Erasmus Plus KA2 – Schools

ISTEM- Innovative and Inclusive Teaching Approaches in STEM subjects in Post-Primary Schools

Partners: Lead GSA, Trinity Access (TCD, Ireland), St Joseph's post-primary school in Rush County Dublin, DIAK the Applied Science University Helsinki, Varsztatovnia, an arts advocacy organisation in Warsaw, Piter Jelles Leeuwarder Lyceum in Holland and Jezioranski Liceum in Warsaw

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"At the moment, Europe faces a shortfall in science-knowledgeable people at all levels of society and the economy. Over the last decades, there has been an increase in the numbers of students leaving formal education with science qualifications. But, there has not been a parallel rise in the numbers interested in pursuing science related careers nor have we witnessed enhanced science-based innovation or any increase in entrepreneurship. Science education research, innovation and practices must become more responsive to the needs and ambitions of society and reflect its values. They should reflect the science that citizens and society need and support people of all ages and talents in developing positive attitudes to science."

(REPORT EU COMMISSION 2015)

The I-Stem project is created to combat early drop-outs and social exclusion. Through innovative approaches, students and teachers will have the opportunity to explore and experience a programme that can advance the innovation of teaching STEM and modernise STEM education in post-primary schools. The performing arts technique of playful thinking allows one to step outside the box of logical thinking and create alternative logic that can assist in creativity. This teaching mechanism provides students with the opportunity to engage the mind and body into a collaborative expression. The project will allow students to discover their own voices, grow in confidence, and develop curiosity and ethical insight into the contradictions and paradoxes of the human condition (science identity).

I-STEM is based on the professional collaboration between universities, science experts, performing arts industry professionals, post-primary school teachers and young people. This project will offer innovative ways to make education in these subjects more engaging to students of post-primary schools. It will develop novel concepts to actively integrate young students in science education using a contest -based approach, creating self-produced digital animations, from young people for young people. The educational

approaches will contribute to fostering students' motivation towards science learning and strengthen the transversal competences they will need for STEM and other careers. They will also reflect on their own roles in the interaction between science and society, and the values embedded in Responsible Research and Innovation. For teachers the I-STEM project will offer a range of teaching techniques, tools and tips on how to support inclusive teaching in STEM Disciplines.

The overall aim of the Outputs is to provide appropriate tools to science teachers that will allow them to develop cross-disciplinary skills such as communication and engagement skills,
team working, and a more holistic and interdisciplinary understanding of research, including Responsible Research and Innovation (RRI) values and social inclusion.

Objectives:

1. To develop e-Book - will offer an overview of aspects identified as innovative and creative in improving Inclusive Teaching in STEM Disciplines.

2. To create Byte-Size Masterclasses for teachers on improving communication skills in teaching STEM subjects - The statistics show a historical problem with the way STEM subjects have been taught with 52% of students agreeing that the way the subjects were taught was off-putting to them. The aim is to transform both the teachers' and learners' experiences with STEM and to create an inclusive atmosphere in the classroom. The humorous-discourse techniques will equip teachers with innovative teaching approaches.

3. To design and develop teaching scenarios on how to implement the "I-STEM" educational programme. The handbook will provide step-by-step guidelines on how to use improvisation techniques and techniques to support the learning of STEM subjects. The core aim for scenarios will be to promote:

    -   Gender equality (LGBTQI+)
    -   Collaboration
    -   Inclusion
    -   Civic competences (active citizenship)
    -   Combating early school dropouts
    -   Boosting skills and employability
    -   Modernising education

4. The digital element (animation) will represent a form of celebration and self-promotion for students. It will promote the importance of

collaboration and inclusion in schools. The project will offer mobility for partnering schools to collaborate on creating these student animations.

5. Sharing Knowledge will combine all the research and evaluations of all the Outputs developed. It will serve as the platform for teachers/educators/researchers for accessing evaluation tools developed specifically to measure the products of these cross-disciplinary projects developed for the purpose of modernising education.