



RESEARCH ARTICLE

Mobile App Training and Informative Experience in Health Education

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Summary

A wide variety of studies have shown that new technologies facilitate the acquisition of knowledge and skills. New technologies were introduced into the nursing field in the mid-1960s with the advent of basic computer programs [1]. In the 21st century, the use of mobile devices such as tablets, smart phones and PDAs has been introduced. Currently, gambling techniques and serious games are proposed and studied in nursing education.

In 1911, the first dummy for basic practice was introduced in the field of nursing [2]. It was not until the mid-1960s that new teaching techniques were introduced using basic computer programs simulating action protocols [3].

These programs proved to be quite successful as the academic performance of nursing students was significantly higher than in previous years when these technologies were not used [4]. Subsequently, in the 21st century, new technological advances were adopted in the teaching of Nursing, using mobile devices (tablets, smart phones, PDAs), computers and even virtual reality [5].

Introduction

Since the mid-twentieth century, new technologies

have been successfully used to impart knowledge and develop skills in students [1].

In 1911 the first dummy for basic practice was introduced to the field of nursing [2]. It was not until the mid-1960s that new teaching techniques were introduced using basic computer programs simulating action protocols [3].

These programmes proved to be quite successful as the academic performance of nursing students was significantly higher than in previous years when these technologies were not used [4]. Later, in the 21st century, new technological advances were adopted in nursing education, using mobile devices (tablets, smart phones, PDAs), computers and even virtual reality [5].

We define technology as the set of methods, techniques and resources logically organized to offer strategies and solutions to problems, situations and processes of material and intellectual life [6]. Technology is identified with the new, modern and updated, it has been considered and is considered as being above the theoretical model [7].

Today's students are used to living in a highly technological world [8]. Mobile devices, computers, and technology in general have become an everyday tool in the practice of nursing, having an important potential in the decision-making of the student and patient, plan-



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ning care and giving importance to the improvement of health [9]. Advances in Information and Communication Technologies (ICTs) offer an opportunity to explore very innovative [10].

In the area of nursing education, the incorporation of new technologies is highlighted for the best performance of the student with respect to knowledge related to the subjects taught in the professional career. These new incorporations make the learning of knowledge dynamic and fun at the same time [11].

Gamification is the use of game elements designed to increase user participation, due to their proven ability to improve motivation, engagement and investment time through multiple settings [12]. On the other hand, a serious game is formally defined as an interactive computer application, with or without significant hardware component, that has a challenging goal and facilitates the immersion and training of collaborative learning experiences.

The use of games in health education is a technique that was used in another century but is currently a pedagogical instrument with greater impact on students and is widely used in teaching and knowledge development [13]. "An educational game is an activity governed by precise rules involving different degrees of probability, in which players compete through the use of knowledge or skill in attempts to achieve specific objectives" [8]. Teaching in relation to any topic requires considerable creativity and imagination in order to retain and entertain students [9]. Games in education are about teaching students while maintaining their motivation to learn by playing [7].

In the field of health, the use of serious games can provide a significant condition for increasing interest in user training, education and performance evaluation [14]. Note that according to Dale: "people learn 10% of what they read, 20% of what they hear, 30% of what is demonstrated, but 90% when what is said and done is combined" [15].

Serious games and simulations represent a major revolution in education, providing an effective pedagogical tool for experiential learning [16]. In recent years, there has been a rapid growth of serious games in educational contexts. There are mainly two factors that have motivated this change. On the one hand, the new teaching and learning methodology in which the student becomes the centre of the process, and practice takes on a more relevant role. On the other hand, the ability of serious games to capture the attention of the learner and make them participate in the content exposed by providing virtual environments in care practice is significant [17].

These games facilitate access and personalize the learning experience, offering an educational tool for students that they can use anytime, anywhere. One of the

fundamental differences between serious games and other commercial video games is that serious games are designed to facilitate the achievement of specific learning objectives [18].

With the introduction of role-playing techniques and mannequins, and with digital games and virtual reality, it is possible for the student or the nursing professional who uses these techniques to develop to the maximum their ability to move, act, think and reflect on "real" situations in a safe environment [7].

