

# THE TEACHERS' PROBLEM-SOLVING PROCESS IN APPLYING THE SPECIFIC APPLICATION OF PHYSICS ON A STEM ACTIVITY THROUGH OPEN APPROACH

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In the 21st century, learning science to explain phenomena of nature alone is not enough for students, the goal of learning has changed from the past. The student has to apply scientific knowledge to solve complex problems in daily life. Therefore, in preparing students for the future, the teacher is a very important person to help students in learning. In order to succeed in this endeavor, teachers have to understand how to learn before coaching students. With this in mind, thirty Thai teachers were the participants in this study. They were encouraged to think through the Open Approach strategy; the Open Approach is a teaching strategy that focuses on giving students the opportunity to think about their problems and take action to solve problems by themselves (Inprasitha, 2004).

The STEM activity through the Open Approach is composed of four phases (Inprasitha, 2010).

- 1) *Posing Open-ended problem*, in the first phase teacher assigns students to create a tool for verifying that 10-baht coins have the same weight.
- 2) *Students' self-learning through problem-solving*, the student integrates Science, Technology, Engineering Design, and Mathematical concepts to apply to solve the problem by themselves.
- 3) *Whole class discussion and comparison*.
- 4) *Summarization through connecting students' ideas in the classroom*.

The problem considered in this STEM activity is applying the concept of rotational equilibrium to create a tool for verifying that 10-baht coins have the same weight, under the constraint of only limited equipment being supplied. The teachers' problem-solving processes were analyzed from the worksheet and the presentation by using a rubric score consisting of three levels: good (7-9 score), moderate (4-6 score), and poor (0-3 score). We analyzed worksheets on 3 topics about rotational equilibrium: the fulcrum, the distance, and how to know 10-baht coins have the same weight.

The results found that 60% of teachers can apply the specific physics concept at a moderate level in the STEM activity. In addition, there are only three basic concepts that teachers applied to create a tool for verifying the same weight of coins which are the fulcrum, the distance between weight and fulcrum, and the error of equipment.

## REFERENCE

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