

“GURU PINTAR ONLINE” AS OPEN EDUCATION RESOURCES TO IMPROVE THE QUALITY OF MATHEMATICS INSTRUCTION IN ELEMENTARY SCHOOL

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Abstract

Teaching mathematics in elementary school is not easy, it needs competencies to make the mathematical abstract concepts into concrete. The children's thinking ability is still at concrete operations stages. Therefore, the teacher must have the skills to handle the students. In relation with this, the teacher should always develop his/her professionalism to improve the quality of teaching. “Guru Pintar Online” (GPO) is one of relevant open educational resources to support teaching and learning delivery. “Laboratorium Pembelajaran” is one of the GPO facilities that contains some collections of case studies' video streaming and also provide a sample solution. In addition, teachers are given the opportunity to provide feedback and other solutions to solve the cases. This article will describe what strategies are offered through “Laboratorium Pembelajaran GPO” and usefulness analysis of this facility especially mathematics instruction in elementary school.

Keywords: Laboratorium Pembelajaran, mathematic, elementary school

INTRODUCTION

Mathematics is a discipline that has unique properties compared with other sciences, because of teaching and learning of mathematics different with others and needed theory to understand the science. Math related to ideas, structures, and relationships that are logically arranged so that mathematics is related to abstract concepts [1]. According to the math definition, it is not easy for educators to teach math properly. By using of appropriate learning media expect an educator able to teach the theory and concepts of math.

On the other hand, primary school students are still in the stage of concrete operations in their cognitive development. They are expected to have a fun learning to enhance the motivation to learn mathematics. Teachers are supposed to be creative to apply strategy and all aspects of learning, including learning materials, learning resources, media, and classroom situations. They are also expected to provide encouragement and overcome barriers of student learning. Moreover to be more creative in designing varied mathematical learning strategies.

Teachers have duties to drive student learning activities to achieve the goal of learning. Thus teachers are required to be able to deliver learning materials. Teachers should always update, and mastering the subject matter. Self preparation onto the material sought by seeking information through a variety of sources, such as access the internet to improve the quality of learning.

Open University (UT) provides a site designed as an online gate of interaction between teachers, known as Guru Pintar Online (GPO). GPO is the Open Resource Learning Center (Open Educational Resources) virtually packaged in a portal provided by the Open University (UT) for teachers. This portal serves trending learning resources that can be used as a reference to the learning process in the real classroom. One of the facilities is Learning Laboratory menu. On this menu there are collections of streaming video based on cases that occur in learning and also the solution. Especially for elementary school mathematics, there are 15 titles related to elementary mathematics learning strategies.

Open Educational Resources

In short, Open Educational Resources (OER) defined as the variety of learning resources that can be accessed freely by educators and students without having to pay royalties or fees for obtaining permission to use [1]. OER have the high quality and openly licensed as permission to use for anyone who wants to use, share, and use knowledge [2]. Thus, the user can access, adapt, and disseminate OER for free [3]. Although open to the public, while OER still protecting copyrighted material by the author. Some allow users to copy the source material, but

there are also sources that only permit the user to adapt the material provided. One of the best known copyright protections is the Creative Commons licensing framework, which facilitates the use permit legally.

OER includes learning resources, online learning communities, curriculum, material, text books, software, streaming video, and other multimedia are designed specifically for the purpose of learning and teaching [4].

Guru Pintar Online (GPO)

GPO is a portal that provides information about the world of education and learning for teachers and educators at various levels, such as early childhood education, elementary education, and secondary education [5a]. This portal was developed as a form of Open University's contribution improving the competence and quality of teachers ongoing based. More detail the aim of the provision of GPO website are (1) provides a wide range of referral open learning sources (open educational resources - OER) according to the developmental needs of teachers and the implementation of learning in schools, (2) providing a reference source about various rules and regulations relating to teaching and learning profession, and (3) facilitate communication and interaction between teachers online as a communication or a communication between teachers to greet each other and share experiences. Facilities and menu may include Learning Laboratory, Materials and Video Enrichment Learning.

Learning Laboratory

Learning Laboratory is a collection of streaming video based on cases that occur in learning and also provided an example of the solution [5b]. Until mid year 2011, the GPO has provided 51 titles streaming video that can be viewed and downloaded. Learning Laboratory can be grouped into 3 (three) categories, which are namely Early Childhood Education Learning Series, Elementary School Learning Series, and Secondary Learning Series. Particularly, teaching elementary mathematics consists of five topics include 1) Developing students' readiness to learn math, including attract students' attention, maintain concentration, build interactive and active or fun activities, 2) learning math interestingly and fun, students has not concentrate to learn math during the day, students have difficulties to memorize math formulas, students do not like math; 3) Children fear to learn math, mathematics consists of the environment as a medium, not master basic multiplication, students are not mastering basic concepts of shape reflection, learn to understand about the test with story; 4) Understand the nature of the counting operation, find the cube root 3 over 1000, and the planting of understanding the concept of division; 5) Learning math grade 1, describe items accurately, low classroom innovation. 6) Learning in 6th grade consists of the concept of integers.

