AUGMENTED REALITY, AS THE NEW TRENDS IN BRANCH DIDACTICS

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Abstract

The article examines the experience of using and developing augmented reality applications within the student scientific class "Modern informational technologies" at the Educational-scientific professional-pedagogical institute during the project on the training course "Basics of AR application development", outlines the main directions of the project "Fundamentals of AR application development" and the training program "Fundamentals of AR application development ", examples of implementation of self-developed projects, as well as reasonable competitiveness and relevant for professionals of any type of business, who have experience with projects which support the augmented reality.

AUGMENTED REALITY, WIE DIE NEUESTEN TRENDS IN DER FILIALE DIDAKTIK

Zusammenfassung

Der Artikel untersucht die Erfahrungen mit der Nutzung und Entwicklung von Augmented Reality-Anwendungen im Rahmen des studentisch-wissenschaftlich-praktischen Kreises "Moderne Informationstechnologien" am pädagogisch-naturwissenschaftlichen berufspädagogischen Institut im Rahmen des Trainingskurses "Grundlagen der AR-Anwendungsentwicklung", skizziert die Hauptrichtungen des Projektes. Grundlagen der AR - Anwendungsentwicklung "und des Trainingsprogramms" Grundlagen der AR - Anwendungsentwicklung ", Beispiele für die Umsetzung entwickelter eigener Projekte sowie begründete Wettbewerbsfähigkeit und rebuvanist Profis jeder Branche, die Erfahrung von Projekten mit Unterstützung für Augmented Reality haben.

Keywords:	Schlüsselwörter:
Augmented reality	Augmented Reality
Learning process	Der Bildungsprozess
Modern technology	Moderne Technologien
Software	Software
Three-dimensional model	Dreidimensionales Modell
Unity	Unity

1   Introduction

Throughout the world, technological progress is growing exponentially, causing radical changes in modern life. According to the studies, in the next 15-20 years, about 47% of existing professions will disappear or transform. Many will have to reevaluate and refresh their knowledge, skills and qualities.

Due to the fast pace of life, augmented reality is integrating in a human life. Knowledge and experience of augmented reality projects will make you a valuable specialist in the international labor market. Within the group of the studential scientific class "Modern Information Technologies", a test project "Fundamentals of AR Application Development" is running at the Educational Scientific Professional Pedagogical Institute of Ukrainian Engineering Pedagogics Academy (t. Bakhmut).

Including AR technologies in studying process would allow students to be more involved into modern technologies. They can experience process of making their own app and it would also help them finding their future job, because most big companies creating or planning to create different AR programs.

AR developer – is specialist of future world. Companies like Google, Facebook etc. use AR technologies in their products right now. Company WayRay became leader on the market of AR automobile navigation systems and for 7 years of working it required 100 million dollars, 80 million from automobile company Porsche. Demand for AR in commercial needs shows that the market need much more specialists in this area. Knowledge and experience about AR technologies gives students huge advantage in employment.

2   Main part

AR – is the result of including interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual.

During studying process student scientific class is preparing the youth for student olympiads, scientific conferences and international competitions

The main point of student scientific class is broadening the outlook about scientific and research creative activities, which are being used by students of our institute.

The main course of this class – is raising up the efficiency of research work of institute, attracting student to do it, increasing the quality of training new professionals.

Within the class student are having meetings and discussions.

The aim of this class is: creating and analyzing strategy of technological progress, controlling the technological progress.

Class "modern innovative technologies" is mostly based on student specialty 015.10 "professional education. Computer technologies" educational level: bachelor, master. Academic groups: BD-K18, BD-K17. 12 students are taking part in our class.

Within the student scientific class "modern innovative technologies" at the Educational Scientific Professional Pedagogical Institute test project is started, it is called "Basics of AR application development"
Here is the list of skills, that students, who are learning "Basics of AR application development", are receiving:
– Capability of efficient usage of utilities, that program Unity offers, for creating own projects;
– Basic concepts of object-oriented programming;
– Fundamentals of project activity;
– Experience with AR equipment.