Although serious game based teaching seems very promising, serious game design and creation is quite expensive in terms of time and effort, mainly due to the graphical interface in which it is developed and the narrative it needs. This type of games, developed mainly for the acquisition of knowledge, aims at instructing the user and motivating him/her as well as entertaining him/her [19].

One way to inject entertainment into education is to use games or other fun activities. This is a departure from the traditional "talk and chalk" master class. Instead, entertainment can be used with a humanistic approach that has a greater emphasis on active learning. Students interact and participate in the entire learning process in a way that is meaningful to them [7].

Facilitating active learning helps to acquire new knowledge and skills in a way that is both challenging and enjoyable [10].

In this way, it is in education based on serious games that learning is perceived as fun and promotes in turn, the direct participation of students and prevents the dreaded PowerPoint, through which students are listening as mere passive actors, often without retaining the knowledge taught [20].

In addition, teaching activities with a fun component can be planned to encourage deep interaction and knowledge acquisition, having a greater impact on the students' learning experience.

For example, a game can be used to teach theory, while at the same time helping the student develop skills in debate, critical thinking and clinical reasoning [7].

Objectives

Overall objective

To demonstrate that gambling and serious games are useful in the education of health professionals to update knowledge. For this purpose, a review of the literature will be carried out, making known some serious games that offer optimal results in the teaching and assistance practice.

Methodology

The databases were used: PubMed, Science Direct,

Scielo and academic Google. The bibliographic period consulted was from 1979 to 2016. The key words and DeCS terms selected were: medical education, gamification nurse, technology, health and game. Using the Boolean operator "and", "or".

Serious educational games used in nursing education were evaluated, as well as others that can be applied at the hospital level.

During the article selection process, studies with full text access were analyzed. There were restrictions on the language of the articles during the selection process, selecting articles in both Spanish and English.

The search process consisted of: (1) Reviewing all the articles found in the different databases referred to previously; (2) Discarding those references that were duplicated; (3) Reading the title and abstract of each reference found (excluding those articles that were irrelevant in relation to the subject matter); (4) Reading the full text of the articles available, excluding those that did not meet the criteria for inclusion.

Once the search process and the selection of relevant articles for this research were completed, the data belonging to each of the references consulted were extracted.

Each of the selected articles was classified based on its level of scientific evidence.

Articles whose summary or content was not related to the topic to be addressed, or whose results did not contain scientific evidence, were excluded.

The inclusion criteria used for the search of this systematic review have been

- Clinical practice guidelines.
- Systematic reviews of literature.
- Bibliographic reviews.
- Applied research studies, which are cross-sectional, case-control, descriptive, randomized, quasi-experimental, qualitative and cohort studies.
- Doctoral theses.

Outcome and Discussion

Most professionals consider that using games improves their knowledge and skills relevant to care practice and prefer to use these educational tools. Both teachers and students consider the games serious as innovative learning tools for knowledge acquisition.

Below are the games that have been analyzed and researched to obtain results:

Lissa

Serious game designed to complement the teaching of CPR (Cardiopulmonary Resuscitation) and also to refresh the knowledge in a pleasant way.

The population that made the study was constituted by 109 students enrolled in a Nursing Degree at the University of Alicante. Most of the students consider that LISSA improved their knowledge and skills relevant to the practice of CPR.

In addition, students preferred to use LISSA individually rather than in groups and emphasized that the use of this game improves CPR knowledge and skills. Both teachers and students find LISSA easy to use and understand, while helping to retain knowledge [19].

Press

Serious play to enhance students' experience in teaching both advanced and intermediate life support, to motivate continuous learning and student engagement, and to improve the psychomotor skills associated with the provision of intermediate life support [7].

The game was used by nursing students at the University of Chile. The results of this study indicate that the simulation game platform has a crucial role in improving knowledge, psychomotor skills and decision-making in nursing students.

"Pulse" has the potential to increase competence and performance in life support techniques and has shown excellent results at the cognitive, behavioural and affective levels [21].

