

The 8th International Scientific Conference
eLearning and software for Education
Bucharest, April 26-27, 2012
10.5682/2066-026X-12-068

**USE OF NEW FEATURES AND ADD-INS IN POWERPOINT TO CREATE
ANIMATIONS THAT STIMULATE LEARNING**

Armand Florin BERTEA

*Textile, Leather and Industrial Management Faculty, „Gh. Asachi” Technical University, Blvd. Dimitrie Mangeron, Iasi
Romania*

E-mail: armand_bertea@yahoo.co.uk

Abstract: *Animations and simulations play a significant role in developing e-learning materials, as they clarify more complicated concepts through visual means. In order to integrate a large range of media in the course content, e-learning authoring tools are used. One of the most known and used unspecialized authoring tool is MS PowerPoint. The paper examines the new abilities of MS PowerPoint 2010, as it is and associated with some add-ins, to create animations. Animations were developed for the Environmental protection course, a course usually regarded as challenging by textile chemistry students, and the students have been questioned to determine their opinions concerning computerized simulations and animations. Changes in the students performance as a result of introducing animations and simulations into the Environmental protection course have been analysed.*

Keywords: *animations, PowerPoint, learning enhancement*

I. INTRODUCTION

E-learning has developed over the years into a crucial element of the modern teaching process, and the teaching methods have changed accordingly [1]. In this context, animations and simulations play a significant role. As many students are mainly visual learners [2], it is largely accepted that animations and simulations can help the student learning process, because they clarify more complicated concepts through visual means, complementing and simplifying the old-fashioned textual based presentations. Animations can offer clear dynamic information that is either implied or absent in static graphics [3].

Animations and simulations have an increased importance when used in web-based courses, where students have to depend only on the course material to obtain comprehensive understanding. Especially engineering courses involve the visualization of the phenomena taking place within a process to better understand the main notions offered in those courses [4]. The effectiveness of animation and simulation multimedia is a result of their relatively high realism level. Dan et al. observed that even if they are not a substitute for real practice, animations and simulations serve as good preparation for reality [5]. Yung noticed that students getting course containing visual material perform considerably better than in the case of a classical text only course [6]. There are also different opinions: Mahar et al. suggests that static slides allow students to retain more information than their dynamic counterparts, because animations involve more concentration with a shorter exposure time [7].

Nowadays, when computers and computer programs have progressed enormously, multimedia can be integrated in course design, allowing students to achieve better outcomes. But the use of computerized simulations and animations isn't necessarily a guaranty of better student understanding [8]. To acquire enhanced learning, the use of animations has to be well planned, considering the

following principles: first, learners must be offered the possibility to set the rhythm and direction of the animation and secondly, the animation has to be accompanied by suitable guidelines and instructions [9].

II. MS POWER POINT AS E-LEARNING AUTHORIZING TOOL

In order to make the teaching content more attractive and interesting, e-learning authoring tools are used to integrate a large range of media in the course content. One of the most known and used unspecialized authoring tool is MS PowerPoint, a presentation software that has evolved significantly since his first edition in 1990 and at present there are over 300 million users of MS PowerPoint® worldwide [10]. Through the years it has become the main technology platform in teaching, even though other options are presently available [11]. There is information showing that PowerPoint presentation may improve student attitudes toward the instructor and class presentation [12]. The important role MS PowerPoint plays in developing course authoring is increased by the fact that many noteworthy professional course authoring tools use its structure [13].

Over the years, MS PowerPoint added tools that an educator can use to develop e-learning courses that go beyond the use of generic themes, bullet points, and clipart [14].

PowerPoint has four kinds of animation effects: entrance effects, exit effects, emphasis effects and motion Paths. This last tool, Motion Paths, first introduced in the 2003 edition of MS PowerPoint, permits objects to move in the Slide Show area, making animations more vivid and interactive; this is why they are frequently used in animating slideshows. For every effect there are many variables such as start, delay, speed, repeat. Elaborated animations can be obtained by combining multiple effects together.

A very useful feature for making animations in PowerPoint, present in all Windows versions of the program since 2003, is Animation Trigger, which allows users to apply effects that can be triggered on object click. This feature is similar in a way to a hyperlink, as it ties an animation to another action on the slide [15].

