

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Extended Mission (9)

Author: Mr. Ryusuke Konishi
Keio University, Japan, r.konishi.1990@gmail.com

PROPOSAL OF EDUCATION METHOD FOR SPACE SUSTAINABILITY: ITS PRACTICE AND
IMPACTS**Abstract**

This paper proposes an education method for space sustainability mainly for elementary school students, and describes its impacts.

The first reason of teaching space sustainability is that it is necessary for children to understand it. This is because the idea of space sustainability is expected to be more important in the future, when they grow up. The second reason is that this curriculum is expected to have good impacts on them if they get involved in space development any way.

However, space sustainability has difficulty to teach elementary school students because sustainability on the earth, in itself, is a high level abstraction for elementary students. It is also because space development isn't based on their experiments, differed from the environments problems on the space. Space sustainability is a relatively novel idea, so teaching materials for space sustainability are limited.

We focus on a concrete education method for space sustainability. At first, a leader teaches the students a concept of space sustainability relating it with reuse and a spin-off from space to the earth. In addition to this, it's necessary to show an example of reuse of a spacecraft, such as Space Shuttle. And then, children observe a model of spacecraft with short explanation about main parts; for example, a satellite, a rover, and a rocket. They require finding technologies and materials which can be reused also on the earth. After close observation, divided into groups, children discuss about their own ideas with mentors' facilitation and put their thoughts together on one big paper. Provided, however, impractical technologies and ideas are allowed in order to make discussion simpler. Each group makes a presentation in front of delegates and leaders. A leader supplements comprehensive explanation as a conclusion.

This paper also shows a practice of this supposed way on Yokohama branch, Young Astronauts Club-Japan (YAC) which is a Japanese group for space education. The November meeting on 2011 was held in Sagami-hara campus, JAXA, and it had a full-scale model of HAYABUSA, which was an object to think about reuse and spin-off. This meeting had two impacts; this theme can stimulate children's imagination and curiosities, and they can review function of parts and materials of the spacecraft from another point of view.

For all of reasons, this paper shows that the proposed education method is feasible, and that it has big impacts on children.