Chapter 4
Prospective Teachers' Interest in Astronomy: The Effect of Conceptual Change Texts in Astronomy

Önder Şensoy
https://orcid.org/0000-0001-5973-1957
Gazi University, Turkey

Yaprak Yeşil Asana
https://orcid.org/0000-0001-9671-5745
Ministry of National Education, Turkey

ABSTRACT

The aim of this study is to develop conceptual change texts to change the misconceptions in astronomy courses and to compare the effect of Conceptual Change Texts on pre-service science teachers' interest in astronomy. A quasi-experimental design with a pretest-posttest control group was used. The study sample consisted of 4th-grade pre-service teachers. The group in which conceptual change texts were applied constituted the first experimental group with 27, the group in which classical texts were applied constituted the second experimental group with 24, and 26 pre-service teachers in which traditional learning was performed constituted the control group. For the data collection tool of the study, the Astronomy Interest Scale was applied to determine the interest levels of pre-service science teachers towards astronomy education. It was determined that there was no difference between the interest of the experimental and control groups towards astronomy before and after the application, the difference was only in favour of the Conceptual Change Texts group.

DOI: 10.4018/979-8-3373-0345-1.ch004

INTRODUCTION

Since the day humanity has existed, it has always wondered about the sky and sought answers to many questions about the universe. In the early times, while seeking answers to questions such as how night and day occur and how solar and lunar eclipses occur today, answers are sought to whether there is life on Mars and whether it is possible to travel to the stars. This process in the history of humanity shows that astronomy is not only the oldest branch of science but also a branch of science that will always remain up to date with the developing technology.

The historical development of astronomy is closely linked to the evolution of scientific thought and has radically changed how the universe is understood in different periods (Taner et al., 2017). Therefore, the place of astronomy in science curricula reflects its historical significance and potential to help students gain a deeper understanding of the universe. Comprehensive analyses of how astronomy is included in science curricula and what the best teaching practices make important contributions to developing teaching strategies (Kalkan et al., 2021).

Astronomy has paved the way for the formation of many branches of science (Trumper, 2006; Türk et al., 2012), played a pioneering role in scientific developments in human history (Yılmaz, 2014) and provided interdisciplinary work in science branches (Kanlı, 2015; Kurnaz, 2016; Türk et al., 2012; Trumper, 2006). In the Science course, which consists of integrated disciplines, the units in which basic astronomy topics are included, as well as the other units in the Science Curriculum, are rich in terms of concrete and abstract concepts by nature. This causes many similar concepts to be confused. Concepts, which are accepted as the building blocks of knowledge, reveal scientific knowledge as a result of the connections between each other and enable this knowledge to be classified and organized as schemes in the mind (İzgi, 2012; Sert-Çıbık, 2011). Concept teaching is of great importance in achieving the aim of the Science course, which includes many concepts (Aydın & Balım, 2007; Wood, 2012).

Misconceptions occur due to perceiving concepts differently from their scientifically accepted definitions (Kuru & Güneş, 2005). Misconceptions negatively affect other learning related to the subject. Therefore, it is of great importance to identify and eliminate the misconceptions existing in students (Kılıçoğlu, 2011; Öztürk & Doğanay, 2013; Posner et al. 1982). Misconceptions in science education are considered among the most important factors affecting student achievement (Eryılmaz, 2002; Halloun & Hestenes, 1985). In astronomy, which has so many concepts, misconceptions are inevitable. Many studies show that these misconceptions are present among the public, students, prospective teachers and even teachers (Bektaşlı, 2013; İyibil & Sağlam-Arslan, 2010; Kalkan & Kıroğlu, 2007; Kanlı, 2014; Kurnaz & Değermenci, 2011; Percy, 1998; Şenel- Çoruhlu & Çepni, 2015; Şensoy