IMMERSIVE EDUCATION INITIATIVE

# IMMERSIVE ITALY

## 7th European Immersive Education Summit

**VIRTUAL REALITY   AUGMENTED REALITY   A.I.**
**3D PRINTING   LEARNING GAMES   SIMULATION**

iED   Lucca & Pisa Italy 16-19 Nov. 2017
ImmersiveEducation.org   **#i2017**

# ABSTRACTS

# IMMERSIVE ITALY

+

# 7th European Immersive Education Summit (EiED 2017)

16-19 November 2017    Lucca and Pisa, Italy

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Please note that the abstracts in this document follow the order in which they appear in the corresponding Program(me) and Schedule of Events, which is available online at:

http://summit.ImmersiveEducation.org/Italy/program_schedule.html

# IMMERSIVE ITALY + EiED 2017

*World's experts in immersion and immersive technologies to convene in Italy this November*

The **Immersive Education Initiative** has announced that Lucca has been selected as the official site for [IMMERSIVE ITALY 2017](#), which will run in parallel with the prestigious [European Immersive Education Summit](#) (EiED) this November. The academic and technical conference, which is open to the public, will feature cutting-edge technology and research from around the world along with related presentations, exhibits, tools, techniques, standards and best practices.

IMMERSIVE ITALY 2017 and EiED 2017 will address the personal, cultural and educational impact of immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), virtual worlds, telepresence, simulations, learning games, 3D printing, personal robotics, immersive teaching and immersive learning systems, and fully immersive environments such as caves, domes and planetariums.

The conference will conclude with special hands-on Virtual Reality and Augmented Reality workshops and social activities at the world-famous Leaning Tower Of Pisa in nearby Pisa, Italy.



*Located in Italy's Tuscany region, and in close proximity to both Pisa and Florence, Lucca is known for the well-preserved Renaissance walls that encircle the city's historic center. Conference attendees will walk together down the historic cobblestone streets and broad tree-lined pathways that run along the tops of Lucca's massive 16th- and 17th-century ramparts as they take part in unique hands-on Virtual Reality (VR) and Augmented Reality (AR) outdoor workshops.*

# Organizers



IMMERSIVE ITALY 2017 and EiED 2017 are organized by the international non-profit **Immersive Education Initiative** in collaboration with **INDIRE**, the research division of the **Italian Ministry of Education**.

The **Immersive Education Initiative** is a non-profit international collaboration of educational institutions, research institutes, museums, consortia and companies. The Initiative was established in 2005 with the mission to define and develop standards, best practices, technology platforms, training and education programs, and communities of support for virtual worlds, virtual reality, augmented and mixed reality, simulations, game-based learning and training systems, immersive teaching and immersive learning platforms, and fully immersive environments such as caves and domes.

Thousands of faculty, researchers, staff and administrators are members of the Immersive Education Initiative, who together service millions of academic and corporate learners worldwide.

Founded in 1925, **INDIRE** (National Institute for Documentation, Innovation and Educational Research) is the Italian Ministry of Education's oldest and most highly regarded educational research organization and is considered the benchmark for educational research in Italy.



IMMERSIVE ITALY and EiED 2017 will take place in Lucca, Italy, from November 16-18 and conclude on November 19 with special hands-on VR and AR workshops and activities at the world-famous Leaning Tower Of Pisa in nearby Pisa, Italy. The event will be co-organized and hosted by **UIBI Foundation**, the Italian non-profit institution dedicated to teaching and pedagogical innovation.

# iED Summits

Building on the success of the previous 11 years of Immersive Education Summits (iED Summits), IMMERSIVE ITALY 2017 and EiED 2017 will feature a unique modular format that premiered at [IMMERSION](#) [2014](#) in Los Angeles, California, and [IMMERSION 2015](#) at the Sorbonne in Paris, France.

iED Summits are official Immersive Education Initiative conferences organized for educators, researchers, administrators, business leaders and the general public. iED Summits consist of presentations, panel discussions, break-out sessions, demos, exhibits, hands-on workshops and hands-on professional development programs that provide attendees with an in-depth understanding of immersion, the technologies that enable immersion, and immersive teaching and immersive learning techniques and best practices.

Speakers at Immersive Education events have included faculty, researchers, staff, administrators and professionals from Harvard University (Harvard Graduate School of Education, Berkman Center for Internet and Society at Harvard Law School, and Harvard Kennedy School of Government), Massachusetts Institute of Technology (MIT), MIT Media Lab, The Smithsonian Institution, UNESCO (United Nations Educational, Scientific and Cultural Organization), Federation of American Scientists (FAS), United States Department of Education, National Aeronautics and Space Administration (NASA), United States Department of the Interior (DOI) National Park Service, Walt Disney Animation Studios, Stanford University, Cornell University, Duke University, UCLA, USC, Google, Microsoft, Intel, Oracle, Halliburton Company, Turner Broadcasting, Gates Planetarium, Computerworld, Technion Israel Institute of Technology (Israel), The MOFET Institute (Israel), Keio University (Japan), Chukyo TV Broadcasting Company (Japan), Nikko Telecommunications Company (Japan), National University of Singapore (NUS), University of St Andrews (UK), University of Glasgow (UK), Coventry University (UK), European Learning Industry Group, Open University (UK), University of Oulu (Finland), Royal Institute of Technology (Sweden), École Nationale Supérieure des Arts Décoratifs (EnsAD; France), Interdisciplinary Center Herzliya (Israel), Graz University of Technology (Austria), University of West of Scotland (UK), University of Barcelona (Spain), Universidad Complutense de Madrid (Spain), Government of New South Wales (Australia), Eötvös Loránd Tudományegyetem (Hungary), Universidade Federal do Rio Grande do Sul (UFRGS; Brazil), Indian Institute of Technology, Delhi (India), and many more world-class organizations detailed online at [http://summit.ImmersiveEducation.org](http://summit.ImmersiveEducation.org)

