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THE OPPORTUNITY OF USING AUGMENTED REALITY IN EDUCATING DISADVANTAGED CHILDREN

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Abstract: *The high degree of absenteeism and the increased risk of school dropout among vulnerable children is one of the main issues of the current society. This study seeks to identify the opportunity to use Augmented Reality in the education of these children, starting with the trend of recent years in which IT technology is capturing the interest of children more and more compared to classical teaching methods. Research results show that, in the opinion of psycho-educators, Augmented Reality is an accessible technology that can be used to increase the attractiveness of the educational process for children belonging to vulnerable groups.*

Key words: *educational marketing, disadvantaged children, Augmented Reality.*

1. Introduction

In the context of a dynamic society where adaptability to change is the indispensable feature of success in the professional and social sphere, the challenge from a marketing perspective is that, through the implementation of educational marketing programs tailored to the specific needs of the educational units, to facilitate access to education (Tecău, 2017), in order to achieve individual and collective performance through the formation of active and responsible citizens, educated in a team spirit and tolerance, being able to learn continuously and to build a career adaptable to the demands of the labor market.

A general training in line with higher quality standards based on knowledge and innovation by correlating pupils' training with local community needs and EU educational standards, ensuring equality of opportunity, social and professional integration of graduates, is essential in today's society, this being one of the priority

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objectives targeted by the European Union through the strategy Europe 2020. (European Commission, 2010).

A significant part of the children belonging to disadvantaged or risk groups enrolled in the education system come from families with a poor socio-economic situation. They need attractive educational methods to recover from the gaps caused by the poor education they receive in families and to achieve social behaviors appropriate to the current state of civilization (MECS, 2015).

This disadvantaged category includes children from rural areas, children of Roma minority, children with special educational needs (CES) or children in difficulty (children from families with low socio-economic status or from single-parent families or from a center placement, orphaned children of one or both parents, children whose parents are going to work abroad) who are deprived of their natural, moral and legal right to a family or whose family does not have the appropriate social quality.

The families they come from, most surviving only because of their children's allowance or low social income, expose them to a significant number of vulnerabilities. Much of the rural children are engaged in household or other activities, from very young ages, with education falling on a secondary place. Of these, there are children who have a high degree of absenteeism, even reaching school drop-out (Bădescu et al., 2016). Early school leaving has important social and economic implications, being one of the significant factors directly contributing to further social exclusion in life.

In this context, extracurricular education gains much greater importance in the policies of any school institution and in the economics of educational activity achieved in each group of students. The potentials of each child must be highlighted and educated through skills training and the provision of information or techniques of exteriorization that give them opportunities to express themselves with individual and social value. The role of education in the school is to build personalities that adapt to different social contexts, to cope with a multitude of situations, able to coexist, assume responsibilities and accept biodiversity and cultural values. It is also essential to increase the attractiveness of the educational activities that these children take, including the use of information and communication technologies in the learning process.

Thus, starting from the benefits of today's digital society, this study attempts to determine to what extent augmented reality can become one of the solutions that could cover this need.

2. Literature Review

Augmented reality (AR) is considered to be one of the most advanced forms of virtual reality (Bulearca and Tamarjan, 2010). It is defined as a form of technology that combines reality with computer-generated images to augment or enrich reality (Virtual Reality Blog, 2009). This form of virtual reality is closest to the world real, integrating simulated real environment in a way that almost eliminates the difference between the two.

The beginnings of augmented reality reside in 1957, when Morton Helig built Sensorama, the first cinematic experience to transpose the user into a virtual 3D

universe. This project was a failure due to the high costs for producing movies for it. Professor Ivan Suttherland, from Harvard University, developed this idea when he created the 3D Headset - "Head-Mounted-Display" (HMD) (Kour, 2015).

The introduction of this technology to the mases takes place in 1999, when ARToolKit is released, launch which made the use of augmented reality possible on mobile devices. One year later, Wearable Computer Lab launches ARQuake, first AR game in history (Sung, 2011).

As Apple's first smartphone was launched in 2007, Augmented Reality technology was facing the opportunity to be distributed to the users. The first two applications that used this technology were Wikitude and Wikitude Drive, applications that augmented the real world through the use the smartphone's camera (Sung, 2011).

Considering the magnitude of the widespread use acquired by Augmented Reality in recent years through applications that are familiar for many people, such as Snapchat filters or Pokemon Go, Michael Porter and James Heppelmann state in their article “Why every organization needs an augmented reality strategy”, that “In the coming months and years, it will transform how we learn, make decisions, and interact with the physical world”.

Research has shown that AR has the capability to help learners develop skills and knowledge that can be learned in other technology-enhanced learning modes but in a more effective way (El Sayed, Zayed, & Sharawy, 2011).

