Out of School Science Education: A Lesson in Planetarium

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ABSTRACT

"Out of school education" means that happens during school time and according to the curriculum but uses settings and institutes outside the physical school building. Out-of school education often uses informal education sources for formal education (Salmi, 1993). Science centers, museums, aquariums, botanic gardens, zoos, industrial organizations, planetariums etc. are out-of school environments serving people from every age group.

For the present study, as an out-of school environment, a planetarium was selected.Planetariums employ optical or digital projection systems to create shows that incorporate images of the sky, space, and occasionally other scientific subjects (Environments & Bell, 2009, p. 259).The system helping people to have information about astronomy, space and other scientific issues may serve the function of an important educational tool particularly for students. There are fixed planetariums as well as moveable types and on demand, these may be taken to schools to serve students. In the present study, a sample lesson plan to teach mass gravity law within the unit of "Force and Movement" included in the 9th grade curriculum was developed and the lesson was taught in moveable planetarium. The study group consists of 9th grade students of an Anatolian High School in Ankara (female: 35, male: 23). The lesson using topic-related critical thinking teaching consists of two parts, one inside the planetarium and one outside the planetarium. Inside the planetarium, by using the "Stellarium" program, a discussion about loadstar and locations of stars was carried out and then two programs called "Astronaut" and "Oasis in Space" were watched. While watching the programs, at certain intervals, they were paused and the students were asked some questions laying a basis for discussions. In the part taught outside the planetarium, main focus was on pre-determined critical thinking skills. The programs and films to be shown in the planetarium were examined by the researchers and a lesson plan was designed. The lesson was taught by the guide. Before teaching, the researcher worked together with the guide to decide how to carry out the lesson. The lesson carried out in the planetarium was video recorded. Before and after carrying out the lesson, semi-structured interviews were carried out with the students and these interviews were evaluated through descriptive analysis, one of the qualitative analyses. In the pre-interviews, the main focus was the students' information about planetariums and their expectations from this application. When the students' responses were generally evaluated, it was seen that they did not make any comments about planetariums and hence they could not describe their expectations. During the post-application interviews, the main focus was on the students' evaluations of

planetarium activity in relation to physics course and its benefits to them regardless of the objectives of the physics course and negative and positive aspects of this application. When the students' responses were evaluated, it was seen that they mostly emphasized the visual and auditory aspects of the application in the planetarium; they got interested in the lesson more than they expected, and they had a fun while learning.

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