# Announcements & Breaking News

Sign up to receive official Immersive Education Initiative announcements and updates directly in your **email** inbox at:

http://ImmersiveEducation.org/signup

Prefer social media? Keep up to date on all Immersive Education activities by liking or following the official iED **Facebook** and **Twitter** accounts:

https://facebook.com/ImmersiveEducation

https://twitter.com/Immersive

# OPENING TALKS

# Immersive Education and the State of Immersion

Aaron E. Walsh[1,2]

## Affiliations:

[1]Immersive Education Initiative

[2]Boston College, USA

## Abstract:

The Immersive Education Initiative is a non-profit international collaboration of educational institutions, research institutes, museums, consortia and companies. The Initiative was established in 2005 with the mission to define and develop standards, best practices, technology platforms, training and education programs, and communities of support for Virtual Reality (VR), virtual worlds, augmented and mixed reality, simulations, game-based learning and training systems, and fully immersive environments such as caves and domes. More recently, the Initiative has endorsed creative computing systems, holograms, 3D Printing, robotics and drones as official Immersive Education (iED) technologies.

Today the thousands of faculty, researchers, staff and administrators who are members of the Immersive Education Initiative together service millions of academic and corporate learners worldwide.

In this opening talk, Immersive Education Initiative Director Aaron E. Walsh will give attendees an overview of the wide range of immersive technologies that are used for teaching and learning along with examples of how these technologies are used around the world at all levels of education today.

Walsh will conclude his presentation with an overview of the current "state of immersion" by providing insights related to the market sizes, scope and growth rates of Virtual Reality, Augmented Reality, 3D Printing, and related Immersive Education technologies.

# SPAN Immersive Space:

## VR and AR Learning Experiences in the City of Lucca

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**Affiliations:**

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[2]Director, Fondazione UIBI, Italy

[3]Research EduLab Manager, Fondazione UIBI, Italy

[4]Researcher, Fondazione UIBI, Italy

**Abstract:**

This presentation describes the features of the "immersive room" that will be hosted inside "SPAN - the Future School Lab". Opening in 2018, SPAN will be a wide indoor area (more than1,000 sm) consisting of different learning spaces and hosted in Palazzo Guinigi, an historic building in the century city of Lucca.

Led by Fondazione UIBI with the scientific partnership of INDIRE (Italian Institute for Documentation, Innovation and Educational Research), SPAN aims at inspiring school communities in their effort to "rethink" the school learning environment as a whole. SPAN is not an exhibition space, it is designed to be a "workplace" available to teachers and students of any school levels where innovative learning environments "live" through trans-media storytelling paths, gamification activities lead by internal professional trainers, or scheduled activities led by trained or self-directed teachers.

The SPAN content (spaces, furnishings, technologies and activities) is aimed at reinterpreting the school curriculum in terms of competencies and subjects. This is pursued by multi and cross-disciplinary activities based on a narrative/playful approach that are not confined into single rooms but span across different spaces such as the maker space, the agorà, the audio/video recording/editing studio, the immersive room.

The SPAN immersive room will be aimed at enhancing virtual, mixed and augmented reality based learning activities, in which students "immerse" themselves into meaningful experiences and challenging tasks, create 3D digital content and "add it" to real environments, engage in virtual co-presence training sessions.

# Immersive Bent's Old Fort: Bringing The Past To Life

R. Walner[1], M. Hotchkiss-Trejo[2], A. E. Walsh[3,4]

**Affiliations:**

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[2]Otero Junior College, USA

[3]Immersive Education Initiative

[4]Boston College, USA

**Abstract:**

Bent's Old Fort was a 1830s - 1840s adobe fur trading post on the mountain branch of the Santa Fe Trail where traders, trappers, travelers, and the Cheyenne and Arapaho American Indian tribes came together in peaceful terms for trade. Bent's Old Fort served as an instrument of Manifest Destiny and a catalyst for change in the United States. The fort's influence with the Plains Indians and its political and social connections in Santa Fe helped pave the way for the U.S. occupation of the West and the annexation of Mexico's northern province during the U.S.-Mexican War.

Today, living historians recreate the sights, sounds, and atmosphere of the past with guided tours, demonstrations and special events. In addition to being a popular tourist attraction, Bent's Old Fort is also an important aspect of elementary school education in Colorado. The fort is part of the core curriculum for 4th grade students in Colorado.

On November 19, 2014, the Immersive Education Initiative announced that Bent's Old Fort would be reconstructed virtually in the video game Minecraft and also as a fully immersive 3D virtual reality (VR) environment. One of several new activities under the Initiative's Immersive Arts and Culture program, Immersive Bent's Old Fort is being developed in collaboration with the United States

Department of the Interior National Park Service, the City of La Junta Colorado, Otero Junior College, and Colorado's East Otero School District.

The Immersive Bent's Old Fort project has three primary goals:

1.  Bring Bent's Old Fort to life using Immersive Education technologies to deeply engage K-12 students as they learn about American History in school.

2.  Give high school and college students in Colorado a unique opportunity to learn how to develop immersive learning experiences using contemporary technology while simultaneously providing them with intimate first-hand knowledge about the fort.

