

Conferences



Complex competency development with augmented reality supported digital storytelling

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Proposal information

In this paper we investigate the potential of combination of two methods: augmented reality and digital storytelling.

Advantages of digital storytelling in education is well-known. There are several studies examined its applicability and gave an account of successful implementations in classroom environments and some different projects (Feher, 2008; Banaszewski, T. 2009; Di Blas, et al. ,2010; Di Blas-Ferrari, 2014). Results of Di Blas et al. reinforce the view that „that students do achieve a number of benefits, both direct (i.e., curricular, traditional...) and indirect (i.e., non-curricular, non-traditional, like, for example, a professional attitude). Digital storytelling supports deep learning and constructivist learning methods as well (Barett, 2006).

While digital storytelling as a method is more than 20 years old, there is a growing attention for new augmented reality applications in educational settings between researchers as well as teachers and students. (Augmented reality applications are widely spread in different areas engineering, computer games, military, medical applications, or

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PR-environments, however educational applications are in their's infancy. (Dunlevy, 2014; Dunlevy-Dede, 2014)

According to Azuma (1997) "Augmented Reality allows the user to see the real world, with virtual objects superimposed upon or composited with the real world. Therefore, AR supplements reality, rather than completely replacing it. Ideally, it would appear to the user that the virtual and real objects coexisted in the same space..."

There are several types of AR existing:

- marker-based (QR-code for example)
- location-based
- projection based
- superimposition based
- outlining AR.

In our project we have used mainly marker-based implementations.

Bozkurt (2016) identified several education and learning objectives with the use of mobile augmented reality. One of them is similar from our purposes: "Engage, stimulate, and motivate students to explore class materials from a variety of differing perspectives".

The aims of our research were to identify the benefits of mixing methods for purpose of supporting constructivist learning approach; to identify the benefits of using AR in different subjects; to find out how to implement a combination of digital storytelling and Augmented reality in real classroom situations, with different age groups of primary school students.

The research framework of study was build of action research principles (O'Brien, R. 2001) and constructivist learning. Our mixed method could be an ideal way for self-expression of students and help them to communicate with others in international projects (for example E-twinning). They will be able to communicate and collaborate with pupils all around Europe with the language of digital storytelling.

Methods

The study conducted last year school term (10 months, 2015-16) at Puskas Primary School in Budapest. A pilot project was run with 5 groups, two groups Grade1 (n=17 and n=12), two groups Grade5 (n=28 and n=12) and one group Grade7 (n=28). 10 teachers were involved in the project. In our action research we applied different types of tools for development of students' skills and evaluation of the process.

For creating digital stories students used drawing applications (Paint, GIMP, KidDoodle, Lapoda Multimedia – developed by Hungarians etc.), sound-recorder, digital camera, smartphone, digital scanner. After finishing work with stories, they needed to convert

them into augmented reality. At this second stage they use at least two AR-applications: Aurasma Studio and LandscapAR. They uploaded their works (ie. digital stories) to the channel of their school or community and shared with others.

Before the start of this stage of the pilot project we carried out a systematic literature search about two main topics: augmented reality and digital storytelling. The methods implemented by researchers during and after the pilot: observing students activities during activities, questionnaire for students, questionnaire for teachers (both are paper-based, 4-point Likert-scale, some open-ended questions), short interviews with teacher participants. Based on these sources we analyzed the motivations and attitudes of students according to augmented reality apps, and collected opinions and suggestions of their teachers.

Conclusion

In this lecture, we present an overview of action research and pilot project regarding to complex development of competencies with augmented reality based digital storytelling.

Some results of the first year of the project:

- more than 80% of students enjoyed new tools and methods, they found them very interesting, useful and motivating.
- according to the answers of participating teachers they found a lot of positive outcomes and only few difficulties.

The benefits mentioned by educators in the interviews were the following:

- visual material are more adequate for young students,
- studens were very motivated with using and created augmented reality applications they had never met earlier.
- the combination of methods has a huge motivational potential for both young and older students, partly because auras (ie. augmented reality applications) created by students can be share with wider audience outside their school.

Some drawbacks mentioned by educators in the interviews were the following:

- creating stories and converting them into AR require much more time as they have in the classroom,
- this way the complex method is applicable mostly with project-based learning and homework,
- the technological issues (wifi-access for example) could be barriers of successful projects.

To summarize our findings: we draw conclusions regarding to the chosen methods and found that Augmented Reality Supported Digital Storytelling is an appropriate method for

development of several competencies (digital, reading, writing, communication) of students. It provides support for group-work and project-based learning as well. There is a need for further research to create and implement an evaluation tool to strengthen our findings.

Keywords: ICT, Augmented reality, mobile application, competency development

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