

APPLICATION OF FLASH ANIMATIONS IN THE INTERACTIVE WHITEBOARD ENVIRONMENT

M. Kučera, J. Hrbáček and J. Strach

Faculty of Education/Technical education and Information Science, Brno, Czech Republic
m.kucera@ped.muni.cz, hrbacek@ped.muni.cz, strach@ped.muni.cz

Abstract—In the context of web technologies, Flash has always aroused contradictory emotions. While some promotes this technology, others condemn it completely. However, Flash may not be used only to create advertising banners, games or video streaming. Flash is perfectly suited for educational purposes thanks to its advantages such as easy creation, user friendly environment with elements of interactivity and its own intelligence, or achieving great clarity by animating effects. These extra benefits can be enhanced in an interactive whiteboard environment, in connection with 3D graphics or external real systems. The paper presents some results of the research conducted by the Department of Technical Education and Information Science in recent years.

I. INTERACTIVE WHITEBOARD AND INTERACTIVITY

Interactive whiteboards can currently be considered a standard among teaching devices that schools normally have at their disposal. With their help, the teacher can easily create active and creative environment. The hardware or software of a specific interactive whiteboard does not matter, because the current boards are practically comparable and bigger software differences mean only a different level of user comfort, which is of course important to consider when choosing an interactive whiteboard. However, it is not a prerequisite for the creation of the aforementioned creative and active environment in the classroom. Thus, a board itself is not a guarantee of interactive teaching, but it enables an extension of the standard interaction of teacher – student and student – teacher for an interaction of pupil – interactive whiteboard, teacher – whiteboard and vice versa, as shown in Figure 1.

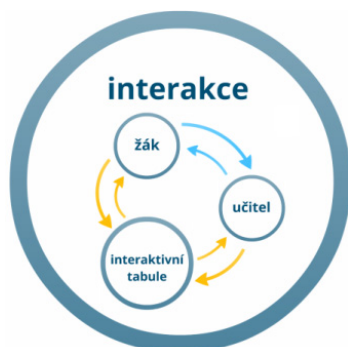


Figure 1. Interaction between participants in the educational process

II. USE IN INTERACTIVE WHITEBOARD

Based on the research conducted in the framework of the research investigation, it emerged that common software tools used to create interactive materials do not allow the creation of chained responses to activities done on board. For instance, a student performs an action and an interactive whiteboard responds to him in some way.

This new dimension of interactive whiteboards is brought by Flash. It should be noted that the level of a student-board interaction should not be at the expense of the teacher's activity in the classroom. On the other hand, there are cases in which the internal intelligence of study materials is welcome such as in the case of self-study, individual work with students, etc. At present, the leading supplier of interactive whiteboard software supports an easy import of SWF files (Flash content) into the developed educational supports. Also, there is an option to use pre-built Flash objects that could be easily modified [1].

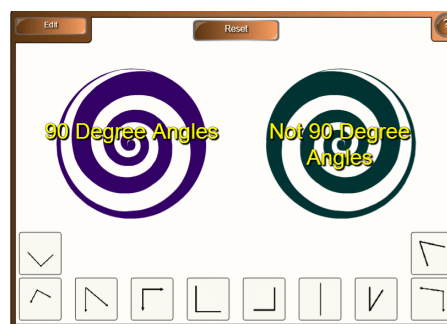


Figure 2. Example of a pre-built soft content of SmartBoard

The development environment for creating interactive material – eduribbon is also based on Flash technology.

Thanks to its multiplatformity, many interactive whiteboards contractors use them for their products as a native software solution.

At the Department of Technical Education and Information Science, there was an investigation of the possibility of teaching creation of Flash applications to primary school students. This issue was taught within the livelong study of teaching computer science. Mgr. Velecký cooperated more closely with our department in

the course of this study and some of the research activities were also carried out with his students. [3]

He became so interested in this issues that in the years 2009-2011 he realized a project called ‘Pupils to pupils’ in cooperation with the EU, whose aim was to introduce a new optional course "Object Oriented Programming" (hereinafter referred to as OOP) to teaching at the elementary schools.

This optional course offered issues of object-oriented programming as an extension of education curriculum in information and communication technologies.