3.  Give Bent's Old Fort visitors a way to "return" to the fort virtually at any time and in an interactive and dynamic way that isn't possible with photographs or video.

The project began with the formation of two new Immersive Education (iED) student clubs in La Junta; one at Otero Junior College (OJC), and the other at La Junta High School. Students in both clubs meet weekly at OJC, where they work together to virtually reconstruct Bent's Old Fort.

In this opening series of presentations we will give attendees a unique overview of Bent's Old Fort, followed by an overview of the Immersive Bent's Old Fort project.

We will conclude by making all current renditions of Immersive Bent's Old For (i.e., Minecraft, 360° Virtual Reality videos, and interactive 3D object renditions) available to attendees, for which corresponding hands-on workshops will be conducted at Immersive Italy 2017 so that teachers can "bring the fort" to their own students after the conference.

# PAPERS

# Heritage Education For Children Through Interactive Visualization With Virtual Reality And Augmented Reality: An Analysis Of The Efficiency Of Both Technologies Applied In Elementary Education In João Pessoa City, Brazil

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**Affiliations:**
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[2]Escola Municipal Afonso Pereira da Silva - João Pessoa – Paraíba, Brasil
[3]Coortex Cortes Especiais – LabCriativo - João Pessoa – Paraíba, Brasil
[4]Aerocarta S/A

**Abstract**:

Preserving the historical and cultural heritage of a place is one of the ways to safeguard the memory of a period of history, especially with regard to architectural monuments, referring the visitor to the time of its apogee.

Throughout the world there are cities with historic buildings or monuments open to visitation, and one of the great challenges is to make residents aware of the value and representativeness of these constructions for the preservation of the local culture. In this context heritage education should start early with initiatives involving elementary school children. Nowadays children have access to technological devices such as smartphones or tablets from a very early age, and therefore, the use of these resources can be valid to aid in heritage education.

That is why some alternatives have been researched to offer virtual visits with the sensation of physical visitation through some device or technological resource. Several companies have developed equipment capable of simulating virtual environments or superimposing information in the real world with great quality, but with very high prices.

Undergraduate students in Architecture of the University Center of João Pessoa - UNIPÊ and public elementary school students worked together on this project, which was developed considering the use of low cost equipment, printed on 3D printers and using free software.

# Promoting The Heritage Through AR And VR: The Ara Pacis As It Was

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**Affiliations:**
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**Abstract:**

This paper presents a case study of an Augmented and Virtual Reality application implemented in the Ara Pacis Museum of Rome (Italy). A qualitative research was performed to investigate how the technology can help in reaching the museum's mission and enhancing the visitor experience.

The research adopts a holistic perspective that covers the human, the technological and the contextual dimensions that affect the visit experience. The results are discussed in order to highlight some relevant insights which can be used to design (or even re-design) augmented and virtual reality applications for the promotion of the heritage.

# The Hestercombe Gardens Augmented Visit:
# An Educational Visit To A Historical Garden Using Mixed Reality

D. Agostini[1,2], C. Petrucco[1]

**Affiliations:**
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[2]Paris-Sorbonne University – ARTS (Culture, Visual Arts and Digital Humanities)

**Abstract:**

This experience took place in England in the county of Somerset, where the Hestercombe Gardens are located. The experience consisted of a visit with the use of an Augmented (AR) and Mixed (MxR) Reality app, a good didactical methodology and the lead of a guide. We aimed to find out whether the

combination of these three elements could help primary school pupils in the understanding of historical, artistic and cultural aspects of the garden.

In summary, our aim with this visit was to find out whether the combined interaction between the students, the app and the guide could help primary school pupils in the understanding of historical, artistic and cultural aspects of the garden.

In this paper, we will address methodological, didactical and technological issues and we will present the first results of the experimentation. Looking at these results, it seems that the process of interaction between student, app and guide have increased engagement and attention if compared with the simple interaction with the guide.

# Peer Learning And Assessment-in-Context With 3D Immersive Glasses

Okada, A. K. Rocha, D. Whitelock, S. Fuchter, S. Zucchi ,

## Abstract:

This exploratory study examines peer-learning and assessment-in-context with the 3D Virtual Reality Glasses (3DVRG), the "virtual classroom" app about the famous Bletchley Park Museum and the TeSLA e-authentication system. Participants were peer students in the UK and Brazil.

The research questions focus on the types of interactions with 3DRVG that enhances peer learning and recommendations for pedagogical activities, assessment with e-authentication and creation of 360 VR apps.

Through a small qualitative study, the results of this pilot revealed possibilities for teaching staff to elaborate pedagogical activities  and for technologists to create useful and engaging resources.

# From Desktop Cave To Home Cave

Tetsuya Kawamoto[1], Nicola Liberati[2], Mario.Verdicchio[3]

**Affiliations:**

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[2] University of Twente, Enschede, The Netherlands

[3] School of Media, Culture and Society, University of the West of Scotland

**Abstract:**

In recent years, several Head mounted display (HMD) HMDs for consumers have been released and the Virtual Reality (VR) market has spread. Also, by combining smartphone and cardboard viewer, ordinary people can enjoy 360 degree video at a low price, and various contents are produced.

However, HMDs have some problems with safety and there are still operational limitations, such as the necessity of many HMDs to allow a large number of people to enjoy the experience at the same time. In Chukyo Television, we have been studying multiple video technologies for several years, and have been developing many cameras and multiple display systems.

We consider our new systems new "Caves". We call them "Desktop Cave" and "Home Cave". The differences between our systems and HMDs are that multiple people can enjoy the same video simultaneously, and that the caves are safer than HMDs.

