The Role of the Educational Multimedia Games to Build Lasting Interest among Young People in the Cultural and Historical Heritage

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Abstract. At present we are witnessing the growth of an entirely digital generation. Young people who, from a very early age, use a computer or tablet and are strong supporters of computer games, can be successfully inspired using that same technologies to love and preserve the cultural and historical heritage of the country.

Keywords: Digital Technology, Multimedia Literacy, Cultural and Historical Heritage, Virtual Reality, Computer Games.

1 Introduction

Information and Communication Technologies (ICT) are changing in unprecedented manner most of the areas in which they enter, and in practice their implementation leads to complete transformation into something radically new and different. Consequently, the society in most cases is not prepared for such rapid and radical changes, and the qualifications of those, who must manage the change, turn out to be inadequate to the modern realities. Most middle-aged (40+) people, who are the backbone of the contemporary labor market, grew up at a time when there was no Internet and digital technologies were almost missing. On the other hand, a new digital generation is growing for which it is quite easy to adapt to the digital reality. Contemporary children are born literally with a tablet in their hands, and the idea of using this affiliation for educational, ethical and cultural purposes is natural and needs to be exploited further.

Most young people are used to play computer games from their earliest childhood, and many useful knowledge practices could be learned through the games. Unfortunately, the educational potential of the multimedia games has long been unnoticed for adults, and even those who have had an idea about it, did not have enough knowledge to make the idea work. However, there are already easy-to-use technologies that allow even people without special technical skills to design and create computer games so now they only need an appropriate storyline and content to make the game a real and useful learning tool in the school, and beyond (Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012).

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2 The Educational Process of the 21st Century

For centuries, the education has been considered as something very special and sacred and, like the church where people went to pray, there was a delegated place (school) where one could walk and learn. This was related to the presence of a dedicated staff (teachers), suitable educational tools (blackboard, desks, etc.) and large groups of other learners (students) so, to some extent, the education has been massively following a peculiar model, typical for the industry. Until the beginning of the 21st century, the Internet was practically non-existent, and the distance learning opportunity was almost unknown in the world. Logically, societies believed that gathering large groups of people into one place would lead to economy of scale and so this remained the model that is still largely used today, although the tendencies to change it soon are already visible even to non-specialists.

Above all, the society slowly but distinctively realizes that in an age, dominated and driven by a knowledge economy, education can no longer be closed only in schools. The modern education gradually breaks the stereotype of positional thinking, where you have to go at a certain time to a certain place in order to be trained. Contemporary education leaves the classroom and can go directly to the end user thanks to the ongoing qualitative transformation of the educational process (Pavlova, 2015). As is in the industrial age, in an attempt to broaden the education and take it out of the framework of elitism, the society has invested in educational infrastructure (schools and universities), so in the 21st century the next level in this trend seems to be the digital environment and the fact that the education is already not limited in time and location, making it accessible for anyone, anytime and anywhere. This is possible thanks to the new ICTs that allow the connection of the end-user to any educational content from anywhere on the planet. The modern distance learning systems already posses all the necessary attributes for a full-fledged learning experience - multimedia and interactive educational content, connection to virtual reality and integration of 3D models in the web space, audio and video-conferencing with teachers and classmates, options for conducting online tests, teamwork software, and more, so in a number of situations they can now adequately replace the traditional classroom. Naturally, the role of the teacher is also changing. Today teachers are required to be facilitators helping learners to make judgements about the quality and validity of new sources and knowledge, be open-minded and critical independent professionals, be active co-operators, collaborators, and mediators between learners and what they need to know, and providers to scaffold understanding (Amin, 2016).

