Extended Summary

Eight Grade Students’ Epistemological Beliefs with PISA Success and their Scientific Literacy

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Purpose

The purpose of the study is to investigate the relationship between eighth grade students’ scientific epistemological beliefs and scientific literacy, which is obtained by PISA questions. Eight grade students’ scientific epistemological beliefs on each dimension were investigated and their conceptual understanding scores, which is based on PISA questions were found out. The study also determined the students scientific epistemological beliefs in terms of gender. The sample of the study eight grade students and their mean age was 15.

Results

The result of the study demonstrated that students’ mean scores in each scientific epistemological beliefs dimensions were moderate. Students had higher mean score for justification dimension of the scientific epistemological beliefs (2.80±0.72). When we looked at the each item, students also had higher score for the item in justification dimension. The other result of the study showed that there is no significant relationship between students’ scientific epistemological beliefs dimensions and gender. However, the mean score of boys are higher than girls in all dimensions of the scientific epistemological beliefs, except justification dimension. The study also revealed that students’ conceptual understanding were moderate level according to test which is prepared by PISA questions. Students got the highest grade on the 1st question, which is related to cloning and students got the lowest grade on the 11-question, which is related to health is risky?. Also, the study showed that there is no significant relationship between students’ scientific epistemological belief dimensions and conceptual understanding test total score. However, each conceptual understanding test questions were examined; there is a significant relationship between
students’ authority dimension and ultrasound and acid rain questions; there is a significant relationship between students’ knowledge production dimension and ultrasound question; there is also significant relationship between students’ justification and Grand Canyon question.

Discussion

Students got higher score on justification dimension of the scientific epistemological beliefs dimensions and this could show that their teachers are using constructivist approach in their classes and doing some experiments and activities for making connections with students’ life. Also, students got the highest score on cloning question in concept test. The reason of this result could be that students could learn cloning topic in the class because this topic is the first topic in the curricula. Thus, this result also could enhance that teacher could be effective for using activities in their course. The other reason of this could be that this question is multiple choice type and in general students got higher grades on multiple choice questions. Students got higher scores on multiple choice questions because students are preparing National Exams and these are multiple choice format and so they could not express their views in open-ended questions. Also, the study revealed that boys had higher epistemological beliefs on each dimension, except justification dimension. This could be the result of the unequal number of boys and girls in the sample. Also, in general there is no relation between students’ scientific epistemological beliefs and conceptual understanding. The reason of this result is that teachers could not use constructivist approach in all classes and teacher could not make connections with students’ life in all classes.

Conclusion

It is concluded that there is not significant relationship between conceptual understanding, which is prepared by PISA questions and scientific epistemological beliefs dimensions. However, there is a significant relationship between some dimensions of epistemological beliefs and some questions of concept test.

Citation Information