Human physical movements such as turning eyeballs and neck are natural within a Cave, but they are not while using HMDs. Thus, we can reduce the sickness and fatigue generally caused by HMDs.

In this work, we report on the development, the achievements, and the challenges of our "Desktop Cave" and "Home Cave" and the relevant perceptual 3D experience.

# A "Memory Palace" For English In Immersive Worlds

Letizia Cinganotto[1], Heike Philp[2]

**Affiliations:**
[1]INDIRE, Italy
[2]let's talk online sprl, Belgium

**Abstract:**

INDIRE, the National Institute for Documentation, Innovation, Educational Research, has been researching new ways to improve the English language skills of CLIL primary and secondary teachers. A specific research project has been designed and implemented by INDIRE researchers, with the aim of investigating the potential of immersive worlds as an innovative teaching method and environment to improve language competences in English.

In particular, the paper will describe the training initiatives carried out in school year 2016-17 with the Italian teachers in Edmondo, the educational Open Simulator (OpenSim) created by INDIRE and addressed to the world of education. The syllabus and the activities were developed with the cooperation of a network of international experts in the field of language learning and immersive teaching.

A particular approach adopted for the delivery of the language course in Edmondo was 'the method of loci', a visualisation technique known to the ancient Greeks and Romans and used by memory contest champions. The mind walks through the rooms of a building, a palace or shops in a street and places objects along the way only to revisit these place, in order to recall the relevant items and label them.

Immersive English language teaching and learning experts, involved in the teacher training initiative, have been using this technique to help attendees memorize vocabulary and phrases.

Using the "method of loci" with a genius twist, the beginner level English course was implemented using a 2D floor plan of a house. Each week, as the course progressed, one room after the other came to life in full 3D serving as memory hooks for new vocabulary and ensuing conversations. For the intermediate course the same method was adopted to a new level, by creating a museum gallery to include a story of the evolution of art, performing arts, the art of invention and discovery and 3D arts.

# Chemistry For Middle School Students In An OpenSim-based Virtual World

M. Occhioni[1]

**Affiliations:**
[1]Istituto Comprensivo San Cesario di Lecce, Italy

**Abstract:**

This work is focused on Chemland, one of the islands of Techland, the only hypergrided OpenSim-based virtual world mostly centered on math and science for middle school students. It collects all topics regarding chemistry in all its aspects: history, models, bonds, reactions, applications.

Other islands in Techland are chemistry related, and host large size installations, as chemical and recycle plants, or temporary projects. Visualization and "learning by building" benefits are discussed. How students, by using a 3D desktop software, combined virtual worlds with 3D modeling, is also discussed.

# Opportunities of Virtual Environments to Drama and Acting

M.Carrozzino[1], P.Bartolini[2], C.Evangelista[1], M.Bergamasco[1]

**Affiliations:**
[1]Scuola Superiore Sant'Anna, Pisa, Italy
[2]Accademia Teatrale, Firenze, Italy

**Abstract:**

The paper introduces a novel project related to the application of new interactive technologies to the fields of acting and performing arts. Virtual Reality (VR), very much like cinema, literature and drama, is nowadays considered one of the many possible existing narrative forms. The group Art, Culture and Education of the Perceptual Robotics Laboratory based at Scuola Sant'Anna, Pisa (Italy) and the

Theatre Academy of Florence have setup a new Virtual Reality Laboratory in order to develop a novel acting pedagogy aimed at interpretative study.

The actors of the academy are experimenting novel opportunities provided by VR immersive contexts which are able to multiply the spaces of memory, fantasy, and theatre settings. This has lead to a series of experimentations using the X-CAVE immersive visualization system as an interactive setting for performances.

The first performance has seen the Academia's director, Piero Bartolini, reciting the XXX canto of Dante's Divine Comedy Inferno in an Information Landscape virtual setting. Information Landscapes (ILs) are abstract virtual environments made up of chunks of text and other multimedia objects placed in a 3D environment whose layout becomes relevant as an additional layer of information.

In this case, the IL was consisting of the words of the Inferno's cantos organized in the typical shape of the inverted cone, as Dante imagined hell. The actor appeared to the public as floating in Dante's words while at the same time declaiming the famous poem. The X-CAVE was again the setting of a monologue (a "poetic exploration of virtual spaces") performed by an actress of the Academy inside a virtual environment changing dynamically according to the actor performance.

A subsequent experimentation has concerned a form of "personal theatre", where actors invited on the virtual setting one single spectator who, wearing 3D glasses, was immersed in the 3D environment shared with performers. The piece was made up of two fragments of Shakespeare's Romeo and Juliet spaced out by a unique sound experience of the Japanese artist Marina Tanaka. Each spectator entered the X-CAVE, sharing the same virtual space with actors , for the first fragment. Then he/she was accompanied in an isolated room listening to the sound experience built in order to ensure an emotional continuity with the performance, while another spectator entered the X-CAVE to participate to the first fragment.

Finally each spectator was brought again to the X-CAVE for the second act. Although spectator were foreseen to establish only a visual/physical interaction with actors, interestingly some of them were stimulated to engage in dialogue with performers. The experimentation includes more conventional forms of videomapping inside immersive physical environments and the analysis of physical performances using motion trackers and other sensors.

