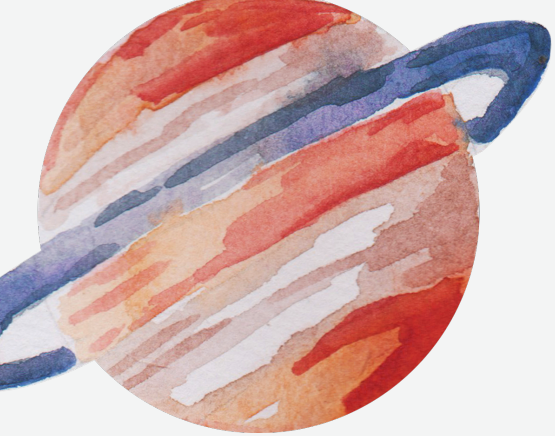


How can we realise the full potential of space & astronomy education?

"I LOVED EXPLORING A NEW DIMENSION OF REALITY"

Against the backdrop of international efforts to foster young girls' engagement with science, this study has explored the potential of a space science programme to encourage such engagement and interest in science through the middle school years.

Dr Magdalena Kersting
University of Oslo
@MagdaKersting

#RASPoster2020

#EinsteinianPhysics

WHY DO WE NEED THIS RESEARCH?

The years of middle-school education appear to be the most crucial in shaping attitudes towards science.

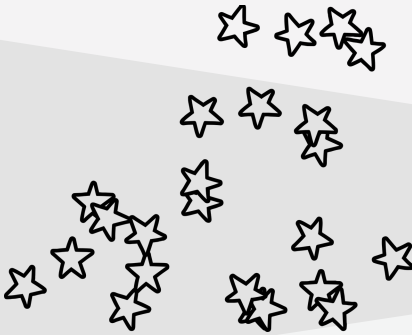
Space and astronomy education, as well as Einsteinian physics, are promising learning domains to foster interest and engagement. However, most researchers have studied learning and motivation in these domains at the secondary or undergraduate level. Unfortunately, the introduction of these topics at the middle-school level is still understudied.

objective

This exploratory case study addressed the need for in-depth research on space and astronomy education in middle-schools with a focus on girls' interests and attitudes.

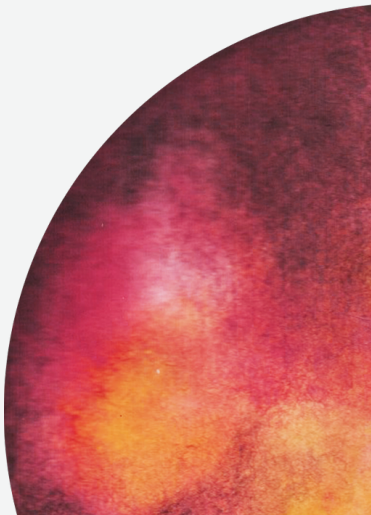
study design

We conducted a space science programme with two year-9 classes (39 girls of age 14-15 years) in an all-girls private school in Australia. Over eight lessons, the girls worked in small groups to design a learning object about Einstein's theory of gravity.



methods & analysis

We used qualitative research methods, including open-ended questionnaires and focus group interviews, to gain insight into how the girls encountered the space science programme in the classroom.



WHAT DID WE FIND?*

DIVERSITY OF EXPERIENCES

We identified three categories that correspond to a personal, scientific and holistic way of experiencing the space science programme. Establishing characteristics of such variation can help teachers respond to the diverse needs of students and facilitate productive opportunities for learning in the science classroom.

INCREASED INTEREST

The majority of the girls expressed an increased interest in science and a wish to learn more. Our analysis revealed a clear link between these positive attitudes and topics of the programme such as gravity, spacetime and ‘mysterious’ phenomena such as black holes.
It seems that many girls had not considered these topics to be part of science before.

CHALLENGE STEREOTYPES

Many girls reported that the programme challenged traditional stereotypes related to the scope and nature of science and to the ways the girls perceived scientists. In particular, the girls appreciated learning that physics was not dry or dull, but an active field covering topics related to astronomy, space science, and even philosophy.

FUTURE POSSIBILITIES

The impact of the space science programme on the girls’ interests and attitudes encompassed future possibilities in science as well. Many girls described science as being relevant for their future, for example as a subject to choose for further studies or as a possible career path. Some girls even stated that the programme had changed their general outlook on learning and education.

*The complete study is currently under review, so stay tuned: Kersting, M., Schrocker, G., & Papantoniou, S.: *‘I loved exploring a new dimension of reality’ - a case study of middle-school girls encountering Einsteinian physics in the classroom.*

This study adds to a growing body of research that aims to foster and maximise the interest of middle-school girls in science.

WHAT DID THE GIRLS SAY?

I used to really not like physics, but this topic has actually made me more excited to learn more about physics and spacetime.

I hope that our school continues to give us chances to learn without limits, to read as much as we like in order to understand, not to be marked. This space learning programme has enforced for me that there is a lot to learn and that that is a powerful lesson and tool that I can take with me in life, whether or not that will be in space, among the stars.

I have always liked subjects such as chemistry and human bio more and have found physics dry in the past. However, the topic of space as seen through Einstein really fascinates me and could be something I see myself exploring in the future.