

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Lift Off: Primary and Secondary Education (1)

Author: Dr. Naomi Kagawa  
Shimane University, Japan

Mr. Kenta Nomura  
Sagamihara City Yaguchidai Primary School, Japan  
Mr. Kohta Tsukawaki  
Japan Aerospace Exploration Agency (JAXA), Japan  
Ms. Keiko Suzuki  
Japan Aerospace Exploration Agency (JAXA), Japan  
Mr. Yusuke Koga  
Japan Aerospace Exploration Agency (JAXA), Japan  
Ms. Sonomi Takamura  
Japan Aerospace Exploration Agency (JAXA), Japan  
Ms. Satoko Nishi  
Japan Aerospace Exploration Agency (JAXA), Japan  
Dr. Akemi Kurotani  
Japan Aerospace Exploration Agency (JAXA), Japan  
Ms. Kaori Sasaki  
Japan Aerospace Exploration Agency (JAXA), Japan

DATA INFORMED SPACE EDUCATION PACKAGE FOR SPACE EDUCATION BEGINNER  
TEACHERS

**Abstract**

The purpose of our paper is to introduce our endeavor to develop the space education teaching resources, called “Space education package” for K-12 teachers who are new to the space education. It is critical to support new practitioners to expand the field of space education. What is unique about our research is that the package is date-informed from our real audience. Japan Aerospace Exploration Agency (JAXA) developed its Space Education Center in 2005 with a belief that JAXA is responsible not only for advancing space industry but also for raising future generations who can critically think about the best possible ways to utilize the knowledge and skills for all. Among various other programs, the Center offers teachers’ one-day professional development programs that introduce the field of space education and help teachers learn how they can use “space” to assist students to develop their curiosity and thinking skills. The Center has collected the participants’ survey data for 8 years. The results show that roughly 25% of participants thought the most attractive feature of space education is that it expands students’ curiosity, perspectives, and thinking skills. More recently (2021-2022), 20% of participants reported that they like how the goal of space education is aligned with the national curriculum. In contrast, 24% of teachers reported that they are not ready to implement space education due to the lack of perceived knowledge and time. In order to tackle these difficulties, we adopted Vygotsky’s sociocultural theory of human learning. Vygotsky argued that cultural tools, such as language and social practices, influence how individuals think, communicate, and learn. This theory suggests that teachers’ learning is influenced by the social and cultural contexts in which teachers participate. This implies that teachers are unlikely to implement space education unless they see its fit within their roles as teachers and see it possible to

implement in their current working condition where the average teachers work 56 hours a week (TALIS 2018). As a solution, the Center has developed the space education package consisting of lesson plans, teaching materials, such as class slides, video clips, and handouts, and how the lesson is tied to the national curriculum. What we learned from this endeavor is the importance of understanding the audience and the clearly determining your goal as space education leaders. In our presentation, we will share more about how these 2 factors affected the way we designed the package.