# Immersive Scenery Proposals – Unity 3D

Bernardo S. Quaresma[1] , S. Keller Füchter[2] , K. Alexander[3]

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[2]Professor at the University of South of Santa Catarina (Unisul), Florianópolis, and researcher at the Teaching Research Internship Program (Programa Estácio de Pesquisa Docente) at the Central State University of the South (Centro Universitário Estacio de Sá) in Santa Catarina, Brazil

[3]Higher Education Consultant, Pittsburgh, Pennsylvania, USA; retired Dean of Junior and Senior Year Programs, Douglass Residential College, Rutgers University, USA

**Abstract:**

This article presents the concept of virtual environments in 3D that simulate physical spaces for study, giving the students an interesting experience in virtual reality that contributes to their learning. Prototype sceneries that consist of elements created in 3D modeling and compositing software were created, designed for the purpose of being inserted into the game platform Unity 3D.

The methodology was exploratory and descriptive, including the Design-Based Research (DBR) method and prototyping. In the end, professionals from the academic and computational arenas evaluated the sceneries. It was concluded that more complex sceneries that allow more interaction have a greater potential to facilitate learning in the VR environment.

# Design Trends In 3D Virtual Reality Environments Including 360 Degree Videos For Distance Learning

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[2]Researcher, higher education consultant, and retired assistant dean at Rutger, The State University of New Jersey, USA

[3]Researcher at the Central State University of the South (Centro Universitário Estacio de Sá) in Santa Catarina, Brazil

[4]Student researcher at the Central State University of the South (Centro Universitário Estacio de Sá) in Santa Catarina, Brazil

**Abstract:**

This paper will present a study of three-dimensional environments created to be used with Virtual Reality in Distance Learning. This technique allows people to view realistic environments using VR headsets, computers, or cell phones, just like a video game.

A prototype was created using the Unity 3D game platform, including interactive features together with 360-degree educational videos. We analyzed the acceptance and impact that this approach had with university students from 17 to 25 years old and a second group formed by three different generations. As a result, it was found that 96.1% of the students interviewed had an interest in participating in a class with this platform. Furthermore, 88.4% of college students responded that being in pleasant and beautiful surroundings can stimulate their studies.

In the second, more heterogeneous group, subjects such as surgical instrumentation, engineering, and architecture were highlighted as major beneficial educational uses of this platform. However, 40% answered that this technology may fail to arouse interest once it is no longer novel. We conclude that content and educational methodologies are fundamental for the effectiveness of this tool, which had strong acceptance, especially among young people.

# Using Augmented Reality (AR) With Marginalized Students To Develop Digital Literacies And Life Skills

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**Affiliations:**

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[2]Graduate Student, Faculty of Education, University of Ontario Institute of Technology (UOIT), Canada

**Abstract:**

Literacy in the 21st century refers to more than just reading the text in a printed book, it includes the myriad of ways a learner can access information and communicate through technology. This ethnographic case study investigated how augmented reality (AR) could be used to help a group of intermediate (ages 11-14), marginalized students develop digital literacies skills as well as life skills, such as cooking.

The study involved the creation of an AR recipe book and findings suggest that although the students developed skills and an affinity for cooking, they exhibited a lack of basic digital literacy skill sets requiring continuous prompting throughout the development of the AR recipe book. This study demonstrates the ability to use AR technology with marginalized students, in non-STEM related classes and as another vehicle for students to use to demonstrate their learning and understanding.

# Information Visualization Technologies Impacting on Individuals' Transliteracy Skills Enhancements Lifelong: a Case Study

J. F. Franco[1, 2]

**Affiliations:**

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**Abstract:**

The growing accessibility to the digital culture has allowed stimulating individuals' cognitive and transdisciplinary thinking skills through using advanced three dimensional (3D) information production and visualization technologies (A3DIPVT) as cognitive tools. However, there has been a lack of longitudinal studies analyzing impacts of applying A3DIPVT on individuals' education in natural learning settings, such as from K-12 education levels up to professional development lifelong.

On the other hand, the results of this case study and ethnographic qualitative analysis have suggested that individuals who have utilized A3DIPVT as multimodal tools for representing and expressing knowledge have improved their cognitive and multiliteracies abilities. One reason for such result is that through several learning activities and processes, subjects have understood the meaning of using web-based hypertext languages and advanced interactive technologies for learning to learn how to read, research, design, produce and publish 3D digital content.

Across longitudinal formal and informal learning processes subjects have experienced the concept and practice of immersive education with support of multimodal interactions related to using a combination of scientific knowledge, traditional, digital and visual literacy resources as meaning-making instruments, which can and have impacted on increasing participation in computing education and producing computing professionals as well as enhancing citizens' cognitive and transliteracy skills.

# Minecraft in the Classroom: Recommendations for Primary School Teachers

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[2]Researcher Technologist, INDIRE, Italy
[3]Primary School Teacher, I.C. "Vannini Lazzaretti" Castel del Piano, Italy
[4]Primary School Teacher, I.C. Porto Mantovano, Italy

**Abstract:**

While Minecraft's learning potential is largely recognized in the educational community, many teachers struggle in integrating it within primary school learning goals and curricula.

In order to ease the process, a team of Italian teachers, coordinated by INDIRE (the Italian Institute for Educational Development), started an action research pilot aiming to: 1) recognize the main critical issues for primary school teachers who attempt to start Minecraft-based learning activities in their school practices; 2) define a set of recommendations (or "golden rules") for the teachers in order for them to overcome the above issues; 3) design and test a set of curriculum and school-time compliant learning activities that embed this set of recommendations and every teacher (even Minecraft absolute beginners) can easily adopt.

