Using virtual reality for implementing physical education programs in workplaces

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ABSTRACT : The modern era is characterized by dynamic, technological and social changes. In this light, the use of new technologies is an opportunity - a challenge that can and should be used as an opportunity to succeed and achieve wider changes, especially in the field of education. Computers represent part of the real world. This article aspires to contribute to the emergence of an intervention framework, which is based on the creation of an innovative action, in an educational management body. The specific action refers to the implementation of virtual Physical Education (virtual Physical Education) in the area of the Regional Directorate of Primary and Secondary Education of Eastern Macedonia and Thrace (A.M.Th). This article aims to study the effect of exercise programs, with simulation, on the relief of their work stress from high workload and the excessive demands on both energy and skills that stem from it. Then a conceptual delineation of virtual reality will be presented, and some general applications of it will be mentioned. The focus is on virtual reality in physical education. Next, reference is made to the international trends of virtual reality and then specifically to the "smart" training platform fitaborate and its application in the Regional Directorate of Education of Eastern Macedonia and Thrace and the advantages are developed. The article ends with the conclusions and some suggestions for future research.

KEYWORDS - Virtual Reality, Distance Education, Fitaborate application.

I. INTRODUCTION

The modern era is characterized by dynamic, technological and social changes. In this light, the use of new technologies is an opportunity - a challenge that can and should be used by professionals not simply as a requirement of the times but also as an opportunity to succeed and achieve wider changes, especially in the field of education. Technological applications also contribute to the formation of high-quality educational programs and the invention of the world wide web (world wide web) contributed to the spread of the Internet, providing users and especially teachers with the ability to search and access unlimited information [1]. Computers represent part of the real world. This is Virtual Reality (VR) [2], a new achievement of science, which advances and evolves at a rapid pace, finding response and application in many fields and in the educational world. Many times virtual environments are used in Physics, Mathematics, Chemistry and Physical Education, in order to promote experiential learning, giving additional motivation to the students - learners for a more active and participative approach to the lesson.

Following the rapid technological modernization, technological development can be the driving force for the improvement in every sector - industry that is applied. However, the new needs resulting from it, a modern way of working (specialization), combined with the economic hardship (more working hours for better earnings, inflexible hours) led people - workers to redefine their priorities and negatively affected the quality of their lives. Physical activity was replaced by a sedentary life, with a direct consequence of the frequent occurrence of diseases, such as for example heart diseases, diabetes - hypertension, etc. On the contrary, physical exercise, as experts and health professionals claim, improves the psychological state and mood and reduces the levels of anxiety, stress and tension in general. In this light, people, especially workers, in order to limit health problems, but also to have peace of mind, should include a systematic physical exercise program in their daily life.

This article aspires to contribute to the emergence of an intervention framework, which is based on the creation of an innovative action, in an educational management body. In particular, the specific action refers to the implementation of virtual Physical Education (virtual Physical Education) in the area of the Regional Directorate of Primary and Secondary Education of Eastern Macedonia and Thrace (A.M.Th). This article aims to study the effect of exercise programs, with simulation, on the relief of their work stress from high workload and the excessive demands on both energy and skills that stem from it. At the same time, it will present whether virtual training programs are capable of increasing productivity, i.e.

increasing production quality and service quality, based on the literature. Then a conceptual delineation of virtual reality will be presented, and some general applications of it will be mentioned. Next we will focus on virtual reality in education and specifically physical education. Next, we will look at international trends in virtual reality, and then the fitaborate application will be mentioned. Then a proposal is made for the application of the previous technology in the Regional Directorate of Education of Eastern Macedonia and Thrace and the advantages are developed. The article ends with the conclusions and some suggestions for future research.

