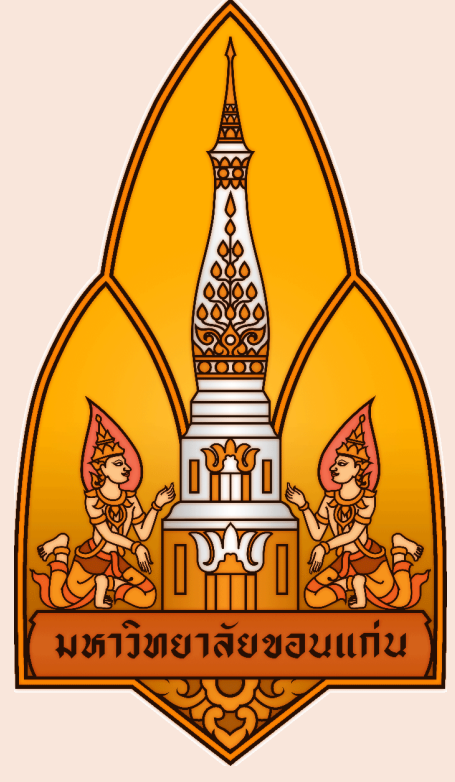
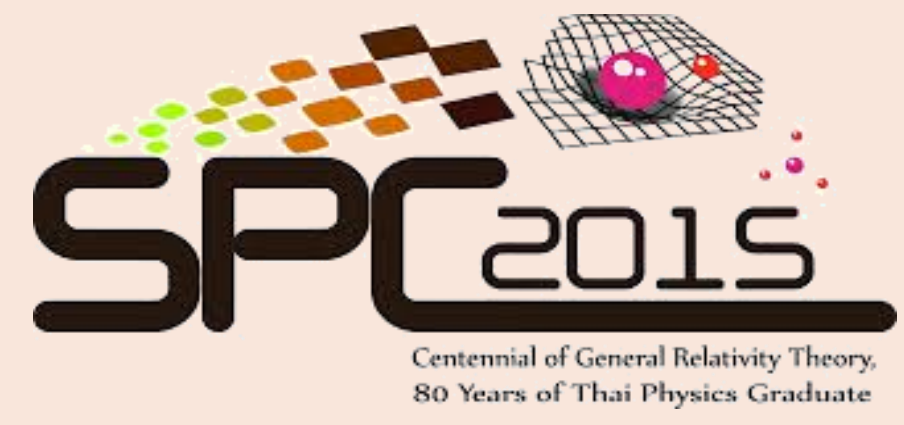


THE DEVELOPMENT OF CONCEPTS OF GRADE 11 STUDENTS ON RESISTOR CIRCUIT THROUGH PREDICT-OBSERVE-EXPLAIN (POE) APPROACH.



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Abstract

This study was qualitative research aimed to improve conceptual understanding of grade 11 students on resistor circuit through Predict-Observe-Explain (POE) approach. There were 34 grade 11 students those studied in the second semester of academic year 2014 (November 2014 to March 2015) in Strisuksa School, the Secondary Educational Service Area 27, Roi-Et Province, participated this study. There were two categories research tools had been used in this study. Firstly, Predict-Observe-Explain (POE) approach lesson plans. Secondly, a set of the evaluation tool, scientific conceptual test, two-tier multiple choice diagnostic test. The collected pre-test data were analyzed for investigating students' background knowledge to be used in lesson plan designing and the post-test was done soon after the POE finished. The findings revealed that students' scientific concepts in prior intervention by POE approach in resistor circuit could be interpreted into various categories and the majority of them were diverged from scientific concepts about connecting light bulbs in series and parallel, connecting resistors in series and parallel. After learning through POE approach, it found that students' concepts generally were according to scientific concepts. It could be concluded that the students understanding could be developed toward scientific concepts by using POE approach.

Introduction

Predict-Observe-Explain or POE technique is an active learning strategy that requires; students to guess the results and give their reasons of the event took place in the activity prepared by teacher. Then, students observe the event and give explains to consolidate their guesses and observes [1]. POE approach provides student attraction and makes them realize their own mistakes by first hand data from observation. For these reasons, that applying POE in concept teaching will be useful [2]. Physics content of the circuit resistance is hard to understand. If the students do not understand the content, they will not interest in learn, which could be the factor that gives students' misconception. Ümit Turguta*, Fatih Gürbüz^b, Güven Turgut^c study about investigation 10th grade students' misconceptions about electric current found that students' misconceptions as current does not flow and none of bulbs are lit when the switch is close [3].