This work highlighted how, in order for the students to make a significant use of Minecraft, the gaming activity has to be framed into a design-driven perspective, in which Minecraft is just one stage of a wider design process that students always need to start "on paper", thus preventing them from leaning towards a merely recreational activity. On the other side, it is crucial that this framework doesn't kill the fun: a critical balance between framework/time constraints and gameplay/degrees of freedom is the winning formula that every teacher has to pursue.

# Aerial Virtual Reality: Remote Tourism With Drones

A. Fabola[1] and A. Miller[1]

**Affiliations:**
[1]University of St Andrews, UK

**Abstract:**

This paper proposes a portable system for group-based exploration of remote landscapes in real-time. The system incorporates a drone for video capturing, a Raspberry Pi for wireless communication, an Android server for streaming and control, and one or more Android clients for rendering the footage in mobile virtual reality headsets.

The system has been evaluated from a technical perspective to investigate and optimise resource utilisation, as well as from a user perspective with participants to investigate usability. The findings demonstrate the feasibility of group-based, virtual tours of remote landscapes in real-time using affordable components.

# PRESENTATIONS

# Relive: A Serious Game To Learn How To Save Lives

F. Semeraro[1,2], A. Frisoli[3], C. Loconsole[3], N. Mastronicola[3], F. Stroppa[3], G. Ristagno[4], A. Scapigliati[5], L. Marchetti[6]

**Affiliations:**

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[2]Dept. of Anaesthesia and Intensive Care, Ospedale Maggiore, Bologna, Italy

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[4]IRCCS-Istituto di Ricerche Farmacologiche "Mario Negri", Milano, Italy

[5]Institute of Anaesthesia and Intensive Care, Catholic University of the Sacred Heart, Rome, Italy

[6]Studio Evil, Bologna, Italy

**Abstract:**

Relive is a serious game focusing on increasing kids and young adults' awareness on CPR. We evaluated the use of Relive on schoolchildren. A longitudinal, prospective study was carried out in two high schools in Italy over a 8-month period, divided in three phases: baseline, competition, and retention.

Improvement in schoolchildren's CPR awareness, in terms of knowledge (MCQ results) and skills (chest compression (CC) rate and depth), was evaluated. Usability of Relive and differences in CC performance according to sex and BMI class were also evaluated.

We demonstrated that Relive was able to improve significantly awareness in terms of knowledge of cardiac arrest and CC skills in a group of schoolchildren without any previous experience in CPR. Relive was able to improve retention of knowledge and was able to ensure retention of CC depth skill at 3 months after only one session of competition. The Relive was perceived as easy to use and providing an effective feedback. Relive could be useful as a tool to spread CPR knowledge and skills in the schools.

# Road Traffic Safety VR Project

Cristina Bralia[1], Chiara Lanzani[2]

**Affiliations:**

[1]Director and teacher of "Polo per la formazione digitale USR Lombardia" (Centre for Digital Learning - Regional Education Authorities for Lombardy) , in Varese and at  I.S. Ponti, Gallarate (VA)

[2]Teacher and consultant of "Polo per la formazione digitale USR Lombardia" (Centre for Digital Learning - Regional Education Authorities for Lombardy) , in Varese and at  I.S. Ponti, Gallarate (VA)

**Abstract:**

According to the EU efforts about road traffic safety education in schools, we would like to propose a VR  6-12 project in order to enhance kids knowledge and awareness of the dangers of the road as pedestrians and cyclists, because road safety practices are literally a matter of life and death for children. It is universally acknowledged that road traffic injuries are the single biggest source of mortality among children aged 10 to 24 worldwide.


The aim of the project is to engage students in the creation of a geolocated path of their small village or neighborhood, both for pedestrians and cyclists.
At the end of the process, the route can then be used by the kids through the VR, offering a safe and contextualized way of street education.

# Isis, the Mother of Goddesses

Maria Antonietta Sessa[1], Emilio Rossi[1]

**Affiliations:**
[1]Liceo Scientifico "Galilei" Benevento - Italy

**Abstract:**

This project is a journey through which it is possible to understand the complexity, richness and beauty of the cultural heritage of our city, where the rites and myths of ancient Egypt overlap and mix with local traditions and the civilization of the Roman Empire.

In 88 a. D. Domitian erected the building devoted to the Egyptian divinity with obvious political intentions in the desire to be revered as a god, associating the goddess with his figure and exploiting her charisma. The existence of the Isis temple is confirmed by the presence of a large amount of Egyptian-style surviving sculptures, made by Roman artists, who used Egyptian materials, such as porphyry, diorite, pink granite. But we neither know the exact location of the temple or there are residual architectural structures related to this building.

The results of the research carried out by the students of Liceo Scientifico "Galilei" of Benevento, with the guidance of teachers Emilio Rossi and Maria Antonietta Sessa, are summarized in a publication developed with the technique of Augmented Reality. Reading the brochure and watching the videos through AR (implemented with Aurasma software and QR codes) you can dive into the atmosphere of the Roman Benevento, in a kind of treasure hunt that will end with the vision of the Temple of Isis.

# CIAK: A Framework To Design A VR School Project

Cristina Bralia[1], Chiara Lanzani[2]

**Affiliations:**

[1]Director and teacher of "Polo per la formazione digitale USR Lombardia" (Centre for Digital Learning - Regional Education Authorities for Lombardy) , in Varese and at  I.S. Ponti, Gallarate (VA)

[2]Teacher and consultant of "Polo per la formazione digitale USR Lombardia" (Centre for Digital Learning - Regional Education Authorities for Lombardy) , in Varese and at  I.S. Ponti, Gallarate (VA)

**Abstract:**

In the last five years educators have noticed an increasing use of virtual technology in the classroom. In the future, VR is expected to change the standard teaching practices in school education.