Four main directions of the project "Basics of AR application development":
1) Working with Unity3D and AR tools– mastering basic application development algorithms in Unity3D. Explore relevant versions of the SDK to create augmented reality apps - ARCore, ARKit, Vuforia. Development of own AR projects
2) 3D modeling, animation and realistic physical simulation – getting to know the basic principles of 3D modeling and working with most popular software for modeling. Receiving fundamental skills for creating 3D models and animating them.
3) Visualization in Unity 3D – Learning about lighting algorithm, cameras, materials and rendering principles in Unity3D.
4) Object-oriented programming - Approach to programming as to modeling of informational objects, which addresses the major problems of structural programming at the new level, from the point of controllability.

3   Course Program

Program of "Basics of AR application development" course:
1) Introduction to "Basics of AR application development" course;
2) Becoming familiar with technologies;
3) Introduction to 3D modeling programs: ARCore, ARKit, Vuforia;
4) Introduction to Sketchup. Interface and basic tools for creating 3D models. Creating basic models

5) Sketchup: Modeling with real scales, texturing of objects;
6) Testing to ensure the result of training. Control tasks;
7) Introducing to the Unity and AR course. Capabilities of programs, getting to know User Interface(UI)design;
8) Fundamentals of object-oriented programming;
9) Features of development of AR for mobile platforms;
10) Developing AR Application for mobile platforms;
11) Features of AR development for stationary platforms;
12) Developing AR Application for PC;
13) Generating ideas for projects. Analysis of ideas. Project description;

Essential skills that students will learn on the course:
– correctly use the basic terms and concepts used in the three-dimensional modeling;
– acquiring the necessary knowledge to work with Unity3D and AR tools;

Fig. 1: Working with Unity

- Develop own program code;
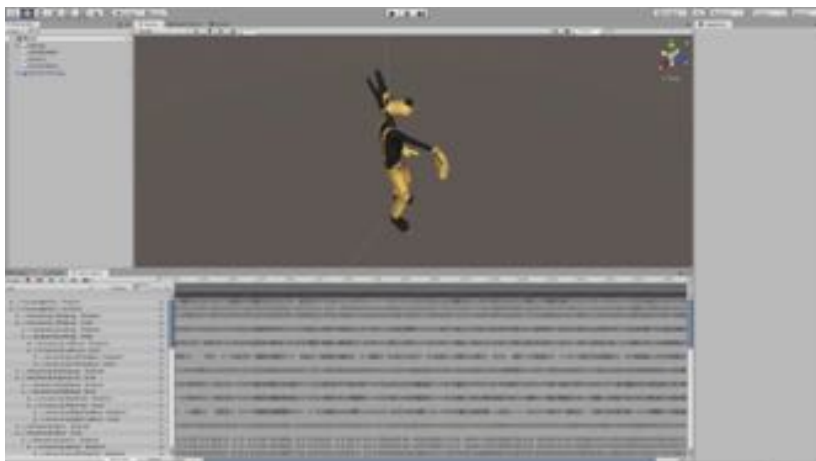

Fig. 2: Example of program code

- animate objects;

Fig. 3: Object animation

- project implementation skills.

Fig. 4: One of projects

4   Future Benefits of Learning AR

During the course of training in the "Basics of AR application development" project participants develop their creative abilities and also algorithmic thinking, because students are not limited in the ideas of AR projects. The research process during the lessons, finding their own ways of solving the tasks they have set. Involvement of participants of the educational process in the project activity. The most important thing is that knowledge is gained through practice, in general, the whole process of learning takes the form of short practical lessons. The clarity of using new knowledge makes the learning process dynamic, keeps student engaged.