It is also important to note that the modern educational technologies already have **a number of totally new features** that, in the traditional education and learning, were simply not available, such as the opportunity for mobile learning (Márkus, et al., 2017) or the independence from the time and the location of the student. For example, few people realize that for every person the optimal learning time can vary over the day for purely individual reasons (biological, economic, social, etc.), and the ability to choose the timing framework is a serious plus for achieving higher individual results and competitiveness. Also, a significant part of the time of the people who often have to travel for one reason or another can now be successfully filled with mobile lessons - they can

browse online while on the move and thus increase the opportunities for raising their qualifications. For example it is enough to post in public vehicles or other locations suitable QR codes (Kaposi, et al., 2013) that lead to certain information sources and citizens, after scanning them with their smartphones, will be directed to gain new knowledge and information.

However, the biggest revolution in the new educational methods remains the ability **to provide personalized content according to the learner's specific needs, opportunities and wishes**. In the traditional method of teaching (many people in a classroom), for purely practical reasons, it was not possible to achieve personalized training and all students had to study absolutely the same thing, which is extremely impractical and short-sighted considering their individual features, skills and interests. Starting from the different needs for workloads on individual subjects, and reaching out to what is to be studied on each of them to date, it is crystal clear that the age-old educational model is fundamentally mistaken and that only the personalized learning can give us the optimal educational outcomes (professional, cognitive, emotional etc.).

The public understanding of the role of education also changes. Since the 1990s, and especially since the beginning of the 21st century, the whole society has become aware that the education is a phenomenon that goes beyond the purely academic frameworks and has a key role in the ever-evolving labor market. While in the past the notion of a better life as a result of a better education has been somewhat abstract, and most people have perceived it mechanically without understanding how exactly these things are associated, it is clear nowadays that the added value of the education shows up only if it is practical, constantly transforming and responding to the current trends in the labor market and adequate self-esteem of people in a knowledge based economy. In general, that concerns not only the professional daily work skills, but also the emotional and cultural nature of the individual and, more or less, his/her general competitiveness and life and career satisfaction.

We have all witnessed how a large number of graduating school and university students can not find an adequate or motivating job, matching their educational qualifications, emotional intelligence level or personal preferences and ultimately turn to a completely different profession from what they have studied or used to be fond of. The reasons are that they did not realize in time that education is meaningless, if it is not oriented towards the trends of the modernity and starting to study something, they must be fully aware whether:

1. The educational content that they are studying will be needed on the labor market when they graduate and are ready to become part of it.
2. They know what their skills and interests really are and encouraging their creativity and critical thinking could be quite helpful to find out.

For instance for many years, the education system has consistently neglected the need for timely updating of the curriculum. Even on the assumption that all people should learn the same, which as mentioned earlier, is definitely wrong, many of the things, that all people study, in a number of subject areas prove to be totally obsolete and inadequate to the trends of the time. The problem with the stubborn teachers, who have been accustomed to teach the same content for 30 years or more without changing a single line and are not ready to upgrade their knowledge in time to meet the needs of

the modernity, has a strong negative impact on many generations and only today, in the conditions of a global competition, we have real prerequisites for breaking this vicious model. The new technological opportunities and the change in the stereotype of teaching provide a basis for unfolding of critical thinking, which plays already a significant role in our subsequent realization (Zulfiqar, 2017), and above all, provide much more choice for the learner. In the end, if you can choose your teacher from thousands of others online, if you are not necessarily bound to the same learning content that is necessarily taught in a certain way, if you have the opportunity to expand your educational horizon according to your interests and deepen in the topics that truly intrigue you (Richards, 2010), the chances of having good educational results are rising sharply. As a result, the chance to get well on the labor market or get a positive life-changing outputs is growing, as motivated people who follow their interests are also much more successful. In short, the educational model of the 21st century turns out to be much more long-term, strategic and profitable than what is visible on the surface, and it is only up to us how to use these exciting opportunities. Most of our knowledge is gained on the path of personal experience, and society is becoming increasingly aware that formal school frameworks no longer matter, but much more important could be our surrounding environment or the online habits that we've built up over the time.