For this reason, an important goal is to quickly come up with a framework (the CIAK model) to be used in the design and implementation phase of a VR school project; thus we are trying to produce a template that can be followed to fulfill teachers' needs. Instead, in the analysis phase of the VR experience, the Rapid Prototyping Instructional Design model could be the starting point we will use to outline the instructional goals and the assessment model of the VR unit.

The aim of this project is to experience how to meaningfully use the CIAK VR design model  in the classroom and to determine the effectiveness of a history lesson planned using our framework in order to employ VR as a concrete instructional tool. The example consists of an instructional unit on the Age of Discovery, focusing on the geographical explorations in the 15th and the 16th centuries.

# Immersive Learning Fosters Empathy Among Students

Harary Limor[1,2]

**Affiliations:**

[1]Head of Innovation and Technology in Education Department, Gordon College, Israel.

[2]ADE (Apple Distinguished Educator), AET Leader (Apple Education Trainer) GCT (Google Certified Teacher), Nearpod PioNear, Seesaw ambassador.

**Abstract:**

The aim of this project is to stimulate students using virtual reality and immersive learning experience to be sensitive to others, to view life through somebody else eye's, to be aware of problems other children experience daily, and even try to think of strategies to help them.

Through using immersive learning activities, this project aims to bring students closer to the basic values of humanity, such as empathy. Thirty students were given cardboards and placed their smart phones inside to watch a 360-degree movie clip which presented different children's perspectives on day to day life. Students observed real stories of children around the world and compared these stories to the Convention on the Rights of the Child.

According to Unicef report (2016) at 2030 167 million children will live in extreme poverty, 69 million children under age 5 will die, between 2016 and 2030 60 million children of primary school age will be out of school. We know that every day children are suffering to survive. Excess stimulation of media leads us to a state of numbness. It is important and essential to educate children to be empathic to others.

The project demonstrates how students can understand the "other" in more meaningful ways, by using Virtual Reality technology. The students' feelings and their knowledge about the subject were measured before and after the learning experience. Immersive learning activities were found to be significant forms of learning, the experience aroused curiosity and empathy towards children whose rights were denied and even created social activism among the students.

# Using Augmented Reality To Support Learning And Teaching In The Recording Studio Environment

R. Clark[1], C. Golding[1], M. Ramirez[2]

**Affiliations:**
[1]Leeds College of Music
[2]Jisc

**Abstract:**

Augmented Reality is transforming the way that we see the world but how can it be used in the classroom?

This presentation explores how Augmented Reality is being used in recording studios at Leeds College of Music to improve student learning outcomes by providing greater immersion, supplementing practical sessions and accelerating learning to high-level thinking.

The collaborative process of developing innovative learning technology within a specialist institution will be discussed, with particular focus on the dialogue between the development team and students and barriers to implementing the technology. The presentation will include a demonstration of the technology and present student feedback.

# Cities in Protest: Educational Possibilities and Cultural Considerations for 360-Degree Video

Karen Alexander[1]

**Affiliations:**

[1]Rutgers University, retired assistant dean

**Abstract:**

*Cities in Protest*, a 360-degree video, provides an example for discussion of 360 video in humanities and social sciences education.

This presentation centers on a 360-degree video available on YouTube at https://youtu.be/hQMXWlL0pVc. The video covers protests in four US cities (Denver, Washington DC, San Francisco, and New York) over a seven-month period, and provides a view of evolving public participation and the development of a protest culture across the country after the 2016 US presidential election.

The video is from the perspective of a participant in the various protests in the video, and the 360-degree format allows the viewer to explore the scene unfolding around them. The issue raised is the educational value of such video for teaching the history and culture of social movements and civic participation.

Some media historical contexts for videos such as *Cities in Protest* are provided. Is this video successful in conveying viscerally experienced information about being in spaces of protest, who else is present, and crowd responses, thus helping to gauge the mood and temperature of publics who come together in times of crisis? What other value might this video or others like it offer in the secondary or higher education classroom? Questionnaires gauging audience response will be made available for those who view the video.

# Enhancing Arts-based Learning Through An Immersive Pop-up Lab

L. Gjedde

**Affiliations:**

Dept. For Learning and Philosophy, Aalborg University, Copenhagen, Denmark

**Abstract:**

This presentation will report on the preliminary results of the exploration of an immersive pop-up space for enhancing arts-based learning.

There is an interest in Danish primary and lower secondary schools towards integrating arts-based and multimodal learning experiences into the curriculum. While visits to museums can be a way to accommodate this, it can, however, be restricted due to time, logistics and budgets.

To explore the potential of augmenting the school with an immersive space which could be used for arts-based learning, an intervention was conducted with an immersive pop-up lab. Groups of learners were taking part in the intervention which transformed the classroom through the use of relevant media-content in an inflatable dome equipped with an ultra-short-throw projector and 3D-sound.

The results from the study point to the potential for enhanced learning by bringing an aesthetic dimension to the classroom through an immersive installation.

# OUTLIERS

# Effective Bio-pharmaceutical Communication Through Immersive And Interactive Virtual Reality Experiences

M. Sosso[1], I. Gottlieb[2],  J. Gottlieb[3]

**Affiliations:**
[1]Untold Games, Genova
[2]Iconomia, Genova
[3]The Virtual Lab, Torino

**Abstract:**

In the last two years, Untold Games (a videogame company), Iconomia (a communication agency specialized in the pharmaceutical industry) and The Virtual Lab (a company that develops B2B and B2C Virtual Reality and Augmented Reality solutions) have developed a number of highly immersive VR experiences that incorporate gaming mechanisms to communicate bio-pharmaceutical information in more engaging and effective ways compared to approaches based on traditional media.