As a support of the project, an OOP textbook was created and Ing. Hrbáček became an expert reviewer and the supervisor. To increase students’ motivation, excursions into programming development centres were ensured. After acquiring the necessary knowledge, secondary school pupils actively participated in the creation of emerging didactic programs for their colleagues at primary school under the guidance of their teachers.

Created training programs were tested and modified so that they can be published. The project also included the creation of a web portal with available methodologies, guidance and a range of Flash educational supports [2].



Figure 3. Example of an environmental game created by pupils within the project ‘Pupils to pupils’

A short video recording from the conference regarding the project is available at the following link:
<http://www.zaci-zakum.svitavy.cz/aktivity/08video.html>

Our department has been devoted for several years to a research of the possibility of using Flash animations in educational supports and their connection with external systems, including their implementation into interactive whiteboards.

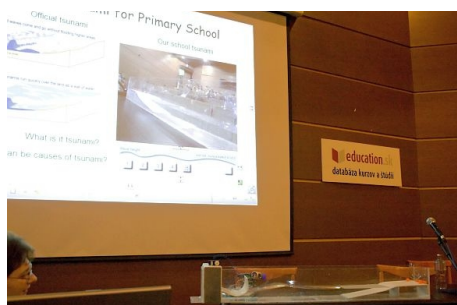


Figure 4. Example of tsunami

In 2009, we presented the first results at international conferences, such as a model showing the formation and impact of tsunami at the Bratislava conference called "Virtual University" [5]. Another example can be an Anemometer controlled by Flash presented at the international conference MPTL in Udine, Italy [4]. Exploring the possibilities of using Flash animations with external systems in special primary school and their influence on the motivation of students with intellectual disability was the topic of Mgr. Martin Kučera’s diploma thesis.

There, he presented connection of Flash didactic computer games and real external systems based on an example of commercial game "Enchanted flat". In this game, there was a robot kit Spykee from the Meccano Company used. It served as further motivation element together with software options that is available in the game. Therefore, a robot responded to the successful fulfilment of the tasks in the game by different sounds, light effects and movements.



Figure 5. Example of didactic computer game ‘Enchanted flat’

Creation of educational computer games for intellectually disabled individuals is to some extent specific due to its demands. In pursuit of maximum personal development of these pupils, we have been constantly looking for new ways, methods and technologies that would at least partially help their personal development. In this context, the research has shown that students with moderate mental retardation managed to work with these systems successfully and these systems can be beneficial at least for some of them. [6]

Another area that the Department of Technical Education and Information Science has also been devoted to is exploring the possibility of connection Flash animations with 3D objects to support technical subjects. In fact, completely new possibilities opened up in the connection of Flash animations and interactive whiteboard. Thanks to this connection, it is possible for created 3D objects to be easily integrated into their own interactive learning supports, which is demonstrated in the Figure 6.

There is a slide with a game designed to practice a rectangular display. The principle is simple. Students are divided into two groups. The first group will draw a 3D object and then they determine the view by clicking on the shape of a cube which the second group has to demonstrate. The task of the second group is to sketch the

view. They have a 3D object available which can be freely rotated. For control, the background color of 3D object changes. If the background color of the 3D object is equal to the selected color of dismantled cube, the object is rotated correctly.

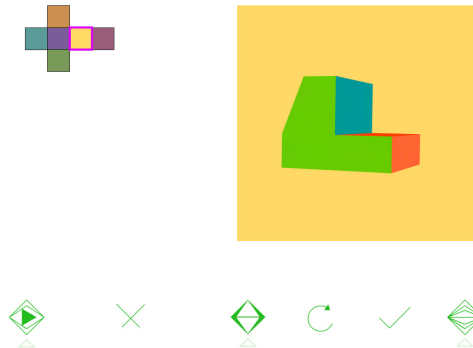


Figure 6. Application of 3D graphic into Flash animations

Currently, we verify assumptions, which emerged from existing results in practice at primary school Mšec. After completing this part, there will be their analysis and depending on it, a methodology of using these materials will be adjusted.

III. CONCLUSION

Even though Flash is condemned by some developers and web designers, it turns out that it is far from being fully replaced by new technologies. In fact, there are application areas where it will not be replaced thanks to its great features and workflow. This paper attempted to summarize some of the results of the research conducted and to show some possibilities of the use of 3D objects implemented in Flash animations. However, exploring the possibility of use external systems controlled from Flash animation has not been finished yet.

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