and skills; because the new material will be constructed by the brain. Constructivist attitude is not merely knowledge transmitted by teachers or parents, but would have to be built and displayed by the students so that they can respond to the information in an educational setting. 2) Meta-cognitive is related to constructivism in how effective learners are aware of how they should learn; they developed the devices and observed the progress of learning. Teachers have to really pay attention to the learning patterns underlining each model of teaching to help students develop meta-cognitive control over each model and try to help them learning to construct knowledge learned. 3) Scaffolding refers to the various ways that can be applied to help students acquire meta-cognitive control to maximum. This strategy is used to observe the ability of the students as a learner and to pay attention to their learning strategies. 4) Finding the most likely areas of development. The best procedure to encourage the development of the individual to the complexity and flexibility is to compare the rate of development of one's personality and the environment, while still trying to get the individual to enter the next stage of development. 5) The role of expert performance in selecting the destination. Essentially, this requires the performance of whatever thing that can be done to build curriculum step by step. The curriculum itself is designed to help students move toward a higher level of competence or anything the teacher delivered to the students in order to achieve the highest performance, while recognizing that the behavior of "expertise" is limited by the development of their ability.

One model of student-centered learning is by involving students in the original research problem, exposing them to areas of investigation, helping them to identify conceptual or methodological problems in these fields, and inviting them to devise ways of solving problems. From here, they can see how knowledge is created and built a community of scientists. At the same time, they will appreciate the knowledge as a result of exhaustive research process and may also learn the limitations and advantages of the present knowledge. The structure of scientific research in the teaching model has many forms. Basically, in the first stage, the students presented the research, which includes the methodologies used in the study. In the second stage, the problem began to be arranged so that students can identify problems in the study. At this stage, students will experience some of the difficulties they have to overcome, such as the interpretation of the data, or the establishment of data, or control trials, or formulation of conclusions. In the third stage, students are asked to speculate on the matter, so that they can identify the difficulties involved in the study. In the fourth

stage, students are asked to speculate on ways to clarify the problem, re-designing trials, process the data in a different way, generating the data, develop the constructs, and so on (Joyce, Weil, & Calhoun, 2009).

The first phase	The second phase
Students are shown one field of study	Students formulate problems
The third phase	The fourth phase
Students identify the research problems	Students try to clarify the issue

Table 1 Structure of The Research Model

Finding and Discussion

A structure in scientific approach of teaching model can be developed to be a learning architecture such as Research Elaborate Order and Publish (REOP).

The first phase, **Research**, explores the richness of the concept of students. This is the process of searching for and finding all the theoretical concepts that must be learned by teachers and students through literature that is useful to construct knowledge in the form of concepts or theories as a whole based on universal scientific standards. Teachers will have to learn the school curriculum or classroom curriculum that will be taught, while students learn necessary concepts in the context of universal science, not international. The steps in Research are:

1. Studying the structure of the existing science to the field of study or related subject, and choosing the concepts of science or field of study or subject area to be taught.
2. Select only the essential concepts. Non-essential concepts should not be used in this research.
3. Teacher and students should do in-depth study of the concepts that have been raised through library, searching on the internet, or asking to the expert of the specific field learned. Keep referring questions. For example: How do I obtain an explanation and definition of the concept? Do the explanation exist in the dictionary, encyclopedia, internet?
4. The results of the study (about the scientific concept) are made into concept map or sequence of logical thought, so a full understanding of the overall concepts taught can be achieved.

5. Write the concept map, the structure of thought or logical order in a way that the researchers can compare the structure of thought which made with each other. As a result, each students will be confident with the structure created with the help of teachers.

The second phase, **Elaborate**. Students along with the teacher confirm the findings of a concept with empirical evidence. This is the process to confirm the findings obtained previously (review) based on evidence that is laboratory or field work observation, interviews and other ways that meet the requirements of science. The results of this process will be the findings of knowledge which has been confirmed with the empirical evidence. Students in private or group will report the findings in writing scientific reports using a common standard. Steps taken:

1. Select the essential concepts that will be studied based on a logical sequence that has been made in the previous stage.
2. Find the real evidence from the daily life or conduct experiments (simple research) in the laboratory. Field work can also be done to verify the concept or theory learned.
3. Arrange the particular evidence in a logical sequence as to elaborate.
4. Students write the findings in the form of evidence in group or individual under customary rules of scientific writing.

