

Further information

Experiences

We have tested role play teaching in our courses in elementary teachers (grades 1- 6) twice for about 85 students, in five groups at a time. And we are having it in our program also this year coming year (2009-2010).

Last year (2009) the results of the role play session were assessed in a course exam two months later. We compared the students (N=65) results in entrance exam and course exam. The typical misconceptions in the entrance exam and after the role play, table 1. Main changes in students' world view were the location of Saturn and Proxima Centauri. After a role play, there were only 8 % of the students considering Saturn as interior planet whereas at the entrance exam 22% of them considered Saturn to be closer to Sun than Earth. Further, in the entrance exam almost 60% of students draw Proxima Centauri as an interior or superior planets but after the role play only some students (16%) answers were not changed.

TABLE 1. The typical misconceptions in the structure of the Solar System at the entrance exam and in the course exam after the ScienceMath role play (n= 65) (Tuominen, A. 2009)

Typical misconceptions	Entrance exam %	Course exam after role play%
Saturn is an inner planet	21,5	8,0
Moon is closer to the Earth than Weather satellite	7,7	15
Moon is situated on the other side of Sun than Earth	1,5	0
Proxima Centauri is outer planet in Solar System	32,3	8
Proxima Centauri is inner planet in Solar System	26,2	8
Proxima Centauri is one of the Moons for Earth	0	5
Weather satellite is revolving Sun	0	3
Moon is inner planet	6,2	3
Weather satellite is inner or outer planet	3,1	0

However, among the role play some new misunderstandings came up. In the course exam some students in their drawings placed Proxima Centauri to revolve Earth instead of Moon and draw a weather satellite close to the Sun. Similarly, 15% of the students switched the locations of the Moon and the weather satellite whereas only some students (7.7%) had this misunderstanding in the entrance exam.



FIGURE 1. Finnish elementary teacher students participating in the Solar system role play, Spring 2009

These results show that conceptual change into proper understanding of the solar system even on very preliminary level demands radical conceptual change, which is not easy to achieve through teaching. However, our experiences to teach solar system using the method of role play are encouraging and we are going to test it again with our new student teachers.

Literature

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The ScienceMath-project: **The solar system – a role play as a teaching method**

Kaarina Merenluoto, Anu Tuominen, Tarja-Riitta Hurme, University of Turku, Dept. of Teacher Education, Finland

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The following articles dealing with students' problems in learning the concept of spherical earth, you can find on Internet page:

<http://www.cs.phs.uoa.gr/en/staff/vosniadou.html>

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