



## Learning Strategy of Role Playing in The Material Submission of The Nuclear Power Application Environmental Physics Subjects

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### Info Articles

#### History Articles:

Received 4 August 2016

Approved 19 September 2016

Published 3 October 2016

#### Keywords:

Role Playing, Nuclear Power,  
Environmental Physics

### Abstract

Establishment controversy of the Nuclear Power Plant (NPP) that is delivered in the Environmental Physics course of Department of Physics of Faculty of Mathematic and Natural Science of Sebelas Maret University use the Role Playing strategy. This strategy brings active student playing the role of the government (policy makers), a group of scientists (neutral) and community groups who refused. Literature studies and group discussions conducted by its students to summarize back knowledge of nuclear power plants, according to the role that will be presented in lectures. The course made in the form of an open debate, where the lecturer acts as a moderator / facilitator. This strategy encourages students to hone the skills of independent learning (individual or group) and can help students to appreciate his knowledge either in small discussion (group) as well as the delivery of openly (public debate).

### How to Cite

Legowo, B. (2016). Learning Strategy of Role Playing in The Material Submission of The Nuclear Power Application Environmental Physics Subjects. *International Journal of Active Learning*, 1(1).

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p-ISSN 2528-505X

## INTRODUCTION

Utilization of nuclear power as an alternative source of power generation is one of the principal subjects of the studies in Environmental Physics at the Department of Physics, Science Faculty of Sebelas Maret University <sup>[1]</sup>. After following the subject of this study, students are expected to be a source of information about aspects of the benefits and dangers of nuclear power plants. Students as information agent is expected to animate really one aspect of the use of nuclear power, both as part of the general public as well as professionals in physics, so it can convey their knowledge with the appropriate expected <sup>[2]</sup>.

The amount of the principal aspects of the NPP utilization study and see the level of intended learning outcomes, the chosen strategy Role play in the collaborative learning approach centered on the students delivered in one session class. This strategy is not only to encourage students in the course of game, but to actively engage students according to the learning outcomes that have been obtained previously <sup>[3]</sup>.

### Strategy Role Play

Role play is a learning strategy that can encourage students to play a role with regard to the basic study that will be presented, social issues and science / inexact <sup>[4]</sup>. Planning role play is began by dividing the class according the group's role will be run. Strategies of searching for information applied early in the session to allow time for students to find material or information that related with discussion material. Role playing made in an appropriate atmosphere or close to real conditions in the form of debate or open discussion <sup>[3]</sup>. The evaluation is based on aspects of teamwork in preparing material, express opinions and gives rebuttal constructive discussion. Rating activity participants involved in role playing on using the *ask with the cards* method.

### Role play in the Basic Study of NPP

Strategy of Role play in the Basic Study of NPP begins by dividing the students into groups of people who reject nuclear power plant, a group of scientists and policy makers group. Furthermore, students are assigned for one week searching for information to support the role that will be presented and prepared in the form of scientific manuscripts, posters, banners and other forms that can be used to strengthen the argument in playing a role <sup>[3]</sup>.

Face-to-face phase is held outdoors to create an open atmosphere for the students. Furthermore, each group gathered in a *U-shape* format <sup>[2]</sup> with the lecturer is in front of the forum as a moderator. In turn, each group is given the opportunity to express their exposure to the material followed by a group discussion and open debate.

Peer assessment carried out on the product packaging information played a supporting role. The cohesiveness of the group in the expression and or refutation of topics presented also an evaluation item.

The *ask with cards* strategies is used to facilitate individual assessment. Students are asked to prepare a small card bearing the Student Identification Number in a certain amount, and submitted to the lecturer (moderator) each time doing activities that are constructive for playing a role. Lecturers provide information on the card according to the assessment activities carried out, including the achievement of competence which is reflected from exposure, denial and or other supporting arguments.

## DISCUSSION

Role play strategy commonly used in social learning requires students because it is capable of playing the role of civil society <sup>[5]</sup>. The utilization of nuclear power as an alternative source of electrical power is very closely related to the social aspect. Distrust of policymakers, unprofesional experts and the missing information caused antipathy attitude towards the application of a technology.

Role play can encourage students to be critical with the appropriate knowledge base of scientific arguments that are constructed from other supporting subjects. Students in the role as a component of any society must know the social background of the people who played so knowing full well the benefits and dangers of the use of nuclear power as an alternative source of electrical power so as to convey scientific arguments based on knowledge of physics owned.

Learning strategy is to encourage the students to reconstruct the knowledge of nuclear technology obtained in the course, and or information that is widely available outside the lecture.

## CONCLUSION

Role play strategy could encourage students to hone their ability of self-motivated learning (individual or group) and can help students to convey knowledge of nuclear physics both in small discussion (group) as well as the delivery of openly (public debate). The ask with cards strategy is used in the implementation of Role play in order to be

easier to measure of learning outcomes stages. Assessment of learning outcomes can be done in group form of the repackaging of information or as individuals to see the activity in the classroom.

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