The third phase, **Order**. Students discuss the results of confirmation with a friend. In this step, there will possibly be controversial issues found, because the step discuss mainly about the subject which sometimes is not in the same line with the study of spiritual values and religious, also moral and cultural values. For example: questioning about child, gender, family, human rights, justice, poverty, democracy, destruction and environmental integrity. This process is important because it has the intention to allow the students to make decisions based on their conscience as the foundation to act according to the conscience of the students. This means that the Order becomes an imperative internalization of ethical values.

The activities and sources on Research can be found from Library Research, e-library, website. The data sources for Elaboration such as Survey, Service learning, Experiment and Laboratorium project. Order activities by reporting, making tutorial, and writing.

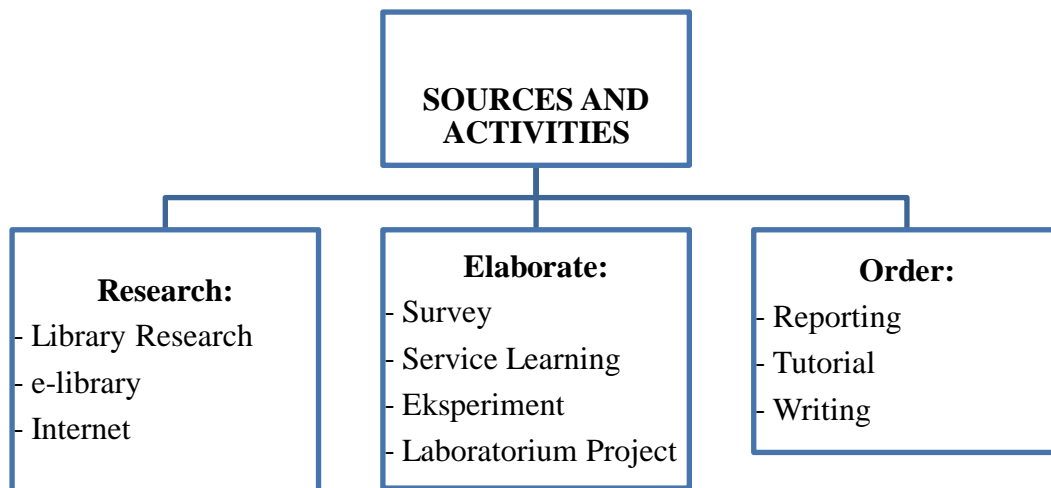


Figure 1. Sources and Activities for Research, Elaborate and Order

The fourth phase, **Publish**. Students communicate the results of their research to others. The process of discussing or reporting the findings obtained in step carefully in the form of discussions, tutorials with classmates by students. Alternatively, invite resource persons or experts in the field. The students will use a variety of medium on their own, for example through workshops, conferences, or seminars. There are opportunities for students to choose a more communicative and expressive medium, for example through painting, performance art, posters, and so on. All feedbacks obtained as the result of communicating the findings of the research-based learning has an educational dimension that is to make the inventors have humility along with high integrity. At this stage students develop the capacity of communication skills (oral and written), application of knowledge (qualitative & quantitative), utilization of IT, improving learning and performance, also the ability of working with others.

The flowchart of REOP learning architecture can be described as follows:

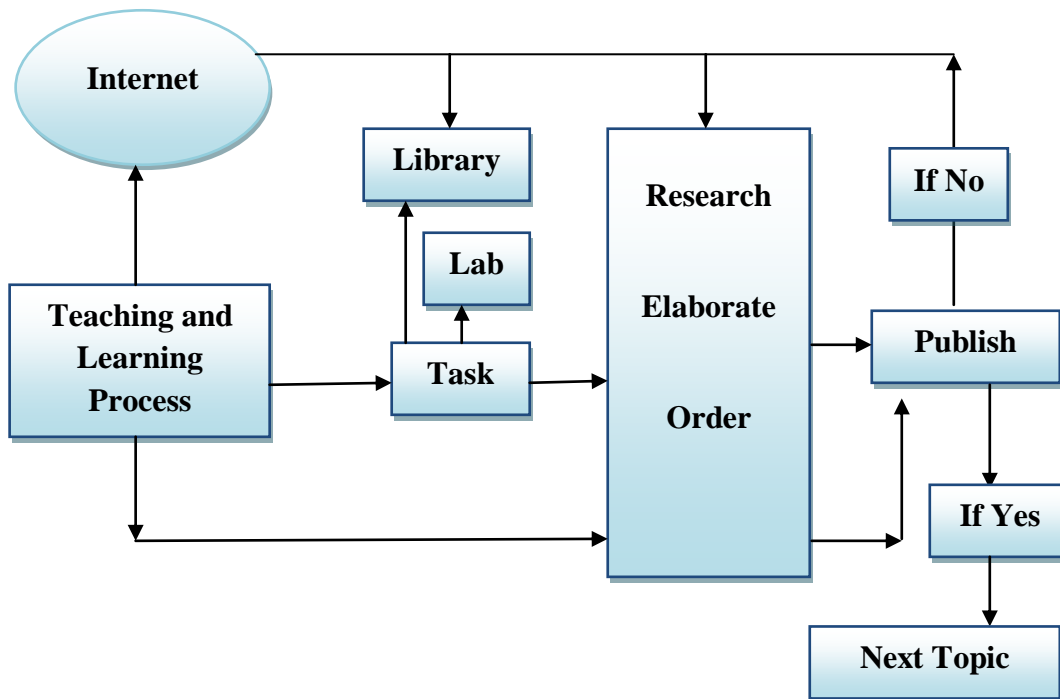


Figure 2. The REOP Flowchart

From the flowchart, it is shown that the teaching and learning process begins by the distribution of tasks. The sources to complete the tasks can be found through searching on the internet, doing laboratory experiment, or through some readings in library. Then, proceeds to Research process. Done with the Research, we then can Elaborate the result of the Research. Subsequently, the result of elaborating should be out in the correct order (following the correct steps of Order). Next, the final result can be published. If the result is accepted, there will be a continuation to the next topic; if the result is not accepted, a further study of the current topic should be made using the exactly same steps as previous.

Conclusion and Suggestion

All processes in REOP learning architecture can be considered as a way to develop a curriculum through scientific approach. REOP architecture is a highly appropriate model of teaching that promotes students' liveliness.

Educators need to be aware that the selection of appropriate teaching model will affect students' learning capacity (Hackathorna, Solomon, Blankmeyer, Tennial, & Garczynski, 2011). An understanding of learning (learning phase, the results of study) is needed in order to recognize how learning and knowledge building. Learning can be viewed from two theories, the theory of learned behavior and cognition theory. Underlying constructivism of learning theory is a theory of cognition, which assumes that learning is a process that follows the

model of information processing, where there is the transformation of inputs into outputs. Learning is a process by humans and is due to the interaction between the learner and the environment, and generates a response due to the interaction between the new information that has been stored in long term memory (Rustaman, 2005).

Teaching is a complex endeavor. Combined factors, such as students' motivation and the instructor's rapport with the students, have the potential to influence how effective any technique is (Tomcho & Foels, 2008). The need to update the learning approach involves the essence, content and methods of learning. This update on a floor by the findings / theories / concepts of the new growth of the brain and intelligence, and is triggered by a change in a multidimensional environment and life requires commitment and human capabilities (HR) is higher (Suryadi, 2007). In Students learning system, students being demanded active doing assignment and discussed with teacher as facilitator. If students active, their creativity will developed (Hadi, 2007).

The success of a teaching model to improve students' learning capacity is influenced by various factors. Factors that play a role in influencing the success of this learning are educational institutions, educators, and learners themselves (Hadi, 2007). The REOP Architecture can be used to develop a curriculum that leads to students' liveliness. A suggestion for further research is about how this learning architecture can be used for all levels of education starting from early childhood education into the college level.

References

- Hackathorna, J., Solomon, E., Blankmeyer, K., Tennial, R., & Garczynski, A. (2011). Learning by Doing: An Empirical Study of Active Teaching Techniques. *The Journal of Effective Teaching* Vol. 11, No. 2, 40-54.
- Hadi, R. (2007). Dari Teacher Centered Learning ke Students Centered Learning . *Jurnal Pemikiran Alternatif Pendidikan INSANIA* Vol. 12 No. 3, 408-419.
- Joyce, B., Weil, M., & Calhoun, E. (2009). *Models of Teaching (Eighth Edition)*. New Jersey, USA: Pearson Education, Inc.
- Rustaman, N. (2005, Juli 22-23). *file.upi.edu*. Retrieved Oktober 12, 2014, from [www.upi.edu:
http://file.upi.edu/Direktori/SPS/PRODI.PENDIDIKAN_IPA/195012311979032-
NURYANI_RUSTAMAN/PenPemInkuiri.pdf](http://file.upi.edu/Direktori/SPS/PRODI.PENDIDIKAN_IPA/195012311979032-NURYANI_RUSTAMAN/PenPemInkuiri.pdf)
- Suryadi, A. (2007). PEMAFAATAN ICT DALAM PEMBELAJARAN. *Jurnal Pendidikan Terbuka dan Jarak Jauh, Volume 8, Nomor 1*, 83-98.
- Tomcho, T., & Foels, R. (2008). A meta-analytic Integration of Learning Outcomes. *Teaching of Psychology*, 286-296.