

The Planetarium as an Outdoor Learning Environment

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Visits to a planetarium are generally aimed for entertainment more than learning. The purpose of this study was to investigate the effect of learning conducted in the planetarium, as part of a complete unit, on elementary-school students' basic astronomy concepts.

Learning in a planetarium has the advantages of being exciting, providing the point of view of an observer on earth and presenting long-term phenomena in a short time, but at the same time it involves many challenges that can be described as aspects of the novelty space. A model for integrating planetarium lessons in school teaching was developed, based on the principles of teaching in Outdoor Learning Environments (Orion, 2003), and a professional development for elementary school science teachers was conducted based on this model. One of these teachers participated in the study.

The sample included three 4th grade classes - Class A participated in the whole unit, including preparation lessons, a planetarium lesson, and a summarizing lesson. Class B participated only in a planetarium lesson, and class C participated in the unit, but not in a planetarium lesson. Learning was measured by Pre and Post tests, students' essays, and interviews.

Comparison of results of Pre and Post tests shows significant improvement in the scores of Group A students ($P < 0.005$), while in the groups who participated only in parts of the unit the percentage of correct responses was lower. For example, only one student in group B and only 18% of group C, compared to 52% of group A indicated the Earth rotation as the reason for day and night. Comparison of the essays students in groups A and B wrote after the experience show that most students in group B concentrated in describing the experience, while students in group A put more emphasis on the content in their descriptions. About five months after the experience interviews with a sample of students in group A showed that students remember the concepts learned in the unit, and can describe what they did in the planetarium lesson.

The findings show that meaningful learning can be achieved with the planetarium, when it is used as part of a complete unit, based on the principles of an outdoor learning environment