Extended Summary

In recent years scientific knowledge has been tremendously expanded and the effects of technological advances on our life has become much more visible. Therefore, the current age necessitates those individuals who could correctly employ and comprehend science and scientific knowledge. As a result educational policies and programs attempt to produce those individuals with higher levels of awareness on science and technology. Given that both classroom teachers and then science teachers have important roles to play in this regard the identification of both group of teachers’ knowledge level about the nature of science and their misconceptions is required.

Aim

The aim of this study are to reveal the knowledge level about the nature of science among prospective science teachers and prospective classroom teachers and to analyse their views on the nature of science based on their field of study.

Method

The study was designed as a scanning research. The participants of the study are 142 prospective science teachers and prospective classroom teachers attending an university in the western part of Turkey. They were first grade and fourth grade undergraduate students. In order to reveal their views on the nature of science the VOSTS developed by Aikenhead, Ryan and Fleming (1989). It is composed of 114 multiple choice items and includes eight sections: “science and technology, the effects of society on science and technology, the effects of science and technology on society, characteristics of scientists, social nature of scientific knowledge, social nature of technology, and nature of scientific knowledge”. Doğan Bora (2005) adapted it into Turkish and carried out reliability and validity analyses. Following the analyses the number of items was reduced to 25 and its internal consistency was
found to be .72. The views of four specialists about the internal consistency of the items were also taken.

**Discussion and Conclusion**

The findings obtained indicated that the participants have realist views on the effects of society on science, the effects of science on society, characteristics of scientist, nature of observations, nature of classification systems, provisional nature of scientific knowledge and changeability of scientific knowledge. It was further found that their knowledge is not efficient in regard to the relationship between scientific discoveries and gender, nature of scientific models, relationship between hypothesis-theory-scientific laws and epistemological nature of scientific knowledge. In addition student science teachers were found to have much more realistic perspective in regard to the definition of science. They also reported much more realistic views about the effects of society on science which was evaluated by two items in the test. The same phenomena was expressed in a realistic but not efficient way by the student classroom teachers. It was concluded that both groups of student teachers had both realistic and inefficient views about the effects of science on society. The same finding was also found about the characteristics of scientists for both groups of participants. Both group of student teachers reported realistic views at the similar levels in regard to the beliefs of scientists: 82.9 % of student science teachers and 83.3 % of student classroom teachers. In regard to classifications made by scientists it was found that student science teachers (50.0 %) have much more realistic perspectives in contrast to student classroom teachers (40.9 %). Student classroom teachers (50.0%) were found to have more realistic perspective about the changeability of scientific knowledge in contrast to student science teachers (40.9 %). Majority of the participants reported inefficient views about whether or not there is a hierarchy between hypothesis, theory and scientific laws: 84.2 % of student science teachers and 93.8 % of student classroom teachers. As indicated by McComas (2000) this misconceptions relies on the assumption that the scientific views have a hierarchical nature. Therefore, it can be argued that the participants have a traditional science perspective. Misconception of the hierarchical nature of hypothesis, theory and scientific law is also frequently reported in the literature. More than half of the participants as a whole reported realistic views about the certainty and vague nature of the scientific knowledge. Both groups had inefficient but acceptable views about epistemological nature of scientific nature. Furthermore, the field of study was found to have statistically significant effects on the subdimensions of the effects of society on science, the characteristics of scientists, and the nature of scientific knowledge. In other subdimensions both groups reported similar answers and therefore there was no statistically significant difference in this regard.

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