As an example, some of these VR experiences are used in medical congresses to explain the mechanisms of action of new biological drugs by letting the user follow the drug molecules inside the human body down to their target cells and receptors. The combination of continuous storytelling, multi-sensorial stimuli (e.g. haptic feedbacks and wind simulation), and gaming mechanisms create a highly immersive experience that attracts and retains the full attention of the users.

We propose to showcase at IMMERSIVE ITALY 2017 a fully functional 4-minute excerpt of the latest VR experience that we have developed.

# EXHIBITS, WORKSHOPS and SOCIAL ACTIVITIES

For exhibits, hands-on workshops and social activities visit:

http://summit.ImmersiveEducation.org/Italy/sponsors_exhibitors.html

For the "Pick 3 for 15"  hands-on workshops series visit:

http://summit.ImmersiveEducation.org/Italy/program_schedule.html

# Location-based Scavenger Hunt and Workshop

Kai Erenli[1]

**Affiliations:**
[1]University of Applied Sciences BFI Wien, Vienna

**Abstract:**

Bring your mobile phone and a keen sense of adventure! Join the experts, meet new colleagues, and make new friends from around the world as you explore the historic city around you during this unique social event and hands-on workshop conducted outside in the cobblestone streets and tree-lined pathways that run along the tops of Lucca's grand 16th- and 17th-century ramparts.

This special IMMERSIVE ITALY 2017 and the 7th European Immersive Education Summit location-based scavenger hunt involves real-time problem solving, exploration and orientation activities, and friendly team-based competition that leads to a golden treasure.

The scavenger hunt social event and "user interface" workshop is complimented by an in-depth hands-on workshop during which you will learn how to create your very own location-based scavenger hunts for a wide variety of purposes (such as school and campus orientation programs, team-building exercises, student and employee engagement, interactive history and social studies, "gamified" education experiences, and more).

# Pokémon Go for Education and Business

Aaron E. Walsh[1,2]

**Affiliations:**

[1]Immersive Education Initiative

[2]Boston College, USA

**Abstract:**

Pokémon Go is the world's first truly mass-market mainstream application of Augmented Reality (AR), and one of the most successful games in history. It is, in fact, one of the most wildly popular apps ever created and is played daily by millions of people around the globe.

You'll be among the first in the world to learn first-hand how the Pokémon Go phenomenon can be harnessed for education and business.

This workshop addresses the following topics, and concludes with a review of the preliminary edition of the Immersive Education Initiative's guidelines and best practices for Pokémon Go that you can use immediately at your own school or business following the conference:

- ❖ Pokémon Go for Teachers and Education
- ❖ Pokémon Go for Business and Marketing
- ❖ Child-safety: Criminal Elements & Physical Safety
- ❖ Legal issues with Pokémon Go and other forms of Augmented Reality (AR)
- ❖ Pokémon Go for Student and Employee Engagement
- ❖ Pokémon Go for Team Building and Relationship Building
- ❖ Pokémon Go for Exercise and Socialization
- ❖ Pokémon Go for Geography, Spatial Awareness and Map-reading
- ❖ Pokémon Go as a Resource Management Simulator
- ❖ Pokémon Go for Teaching Math, Estimation and Conversions
- ❖ Incorporating Pokémon Go into Curricula and Lesson Plans
- ❖ Inquiry-based learning (IBL) with Pokémon Go
- ❖ Project-based learning (PBL) with Pokémon Go

# 360° Video, Storytelling And Gamification For Immersive Education

D. Wortley[1]

Affiliations:
[1]GAETSS (Gamification and Enabling Technologies Strategic Solutions), UK

Abstract:

360 Degree Video and Photographic devices are increasingly affordable and accessible to consumers and provide opportunities for innovations in Immersive Education.

This workshop is a practical example of how a combination of Gamification, Storytelling and 360 Video technologies can be used in workshops and classrooms to stimulate and motivate learner engagement.

The session illustrates the use of these technologies to combine STEM (Science, Technology, Engineering and Maths) Education with Arts, Culture, History and Geography.

# Creating 360° Video + Pisa 360° Video Challenge

D. Wortley[1]

Affiliations:
[1]GAETSS (Gamification and Enabling Technologies Strategic Solutions), UK

Abstract:

360 degree video and photographic devices are increasingly affordable and accessible to consumers and provide opportunities for innovations in Immersive Education. This workshop is a practical example of how a combination of gamification, storytelling and 360 video technologies can be used in workshops and classrooms to stimulate and motivate learner engagement.

The session illustrates the use of these technologies to combine STEM (Science, Technology, Engineering and Maths) Education with Arts, Culture, History and

Geography master class on some of the most popular 360 degree cameras, associated mobile and desktop applications.

Delegates will be shown 5 different consumer 360 degree cameras from different suppliers. Cameras will then be loaned to small teams for the trip to Pisa, with a mission to both stream live 360 video and capture images and short videos for later processing and publishing to YouTube, Facebook and the internet.

For exhibits, hands-on workshops and social activities visit:

http://summit.ImmersiveEducation.org/Italy/sponsors_exhibitors.html

For the "Pick 3 for 15" hands-on workshops series visit:

http://summit.ImmersiveEducation.org/Italy/program_schedule.html

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