Materials and Methods

Scientific Concepts test, two-tier multiple choice diagnostic test.

The collected pre-test data were analyzed for investigating students' background knowledge to be used in lesson plan designing

Predict-Observe-Explain (POE) approach lesson plans.

Scientific Concepts test, two-tier multiple choice diagnostic test.

The post-test will be analyzed and categorized the conceptual understanding of the student by considering to their answer.

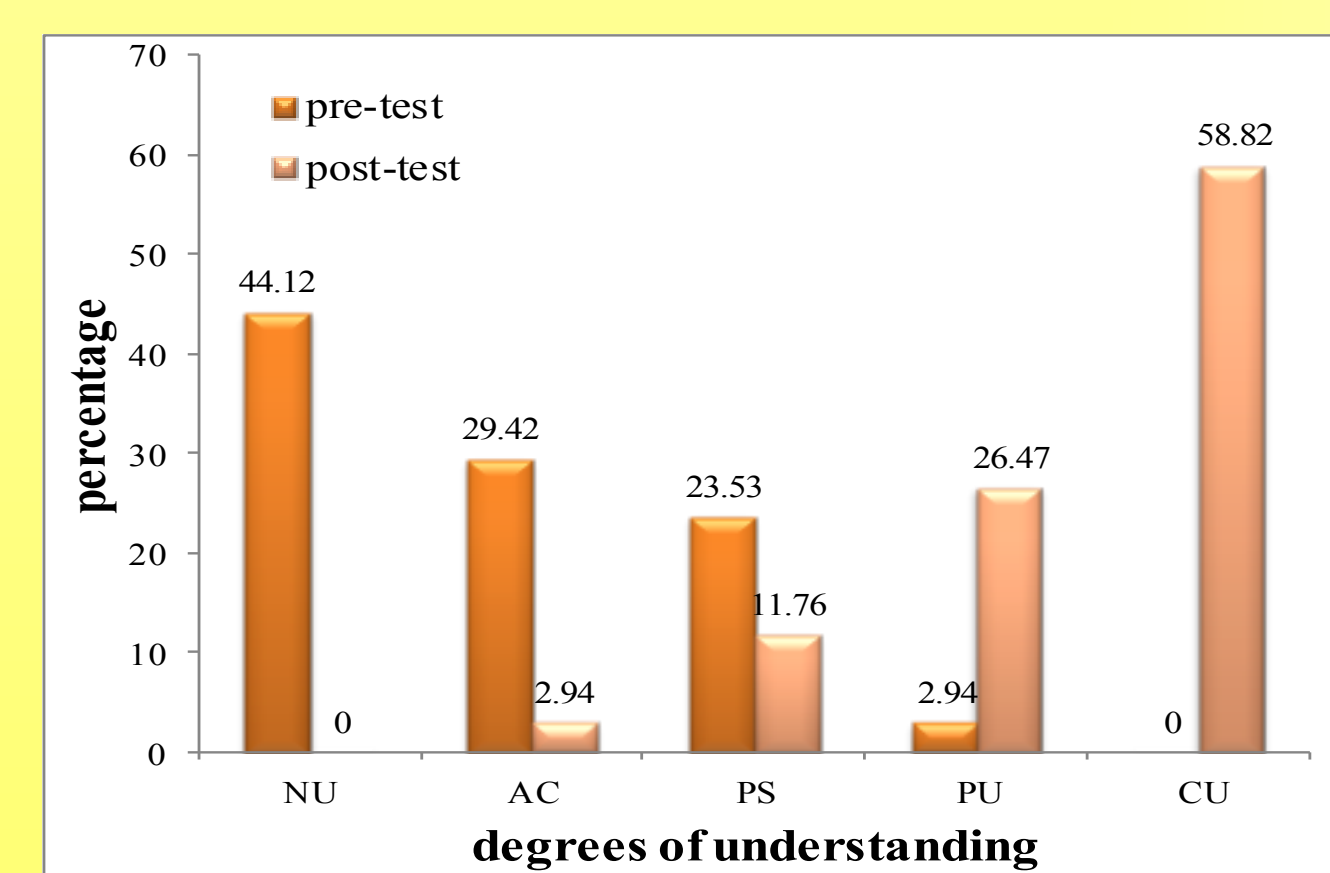
Data analysis

The data from any test were interpreted and ranked into 5 levels of understanding based on worked of Westbrook and Marek (1991, 1992)