III. ATEST (BY NOW) MS POWERPOINT: PROS AND CONS

The latest edition of MS PowerPoint introduced a number of features for creating animations that can be used to increase the instruction level of the students.

A very useful feature introduced by the latest edition is Animation Painter, that allows the user to copy all the animation characteristics of an object to another object, saving a lot of time and effort, as animation properties don't have to be added to each object separately.

Another new feature is the capability to embed videos in the presentation instead of linking them, by directly inserting the videos from the respective files. This way they become a part of the presentation file. Most file types can be embedded (MS PowerPoint 2010 supports a large variety of formats comprising QuickTime, Flash, Windows Media, and MP4, not only wav files like in previous versions) and there is no size limitation (in previous versions the size limit was 50 MB). In addition to this, editing video is now easier, as video clips can be trimmed within PowerPoint and different effects such as changing the brightness and contrast, jumping to a particular spot in the video quickly or inserting a bookmark can be added [16].

An alternative method to insert videos available in PowerPoint 2010 is directly from online video sites such as YouTube or Vimeo.

Another much needed new feature is the capability to output a presentation directly to video formats, which could be done in the past only once using third-party solutions. Now the presentations are more simple to distribute as they can be converted in MS PowerPoint 2010 to WMV video files, easy to share online [17].

Another new improvement in PowerPoint 2010 (and all the Microsoft Office 2010 applications) is the Backstage view, which replaces the Office Button in PowerPoint 2007, and can be

accessed from the File tab. Backstage view is a convenient to use feature when managing frequently used features, as it contains all the PowerPoint file management, options, Help and security features.

To help picture editing there is Background removal function (also available in Word, Excel and Outlook 2010), useful when it is needed to include an image without its background. The process is very quick and easy for any picture. In addition, new transition and animation options are available in MS PowerPoint 2010, which are easier to apply using the new Transitions tab on the Ribbon.

Unfortunately, there are some features that used to be handy in animation making and that don't appear in the latest version, such as flash once animation. Flash Once was a feature present in previous edition, which made an object flashes one time and then disappear. When putting a series of images together, they appeared in sequence and gave the illusion of motion [18].

The PowerPoint animation making abilities can be enriched even more with the help of add-ins such as motion path add-in, a freeware tool that merges Motion path end position tool (that creates duplicate shapes at the position where a motion path animation ends, allowing this way to easily identify the end position of the animation at design time) and Align/Join Motion Paths (a tool that aligns the selected motion path assigned to a shape end to end, and is capable to associate individual segments of motion into a single continuous path) [19].

IV. MS POWER POINT ANIMATIONS IN TEACHING ENVIRONMENTAL SCIENCE

The purpose of this study was to examine new methods to improve the instruction of environmental disciplines in textile higher education by implementing teaching methods that associate simulations and animations together with conventional teaching methods. Teaching environmental science to the students who desire to become chemist textile engineers is a challenge because it encompasses a varied and large information content ranging from textile chemistry to wastewater treatment and to ecotoxicology.

Environmental protection in textile finishing and Integrated pollution prevention and control are courses for the students who are majoring in Textile Finishing in the Faculty of Textile, Leather and Industrial Management, at the Technical University in Iasi, Romania. These courses include modules on pollution, wastewater in textile industry, wastewater treatment, sludge treatment and disposal methods and environmentally friendly textile technologies.

In order to successfully meet the course objectives, the students have to make efforts to comprehend the processes involved, as some of them lack chemistry information needed for understanding the processes that occur during wastewater treatment technologies.

To encourage students' interest and to facilitate learning, the courses are based mainly on visual presentations including many animations describing the main processes that are used. This way the students aren't overwhelmed by large volume of complex information and their understanding of challenging concepts is improved. The courses content is presently distributed in print based and web-based format, and in the future a CD-ROM format will be available for the students.

The animations made for the above courses are mainly designed to be two dimensional, and they are intended to transmit knowledge to the students. They were designed as simple as possible in order to permit the students to effortlessly follow and comprehend the processes. All the animations were accompanied with textual explanations.

