EVALUATION OF ONLINE TOOLS AS DIDACTIC RESOURCE IN THE UNIVERSITY EDUCATION

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Abstract

Recently, many efforts have been made in the academic world to adapt the new degrees to the new European Higher Education Area (EHEA). New technologies have been the most important factor to carry out this adaptation. In particular, the tools 2.0 have been spreading quickly, not just the Web 2.0, but even in all the educational levels. Nevertheless, it is now necessary to evaluate whether all these efforts and all the changes, carried out in order to obtain improved academic performance among students, have provided good results. Therefore, the aim of this paper is focused on studying the impact of the implementation of information and communication technologies (ICTs) in a subject belonging to a Master from the University of Alicante in the academic year (2010-2011). In special, it is an elective course called "Advanced Visual Ergonomics" from the Master of Clinical Optometry and Vision.

The methodology used to teach this course differs from the traditional one in many respects. For example, one of the resources used for the development of this course is a blog developed specifically to coordinate a series of virtual works, whose purpose is that the student goes into specific aspects of the current topic. Next, the student participates in an active role by writing a personal assessment on the blog. However, in the course planning, there is an attendance to lessons, where the teacher presents certain issues in a more traditional way, that is, with a lecture supported with audiovisual materials, such as materials generated in powerpoint.

To evaluate the quality of the results achieved with this methodology, in this work the personal assessment of the students, who have completed this course during this academic year, are collected. In particular, we want to know their opinion about the used resources, as well as the followed methodology. The tool used to collect this information was a questionnaire. This questionnaire evaluates different aspects of the course: a general opinion, quality of the received information, satisfaction about the followed methodology and the student’s critical awareness.

The design of this questionnaire is very important to get conclusive information about the methodology followed in the course. The questionnaire has to have an adequate number of questions; whether it has many questions, it might be boring for the student who would pay no enough attention. The questions should be well-written, with a clear structure and message, to avoid confusion and an ambiguity. The questions should be objectives, without any suggestion for a desired answer. In addition, the questionnaire should be interesting to encourage the student’s interest.

In conclusion, this questionnaire developed for this subject provided good information to evaluate whether the methodology was a useful tool to teach "Advanced Visual Ergonomics". Furthermore, the student’s opinion collected by this questionnaire might be very helpful to improve this didactic resource.

Keywords: online teaching, Technologies of the Information and the Communication, questionnaire, blogs.

1 INTRODUCTION

In recent years, many changes have occurred within the university academic context. The most important change was the university restructuring following the Bologna Declaration in 1999, the Bologna Process. In this process, the European Higher Education Area (EHEA) was created with the objective of making a standard educational system between different countries, with the main purpose of facilitating the exchange of students between these countries.

To achieve the objectives, many efforts have been carried out for the implementation of reforms in different areas of the education sector. For instance, a reorganization was necessary to adapt o
generate the curricular contents of the existing degree courses and to transform into the new degrees framed within the European Higher Education [1]. Thus, a new model was implemented by changing the system of credits: the European Credit Transfer and Accumulation System (ECTS). With the old system, a credit corresponded to ten hours of attendance to lessons. However, the ECTS measures the number of hours that a student needs to acquire knowledge or skills that are provided by a subject (1 ECTS credit is equivalent to between 25 and 30 hours of student work). Since, the ECTS credits have to consider the entire volume of work done for the student, the teacher has to restructure the course by considering as theoretical and practical lessons as the work done for the student with individual or team works, seminars, etc. This implies that the number of lesson hours is reduced in all the subjects. Therefore, the teacher should provide the student a series of individual and team activities to develop part of the knowledge. To carry out this task, new technologies have played a major role. In particular, the tools 2.0 have been spreading quickly, not just the Web 2.0, but even in all the educational levels. For this reason, training for teachers about the use of these new technologies has been necessary.

Among the actions that have taken place within the University of Alicante to encourage the use of new technologies to improve the quality and innovation in university education, it is worth mentioning the program “Redes”, which is an annual project sponsored and managed by the Vice President of Strategic Planning and Quality and the ICE (Institut of Education Sciences). This program promotes the exchange of experiences, methodologies, tools and, ultimately, strategies for improving teaching and learning system, which is the goal of the EHEA [2-8].