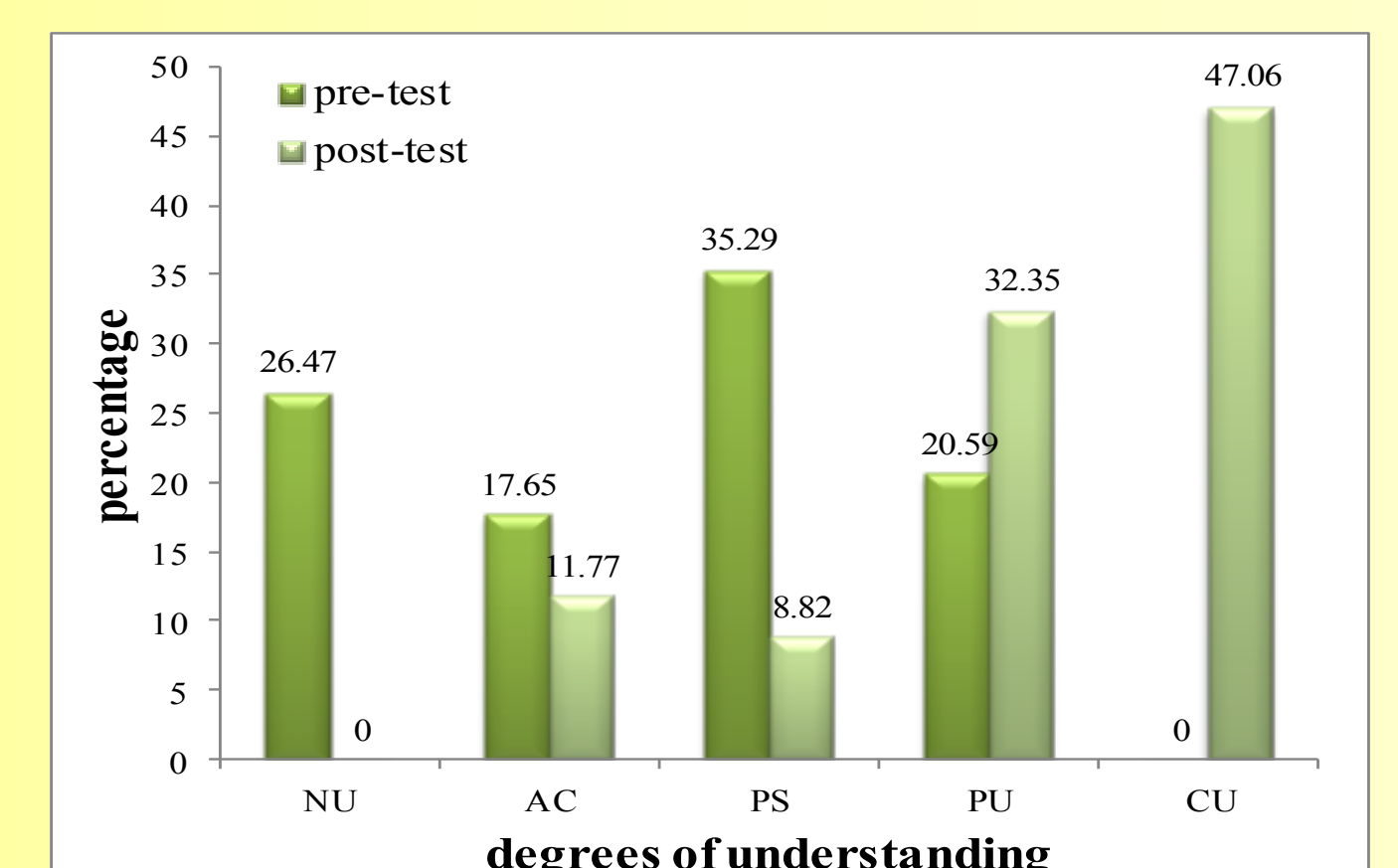
Results and Discussion

Table 1: students' misconceptions

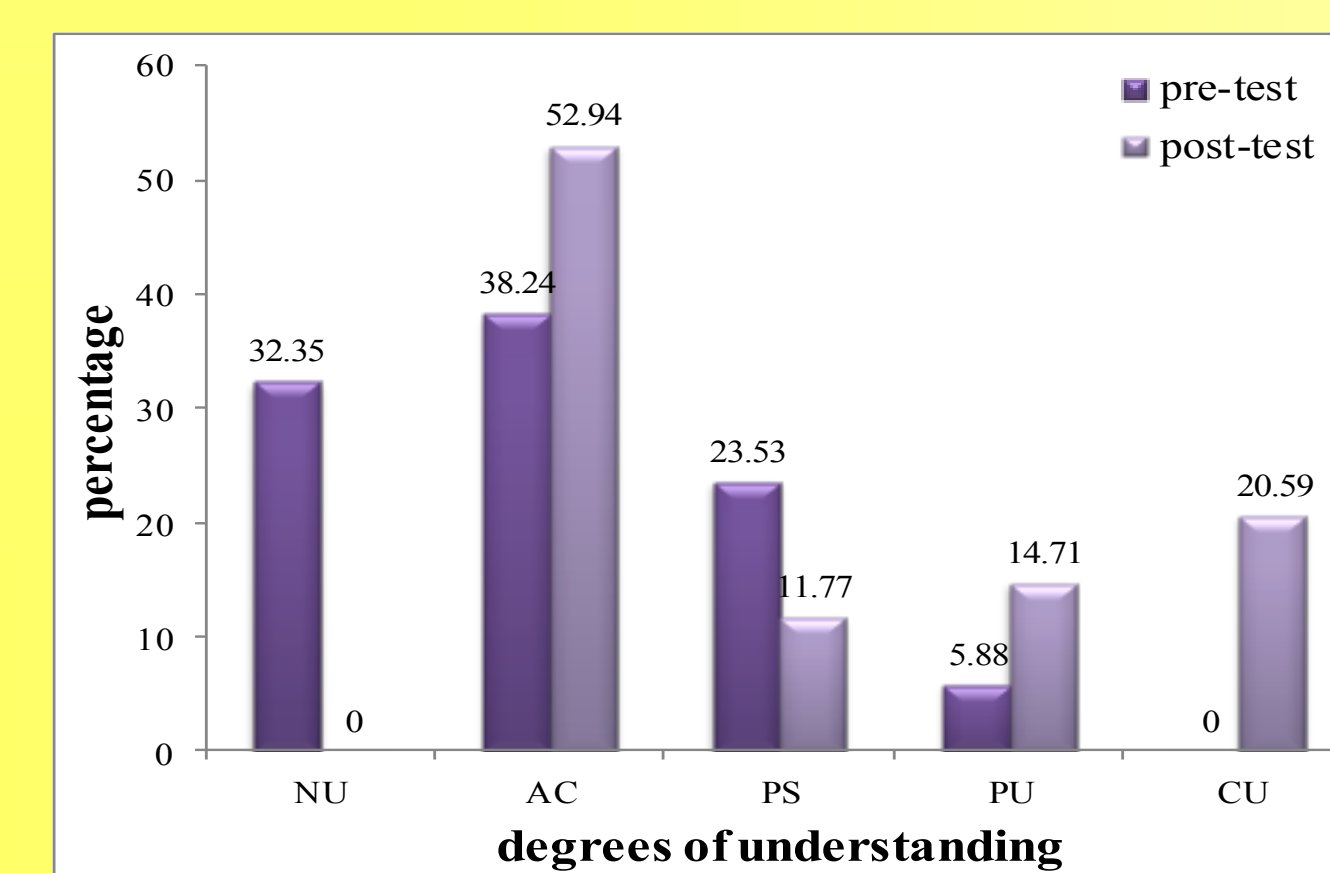
Item	Misconceptions
1	When resistors are connected in series, the total potential difference across all the resistors is equal to the potential differences across each resistor.
2	When resistances are connected in series, current decreases when it passes through the bulb.
3	When resistors are connected in series, the total current all the resistors is equal to the sum of the current each resistor.
4	The total resistance of each resistor is decreases. When resistors are connected in series.
5	Current does not flow and none of bulbs are lit when the switch is closed.
6	Bulbs in the parallel are always brighter than those in series.