Learning Mathematics

WW Sawyer stated that mathematics is the classification study of all possible patterns [6]. That is the pattern in a broad senses, it covers almost all kinds of regularity that can be understood in our minds. Meanwhile, mathematics may be defined as the study of deductive reasoning, as a language, as the queen and maid of science, as art, and as a human activity [7].

Given objects studied in mathematics are abstract and the concept structured hierarchically, principles and rules contained in any materials should be submitted with a logical order and notice the learner's readiness. It is intended that students can absorb the information from teacher properly and optimally. Six mathematical characteristics [8], such as 1) object has an abstract study, 2) focus on the agreement; 3) deductive thinking patterned; 4) having an empty symbol of meaning; 5) noting the universe of discourse (universal); 6) consistent in the system.

According to the opinions above, the features and characteristics of mathematic, and the abstractness of mathematical objects are arranged in a hierarchical manner. Thus to facilitate the students to learn a concept or to be able to absorb the information properly and optimally, educators should pay attention to students' readiness. This means that learning mathematics should be gradual and sequential and always based on the past learning experience.

GPO's learning laboratory utilization in learning mathematics

It has been stated previously that the eminence of Guru Pintar Online can be felt when the visitors of Portal do register and enter the menu "Learning Laboratory". There is a presentation of various case study in streaming video format lasted approximately 5 minutes which used optimally can be a learning clinic.

Particularly on learning elementary mathematics, learning laboratory presents six topics with 15 streaming video. Each video stream contains the case study and its solutions. Such as video about "Doing about the story test, learn to understand how to resolve the matter of the story". This video is about problem solving strategies in learning mathematics in primary school. In the first fragment, contains the story of elementary mathematics teaching with the topic "Working Problem Story". On this topic the teacher often had difficulty in understanding the correct and

proper story about how students solve the problems. In the second fragment, tells a solution in giving the students an understanding of how working on a story using exciting educational media such as fake banknotes and fake fruits (apples and oranges).

This video described the teacher's strategy to give insight to students on how to resolve the matter of the story. The solution offered in this program is the teacher asks the students to practice with fake paper money by buying and selling toys and fruit display, so that students can directly calculate the amount of money that must be paid by fake money. Teachers give reinforcement when students respond well to what has been described.

Another example is the understanding of Division Concept. The program contains video about problem solving in mathematics learning strategies in primary school. The first fragment talked about the topic of learning elementary mathematics "Subdivisions". On this topic the teacher often had difficulty in understanding the correct and proper division concepts to students. In the second fragment, tells the teachers' strategy to give students an understanding of the concept of division, using glass and marbles, so that students can observe the meaning of subdivision directly. Teachers provide reinforcement when students respond well to what has been described.

After viewed the streaming video provided, teachers can give comment about the content of the video.

The teachers who are viewed streaming video of case study and do reflection can help provide an alternative solution for the case of learning by using a contextual approach, namely shooting conditions and different learning situations depending on where the teacher teaches. Other teacher's colleagues who read the reflections of streaming video can adopt the results of critical thinking and apply them in the context of their own learning. The process of examine, share a similar experience with the case study presented, and propose an alternative solution, are process of mutual clinical teachers.

Teacher's responses about usefulness of GPO's Learning Laboratory provided

There are so many positive comments were given. In addition, the teachers also expressed several solutions that can solve the problem/case presented. Overall the analysis results of the usefulness of laboratory of this study indicate that teachers states the videos are available in GPO enrich the learning process. The video show can make respondents interested to open another video, and 97% indicated that the videos trigger critical thinking, spur creativity in the learning process, and made them want to find other learning resources with the same topic.

In addition, teachers stated that the case study presented in the video was ever experienced by teachers, and 97% stated that the visitor comments or opinions given after watching video programs can provide ideas for learning improvement in the classroom. 97% respondents stated that the material contained in the video program can be applied to learning in school, and 80% stated that the video can be accessed with sufficient speed. 60% of respondents stated that they want all topics are available in the video collection, and 71% stated that the duration / length of video are too long. On the other hand, there are 40% of respondents who did not agree and strongly disagree with the statement that he wanted all topics are available in the video collection and 29% of respondents disagree and strongly disagree to the statement that the duration/length of video is too long. Thus, variation and duration topic deserves for improved quality.

CONCLUSION

It has been mentioned before that Guru Pintar Online is OER packaged in a Portal. GPO enriched with a variety of materials that are expected to be utilized by teachers who need referral to a variety of professional activities. The uniqueness of Guru Pintar Online is learning laboratory, which contains the presentation of learning resources based on the case study in streaming video format. The design of learning resources based on the case study is intended that the teachers as adult learners are motivated to improve critical thinking skills. They can use creativity to proposed alternative solutions for the case study presented via streaming video. On the menu of learning laboratory, there are 15 streaming video divided into six topics. Generally teachers responded positively to the videos presented.

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