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WP2 - Activity 3

Online Training to teachers for transfer the information about the technology

BIOS4YOU
AR 2.0

BIO-INSPIRED STEM TOPICS FOR ENGAGING YOUNG GENERATIONS
THANKS TO THE USE OF AUGMENTED REALITY

Project Number: KA220-BW-23-30-126516

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Università degli Studi di Palermo
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Introduction

The BIOS4YOU project, launched in 2019, aims to engage young Europeans in STEM subjects by addressing current issues such as the social and environmental impact of new technologies, in order to develop advanced skills and promote awareness of sustainability and innovation.

In 2023, the follow-up project, BIOS4YOU AR 2.0, was presented and approved. Link to the project

The BIOS4YOU AR 2.0 project aims to raise students' awareness of STEM topics related to Bio-Sciences, Bio-Engineering, Bio-Architecture, Bio-Technology, Bio-Photonics, and more, by creating innovative educational materials through the use of new augmented reality technologies. This approach will make learning and teaching much more engaging for both students and teachers.

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Course Description

Introduction to Augmented Reality: Theory and Practice

Bios4You AR 2.0 online course offers a comprehensive introduction to augmented reality (AR), combining theory and practice to provide participants with a solid foundation in this emerging technology. Throughout the course, participants will explore the applications of augmented reality in the education sector, learn techniques for creating AR experiences, and develop practical projects using specific tools and software.

Course Objectives:

- Understand the fundamental concepts and technologies behind augmented reality.
- Learn to adapt STEAM education to AR technology.
- Explore the applications of augmented reality in education.
- Acquire practical skills in designing and developing AR content.
- Learn how to use software and tools to create interactive AR experiences.
- Develop a final project that integrates 3D content and augmented reality.

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Activity Sessions

1. **Introduction to Augmented Reality and STEAM Education**

- Introduction to the key concepts of augmented reality and an overview of STEAM education:
  This session will start with an introduction to augmented reality (AR), explaining its fundamental principles, technologies, and applications. Participants will learn how AR enhances real-world experiences by overlaying digital content. The session will then explore STEAM education, highlighting how AR can be integrated into STEAM subjects to make abstract concepts more tangible and engaging for learners.

- Exploration of Existing AR Application Examples:
  Participants will explore various AR applications currently used in education, showing how AR can teach complex STEAM concepts, like visualizing 3D models in chemistry or simulating architectural designs in engineering. Case studies and classroom demonstrations of successful AR implementations will offer inspiration and practical insights.

- Discussion on the Differences Between AR, VR, and MR (Mixed Reality):
  Participants will engage in a hands-on activity to create a presentation or concept map, conceptualizing an innovative AR application for STEAM disciplines. They will think creatively about how AR can solve real-world problems, enhance student engagement, or simplify complex concepts. The session will conclude with participants presenting their ideas to the group, fostering collaboration and feedback.

Activity: Create a presentation or concept map that describes an innovative AR application that could be integrated into various STEAM disciplines.

To solidify their understanding, participants will engage in a hands-on activity where they will create a presentation or concept map. This task will require them to conceptualize an innovative AR application that could be integrated into one or more STEAM disciplines.

Participants will be encouraged to think creatively and consider how AR can be used to solve real-world problems, enhance student engagement, or simplify complex concepts. They will then present their ideas to the group, fostering a collaborative learning environment where feedback and suggestions are shared.

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Activity Sessions

2. **AR Tools for STEAM Education**

- In this session, participants will explore a range of AR tools specifically designed to enhance STEAM education. Tools like **Merge Cube**, **CoSpaces Edu**, **3D Bear**, **AClass**, and **Assemblr World Studio** offer unique ways to bring abstract STEAM concepts to life. Participants will learn how to use these platforms to create immersive and interactive learning experiences.

Activity: Participants will choose an AR platform and design an interactive lesson within one of the STEAM disciplines. This task will encourage them to apply what they've learned about the tool, considering how AR can be used to engage students and simplify complex ideas in subjects like science, technology, engineering, arts, and mathematics.

3. **Creating 3D Content for STEAM Education**

- In this session introduces participants to 3D modeling, a crucial skill for creating effective AR content. Participants will learn the basics of 3D design and how these models can be integrated into AR applications for educational purposes. This is particularly relevant in STEAM education, where visualizing complex concepts in three dimensions can greatly enhance understanding.

Activity: Participants will design a 3D model that represents a concept from science, mathematics, or technology. This model will then be integrated into an educational AR application, helping students to interact with and better understand the concept.

4. **Educational Design with AR in STEAM Subjects**

- Participants will discuss and explore effective teaching methodologies for incorporating AR into STEAM lessons. The focus will be on how AR can be strategically used to improve student engagement, understanding, and retention of complex topics. Participants will also learn how to align AR activities with curriculum objectives and educational standards.

Activity: Participants will develop a comprehensive STEAM lesson plan that incorporates AR technology. The plan will detail how AR will be used to facilitate learning, including specific objectives, activities, and assessment methods. This exercise will help participants translate

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Activity Sessions

5. **AR in a STEAM Context**

- This practical session focuses on the real-world implementation of AR in the classroom. Participants will learn how to plan, execute, and evaluate AR-based educational activities within a STEAM context. The session will provide tips on managing classroom dynamics and ensuring that the AR technology enhances, rather than distracts from, the learning experience.

Activity: Participants will create an interactive educational session that integrates both STEAM and AR elements. This session will be tested with fellow participants, providing a hands-on opportunity to refine their approach based on real-time feedback.

6. **Final Presentation and Feedback**

- The course will conclude with participants presenting their final projects to the group. These presentations will showcase the AR-enhanced educational materials and lesson plans developed throughout the course.

Activity: Participants will present their educational projects, receiving constructive feedback from both peers and instructor. The feedback session will focus on identifying strengths, suggesting improvements, and discussing potential future applications of AR in STEAM education. This final activity is designed to ensure participants leave the course with actionable insights and refined AR- based teaching strategies.

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Instructions

The project consortium looks forward to the first meeting on **September 12th at 16:00 CET**.

Sign up now: https://forms.gle/DJ7uDXzK5QdMKD4V8

After your registration, you will receive a direct link to the first meeting.

Please ensure you have access to a laptop and a reliable internet connection.

By the end of the course, participants will have gained a deep understanding of how to integrate augmented reality into STEAM teaching, with practical skills to design and implement innovative and engaging lessons. The final projects will demonstrate the practical application of AR technologies in STEAM education, promoting more dynamic and interactive learning.

For more information about the Bios4You AR 2.0 Project, please visit the **project website**.

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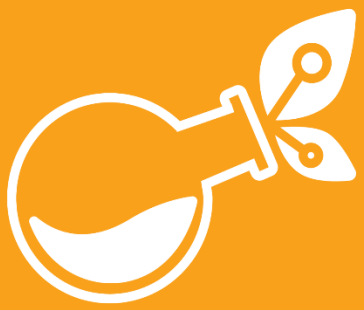

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