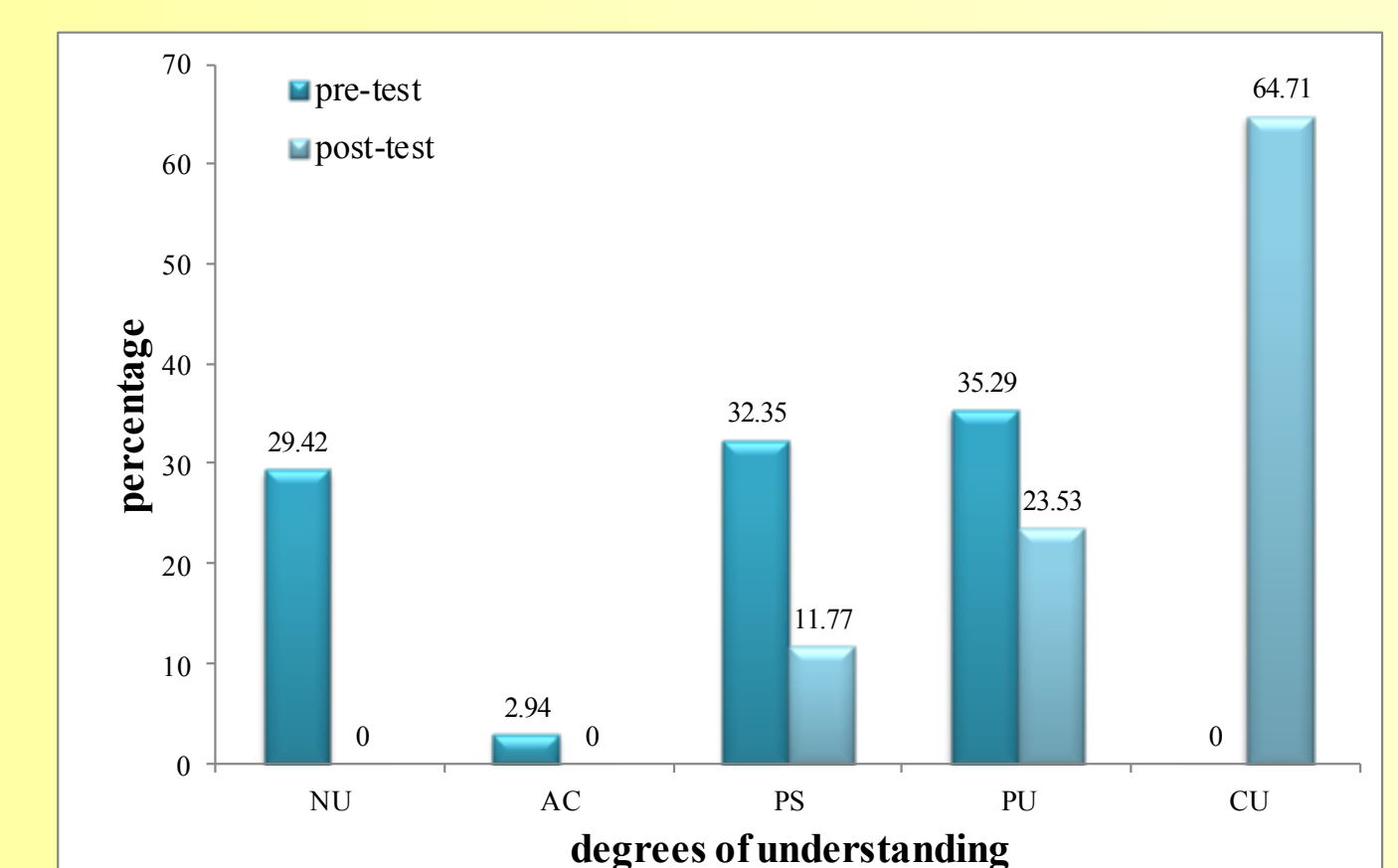
(a)



