

## BIZ4FUN - 3D VIRTUAL WORLD AS A MOTIVATOR FOR YOUTH ENTREPRENEURSHIP EDUCATION

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### Abstract

*The education environment proposed in this paper aims to motivate, train and support people by increasing the competitiveness of young, mostly inexperienced people, on the job market. For this purpose, a 3D virtual world will be created as a tool to help to teach entrepreneurship through a social game focused on the business domain (Biz4Fun). Everyone having access to Biz4Fun will be able to interact with many kinds of multimedia content without an established predefined plan. Videos and presentations about successful start-ups are among these contents. The environment will also offer the possibility to all learners to be connected simultaneously and to interact with each other in order to exchange information, life experiences and documents. Biz4Fun will create and publish courses content and open educational resources (OER), supporting young practitioners in learning topics related to business and acquiring the skills needed to establish and successfully manage a business company. The next step will be to construct the virtual world, composed of knowledge areas comprising topics related to entrepreneurship. The Biz4Fun project has applications suitable for helping youth to develop start-ups and grow their business in agriculture and offers them innovative tools for learning and training to become successful entrepreneurs.*

**Key words:** virtual Reality, 3D virtual world, entrepreneurship, virtual education, learning technologies, teaching environment

### INTRODUCTION

Youth unemployment in Europe remains a serious concern: 8.7 million young Europeans cannot find work and the proportion facing long-term unemployment or involuntary part-time work remains high. In total, 13.7 million are neither employed nor in the education system or in training (NEETs). Close to 27 million are at risk of poverty or social exclusion [5]. Stimulating youth entrepreneurship is seen as a strategic effort for creating employment opportunities, fighting youth unemployment and social exclusion.

Start-up companies offer a solution to the situation mentioned above. Start-ups and technology incubators provide the proper environment to help and assist young entrepreneurs to kick-off technology companies in the early stages by offering entrepreneurship education and training along

with low-cost and low-risk access to technical resources used in shared-environments and specific to commercial and industry sectors. The aim is to help the growth of the local economy through the creation of a support community for technology entrepreneurs and through stimulating and cultivating a dedicated environment, where youth and start-ups can create, test, learn, scale and thrive.

One of the main objectives of the Biz4Fun project is to support and increase the competitiveness on the job market for the young (most of the times inexperienced) people. It provides an answer to the previous mentioned challenges by enhancing the young people's knowledge in economics and by broadening the basic knowledge of entrepreneurship and the ability to plan their career paths to become successful entrepreneurs.

With the development of new technologies, people are always changing how they interact

with the world around them. The same occurs on the education level, regarding self-learning approaches through e-learning [8] and also through the use of virtual reality (VR) in education [3]. The use of VR on training and education is available in many different knowledge areas like renewable energy [1], civil engineering [4], mathematics [7], language [18], surgical training in medicine [14] and many others. The motivation for using such technology either immersive or not, has already been studied [15].

Agriculture is a specific field where VR may have multiple applications designed to enable farms managers and employees to use modern agricultural production tools and modern management methods. However, agriculturists and farm managers' training in VR is restricted by the limited availability of time and place where they could benefit from the 3D virtual world suitable to their experience and available hardware equipment. For this reason, virtual and augmented reality interactive training platforms could be created and adapted to each agricultural field such as: Agriculture, Horticulture, Animal Husbandry, Land reclamation and environment protection etc. In this way, farm managers and agriculturists could get knowledge, skills and experience in developing their business by combining "digital image processing, computer graphics, artificial intelligence and multimedia technology" [17].

VR is considered as an interesting tool for applying new strategies, and practices. This is because of the different advantages that are becoming affordable with the use of this type of technology. For example, the use of VR in education can enhance the exploration of some phenomena which cannot be visualized in real life. Moreover, VR enables students to do experiments which can be dangerous or causes serious health problems [10]. In some learning fields such as engineering, biology, physics, there is a need to use very expensive equipment, facilities and chemicals for effective and efficient teaching processes. By making use of the VR instruments and learning materials, teachers and students are improving both ICT skills and benefit of a whole new learning experience. Teachers can

integrate and use the new VR technology in learning activities, both in face-to-face and in distance learning classes. They can also benefit from a VR environment as an instrument to publish learning materials online and share teaching experiences in using VR in education at a whole new level. Students can benefit from using the VR technology to improve their learning process in their courses. They can use the immersive learning environment from a virtual world to collaborate with other students in online group learning activities, to interact with each other to solve more complex tasks and assignments and to benefit from a more attractive, interactive, fun and dynamic learning experience.

