

Use and abuse of audiovisual media in the college classroom. Slides show and web pages

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Abstract

The multimedia development that has taken place within the university classrooms in recent years has caused a revolution at psychological level within the collectivity of students and teachers inside and outside the classrooms. The slide show applications have become a key supporting element for university professors, who, in many cases, rely blindly in the use of them for teaching. Additionally, ill-conceived slides, poorly structured and with a vast amount of multimedia content, can be the basis of a faulty communication between teacher and student, which is overwhelmed by the appearance and presentation, neglecting their content. The same applies to web pages.

This paper focuses on the study and analysis of the impact caused in the process of teaching and learning by the slide show presentations and web pages, and its positive and negative influence on the student's learning process, paying particular attention to the consequences on the level of attention within the classroom, and on the study outside the classroom. The study is performed by means of a qualitative analysis of student surveys conducted during the last 8 school Civil Engineering School at the Polytechnic University of Madrid. It presents some of the weaknesses of multimedia material, including the difficulties for students to study them, because of the many distractions they face and the need for incentives web pages offer, or the insignificant content and shallowness of the studies due to wrongly formulated presentations.

1. Problem statement

Technology has entered the university classrooms in a very fast pace in the past years, bringing continuously new developments. This way, we have experience a shift from a lecture based solely on the use of a blackboard and analogical projectors over the past 30 years, towards the use of electronic boards and digital projector that allow displaying holographic and 3D images.

However, one of the most significant changes in the way of carrying out the lecture has been, and remains still, the use of PowerPoint (colloquially this name refers to all commercial programs that allow a multimedia presentation based on slides).

Slides show applications have become a fundamental tool for university professors, who, in many cases, blindly rely on them in order to teach. Also, slides wrongly design, poorly structured and with great multimedia content, can be the source of a faulty communication between teacher and student, by being the design and layout the aim, forgetting the content thus.

The student has neglected, when studying, the written documentation (notes or textbooks), adopting documentation based on slides and web pages full of visual stimuli, leading to a dependence of both teacher and student on those means. This fact is dependent on the evolution of the individual. Nowadays the child, afterwards the adolescent and later on the university student have become more visual oriented than thirty years ago, when there were only written media, and learning and assimilation of stimuli was markedly different. This is not to say it was better or worse, just different. The individual today is visual oriented rather than ear or tactile oriented

In light of this revolution one may wonder Is PowerPoint an effective tool? Is it used properly in the classroom? Are we tending to abuse it?

2. Purpose of the study

The purpose of this article is the reflection, study and analysis of the impact in the teaching and learning process of the slides show and web pages, and how they impact in a positive and negative manner in the knowledge acquisition process of the student, paying particular attention to the consequences with regards to the level of attention in the classroom and the studying process outside it.

3. Research methods

The slides show and web pages recommended by teachers of 10 subjects for the past eight years in the School of Civil Engineering of the Polytechnic University of Madrid had been analyzed. It has also been conducted a qualitative analysis through surveys to students in that school during that period of time.

The analysis with regards to the slides is considering the following parameters:

- Number of slides per 50 minute class.
- Structure of the slides.
- Content of the slides.
- Number of words per slide.
- Type and font size of the slides.
- Number of different colors used in the slides.
- Number of images / videos used per 50 minutes class.
- Number of different transition effects between slides.
- Maximum number of animations inside a single slide.

The analysis of Web pages is based on the amount of multimedia content inside web pages, with particular attention to videos and flash presentations that appear directly (without user interaction) on them.

4. Findings

The results of the surveys and studies are presented in the following tables [1], [2]:

Table 1: Slides show survey results

Analyzed item	Remarks
Number of slides per 50 minute class.	The average is 32,6 slides
Structure of the slides.	In the vast majority of cases well structured.
Content of the slides.	In the vast majority of cases in accordance with the syllabus to be presented.
Number of words per slide.	70

Type and font size of the slides.	Times New Roman, Arial y Calibri. Size between 12 y 36.
Number of different colors used in the slides.	4,2
Number of images / videos used per 50 minutes class.	30 / 0,5
Number of different transition effects between slides.	0,75
Maximum number of animations inside a single slide.	1,1

With regards to Web Pages the following results can be presented:

Table 2: Web site survey results

Analyzed item	Remarks
Number of visual stimuli	The average is 5

5. Conclusions

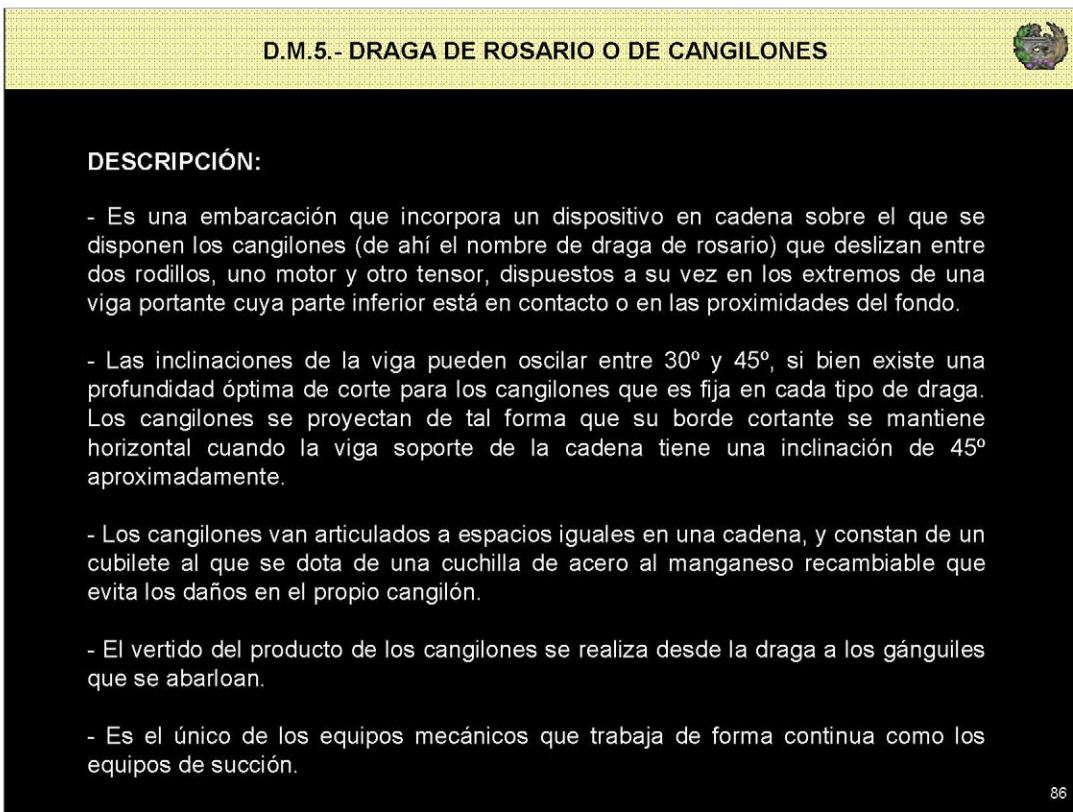
The use of images, graphics and videos, allows bringing to the classroom a real professional experience (Figure 1). Over 50 years ago, professors draw on the board the outline of a machine or the pieces of an object in a handmade manner, having the skill of the teacher a decisively influence in the way students would get information. In addition, the time required for completing such a scheme or drawing could reach up to 10 minutes, breaking the flow of the lecture and the student's concentration. Using PowerPoint allows precise and detailed images which are crystal clear and quickly available. Thus, we consider essential the use of these means in specific technology areas, but their use in the core subjects should be reconsidered.



Figure 1: Use of images on a slide

This type of application has brought significant improvements in incorporating multimedia into the classroom, with relative easiness, and allows teachers to incorporate new slides or modify existing ones in a very simple manner. However, most teachers work on the slides just one time and leave them as they are forever, becoming obsolete, and not worrying about their update, which is mandatory at university level education due to the evolution of technology, which drives a permanent renewal of teacher's knowledge. Due to all of this, a reflection on using these techniques depending on the type of material (basic science, common technology or specific technology) is required. It would be extremely dangerous presenting the equations of continuity, momentum and Bernoulli fluid mechanics to students directly without any explanation to the audience by just reading them, because they are the basis of many disciplines in civil, aeronautical and naval engineering, not understanding the physics of the processes, but its consequences.

Many teachers lecture in their classes with slides full of phrases (Figure 2) that they read or repeat to the student. This allows a novice teacher, or even someone that does not master the subject, teaching it with relative ease, but, make no mistake, it is an abuse of trust and bad for the student. It happens that these teachers are not able to teach when the multimedia appliances fail because their "light" knowledge on the subject reveals their weaknesses immediately. Slides should not be used by teachers as support material for their knowledge. Phrases and numbers should not be written just to be read directly from the slide. The student is able to read, and it does not need the Professor to do so.