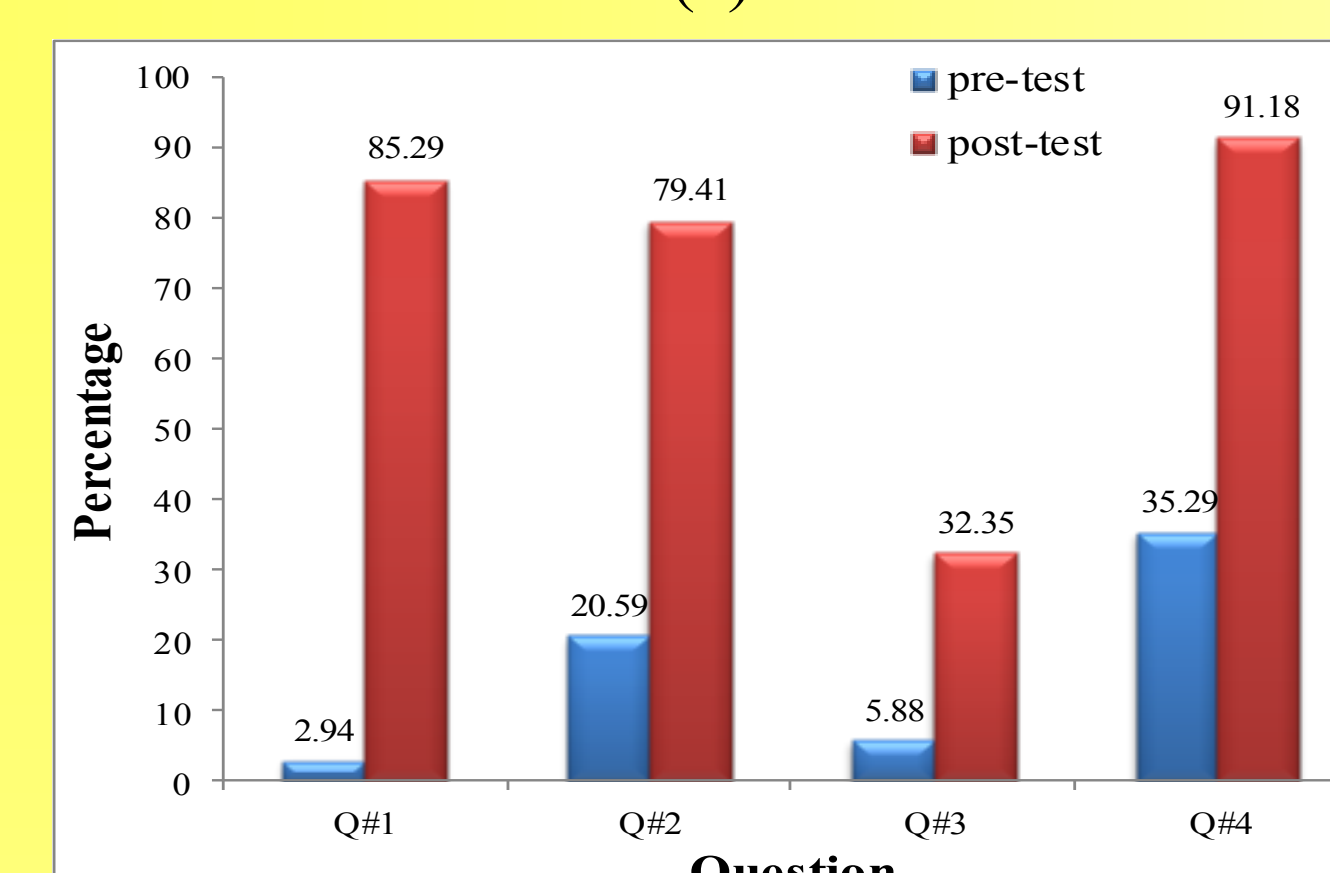
(b)



(c)



(d)



(e)

Figure 1. Show the percentage of pre-test and post-test for 4 questions; (a) Resistor are connected in series, (b) An electric circuit of a series-parallel combination of equal resistances, (c) Simple Electric Circuits, (d) A circuit representing a series-parallel combination of equal resistances, and (e) Show the percentage of students' scientific concepts.

The qualitative results indicate that the data obtained in this study, the student' scientific concepts in prior intervention by POE approach in resistor circuit could be interpreted into various categories and the majority it can be said that the misconceptions detected in the sample resemble some misconceptions in the literature. After learning with POE activities, the students had higher level of scientific concept in CU and PU. In contrast, the students had lower level of misconceptions in NU, AC and PS. It could be concluded that the students understanding could be developed toward scientific concepts by using POE approach.

Conclusions

This study aimed to improve conceptual understanding of grade 11 students on resistor circuit through POE approach. The result showed that student' scientific concepts in prior intervention by POE approach in resistor circuit about connecting light bulbs in series and parallel, connecting resistors in series and parallel. After learning through POE approach, it found that students' concepts generally were according to scientific concepts. It could be concluded that the students understanding could be developed toward scientific concepts by using POE approach.

Acknowledgments

The author wishes to gratefully acknowledge the scholarship support by Institute for the Promotion of Teaching Science and Technology (IPST), Thailand. Faculty of Education, Khon Kaen University and Strisuksa School, Roi-Et Province were appreciated.

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