

Investigation of Transitions Between Multiple Representations in the Science Textbooks

Mehmet Altan KURNAZ, Ebru EZBERCİ ÇEVİK, Nezihe Gökçen BAYRİ

Summary

PURPOSE AND SIGNIFICANCE

Today, any information can be presented in a different way by the same sources. Teaching of concepts with various representations types in educational environments make a significant contribution to develop skills of association (MEB, 2013). In the related literature, there are many studies that investigate textbooks in terms of various perspectives; however, in these studies transitions between representations types are not highlight enough. In this study, it was aimed to determine representation types used in the textbooks and to reveal the nature of the transition between them.

METHODS

The study was conducted as a qualitative research and by using document analysis method. During the study, six textbooks which of different publisher approved by Chairman of the Board of Education, in sixth, seventh and eighth grades (two books in each grade) were examined. Initially, a preliminary analysis performed to examine the textbooks. In the preliminary analysis, it was determined that texts as a verbal representation, graphics, pictures, photographs and tables were used as the representation types in the investigated textbooks. Investigation of the textbooks was carried out in terms of a criteria developed by Kurnaz, Gültekin, Aydınli and Çağlar (2014). In the analyses, the nature of the transitions between the representation types was also detected as evident, semi-evident and not evident.

RESULTS

In the light of the obtained data, only graphic, picture, photograph and table, besides the texts as a verbal representation, were highlighted as the representation types in the sixth, seventh and eighth grade science textbooks in the study. It was also determined that the numbers of representation types are increasing in the upper grades. While photographs and pictures are the most used representation types in all grades and in the whole publications, the table and graphic are the least used representations types. In the textbooks, the numbers of representation type are also changing in terms of the learning areas. For example, while table representation type is used most in 'matter and changes' learning area in all grades, it is used least in 'Earth and Universe' learning area in all grades. Graphical representation type is used the least representation type among the others, and is generally used in eighth grade. On the use of representation types in a systematic manner from sixth grade to eighth grade, the textbooks are not adequate. Although a total of six textbooks on the study of different authors from different publications, it was observed that there is a general trend in the transition. That is, when the transitions between the representations types are investigated, the textbooks are lack of high qualifications on improving transition skills of students. The textbooks are mostly focus on the same transitions -transition from text to picture or photographs-. When the transitions between the representations types are investigated in terms of the learning areas, it was observed that most of the transitions have in semi-evident qualification.

DISCUSSION AND CONCLUSIONS

The study was concluded that the investigated textbooks were highlighted the photograph and picture representation types besides verbal representations more than the

other representation types. In the Turkish Science Curriculum, it is intended to highlight the representation types in a wide manner in all grades. Thus, it is evident that since the textbooks written by the various publications focused on specific representation types in all grades, they are partially sufficient. This case is similar to the emphasis in the related literature. In the studies of Kurnaz, Gültekin and Çağlar (2012), Kurnaz (2013) and Pektaş and Kurnaz (2013), it was determined that during the science teaching processes photos, pictures, tables and graphics are the most used representation types in courses and/or science textbooks. In the study, it was also determined that the textbooks were not sufficient in the use of transitions between representation types. Thus, it is thought that the transitions between types of representation are not reflected expectations of the Turkish Science Curriculum. Similar results were mentioned by Bayri (2014). In the study of Bayri, it was determined that pictures as a representation type were given more intensity than the other representation type, and the investigated document was only sufficient in the transitions between text and picture representation. Moreover, in this study it was determined that some of the representation types -especially graphics and tables- presented in specific learning areas. As conclusion, the textbooks writers should be give more attention on using representation types and transitions between types of representation. Also, researchers should be carried out more research on this issue.