The courses contained animations of wastewater treatment processes such as discrete particles settling, reverse osmosis and electrodialysis.

The discrete particles settling shows the process of settling as a function of water flow velocity (V_f) and settling velocity of the particle (V_s), which is influenced by the gravitational force, the buoyant force, and the drag force. The student can visualise the way the balance of these two parameters decides if a particle is retained in the settler or is evacuated with the treated effluent. The three possible situations ($V_f < V_s$, $V_f = V_s$ and $V_f > V_s$) can be observed in the animation (Fig. 1). To get views of all these cases, Animation Trigger tool has been used. The triggers are the three numbered

round boxes, and when each trigger is clicked, an animation sequence starts showing the particle moving in the settling area according to the specific situation.

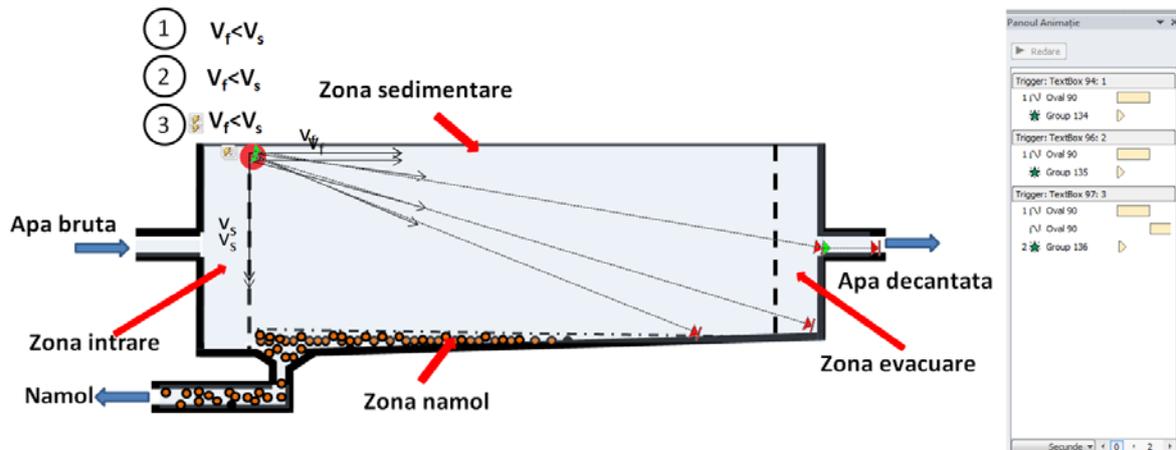


Figure 4. Discrete particle settling with the associated animation pannel

In Figure 2 it can be seen an image from the reverse osmosis animation. Beside motion path tool, adequate order of the animation effects has to be considered to obtain the accurate representation of the process.

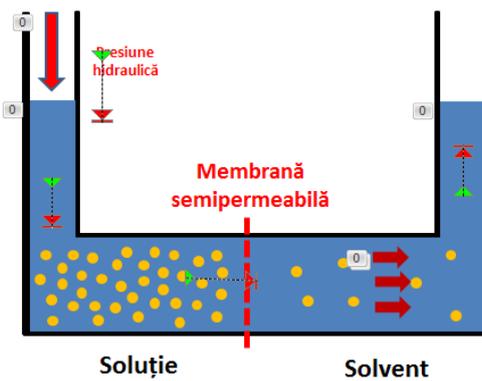


Figure 5. Image from the animation of Inverse osmosis

Figure 3 shows the animation demonstrating the principle of electro dialysis water treatment.