Nevertheless, it is now necessary to evaluate whether all these efforts and all the changes, carried out in order to obtain improved academic performance among students, have provided good results. Therefore, the aim of this paper is focused on studying the impact of the implementation of information and communication technologies (ICTs) in a subject belonging to a Master from the University of Alicante in the academic year (2010-2011). In special, it is an elective course called “Advanced Visual Ergonomics” from the Master of Clinical Optometry and Vision. The methodology used to teach this course differs from the traditional one in many respects. For example, one of the resources used for teaching this course is a blog developed specifically to coordinate a series of virtual works, whose purpose is that the student goes into specific aspects of the current topic. Next, the student participates in an active role by writing a personal assessment on the blog.

To evaluate the quality of the results achieved with this methodology, in this work the personal assessment of the students, who have completed this course during the last academic year, are collected. In particular, we want to know their opinion about the used resources, as well as the followed methodology. In addition, this evaluation is contrasted with the academic achievements.

2 METHODOLOGY

2.1 Presentation of the subject

The course “Advanced Visual Ergonomics” is an elective course that is taught in the Master in Clinical Optometry and Vision. This course has 3 ECTS credits, which are structured between attendance to lessons (theoretical and practical lessons), individual and team works, tutorials and seminars.

Since the implementation of ECTS credits reduces the attendance to lessons is essential to establish a new methodology of work by providing the student more activities to complement the basis knowledge presented in the classroom. ICTs tools are a great resource for this purpose because of its versatility. To ensure that the student achieves the objectives set in the curricular contents, the lectures were complemented by a series of individual activities consist of reading information related to the different topics and then make some reflection or comment that reflects an understanding of the contents worked on that topic. To guide these activities a blog was prepared [9] where the activities are shown and in where students can add some comments.

In addition, there are certain tasks which are still considered essential to attendance to lessons, and therefore, the methodology remains the same as before the adaptation of the subject. These tasks are practical lessons due to they are performed with commercial software (Matlab).
2.2 Participants

9 of the 10 students who completed the course referred to in that academic year were involved in this study. They were asked to complete a questionnaire to give their opinion about the methodology followed in the course “Advanced Visual Ergonomics”.

2.3 Instruments

The tool used to collect this information was a questionnaire. This questionnaire evaluates different aspects of the course: a general opinion, quality of the received information, satisfaction about the followed methodology and the student’s critical awareness.

The design of this questionnaire is very important to get conclusive information about the methodology followed in the course. The questionnaire has to have an adequate number of questions; whether it has many questions, it might be boring for the student who would pay no enough attention. The questions should be well-written, with a clear structure and message, to avoid confusion and an ambiguity. The questions should be objectives, without any suggestion for a desired answer. In addition, the questionnaire should be interesting to encourage the student’s interest. By taking these recommendations into account, a questionnaire was designed with 20 questions divided into 5 different aspects:

- 8 questions about the general use of the blog.
- 4 questions about the content of the blog.
- 5 questions about the satisfaction of the students on the methodology used by the teacher.
- 2 questions to collect their opinion about the subject.
- 2 open questions to collect feedback from students about how they think the subject could be improved.

The questionnaire was developed using an online tool, JotForm [10]. Although the unlimited use of this tool is not free, for the number of surveys that we needed to do it was enough. The program collects and save the results of all surveys completed. Below the complete questionnaire is shown.
Next, you will be asked to answer some questions related to the course "Advanced Visual Ergonomics". You only need about five minutes to complete the questionnaire. Please, pay attention to the question and give your opinion by taking into account that 1 point corresponds to a complete disagreement and 5 points correspond to a complete agreement.