From the studies carried out so far, it appears that among the most widespread uses of AR in the field of education, for which high potential applications have been developed in the educational process, are the overlapping in the real world of objects, things, animals, phenomena of nature, the experimentation of physical, chemical reactions, the exploration of the solar system, the visualization of the photosynthesis process, the manipulation of the virtual objects in order to facilitate the mathematical thinking and the understanding of the spatial relations (Wu et al., 2013).

AR application developers promote as advantages of this technology the fact that it makes learning more attractive and easier to understand decreasing the time needed to assimilate complex knowledge and facilitate skill acquisition (Blippar, 2018).

Many studies have researched Augmented Reality usefulness in education and reported positive impact of applications that use this technology in terms of student’s motivation, learning gains, collaboration, interaction, learning attitudes and enjoyment (Bacca et al., 2014).

Nincarean et al. (2013) have studied the potential of mobile augmented reality for education and the main conclusion of their research based on a literature review of several publications is that Augmented Reality is one of the latest technologies which combined with adequate pedagogical methods has created new opportunities for improving the quality of teaching and learning experiences.

Developers of augmented reality educational applications believe that this technology can help extend the child's thinking process and the capacity to assimilate new knowledge (AugThat, 2015).

Also, the results of a study conducted by a group of teachers in Sweden reveal the fact that exposing the augmented reality through specific applications in books and

magazines contributes to improving the memory and literacy of children by 7% (Brainspace, 2018).

In terms of teachers' attitudes towards using this technology in education, a study by Samsung Electronics Germany published in 2017 reveals that they are very open-minded when it comes to implementing new technologies like augmented reality or virtual reality in the teaching process, showing an increased interest and desire to use this technology in their classes. They argue that "digital technologies can help reshape education for a better tomorrow" (Samsung, 2017).

Another study emphasizes the importance of graduates being able to keep up with technological changes, particularly in information technology, in order to increase the chances of possible employment and add value to their accumulated knowledge (Palade and Constantin, 2013).

Studies conducted in this research area had as research subjects: over 50% primary and secondary school children, 29% students, 3% teachers and nursery children (1%) (Akçayır, M. and Akçayır, G., 2017).

The main advantages of the use of AR in the educational process revealed by the researchers are the increase of students' involvement, new possibilities of presenting and exposing the teaching material, ensuring multiple ways of expression (Bacca et al., 2015).

However, very few studies have been made on the benefits of AR applications and their impact on the educational process among children with special educational needs, such as learning difficulties (Bacca et al., 2014).

From marketing perspective, in order to be competitive, schools must meet the needs of the beneficiaries and diversify their offer, educational curriculum, and services, so that they are adjusted to the specific needs of each child.

In this context, the mission of schools should be based on the principle of the equalization of opportunities and it has to ensure access to quality education for all children, in order to integrate them academically, professionally and socially as well as possible (Brătucu, G. and Brătucu, T., 2012). Development in this direction should also be a priority for rural areas, considering the fact that the school education of the rural population is precarious (Chițu 2006, p. 95).

3. Research Questions

Starting from the recommendations of the proposed researchers on the future directions of action, the following gaps and needs existing in AR research have been identified:

- The potential of AR could be further expanded by adapting and implement it within the educational process of children facing high school drop-out and for those who have problems with learning, integration and adaptation?
- To what extent the use of augmented reality can contribute to increased access to education, participation and scholar and social progress, equal opportunities, and the attractiveness of the educational act for children belonging to disadvantaged groups?

- Can AR be one of the alternatives to overcome the problems faced by children with high risk of school drop-out rates or early school leaving, such as poverty, social exclusion, discrimination, limited access to information?

4. Research Objectives and Methodology

Starting from the identified problem, taking into account the current context in which issues related to the development of the concepts of "school inclusion" and "inclusive school" have been debating more and more, in a qualitative marketing research that was carried out through a focus group, one of the purpose was to identify the views of some specialists in the field regarding the opportunity to use AR for increasing the attractiveness of the educational process among children belonging to vulnerable groups. Discussions were held with a group of psycho-educators (teaching assistants or support teachers for children with special educational needs and children with learning difficulties, integration and adaptation to the education system). The discussions consisted in of presentations and demonstrations of applications that use augmented reality.

Among the research objectives were:

- Identify the opportunity to use the augmented reality in increasing the attractiveness of the educational process for children belonging to vulnerable groups.
- Identify the extent to which it is possible to adapt the teaching material to the individual interests and needs of these children with Augmented Reality.

5. Research Results and Discussions

In the opinion of psycho-educators, Augmented Reality is an accessible technology that can be used in the educational process for children belonging to vulnerable groups.

Among the advantages of using the Augmented Reality in the opinion of the psycho-pedagogues participating in the research we emphasize:

- helps to develop imagination, self-esteem, cognitive development;
- facilitates knowledge, sensorial stimulation;
- can be a concrete material as the basis of learning;
- ensures the possibility to experience situations inaccessible in reality;
- provides access to multiple and varied materials;
- presents multiple ways of exposure to new situations;
- is an alternative to classic teaching materials;
- determines the increase in interest and motivational components.