3 The Role of Digital Resources for the Education

Rich digital content is a powerful way of providing today's students with high quality, relevant and up-to-date instructional materials (Yoshinov, Pavlova, & Kotseva, 2015). We have already clarified that modern education goes far beyond the classroom. The opportunities to join from home, on the road or while on a holiday extend a lot our educational horizons, while at the same time embark on the standard digital skills that most people already use for everything - from information search and booking tickets to online entertainment and computer games. In fact, the computer gaming model is particularly well suited for educational purposes as the young people, following their personal biases, engage themselves in the game scenario and its goals and ultimately acquire new knowledge in a relatively easy and amusing way, while the element of personal engagement is much more spontaneous and casual. Respectively, if we can plug the important themes such as the nation's cultural and historical heritage in the form of various computer games, the interest of the teenagers in our past would be much more real and lasting.

Bulgaria has a rich historical past and culture, so it is no coincidence that the Bulgarian city of Plovdiv won the nomination for the European Capital of Culture in 2019, in contested competition with cities from all over Europe, and the idea to include an increasing part of our national identity also in different online campaigns and social networks, is still gaining momentum. The idea that more and more cultural monuments should have their virtual copy and preserve and promote their mission in time and space through the means of ICT is completely in line with the trends of the modernity. Ultimately, most of these cultural monuments are being damaged and destroyed over time and the digital technology is the only viable way to keep the memory of them. For

example, the so-called chitalishta, the churches, and the schools have once been among the most representative and architecturally distinctive buildings in Bulgarian villages (Denchev & Vassileva, 2010), while today a large part of them are already in ruins and many of these architectural monuments will never be restored. More and more experts are turning to digital technologies as a modern and contemporary way of transmitting a message to the present and future generations. A good example of a specially designed project for a social network that enjoys high popularity among young people is, for instance, the social brand project Like.Bulgaria (Fig.1), where some of the hallmarks of our cultural and historical heritage are illustrated, such as the golden mask of the Thracian ruler Teres, Ivan Alexander's Tetraevangelia, the Sveshtari Tomb, the Boyana Church, the works of Zahari Zograf and Vladimir Dimitrov-Maistora, the Madara Horseman, the Panagyurishte Gold Treasure and others.

Fig. 1. Snapshot from http://www.like-bulgaria.com/portal

There are a number of initiatives for the promotion of the cultural and historical heritage (especially in the context of the development of cultural tourism), including various state institutions (the St. Cyril and St. Methodius National Library, the Archives State Agency, The Bulgarian National TV, the National Center for Information and Documentation, the National Commission for UNESCO, etc.) and companies, but despite the considerable efforts, none of them succeeds in establishing the basis of any permanent educational initiative even though the necessary prerequisites are present.

Perhaps one of the most serious efforts to promote the cultural and historical themes was made by the Ministry of Education and Science in cooperation with the newspaper Trud in the period 2009-2013, supporting the site "Virtual Bulgaria", where several hundred high-quality virtual panoramas, comprising most of our famous cultural and historical landmarks were put together. Unfortunately, the project ended, and with the cease of funding the effort was abandoned and thus these wonderful multimedia materials did not find place in any educational digital textbook.

Of course, other European countries have also done significant efforts to digitize and promote their cultural heritage and rich history. Among the most world famous digital representations, we could give credit to the Louvre Museum virtual tour

(https://www.louvre.fr/en/visites-en-ligne), the 3D survey and VR modeling of the Basilica of Sant'Ambrogio in Milan (Banfi, Brumana, & Stanga, 2019) as seen in Fig.2, the Virtual Reconstruction of Torre Guaceto Landscape – Brindisi, Italy (Spada, Cesaria, Chionna, Cucinelli, & Scarano, 2016), the 3D reconstructions of the historical Greek city of Nafplio, including monuments and buildings that do not exist anymore etc. (Kargas, Loumos, & Varoutas, 2019). One of the serious European level efforts for bringing together cultural heritage however is the project EUROPEANA (https://fr.wikipedia.org/wiki/Europeana) and its database is constantly growing.