II. LITERATURE REVIEW

Virtual Reality (VR) is a three-dimensional environment of interaction and interface, based on computer systems [3]. In this virtual environment the user can participate and interact and at the same time is provided with the ability to represent, reproduce and also create synthetic realities in a virtual world. In other words, it is a multisensory environment, in which each user observes the result of his actions, as it might happen in a real world [4], [2]. The user has the illusion of being in a virtual world and is isolated to a certain extent from the stimuli of their physical environment. This is about immersion, one of the main characteristics of virtual reality [5]. Virtual reality as a science represents virtual worlds - "virtual environment" for the purpose of entertainment, communication, education, research, etc. Special mention is made by the researchers for the experience per se, experienced by the users, as they navigate through an intelligent virtual environment and a fictional-ideal world [6].

Nowadays, the practices of Virtual Reality, in addition to entertainment, find application in research and professional areas. For example, in Architecture and urban constructions, solutions are proposed and architectural interventions are carried out, which focus on visualizing the architectural result and finding any imperfections at an early stage, before final construction decisions are made on the future project [7]. Subsequently and in the Medical field Virtual Reality is utilized in the most appropriate way and as "close" to the real one as possible [8]. Also, in the Industrial construction sector [9], but also in the entertainment industry, science fiction cinema, advertising [10], virtual reality finds many applications. However, the use of virtual reality in the educational field has been exploited more and more in recent years with increasing possibilities and pedagogical perspectives in the transmission of knowledge and the promotion of the effective teaching process [11].

Educational Technology, according to the Association of Educational Communications and Technology (Association of Educational Communications and Technology) as a science, with the application of appropriate technological knowledge, techniques and systems contributes to the improvement of human learning (AECT, 1977). In particular, it designs, develops, manages and applies procedures, methods and the appropriate materials-tools, with the ultimate goal of solving the problems of teaching and learning [12]. Virtual reality is a set of technologies and interactive environments are created through them, which can be used appropriately for pedagogical and educational purposes. The use of virtual reality in education can have positive effects and beneficial effects on the learning process [13].

It can simultaneously provide unlimited possibilities and opportunities to it, which makes it almost indispensable in all educational activities, in light of the convenience of choosing the time and place to access the received information [14]. With simulations, such a learning environment is provided, able to encourage personalized learning and at the same time offer an active and autonomous behavior of the learner and a more effective and efficient attitude. Thus, a new perspective was given to all Educational disciplines and among them the Physical Education (PE) discipline, which began to provide better quality learning experiences to students and learners in general [15].According to [16], the impact of multimedia use in PE provides, beyond originality and innovation, additional motivation for students and learners to engage in their later life course. The study by [17] reached exactly the same conclusion, pointing out that in this way the role of Physical Education teachers is being modernized. In a study conducted by [18], using a simulation program of Olympic athletics and specifically the triple jump, in the form of a game to students, he concluded that this particular form of simulation teaching may in the future be an effective way of learning of the skill. The results of this research converge with those of [19], who three years before had been involved in teaching golf, with simulation. It should be pointed out that the aforementioned studies, as well as a number of others identified in the literature, were based on technologies, which were innovative for their time, but were lacking in quality. So as technology progressed and was in constant development at a very fast pace, new data was being recorded and at the same time interactive multimedia was being developed, with sound, moving graphics, digital video, etc. These multimedia are more attractive to the learners and help more in the assimilation of information [20].

This also emerged from the results of the research by [21], which was conducted about a decade later than the corresponding one by Ross and in which they used interactive video (Interactive Video Instruction) in Primary Education, as a more effective teaching method, compared to the traditional way of learning motor skills. According to research by a group of experts, regarding the publication of the Horizon report of the NMC 2016 K-12 (Horizon report, 2016), six key trends (trends), six key challenges (challenges) and six technological developments (developments in Technology) will affect the technological planning and the right decision-making in education during the five-year period (2016-2020). One of the medium-term trends is collaborative learning, which is increasingly integrated into curricula and educational processes and is an opportunity to evolve school philosophies, deeply embedding the spirit of teamwork and collaboration into school cultures.
Cooperative learning is the active learning system, in which each student - learner, as an equal member of a group, interacts and shares knowledge, experiences and common educational goals with the other members of the group [22].Roberts (2006), published an educational blog, which he called "Online Collaborative Learning in High School" with the ultimate goal of being on the one hand a pillar of collaboration and interaction for learners, developing communication skills, and on the other a repository of professional resources , information and knowledge, for better academic results. According to [23], the blog at another University in Australia (Deakin University), was called 'Collaborative Icebreaker', which was created to promote student interaction and its main goal was to socialize learners.