Additional benefits students will receive while attending the course:

1)Competitive advantage - AR application development experience is a huge plus in employment or introduction, regardless of type of activity, because most modern companies have AR related projects (or plan to launch them);

2) High levels of revenue, because augmented reality projects already reach tens of millions of users;

3) Required professions - at the time of publication on the popular job search services, about 150 vacancies

with salaries in excess of $ 1,200, social packages and offices of category "B" and above were published;

4) Unique knowledge and excellence - now that startups are on par with the largest international giants.

All this happening right now, because the ideas of usage of augmented reality are becoming real due to extreme growth of technological capabilities.

5 Practical Activity

There are already first results of the project from the training course "Basics of AR application development": 3rd year student Rogovenko Daniel, led by senior teacher Bulgakova Irina, submitted a scientific thesis to the publication and made a presentation on October 30, 2019. At the Educational Scientific Professional Pedagogical Institute of Ukrainian Engineering Pedagogics Academy (t. Bakhmut) at the IV scientific and practical conference, with international participation "Students and Youth - for the Future of the Country" on topic "Augmented Reality as an Innovative Model for Increasing the Target Audience". According to the report, the student took first place in a scientific and practical conference.

Fig. 5: Speech at the IV scientific and practical conference, with International Participation "Students and Youth - for the Future of the Country"

On October 23, 2019 students of the scientific Class "Modern Information Technologies" took part in Career Day, which was ran by the Bakhmut City Employment Center, for high school students of the city and county, where one of the innovative and exciting locations was location "Virtual and Augmented Reality" with pre-made AR and VR projects, virtual 3D tours, which were created by students during the work of scientific class.
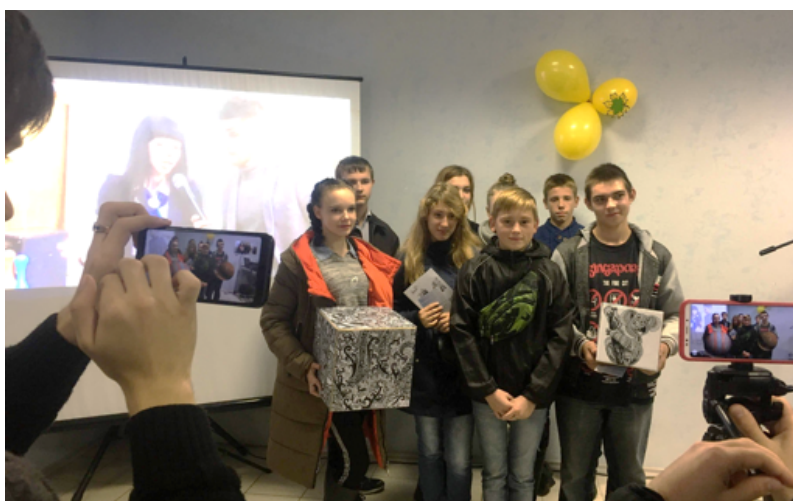
Fig. 6: Presentation of augmented reality project for Career Day

The next stage is to submit scientific project to create AR applications for the second round of the Ukrainian Research Contest in 2019-2020.

During the further project we plan to research successful foreign models of education, broadening the usage of augmented reality technologies, and also continue creating our own 3D models and developing AR applications.

6 Conclusion

Today, AR technology is actively used by leading companies to advertise their products. The spectrum of using augmented reality in marketing is huge, for example, some companies have installed a large screen with AR, phone users only have to move the camera to the screen and get a three-dimensional image of the product that the company is advertising. The expansion of augmented reality will lead the market to move from single-sided marketing campaigns to constant direct dialogue with the audience, using both virtual space and a user-friendly real-time environment.

Based on all of the above material, we can conclude that the use of augmented reality in the educational process have many advantages, namely:

1) Development of creative abilities, as well as algorithmic thinking, because the students are not limited in the ideas of AR projects.
2) Experience in developing AR applications is a huge advantage when hiring, regardless of type of activity, because most modern companies have projects (or planning to launch them) related to AR in one way or another.
3) Increasing the level of development of project thinking, acquisition of skills in the preparation for promising projects, which will have a clear social orientation and obvious economic result.

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