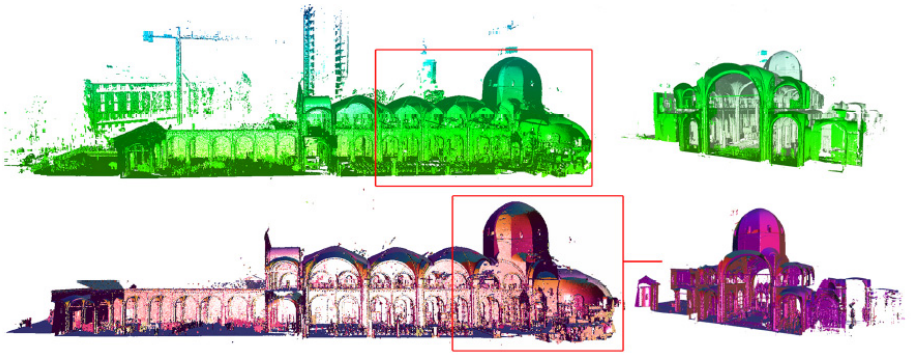

Fig. 2. Different layers of point cloud data for the generative process of the Basilica of Sant'Ambrogio 3D model

4 Development of Educational Games for the Purposes of Cultural and Historical Memory

Several European and international teams already initiated development of suitable computer-based educational multimedia games that would have a long-term effect on our nation's cultural level. Considering Bulgaria, we could mention the development of educational video games for Bulgarian orthodox iconography (Luchev, et al., 2016), we meet with the Italian cultural heritage with the Rome Reborn project (Frischer, 2008), the Virtual Priory Undercroft is in UK (remains of Coventry's original Benedictine monastery) (Anderson, et al., 2009), the 3DMURALE project developed 3D multimedia tools to reconstruct and visualise archaeological ruins in VR using the ancient city of Sagalassos in Turkey, the Parthenon Project is a short computer animation that "visually reunites the Parthenon and its decorations" (Debevec, 2005) and we could also mention the Virtual Egyptian Temple project (Jacobson, 2005) etc.

Obviously, the idea of digitizing cultural objects and putting them into different storylines for educational, role-playing or simply entertaining cognitive games is very appropriate given the stereotype of thinking and behavior of the modern students. Still, despite their educational level, ethnicity, social environment, economic situation and other accompanying factors, modern teenagers are zealous supporters of computer technology, and YouTube, Facebook and Instagram are their natural environments, so we

can successfully paraphrase the popular sentence, “nothing digital is unfamiliar to them”. In this line of thought we can develop a relatively simplified model of successful public-private partnership in the field of multimedia games with a cultural and historical focus. The most appropriate would be a historical storyline, but it may also be a geographic game or even a modern detective story, as long as it is necessary for the player to get acquainted in detail with suitably matched cultural and historical elements. It is possible to create a whole series of suitable role-playing games (Mortara, Catalano, Belotti, Panchetti, & Petridis, 2014), as long as one gathers and provides the potential developers with the right content elements - digital photos, virtual panoramas, text and graphics, describing the specifics of each cultural and historical landmark, while the target of all games could vary. Depending on their age group, students could participate in a virtual quest for a hidden treasure, using the landmarks’ details, could solve different tasks concerning the shortest possible travel time and the optimal route between the culture monuments, or develop a business strategy including a plan for the development of cultural tourism in the region, referring to the available historical objects and artifacts. Using gamification as a strategic weapon to attract all kinds of tourists, interested in cultural heritage, should have much broader potential if we succeed to diversify the storyline, according to the specific kind of tourists (age, nationality, educational level etc.), so the idea is definitely not restricted to the academic community and to the people formally involved in the educational system (Lee, 2019). On Fig. 3 a simplified model, illustrating the partners, the objectives, the prerequisites, as well as the long-term benefits, can be seen.