### ABOUT THE USE OF THE BLOG

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The blog is clearly structured and follows a logical and intuitive order.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. It was clear what activities to be performed on the blog.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. The blog use was easy.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. The activities set out on the blog were specified clearly.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. The blog is a tool that has facilitated the development of activities.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. The blog has facilitated the assimilation and understanding of the course.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. The use of the blog has not required much more time to develop the tasks.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. You would recommend the use of a blog in other courses.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

### ABOUT THE CONTENT OF THE BLOG

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
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<tbody>
<tr>
<td>9. There are enough materials to develop the proposed activities on the blog.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. The blog has other interesting links and information to go into this subject.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11. The questions proposed have been useful to go into the subject.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. I read all the comments written for other classmates on the blog.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

### ABOUT THE WORKING METHODOLOGY

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
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<tbody>
<tr>
<td>13. The distribution of tasks (individual and team work, online tasks) was clear.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14. I have done all the activities although these activities will not be evaluated.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. I worked about the number of hours established for each topic.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. The activities were well balanced to be developed in the expected time.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>16. The score obtained reflects the effort done in this subject.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

### ABOUT THE COURSE

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. The way to present this subject has been motivating</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. I would recommend this methodology for other course.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

### FEEDBACK

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Would you propose any change to improve the course?</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 1. Questionnaire to assess the working methodology in the course “Advanced Visual Ergonomic”.
3 RESULTS

In this section, the results and the conclusions obtained from the questionnaire are presented. The colour code used is the same for all the figures. To simply the visualization of the figures, in the Fig. 2 the colour code is shown.

![Colour code]

Fig. 2. Colour code used for the analysis of the questionnaire results.

It is important to point out that the number of participant for this questionnaire was low, nine students. For this reason, the results should be evaluated carefully since, for instance, a percentage of 11% shows the response for only one student. Therefore, the number of student has to be taken into account to evaluate and to draw the main conclusions.

3.1 About the use of the blog

The distribution of scores obtained can be seen in Fig. 3, where the resulting percentages for each response of this group are shown.

For the first question, all students of those polled answered with a score equal to or higher than 3, and in particular, 50% of those polled gave a score of 4. From these results, it can be conclude that the blog has a clearly structured and follows a logical and intuitive order.

For the second question, it can be seen that only 11% of students disagreed with the statement, the rest of them responded with a score equal to or higher than 3 points. In fact, there are as students completely agree or just agree with the statement (22.5% + 22.5% = 45%), as students who remain in a neutral position, by scoring a 3. The main conclusion from this question is that the activities proposed on the blog are clear, however, there is no a categorical response. For this reason, it would be interesting to reinforce this by adding some type of material (webquest, Gloger, ...) what provide an interactive guide throughout the academic year.

From the third question, it is confirmed the use ease of the blog for any student since all of them answered the question with a score equal to or higher than 4.

The questions 4 and 5 show a symmetric distribution in the results. There are as students agree with the statement as students who disagree it, although the majority of students remain in a neutral position. For this reason, it is very important to improve both aspects; an improvement in the explanation of the activities and to find a relationship between the activities and the blog.

The question 7 evaluated the assimilation and understanding of the contents by using the blog. While the majority remains a neutral position, 22% of those polled think that the blog does not help to assimilate and understand the course contents.

The question 8 about the recommendation of the use of a blog in other courses, it does not offer a categorical response since 67% of those polled answered with a neutral position. For this reason, it would be interesting to reconsider some aspects of the blog to improve the general assessment.
3.2 About the content of the blog

Next, other four questions were proposed to evaluate the quality of the contents provided by the blog. The results are shown in the Fig. 4.
33% of students disagree with the statement about the materials found on the blog to develop the different activities. However, 45% of students agree with the statement, considering that there are many materials that can be obtained through the blog. Some materials are provided by the platform “Campus Virtual” of the University of Alicante. However, by taking into account this response, it would be interesting to add these materials on the blog and to facilitate the work only from the blog.

Nevertheless, most of the students think that the blog provides many interesting links to go into the subject since it can be seen from the results of the question 10.

Question 11 tried to evaluate the quality of the activities in terms whether they are useful or no to go into the topic. 56% of the students consider that the activities of the blog are useful to go increase the knowledge about the different topics but 22% disagree with this statement. In spite of these good results, it is important to point out that some responses are contradictory. The blog seems to be easy to use (conclusion from question 3) and the students think that the different activities are useful to go into the different topics (conclusion from question 11), however the student thinks that this tool was not useful to help the understanding and assimilation of the course contents (conclusion from question 6).

