

Short name of the project:**Orbis Pictus: Treasures of Europe**

Full name of the project: Treasures of Europe, development and implementation of a board game supporting European identity building using 3D AR technologies

Motto: "... and so He came to them, and pointed them directly to that thing, and they never forgot the sight of it."

John A. Komenský: Orbis Pictus, 1658

Mission:

To create a pioneering educational board game directly focused on the topics of the framework curriculum *Man and his world* in the European context using augmented reality elements. The game and related methodologies will streamline the learning process using 3D models of key topics and concepts. At the same time, it will promote IT literacy and activate students and teachers in relation to the educational objectives.

Vision:

The Treasures of Europe board game will be a gateway for students and teachers to the world of augmented reality, but it will also be fully functional without the need to use AR. Using sophisticated methodologies, the game will support the main objectives of the Framework Curriculum in an attractive, modern and accessible way.

After the successful introduction of the game into Czech schools, the experience gained will be used to further develop the project at the European level, when it will be possible to create an even more detailed and sophisticated pan-European version in cooperation with foreign partners. The game and related methodologies will support the building of a European identity by moving pupils around a map of the whole of Europe and acquiring country-specific "treasure" cards, again using AR models and methodologies for the use of individual themes. In terms of education for global citizenship, the project can then be continued to the world map (Treasures of the World) with corresponding new cards and methodologies. The content of the collected cards can then be expanded within each theme, or entirely new categories can be created (for example, famous battlefields or major export items).

Target:

To equip Czech primary schools with a board game with AR elements and related methodologies that will develop themes from the Framework Educational Programmes and support European identity building, to successfully implement the project in schools.

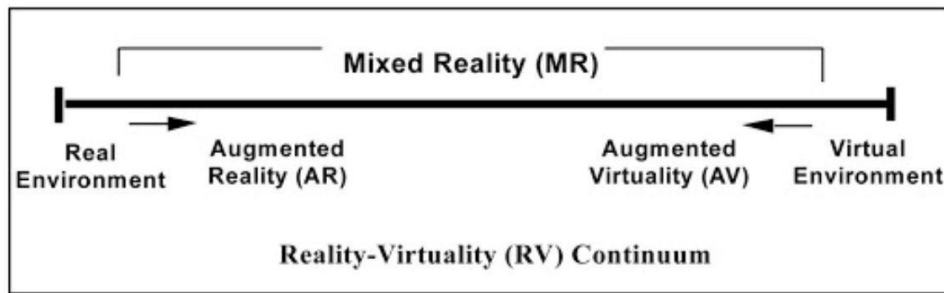
The basic idea of the project:

Augmented reality (AR), virtual reality (VR) and mixed reality (MMR) are groundbreaking technologies whose educational potential remains untapped in Czech schools. Existing international studies show that the use of AR, VR and MMR elements leads to better and deeper cognitive grasp and memorisation, especially through the use of 3D perception. Globally, the coronavirus pandemic has further encouraged the rampant development of AR, VR and MMR technologies, which will soon become the next significant technological stage. If this opportunity is seized, Czech education has a unique opportunity to move towards modern learning technologies and processes that are and will be key to success in the 21st century.

The creation of the Treasures of Europe board game, which will use AR elements, is an important entry point that will open up opportunities for schools to further use AR, VR and MMR technologies. The basis is a simple board game for 2-5 players on a stylised map of Europe. Players are tasked with traversing the country and collecting as many 'treasures' of different types (buildings, animals, plants, personalities associated with a particular place, prominent landscape features, typical products, important historical events) along the way, which they can combine and exchange to form one of the winning combinations. The mechanism of the game will be basically based on the well-known principle of the movement of the pieces after the roll of the dice, which is widely known from *Man, Don't Be Angry*, and is therefore easy to grasp and explain for pupils and teachers.

The game will also include a mobile phone and laptop app that will allow the game board itself and the individual game cards to instantly transform into animated 3D models that will grow organically from the game board and the individual cards that students will acquire during the game. These cards can then be further worked with in the school within the framework of the developed methodologies. Pupils will be able to take the cards home and use them to prepare reports or other projects. The full version of the game will include both competitive and cooperative variants, as well as levels of rule complexity depending on the age or experience of the players.

Theoretical background:



With the rapid development of technology, the use of AR, VR and MMR elements will become more and more common, and we will be able to choose our position on the continuum between the real world and total virtuality according to different situations. Studies show that AR, VR and MMR significantly improve the memorability of information by engaging 3D perception (Krokos et al., 2018). The board game with AR elements is an important intermediate step in the process of engaging Czech schools in the digitalisation process, as it is based on a physically attractive educational board game that can be used without AR elements. However, the mobile app will add another dimension to the game, for example, by allowing the game plan to be viewed through various filters (mountains, flowing rivers, road network, rail network or cultivated crops). The app also makes the individual game cards "come alive", allowing for a unique didactic experience. Educational board games work well within the pedagogical concept of E-U-R (evocation, awareness, reflection), as demonstrated, for example, in the Ekopolis or Multipolis projects, focused on environmental or multicultural education. The majority of Czech teachers have experience with the use of board games in teaching, for example in the framework of project days. The success of the Ypsilon board game, which focuses on an alternative approach to teaching hard and soft i/y, shows that this type of tool is both attractive and effective, especially for primary school pupils.

In terms of equal access to education, freely available AR, VR and MMR teaching materials are important tools that can help to compare the level of knowledge among students.

Project outputs:

Treasures of Europe board game including AR board and AR playing cards.

Methodologies for teachers on how to work with play in a way that meets the objectives of the curriculum framework.

Creation of a web portal concentrating information about the use of the board game and the individual "treasures" of the game.

Organisation of seminars for teachers on the use of the Treasures of Europe board game in the classroom.

Basic references:

Eric Krokos, Catherine Plaisant, Amitabh Varshney. Virtual memory palaces: immersion aids recall. *Virtual Reality*, 2018; DOI: [10.1007/s10055-018-0346-3](https://doi.org/10.1007/s10055-018-0346-3)

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Author of the concept:

PhDr. et Mgr. Kryštof Kozák, PhD., co-author of a number of board games (Dorn, Malacca, Numerix, Ekopolis, Multipolis), co-publisher of the board game for teaching enumerated words Ypsilonia, deputy head of the Department of North American Studies at the Faculty of Social Sciences of Charles University, co-author of teaching methodologies for environmental and multicultural education, member of the educational committee of the Prague City Council.