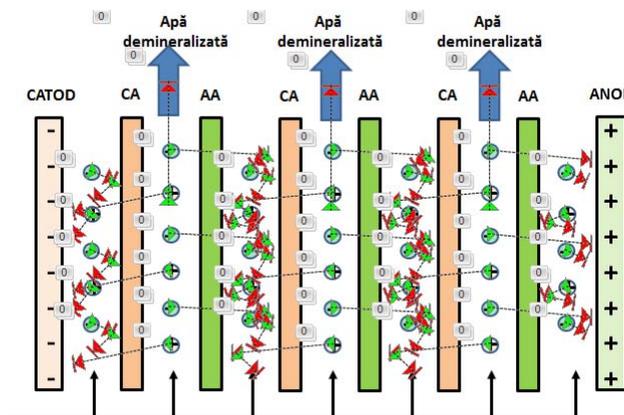


Figure 6. Image from the animation of Electro dialysis

It can be seen that a lot of motion path have been used, and this is why Animation Painter, the new PowerPoint 2010 feature, proved to be very useful. To join correctly the motion paths of the ions that are rejected from the ion exchange membranes, the motion path add-in has been used.

V. STUDENTS' PERCEPTION OF MS POWER POINT ANIMATIONS

In order to identify the role of animations, the same course content was delivered to two groups of junior students, one exclusively with static graphics, and the second one with animations, and afterwards the students have been tested. To assess the students' comprehension of taught concepts, graded quizzes (multiple choice) regarding the recently acquired knowledge have been created using iSping QuizMaker and inserted at the end of each presentation. It was found that, to some extent, computerized animations increase students' understanding and students' performance was better as a result of introducing animations and simulations into the Environmental protection course.

The students have been questioned in order to determine their opinion concerning computerized simulations and animations. An anonymous questionnaire regarding key advantages and drawbacks of simulations and animations as teaching supports in higher education was distributed to 50 students of the Textile, Leather and Industrial Management Faculty from Iasi. The results are shown in Figure 3.

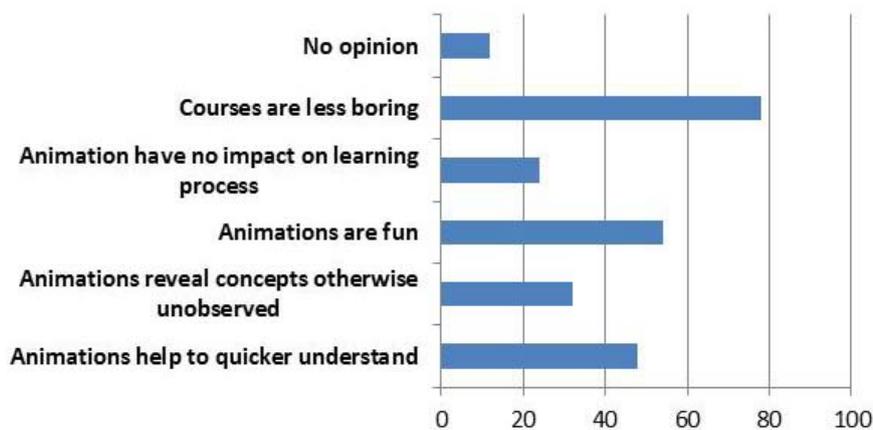


Figure 7. Students' opinions regarding the role of animations in learning (in per cents)

From this questionnaires we have found that students' interest in the course is much higher when the course contains computerized simulations and animations (almost 80%), and a significant number of students found them even fun. Only about a half of the students considered that the simulations enhance their perception on the represented processes, and approximately 30% of them indicated them animations reveal concepts otherwise unobserved. Only a small per cent of the questioned students considered that animations have no impact on the learning process.

VI. CONCLUSIONS

To encourage students' interest and to facilitate learning, MS PowerPoint animations of processes were developed for two courses, namely Environmental protection in textile finishing and Integrated pollution prevention and control, courses considered to be challenging by the Textile, Leather and Industrial management faculty students. The students could visualise the in-depth development of the phenomena, and some of the animations have interactive features.

It was found that animations inserted in a course can increase students' understanding and that students' performance improves as a result of introducing animations and simulations into the environmental protection courses.

Students appreciated the animations in the courses, especially because the delivered content becomes more attractive, and a significant number of them declared them animations help them quicker and better understand the processes.

Acknowledgements

This paper was realised with the support of POSDRU CUANTUMDOC “DOCTORAL STUDIES FOR EUROPEAN PERFORMANCES IN RESEARCH AND INOVATION” ID79407 project funded by the European Social Found and Romanian Government.

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