Along with the trends and according to the Horizon report of the NMC 2016 K-12 (Horizon report, 2016), one of the six technological developments is virtual reality (virtual reality), which is a medium-term technological development with a time horizon of two up to three years. Virtual reality is a computer-generated, interactive environment that simulates the physical presence of people or objects. In today's applications, users are allowed through touch devices to "feel" the various objects on these screens. The various wearable displays transform game environments into more vivid performances. In the same way, virtual learning can make learning simulations more authentic.Both new technological and educational trends create another kind of learning. It is about virtual learning, which changes the educational process to a great extent. Thus the role of the teacher-teacher and the student-learner changes, because on the one hand there is no simultaneous communication between them, on the other hand the learner can intervene in the provided educational material, which is updated very quickly. In this light, the role of the learner is more active, since there is no one-way flow of the received information.

III. SPORTS PROGRAMS IN ORGANIZATION AND PRODUCTIVITY :
Employee health and increased productivity seem to be two interdependent concepts. In other words, the implementation of exercise programs for employees, with which their health is promoted, seems to have a positive effect on productivity and on all the factors involved in the latter (increase in the quantity of production, increase in the quality of products - services, reduction in the time required to produce the required work or a combination of all) [24].According to [25], the implementation of sports programs in the workplace brought spectacular results to the health of employees and, by extension, to efficiency and the improvement of products and services .Research conducted in the United States of America, during the 1980s and specifically in 1358 companies, on whether the implementation of sports programs improves the health of employees, concluded that it has spectacular effects on the physical and mental health of employees. It was also found that 65% of the companies had already implemented these programs and 1/3 of the companies that had not implemented them, intended to include them in their workplace. And this is because employees spend several hours at their workplace and feel more familiar if they exercise together with their colleagues.

A corresponding research [26], conducted in America and Canada, reaches the same conclusion, that the implementation and operation of these programs can only bring benefits to employees. In other words, their physical and mental health improves and at the same time employees can control anxiety, pressure and stress and have a better quality of life in general. In fact, in the same survey, they found that in this particular decade there was a very significant upward trend in their companies for the implementation of sports programs, which is consistent with the fact that most employers had realized the positive effect of sports in their businesses. In [27] positively evaluated the effectiveness of providing sports services to employees, because it increases their efficiency and productivity. Among other things they concluded that the productivity of a business or an organization cannot be increased if some new incentives are not given to the employees. In this sense, they considered the provision of sports programs in the workplace as a new motivation, with a positive impact on the physical and mental health of employees, thus increasing their productivity.