In principle, such a project should be developed as a nationally significant initiative and supported by ministries or government agencies, and, as long as there are local companies interested in supporting local culture and national identity, the project could be a great joint effort and public-private partnership. Sponsors, stakeholders and developers of such an initiative could include companies from the software and tourist industry, universities, museums, libraries, galleries, and more. The initial content and scenarios should be developed and maintained by their organizational owners and their employees (i.e. museum and gallery curators/experts), as they are interested to attract visitors, but further development could be encouraged by any interested party, thus giving push to many fresh ideas, regarding the creation of new ways for assimilating content. No matter how fragmented efforts were previously made in the area of the cultural and historical memory, it is essential to make use of all major existing resources such as (for the BG case) the Virtual Encyclopedia of Bulgarian Icons (Pavlova-Draganova, Georgiev, & Draganov, 2007), Virtual Bulgaria and others that could be integrated into the future games. Given the national status of the project, all copyrights on the materials should be pre-arranged, and the development of appropriate educational scenarios can be addressed in various ways, including students’ competitions for best story etc. The multimedia games can be stored in a national data center or distributed cloud infrastructure system, owned by various actors - universities, museums, etc. (Dimitrov, Pavlova, & Boyadzhiev, 2011), which can flexibly exchange information. This also corresponds to the development of digital libraries towards systems with a dynamic federation of functional units (Pavlov, Paneva-Marinova, Goynov, & Pavlova-Draganova, 2010).

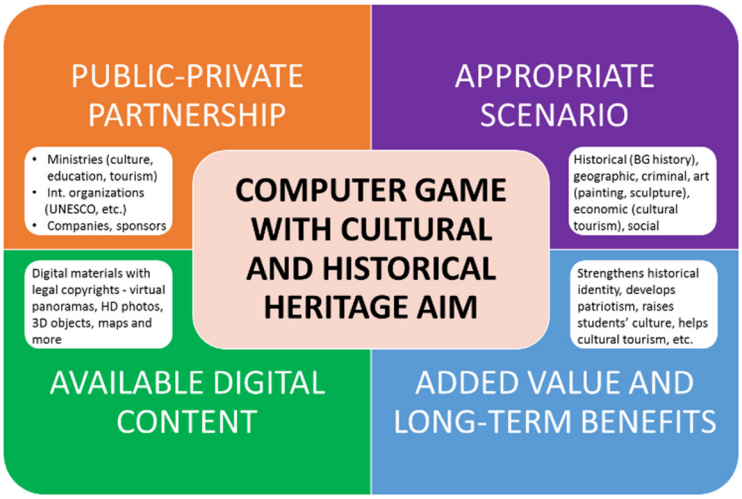

Fig. 3. Factors, targets and stakeholders for support of cultural heritage computer games

The long-term benefits of such an initiative would be significant and important for the national identity, the self-esteem, the sovereignty, the cultural level of the nation, the preservation of the historical memory and the development of economically significant activities. The chosen entertaining form (computer online game) to attract students would in turn help to increase their interest in the national history, develop critical thinking and permanently engage their consciousness with understanding and respect for the respective historical memory and cultural identity.

5 Conclusions

The development of a digital technology significantly changes the social ecosystem. Advances in artificial intelligence and robotics have powering a new wave of automation, with machines matching or outperforming people in a rapidly growing range of tasks (Tyson, 2017). Unlike their parents, modern students have a more impartial view of the digitization as it encircles them from an early age and is their natural environment. Thanks to their affinity for technology, they are more willing to accept messages distributed by digital means, and through computer games. This affirms computer games as one of the most natural channels for communication, information and training for young people, and the games in a non-aggressive way become an essential element in today's educational environment.

The ability to digitize the nation's cultural and historical heritage is a natural consequence of the society transformation due to the emerging, knowledge-based economy where more and more information needs to be digitized in order to become more manageable. The combination of these current trends gives us the idea of developing multimedia games with cultural and historical heritage scenarios that will enable young people in a friendly and convenient way to gain knowledge in the area and to preserve and develop their national identity and cultural affiliation in the new digital reality.

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