D.M.5.- DRAGA DE ROSARIO O DE CANGILONES

DESCRIPCIÓN:

- Es una embarcación que incorpora un dispositivo en cadena sobre el que se disponen los cangilones (de ahí el nombre de draga de rosario) que deslizan entre dos rodillos, uno motor y otro tensor, dispuestos a su vez en los extremos de una viga portante cuya parte inferior está en contacto o en las proximidades del fondo.
- Las inclinaciones de la viga pueden oscilar entre 30° y 45°, si bien existe una profundidad óptima de corte para los cangilones que es fija en cada tipo de draga. Los cangilones se proyectan de tal forma que su borde cortante se mantiene horizontal cuando la viga soporte de la cadena tiene una inclinación de 45° aproximadamente.
- Los cangilones van articulados a espacios iguales en una cadena, y constan de un cubilete al que se dota de una cuchilla de acero al manganeso recambiable que evita los daños en el propio cangilón.
- El vertido del producto de los cangilones se realiza desde la draga a los gánguiles que se abarloan.
- Es el único de los equipos mecánicos que trabaja de forma continua como los equipos de succión.

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Figure 2: Abuse of text on a slide

Using PowerPoint while doing exercise in classes regarding subjects that require sophisticated calculations, is very questionable. To begin with, preparing the slides requires a great effort from the teacher. In contrast, it allows the student to have the exercise with a perfect quality. But what happens in the classroom? If the teacher does not have an electronic whiteboard, the teacher will be limited to pass by the slides without being able to write on them. The student will browser through the solution of the exercise only. The teacher, in our view, should solve the

exercises using the board (chalk or pen), allowing students to follow in an easier manner the solving steps of the exercise, while it forces the student to make an effort that will improve their learning.

An important issue is the number of slides to be used. There are many opinions on what is the ideal number for a 50 minute class. Without getting into that discussion, we want to highlight the situation where students see hundreds of slides pass before their eyes in short intervals, numbing the brain and being in class as if it were a TV show. When the class is finished, the student will recall certain images which have impacted or interested the individual, but it is very likely they will not be able to remember most of what they have seen. The aim is not to entertaining the students for 50 minutes!

One of the most worrying problems in society today is the use of slides as books or notes for the subject. Students generally ask the teacher for the PowerPoint presentation as a method to study. The teacher, usually, allows it and uploads it on an electronic platform, so that the student is able to download a content assuming it includes all the theoretical material. Moreover, it make use of it even when reviewing the marks of the exam.

A slide show, does not have and should not contain, all the information regarding the explanation, since it would be unthinkable to compress 50 minutes of lecture within slides, unless it is done in an schematic manner. The PowerPoint should not replace books (whether in paper or electronic format). PowerPoint is a tool that allows the teacher to design and build multimedia resources based on the idea that "a picture is worth a thousand words", but the student must read, summarize and bring that image to a written or oral expression.

In addition, the abuse of using slides full of images, transitions, animations and all sorts of possible effects as means to study, is sending the student very powerful stimulus, distorting the true sense of slides, which must be the way of transmitting information or suggest some guidelines of thought. It is reasonable that we will see a scenario in which many of our students (university) confess that they do not read many books because they're bored, or because after a couple of minutes lose focus and leave. They need some stimuli to which they have become accustomed, and they cannot remain focus in a written material solely made up with text where there are not moving objects.

The possibility of using audiovisual techniques helps to speed up lectures and cover the full syllabus of the subject, without paying attention to the learning process of students, who watch stunned as lessons pass by given the speed that allows the use of PowerPoint type applications by teachers. This is clearly a drop in the quality of teaching and bring in an additional difficulty in extracting the basic contents of the courses and the achievement of the expected learning outcomes by our students, lost in so much information.

Sometimes there is a inappropriate use by teachers of individual and collective work done by students that allow them to have updated material for their classes without having to work by themselves, only by correcting and coaching, taking advantage of the contributions of students both as material for teaching and research. In this regard, we should be very critic and the University should not be mainly supported thanks to internship workers or student's work. The effort of the teacher must be perceived by the student always.

Undoubtedly education has improved vastly, and technology brings us closer to an increasingly virtual world "almost real" in which there are no limits. Innovation in education and new technologies has brought changes in the mindset of the student and the teacher, but we must not forget that the speed in which some of those changes had taken place does not allow us to stop and think if they are all beneficial or not. One way or another, we've gone from students who spend their time in the classroom with their heads looking down at a sheet of paper on which they were taking notes copied, to students, that remain with their head up and their eyes wide open, looking to text, pictures, graphics, videos ... not just taking notes.

Technological tools (slide presentations and web pages), as we have seen, are very useful in drawings, diagrams, photographs and video, but complementary to traditional techniques. It is essential to extract from the past the best techniques and their results in order to develop a future where the student reaches the highest efficiency, therefore, the combination of media is fundamental.

References

- [1] Teacher Questionnaires (Anonymous, 2004 – 2011).
- [2] Student Questionnaires (Anonymous, 2004 – 2011).