FORSAN: TRAINING FORMATING PROFESSIONALS AT BIOMEDICAL RISKS THROUGH HIDDEN PATHOGENESE GAMES INCLUDED ON A MOBILE WEB

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Abstract

The rapid development of network and multimedia technologies has allowed obtaining new ways of learning. This paper shows a researcher wish the main object of the decrease the risks, that might have to face the nursing students in the close future, it has been accomplished a development and implementation project focused on a mobile, interactive and self-manageable web, that includes the mayor number of the latest multimedia tools accessible in the market with these objectives: 1 Detect the previous knowledge and the accidents’ incidence, 2 The creation and implementation of one formative mobile web which includes multimedia tools such as videos, games, tutorials, news, social networks, etc. and detect the degree of satisfaction and the influence of the informatics tool in the formation and prevention in biological accidents. The methodology has been divided on:

1º Fulfilment of a descriptive observational study about a students’ sample from UCO that have been enrolled and passed the practices, 2º Development of a formative web: (http://www.uco.es/investiga grupos/LVRiesgosLaborales/formacion-sanitaria/animaciones) that is formed by games, such as “Mapamundi”, tutorials, evaluation questionnaires, gallery of images, virtual laboratories and help and 3º Evaluation of the games and the mobile web by the students.

The evaluation of the basic knowledge shows that the frequency of correct answers increase related to the growth of the year. The incidence of biological accidents, most of them needlsticks, although is low, it increase related to the year of the practice.

The virtual classroom incorporates the interactive formation in order to decrease the incidence of biological accidents, specially the needlsticks and it is well evaluated by the students considerate it a resourceful resource in the self-learning and in interactive and ubiquitous information.

Keywords: Virtual Web, Games, Medical Risk Prevention, Nursing Students.

1 INTRODUCTION

The exhibition to biological agents is the risk of major incident between nursing students during the procedures that imply direct contact with corporal fluids. The needlestick is the biological accidents of major frequency [1]-[3]. According to the Centers of Disease Control and Prevention (CDC) between 600.000 and 10.000.000 needlestick takes place annually [4]. The students are thus more susceptible to these accidents during the practices, especially when they are in contact with the patient' body fluids. Furthermore, students have to face situations where exists a biological risk that might compromised the students or patients health such as nosocomial infections. For all that has been, it is necessary to increase and improve in education about biological risk and how to prevent biological accidents.

The rapid development of network and multimedia technologies has allowed obtaining new ways of learning as a complement or alternative to traditional learning based on master classes and real experiments in practices [5]. As a result, an efficient alternative to get the students to learn by themselves and in an efficient way has been developed in order to make them able to handle different situations such as the instruments used in medical practices. In addition, this alternative could be combined with the use of virtual reality techniques before the incorporation of the student to those
practices. From the standpoint of effectiveness, there are studies that show how students’ agreement with the use of virtual workplace web in the learning process [6]-[9].

The researches’ results, developed principal in countries such as Canada or Unites Stated, [7] emphasising a large variety of didactic and interactive tools accessible from laptop, mobile or tablets [8] for nursing students, being the mobile phone the device with mayor usability and better opinion among the students. These researchers have proven how the use of informatics tools drive to improve in the learning especially the e-games that are better evaluated by the students [10]-[13].

For all said previously, including the main object of the decrease the risks, that might have to face the nursing students in the close future, it has been accomplished a development and implementation project focused on a mobile, interactive and self-manageable web, that includes the mayor number of the latest multimedia tools accessible in the market with these objectives: 1º Detect the previous knowledge and the accidents’ incidence, 2º The creation and implementation of one formative mobile web which includes multimedia tools such as videos, games, tutorials, news, social networks, etc. and detect the degree of satisfaction and the influence of the informatics tool in the formation and prevention in biological accidents.

The objective wanted to achieve is that the sanitary professionals received a complementary formation about risks that might be able to help them preventing unnecessary risks during the work by e-games and the evaluation of the software.

2 METHODOLOGY

The methodology has been divided in three parts:

1 Fulfilment of a descriptive observational study about a students’ sample from UCO that has been based on anonymous freewill google survey.

2 Development of a formative web: (http://www.uco.es/investiga/grupos/LVRiesgosLaborales/ formacion-sanitaria/animaciones) that is formed by e-games, tutorials, evaluation questionnaires, gallery of images, virtual laboratories and help. The e-games are based on information, videos, imagines and links that allow the interactive information and formation. Furthermore, it is shown news, communication blog and permanent access to social networks (figure 1).

The games area is based on three different games developed by Genially software: the microorganism search around the hospital, Biolchis which is focused on gaming by dice and the pathogen search called the Mapamundi. All the games integrate breve tutorials about the pathogens or microorganism found; their area of influence and the sanitary outcomes.

3 Evaluation of the games and the mobile web by the students using a survey in order to know the degree’s satisfaction and usefulness.

2.2. Description of the e-games

The games are based on the HTML5, CSS3, Javascript con jQuery, JSON y Ajax which allows the user to play at any electronic device such as phones or tablets.

It has been developed e-games focused on the formation and information of formatting professionals. In the game area exists a specific game which the principal objective is to provide information about the biological agents around the world and the diseases caused. The name of this e-game is Mapamundi (Figure 2) where it can be touched around the map and it is seen all the information about the specific biological agent including videos, images and hyperlinks.
3. RESULTS

Table 1 shows the frequency of the basic and specific knowledge according to the degree’s year results of the anonymous freewill google survey answers. An increase in the basic and specific knowledge related to the study year (second, third or fourth nursing degree) has been observed.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Basic knowledge</th>
<th>Specific knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second</td>
<td>65%</td>
<td>20%</td>
</tr>
<tr>
<td>Third</td>
<td>80%</td>
<td>32%</td>
</tr>
<tr>
<td>Fourth</td>
<td>74%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Table 1. Frequency of basic and specific knowledge
Table 2 shows the incidence of biological accidents that have suffered the students. It is shown an increase of nine percent in the biological accidents from the second to the fourth year which could be produced because of the growth in the tasks and the necessity of speed.

![Incidence of biological accidents](image)

**Table 2. Incidence of biological accidents**

Finally, it has been evaluated the students’ satisfaction’s degree about the e-games contained in the web platform (Table 3). The high frequency (3.9/5) shown in the satisfaction’s degree by the students reflects the common thought of the e-games’ easy use and the facility to learn with them.

![Results about the e-games](image)

**Table 3. Results about the e-games**

4. CONCLUSIONS

The evaluation of the basic knowledge shows that the frequency of correct answers increase related to the growth of the year. The incidence of biological accidents, most of them needlesticks, although is low, it increase related to the year of the practice.

The virtual classroom incorporates the interactive formation in order to decrease the incidence of biological accidents, specially the needlesticks and it is well evaluated by the students considerate it a resourceful resource in the self-learning and in interactive and ubiquitous information.
The high frequency (3.9/5) shown in the satisfaction’s degree by the students reflects the common thought of the e-games’ easy use and the facility to learn with them.

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REFERENCES