Question 12, the last question of this section, was formulated to know whether the student were concerned about the other classmate’s comments. This question is very important because a purpose of a blog is to provide a forum where the student can discuss, interact and construct the knowledge by themselves. Half of the students admit to have read the other classmate’s comments.

### 3.3 About the working methodology

Questions about the working methodology were also formulated. The course was drawn up with attendance to lessons and the accomplishment of different activities through the “Campus Virtual” and the blog. Therefore, it is important to know whether this methodology is helpful for the student.
Firstly, the student was asked about their opinion about the use of both tools: “Campus Virtual” and the blog. The results are surprising. There is the same percentage of students what considered that the use of both tools is confuse (34%) as students who think it is clear (33%). These results agree with the results found in the second question. Therefore, for incoming years, it would be interesting to help the student with an interactive guide (websquest, glog, etc.)

Question 14 tried to assess the student's interest about this course. Most of student showed a great interest because most of them did all the tasks although they were not taking into account for the evaluation.

With the new ECTS system, the number of work hours by the student should be estimated by the teacher previously. Thus, another interesting issue is to know whether this estimation is accurate. Related to this issue, the responses are very close between students. Most of students consider that the number of hours planned by the teacher do not correspond to the time needed to develop the activities.

Finally, the student was asked to know the degree of satisfaction, that is, whether the effort done by the student was reflected in the final evaluation. There is only a low percentage (11%) that is not satisfied with the mark. Therefore, the way to do the final evaluation of the student was good.

### 3.4 About the course

A general opinion about the course was also collected by means of two questions. The way to present this course was motivating for 22% of students and 22% of student were not motivated with this methodology. However, it is noteworthy that more than half of students (56%) have a neutral opinion; they do not appreciate this aspect positive or negative.

The last question was focused on knowing whether the course would be recommended by the student to other students. The results are similar that those obtained in the previous question. The distribution of answer is very symmetric. 22% of students would recommend the course while other 22% of student would not. However, it is again noteworthy that more than half of students (56%) have a neutral opinion.
3.5 Feedback

Finally, we wanted to get constructive criticism from students. Therefore, the last question proposed was "Would you propose any change to improve the course?"

Only three students responded to this question, and its proposals were:

- Explain the contents of each topic, although this means to reduce the amount of information provided, but the main concepts would be clearer.
- It took a long time to do some activities. Most of them provided new information but they did not help to get into the topic. For this reason, some important concepts were forgotten.
- To reinforce the theoretical concepts with attendance to lessons.

These contributions are very interesting and it may be taken into account in the future to improve the course.

4 DISCUSSION AND FINAL CONCLUSIONS

Finally, the main conclusions are summarized in this section.

By considering the student’s opinion, it can be concluded that the blog is clearly structured and follows a logical and intuitive order. The student think it is a tool of easy use and it does not imply to work more time to do the different activities proposed. However, the blog does not help to do the proposed tasks or to assimilate better the concepts. On the other hand, the methodology followed during this course (use of the blog and the “Campus Virtual”) was confused for many students. Therefore it is necessary to review the blog; checking the writing of questions and provided files. In addition, the planning of the course should be explained in detail at the beginning of the course to clarify doubts. To improve this problem, a new tool could be very useful to be an interactive guide for the student. This tool could be a glog. This tool allows to make an interactive poster to guide the students through the topics, activities, materials, links, etc.

Nevertheless, it is important to point out that the quality of contents (materials, links and open questions) on the blog is very good by considering the student’s opinion.

Finally, from this questionnaire, it is possible to detect the problems about the methodology used to teach the course. In our case, for next year, we will solve the problems found: the time required to do the activities will be adjusted, the activities will be reviewed in order to guarantee a perfect understanding by the students, the new activities will be proposed to help the student to go into the topic, etc. For this reason, we think it is very important to develop this kind of studies to evaluate whether the new working methodologies are useful or not for students.
REFERENCES