IV. THE CONTRIBUTION OF FITABORATE TO GREEK REALITY :

The rapidly changing global environment, as reflected in the aforementioned Horizon report of NMC 2016 K-12 (Horizon report, 2016), confronts Greek education with new trends, challenges and technological developments. The implementation of a fitness program in the form of virtual Physical Education, such as Fitaborate, can contribute substantially and help any Ministry organization to utilize these changes in the best possible way. It could be an object - a model and "give birth" to opportunities for innovative actions in other organizations as well, which in the medium term will be able to combat work stress - professional burnout (burnout) of their employees and at the same time will be able to increase their professional satisfaction and their productivity in general. In the long run, they would establish a pleasant working climate, which would improve the overall image of the agency. The broader international processes and challenges push for substantial changes in the Greek education space as well. Many fields can be the subject of "transfer" between the member states of the European Union (EU). An important role is played by European programs (e.g. Erasmus +), which were created to contribute to the achievement of the goals of the "Europe 2020" strategy, emphasizing the education sector. The specific programs aim to promote mobility and cooperation between European countries and through the exchange of experiences and good practices to provide high quality education. Thus, Greek education must harmonize and exchange information and good practices with the other EU countries. At the same time, the Operational Program Education and Lifelong Learning 2007-2013 had incorporated changes in the education system, so that all teachers adopt Lifelong Learning, focusing on objectives such as: upgrading the quality of education, emphasizing the training of teachers in innovative actions and in the use of Information and Communication Technologies (ICT).

V. PROPOSAL FOR THE IMPLEMENTATION OF A FITABORATE PROGRAM IN THE REGIONAL EDUCATION DIRECTORATE (R.E.D.) OF A.M.TH

R.E.D. of A.M.Th has a suitably configured space with a microphone installation and audio-visual media, computers, televisions and screens, for access to the internet and social media, which can be used as a gym for employees . For the Fitaborate fitness platform to work, it is enough to have computer screens and an internet connection. Each employee will set the various parameters by themselves, e.g. available training time, what type of exercise they want and its level of difficulty, as well as what time they will train. They will be able to follow various programs such as training with virtual bikes (virtual bikes), programs and dance machines (rhythmic dance machines), sports simulators (sports simulators), etc. They will also be able to exercise, communicate and have eye contact with other people from any other country. They will be able to wear wearable devices (e.g. fitness bracelets, heart rate monitors, etc.) so that they can see their heartbeats and the calories they burn live on the screen.

For the implementation of Fitaborate, no additional resources will be needed. The connection to this platform is without subscription. All portable devices can be provided by the School of Science of Physical Education & Sports of Komotini, which has complete and perfect equipment and renews it at regular intervals, through European Programs. In addition, there are specialized trainers (fitness instructors), who provide their services through the platform in question. Then the needs of the employees will be analyzed (e.g. elimination of stress, elimination of headaches, job satisfaction, more motivation, etc.), as well as the frequency of their participation, by completing some questionnaires. Subsequently, the program will be presented to the Central Service of the Ministry, to give their permission and approval.

The programs will be evaluated with two types of evaluations. One will be done with questionnaires before and after their implementation, measuring the productivity of the employees and in the second the participants themselves will evaluate the quality of the services they received. In other words, their own opinions will be explored - suggestions for improving the program. Sustainability depends on the adoption of a positive attitude by the Administration at the local level and at the Central Administration level.

With the implementation and implementation of virtual Physical Education (VPE) in P.D.E. A.M.Th, employees will receive all the benefits that physical exercise brings on a biological, but also on a psychological-spiritual level. They will expel all the negative energy they get from a demanding and stressful work environment, with a lot of documents and issues to solve on a daily basis, which often forces them to work at the upper limits of their capabilities and strengths and leads to burnout. In addition, they will have a positive effect on reducing conflicts, dealing with headaches and the ability of workers to concentrate and pay attention, increasing their self-esteem. Possibly, the number of sick leaves taken will also decrease and ultimately they will be able to be more efficient and productive.

VI.   CONCLUSION, LIMITATIONS AND FUTURE EXTENSIONS

The bibliographic search revealed a lack of extensive international and Greek literature dealing with virtual sports environments focused on the workplace of public administration. The influence of various factors is reviewed, such as possibly the bureaucratic organizational structure, especially in the field of education. However, methods and good practices are sought for their implementation, because the creation of innovative actions in the field of education can be characterized as an important challenge in the modern constantly changing environment. It would not be an exaggeration to guess that the implementation of virtual sports programs using new technologies in a public service would make it highly competitive in terms of service quality and efficiency and at the same time place it in the center of interest.

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