The traditional way of education shares some characteristics with the education that uses virtual worlds. A virtual world is different from a traditional educational system, first of all because it offers a virtual 3D environment with a totally different spatial dimension, 3D objects and specific activities through which users can interact with them and between themselves. Users are using 3D avatars as their representation in the virtual world and may have a different experience of immersion depending on the hardware equipment used to connect and interact with the 3D virtual world. By doing new things, being able to work in teams to solve tasks, being able to reset experiments and simulations, create various scenarios of problems to solve, having access to virtual instruments and systems that are accurate replicas from real world, using virtual worlds in education can significantly enrich the traditional learning systems.

The next sections are structured as follows: Section 2 presents the theory and the approach used in Biz4Fun Project. Section 3 describes the strategies that will be used to teach entrepreneurship and presents some samples of a 3D world related to the topic. Section 4 gathers the conclusions to this paper and presents future potential developments.

## **MATERIALS AND METHODS**

First of all, the target groups which are the focus in the Biz4Fun project were identified

as: young people who have an interest in setting up and running their own business; unemployed young people, who could gain useful skills to increase their employability or start businesses of their own; already employed young people, but who are looking for chances to increase their skills and entrepreneurship capabilities; educational centres, career counsellors and agencies, institutions and organizations involved in VET; and policy makers and umbrella organisations, which can provide help and resources for incubators, start-ups and spinoffs.

The framework used in the project is based on the technological pedagogical content knowledge (TPACK) [12].

Biz4Fun uses a 3D virtual world, designed and built using OpenSimulator, basically an open source 3D application server on which learning courses are implemented based on scenarios developed in the project. The 3D virtual world is used as a virtual learning environment, that users (teachers and students) can access by using different software applications called clients [13]. Designers and developers of the Biz4Fun 3D virtual environment can create various 3D objects, can define interactions, build virtual regions with different purposes for each learning topic, design terrains, apply 3D elements, textures and graphics, and customize avatars. Real time physics simulation is supported with multiple engine options. It also offers an interface to define interactivities among avatars and the interaction between avatars and 3D objects. OpenSimulator also allows the creation of complex behaviour through scripts.

In the process of creating the 3D virtual world, the first step is to make the description of the learning scenarios. This step is done through the collaboration of experts with different roles and professional background (e.g. pedagogical experts, scientific learning content experts, designers, programmers and teachers). The result of their work is a collection of learning scenarios that form the knowledge area. The learning scenarios are then implemented in the 3D virtual world as special customized places for each learning

topic, where users can interact with each other, with the 3D objects, can access all the multimedia content and also interact with the Non-Playable Characters (NPC). NPC's are avatars that are not controlled by a player and are programmed to interact with the players to provide guides, hints and help to perform tasks in the 3D virtual worlds and access the learning content.

Using a 3D viewer software, such as Firestorm [6], teachers and students may access the 3D virtual world. The user that enters the 3D virtual world, will have its own personalized learning experience based on its own different actions and decisions taken each time in the 3D virtual world.

Previous research and works from the project group members [16] and [11] comprise the design and development of learning virtual worlds, such as World of Physics (WOP) and Virtual Reality for Science, Technology, Engineering and Mathematics (VR4STEM) projects. WOP implements the strategy of having several knowledge islands used to teach various topics in physics, while VR4STEM is aiming to assist young people to gain entrepreneurship skills. The lessons learned from the WOP and VR4STEM projects offer a great added value along with the pedagogical experience of the project members, in the development of the Biz4Fun project. This project aims to have a significant positive impact on youth, on the young students and on the young individuals, in order to improve their situation on the job market. Furthermore, trainers, teachers, tutors, school and youth educational centers will benefit by implementing the tools developed in the Biz4Fun project in their own educational activities. The innovation factor in the project is based primarily on the intention to present possibilities of self-employment and own business offers for young people through an attractive and popular form. For this purpose, the project will make use of information and communication technologies (ICT), mobile devices and a custom designed social game. Project partners, universities and small to medium enterprises, have experience in developing and working with incubators and start-ups. These partners are translating

their experiences into innovative educational materials and the social game. This will make the education of young people more attractive, assertive and motivating.

The developed open educational resources (OERs) and the social game will be the first of their kind. These will cover not only topics like the development of a successful business plan, how to establish business company, how to manage financial affairs, forms of support, but also topics like feasibility analysis, collaborative approaches, equipment provisioning, business models, including finance, sources of finance, management, added-value services and marketing as well.

## RESULTS AND DISCUSSIONS

A 3D virtual world will be developed in Biz4fun project as a social game to increase the competitiveness on the job market for the young (often inexperienced) people.

Since the beginning of the project, we completed the evaluation stage based on the questionnaire and reached some important conclusions regarding what is considered to be a “must” in becoming an entrepreneur and developing a business. We collected more than three hundred answers which were classified by countries. Four different questionnaires were distributed for each type of stakeholder with shared interested with the project regarding successful entrepreneurs, youth, education centers and policy makers. The distribution of answers is shown in Table 1.