Participants in group discussions consider that the potential of AR could be further expanded by adapting and implement it within the educational process of children facing high school drop-out.

They consider that with the help of AR, teachers have the opportunity to create learning contexts so that they generate the right framework to stimulate pupils' curiosity, create better mood and drive away the monotony. This technology can stimulate the children desire to be knowledgeable and involved in the teaching activities

proposed during the study hours, may determine them to keep their focus for a longer time, and can build their aspiration to progress and good results.

In support of this view, the subjects assert that through differentiated learning activities tailored to age specifics, individual interests and needs, the degree of education can be increased and the potential of preschoolers can be enhanced, in order for the children in this category to overcome their problems with learning, integration and adaptation and to be able to collaborate, compete and perform.

The psycho-educators sustain that given the increased interest children have towards technology and state-of-the-art equipment, the Augmented Reality could significantly contribute to increasing the attractiveness of educational act for children living in rural areas or for other risk categories in order to prevent abandonment and demotivation of going to school.

They also explain that the use of digital and non-formal tools favors discover-based learning and has a positive impact in terms of accelerating learning, enhancing assimilated knowledge, recovering gaps which can also contribute to a great extent in increasing access to education, participation and scholar and social progress and equal opportunities for children belonging to disadvantaged groups.

In order to overcome the problems faced by children with high risk of school drop-out rates or early school leaving, such as poverty, social exclusion, discrimination, limited access to information, research findings reveal that, in the opinion of psycho-pedagogues, Augmented Reality is an instrument that could contribute, together with other specific actions, to increasing participation in pre-school and school education, especially for early-leaving groups of vulnerable people: rural children, children belonging to vulnerable groups minority Roma, children with SEN, etc. by developing an attractive educational system for children, which will encourage them to attend school, motivate them to learn and get good results at school. Complying with this goal, in the long run, will create the premises of developing an educated generation of children, that has the chance to overcome the socio-economic status of its families. A generation open at moral values, accepting cultural differences, that understands the need for coexistence in the spirit of social inclusion and sustainable development.

6. Conclusions and Recommendations

Augmented Reality is an attractive and accessible technology that can be used in the educational process for preschools and school children as a tool for exercising and enhancing knowledge and increasing the attractiveness of educational programs, increasing the interest and the motivational component for reducing and preventing early school abandon and promoting equal access to pre-primary and primary high-quality education.

A platform that uses AR technology and can be successfully implemented in the educational process is Blippar (https://web.blippar.com/), which offers a package of services to educators consisting of open access blipps, watermark free blipps, exclusive training resources, ad free blipps, access to education community, comprehensive data analytics. The application provides the opportunity to design interactive learning

materials based on an AR creation tool, called Blippbuilder, which can be used to study and experiment any subject. Some of the domains for which a series of educational blippings are created by Blippar are in fields such as Geography, Physics, Biology, Art.

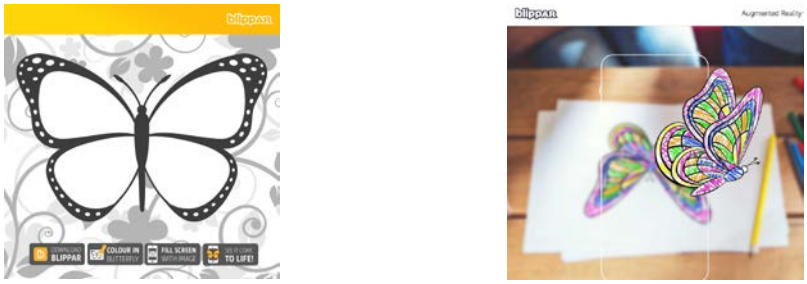

Fig. 1. *Exemple of Augmented Reality Application that can be used in education - Blippar*
Source*: https://web.blippar.com/augmented-reality-for-education*

The first image presented in Figure 1 is a marker that can be downloaded for free from the demo version of this application. Later, it can be printed as a worksheet for children and once colored by them and scanned using the mobile device or tablet via the Blippar application, the butterfly comes to life and 'breaks off' the paper, flying through the class, to the amazement and fascination of the children.

Blippar application is an example of an application that uses Augmented Reality and can be used in the process of educating preschoolers and school students belonging to vulnerable groups. This has been conceived as an interactive learning tool that allows "creating own augmented reality experiences to bring lessons to life" (Blippar, 2018).

In conclusion, it can be argued that, regardless of the problems they face, all children are entitled to equal chances of quality education, even if they had an unluckier start of life, this being possible by creating attractive educational programs tailored to the specific needs of these children.

Proposals on future research directions - identifying the specific needs of children with special educational needs and designing applications that use augmented reality tailored for them.

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