



# Web-Based Multimedia Educational Application for the Teaching of Multimedia Contents: An Experience with Higher Education Students

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## ABSTRACT

*This paper describes an experience undertaken with higher education students, which consisted in utilizing a Web-Based Multimedia Educational Application to serve as an aid in the teaching of Organizational Multimedia. This course is taught to students on the 4<sup>th</sup> year at Escola Superior de Ciências Empresariais (Higher School of Managerial Sciences, Setúbal, Portugal), where the first author teaches.*

*Briefly referred to in the paper, the model used for the planning, development and evaluation of the above-mentioned application. In relation to the resulting application, the way it was applied and its evaluation are also presented. The results obtained are interpreted and future developments are proposed.*

## 1 INTRODUCTION

The utilization of Information Technologies, is presently part of the day-to-day of the majority of public and private institutions. The traditional education system also had the necessity to adapt to this new society [4] and has benefited quite a lot from the contribution of these types of technologies/applications [3,9]. Simultaneously, the “professional philosophy” has also evolved to life long learning [18] and professional careers are becoming increasingly demanding, implying a rapid adaptation and constant education in less time, and preferably without dismissal of employees [1,5]. This leads us to E-learning, a teaching method, which utilizes Internet technologies to supply, by distance, a set of solutions for the acquisition and/or updating of knowledge [11,17,18].

The main reason for the growing popularity of this teaching method is due to the fact that it combines the advantages of using Information Technologies in education [3] with the advantages of distance learning [11,17], namely, access to the information using the new instructional model “anytime, anyplace and anybody” [2]. This was therefore the main reason which led us to chose on using a Web-Based Multimedia Educational Application (WBMEA) to serve as an aid in the teaching of Organizational Multimedia, a course taken by 4<sup>th</sup> year students at the Escola Superior de Ciências Empresariais. As it is an obligatory course, the resulting classes were very heterogeneous, collecting students from five different academic areas with, naturally, implied difficulties in teaching the classes.

The model used for the WBMEA planning, development and evaluation resulted from the integration of the model presented in the first author’s Master’s thesis [15,16] with other methods [21], methodologies and guidelines proposed by other authors [6,7,8,10,12,13,14,19,22,23,24]. The final model is composed of 9 grouped phases in three different stages and, in very general terms, implies the initial development of a prototype which, if proven efficient, will serve as the basis for the subsequent development of the final WBMEA.

## 2 WEB-BASED MULTIMEDIA EDUCATIONAL APPLICATION (WBMEA)

Students which could not attend classes were considered to be the target group for the WBMEA. That is why the most important factor was to develop a WBMEA, which would best compensate for a student’s absence. All classes are laboratorial and last 3 hours. The first hour and a half is theory and the reminder dedicated to practice. Given that the model used for the planning, development and evaluation of the WBMEA assumed the initial development of a prototype, the WBMEA will be designate as prototype. The prototype comprises 3 different sections: the section with the content of a laboratorial class about animation (the practical part of the class), the Frequently Asked Questions (FAQ’s) section and the exercises section (including resolution).

## 3 EVALUATION METHOD

Some students of the course participated in the final evaluation made to the prototype (68 out of 90), which consisted in an experiment and in the application of a questionnaire:

### 3.1 The Experiment

- 68 students participated in a one hour and a half theoretical class about animation;
- After being characterized they were distributed into two groups of 34 students each. Each group occupied a separate classroom;
- One of the groups was submitted to the other hour and a half class, which corresponded to the practical part of the laboratorial class. Meanwhile, in the other group, each student had, during an hour and a half, access to prototype which was meant to be a substitute for the practical class;
- The prototype was installed on a public server and each user achieved speeds similar to that of a 56Kb-modem connection (the most frequent type of connection speed achieved amongst the student population);
- Afterwards all students were submitted to individual practical exercises.
- In a general way, all students easily resolved the exercises. However, the results obtained by the students who initially attended the practical class and the results obtained by students who initially only used the prototype, were different. The results obtained amongst:
  - students without a lot of previous experience in using the Internet (18) were the same for both groups;
  - students with experience in using the Internet but without previous knowledge of animation (34) were more or less the same for both groups;
  - students with experience in using the Internet and previous knowledge of animation (16) were very good and better amongst those who sat in for the attended class. These students already had previ-

ous knowledge on animation and participated quite actively in class by posing several questions and doubts, which were immediately clarified. Those who used the prototype could also have had their doubts but as they were not immediately clarified (they had to use the FAQ's section) the result was a slightly worse score.

### 3.2 The Questionnaire

After finishing the above-mentioned exercises the group that had the practical class, was asked to consult and evaluate the prototype. Meanwhile, the group which had used the prototype was lectured a practical class. Afterwards, all students were invited to fill out a questionnaire where they could freely and anonymously express their opinions on the prototype. The answers are resumed in Table 1.

As verified in the table, the majority of the students considered the prototype good in general terms. However, some attention needs to be paid to the results related with the prototype lack of speed.

We also noted that although all students considered this type of prototype to be a good (59) or medium (9) substitute for attended classes, only 49 considered it sufficiently good to substitute the class. This indicates that there are still some improvements to be made to the prototype in order to make it more efficient and personalized.

In relation to the open questions, students were asked to identify the strong points, the weak points and to suggest ways to improve the prototype. Strong points mentioned were that it helped students who could not attend classes (58), it was accessible from anywhere at any time (61), motivating (62) and a different and original study method (36). Weak point mentioned was slowness (47).

## 4 DISCUSSION

In order to facilitate the access to information from any place at any time, a WBMEA was developed to serve as an aid in the teaching of Organizational Multimedia, a course taken by 4<sup>th</sup> year students at the Escola Superior de Ciências Empresariais. The final evaluation made to the prototype of the WBMEA consisted of two parts, an experiment and a questionnaire, both with the participation of 68 students.

The experiment showed us that the majority of the students feel quite enthusiastic using this type of WBMEA. In relation to weak points the only problem pointed was the slowness in downloading the prototype. In general, the obtained results are very encouraging and show us that the production of these types of applications should be encouraged. The enthusiasm/results achieved with the usage of the prototype justifies that this work is further developed, and at the time the prototype is being perfected, especially the referred access speed problems. Another incentive to continuing this work is the fact that the School is currently developing an e-learning project which,

Table 1. Answers Obtained in the Questionnaire

About the prototype:	More Or Less			
	A Lot	A Little	Very Little	
1. Has an attractive design	47	18	3	0
2. The information is well organized	60	7	1	0
3. Simple and intuitive navigation	58	8	2	0
4. The subjects are exposed clearly	61	7	0	0
5. Easy to use	56	10	0	0
6. Motivating	63	5	0	0
	Good	Medium	Weak	Bad
7. Number of examples	60	7	1	0
8. Number of exercises	19	36	13	0
9. FAQ's section	57	6	5	0
10. In terms of speed, the result was	0	21	37	10
11. Is a good method of substituting the attended class	59	9	0	0
12. Global evaluation	44	15	9	0
	Yes	No		
13. Good enough substitute for the attended class?	49	19		

will be implemented in the short term, and will, benefit from these types of studies and resultant WBMEA.

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