Table 1. Distribution of answers by group of stakeholders

Country	Successful entrepreneurs	Youth	Educational Centres	Policy makers
Romania	5	33	2	1
International	0	9	0	0
Greece	2	21	0	0
Slovakia	13	21	5	5
Italy	3	38	0	0
Turkey	3	66	7	5
Czech Republic	2	54	5	1
Total	28	242	19	12

Source: project BIZ4FUN, © 2019 by www.biz4fun.eu, Accessed on Nov.10, 2019 [2].

The idea for the next step in development is to construct a knowledge island for

entrepreneurship with several presentations, videos and links with important information. Some images are presented in this article to demonstrate some of the ideas. The user is able to have access to the outside information like websites and videos without having to leave the 3D world.

Fig. 1 shows the welcome scenario on the knowledge island of entrepreneurship, under the form of an entrance to a building, that presents a panel of topics to be learned inside. These are important topics, on how to build a team, get funding for a project, making a business plan and developing marketing strategies.

The user can access the topics in any way that suits him best. Once a topic is selected, the user has access to the content, such as the slides of the presentations, showed in panels as well as documents with information structured in tables.

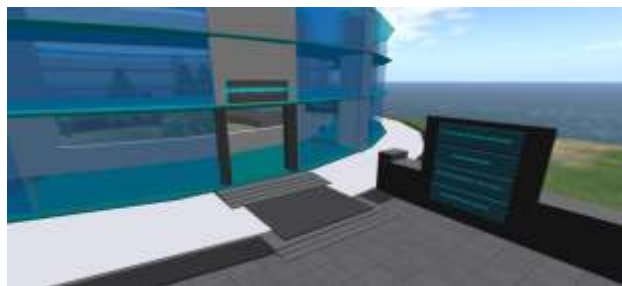


Fig. 1. The welcome scenario on the knowledge island of entrepreneurship

Source: project BIZ4FUN, © 2019 by www.biz4fun.eu, Accessed on Nov.10, 2019 [2].

Fig. 2 shows the avatar of a user between a table with readable and collectible documents and panels.



Fig. 2. An avatar of a user exploring an area with presentations and documents

Source: project BIZ4FUN, © 2019 by www.biz4fun.eu, Accessed on Nov.10, 2019 [2].

Fig. 3 illustrates the section of the building with information about the business plan.



Fig. 3. Presentation of the content related to the business plan  
Source: project BIZ4FUN, © 2019 by www.biz4fun.eu, Accessed on Nov.10, 2019 [2].

Fig. 4 shows the use case of the Happy meals, a sample of the marketing strategy used by McDonald's in order to improve their sales. All tips and information learned in the environment could be added by the user as notecards to future reference.

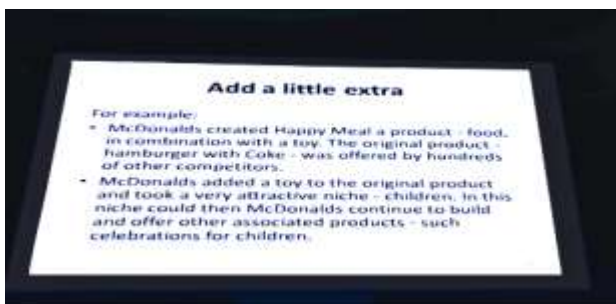


Fig. 4. Sample of use case related to the marketing strategies  
Source: project BIZ4FUN, © 2019 by www.biz4fun.eu, Accessed on Nov.10, 2019 [2].

Fig. 2 and 4 look darker than Fig. 1 and 3, because the users were accessing the content in different hours of the day. This kind of details get the virtual environment closer to the real world and aim to improve the immersion level and experience for the user. Young people usually became attracted by technologies like 3D Virtual Reality [9] and social games. Through Biz4Fun entrepreneurship learning becomes a more fun experience for them. This approach can present valuable knowledge to youth public with a huge impact in their professional life.

## CONCLUSIONS

This paper presents the main idea of the Erasmus + project Biz4fun *Let's have fun with the business start-up* - 2018-1-SK01-KA202-

046271. The process of creating the entrepreneurial social game using 3D virtual reality has already started. This social game aims at supporting the learning experience of young people to gain and enhance their entrepreneurship skills.

Questionnaires were made and distributed through the community and valuable information was gathered from several stakeholders. Samples of a virtual 3D environment with information related to the theme were illustrated in order to give an idea of the possibilities that can be explored with this technology.

The next steps include the creation and publishing of a guide on how to develop successful Biz4Fun “Course curriculum & Content”, the creation and publishing of course content and an OER, supporting young practitioners in learning topics related to business and acquiring the skills needed to establish and successfully manage a business company. Another important step is to finish the development of the social game that supports and links back to the OER to reinforce the learning outcomes.

The learning and training tools from the Biz4Fun project offer a great opportunity to youth to develop start-ups and grow their business in the agriculture field to become successful entrepreneurs.

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