Medication Geriatrics Game® GMG

It's an aging simulation game. It is designed to improve students' attitudes, understanding and sensitivity to older adults in the health care system. The study was conducted at a School of Nursing in the Midwest of the United States. It resulted in significantly improved student empathy towards older adults and a greater understanding of the health system and experiences with adults. It was concluded that incorporating games into the curriculum can be a useful educational strategy and can stimulate learning in a low-risk environment [15].

Ward

It is a simulation game to promote student decision-making, critical thinking and teamwork in clinical practice. One study evaluated the effectiveness and appropriateness of "Ward" in nursing students at Curtin University of Technology in Western Australia. "Ward" proved to be a useful simulation exercise that helped to promote the critical role of nursing student teamwork and close the gap between theory and clinical practice in a safe and secure manner [22].

Nursopardy

Game to review the material learned in Nursing Fundamentals. A study was conducted to evaluate the perceptions of nursing students and faculty at the University of Alabama in Huntsville. In the results obtained, this game helped them to review the teaching material

and given in the master classes, the students showed a preference in the use of the game to review the clinical material [23].

Captain Novolin®

Super Nintendo video game released in 1992 and starring the super hero who suffers from diabetes, who is the only one who can stop the alien Blubber man and rescue the mayor. Players earn points by correctly answering well-chosen questions about diabetes.

The game is sponsored by Novo Nordisk, manufacturers of Novolin® insulin.

This game is aimed at an audience between 8 and 14-years-old, mainly with diabetes, who by playing this game understand the foods they should avoid in their diet and those that are allowed, and develop the ability to interpret the amount of blood glucose, allowable limits and the administration of insulin guidelines [24].

Emergency

Emergency is a simulation-strategy video game developed by Sixteen Toons on Emergency Services. Throughout the missions, you will have to deal with incidents such as demonstrations, explosions, traffic accidents, shoplifting, fires, etc.

The player has the opportunity to identify himself as a policeman, fireman, doctor, nurse and pilot. Where in each mission he has to fulfill some extreme survival and rescue objectives [25].

In the cognitive, behavioral and affective sphere, these games that have been analyzed, show us the following characteristics [15,19,22,23]:

In the cognitive sphere: This refers to understanding and retention at the conceptual, strategic and procedural levels [18]:

- They taught the students specific terminology, concepts and action plans.
- They helped the students understand the physiopathology.
- Demonstrated the difficulty in procedures, in the application of protocols and action plans.
- They improved knowledge retention.

In the behavioural sphere (skills and development practice) [7]:

- Enabled students to put into practice the concepts they have learned through decision-making and to experience the consequences of their actions in an interactive environment.
- They improved student teamwork and related skills.
- Generated practical experience in making and executing medical decisions.

- Developed the analysis and decision making as well as the skills of the students.

In the emotional sphere [16]:

- They improved the students' attitudes towards discipline.
- They promoted the motivation and commitment of the students.
- They increased student satisfaction with the learning experience.

After reading a wide variety and extent of research, it has been possible to provide relevant data and useful information on the application of serious games and the benefits of gambling, both in nursing students and professionals.

The contributions of the different studies to the knowledge of the serious games in education have been presented and developed, with the purpose of adapting the teaching of Nursing to the different capacities and learning styles of the students, exploring its influence among the university teaching staff, as well as obtaining statistically significant results of the applicability of the gamification in the Nursing classrooms of the Spanish University System [26].

Conclusions

The application of gambling and serious games in the field of education to health professionals is beneficial. Health professionals who practice this discipline in different universities have preferred to complement the master classes with games, giving excellent results at the cognitive and academic performance level [5].

In spite of the results found, in practice the gamma components are not used due to the lack of resources, material and high teaching and learning loads of the teaching staff. This makes it difficult for teachers to apply ICT-based tools [27]. However, the implementation of gamma components in the new teaching guides would improve the academic performance of students in nursing and other disciplines.

Nursing students who have undergone the practice of serious games and gambling achieved greater learning than those who only attended traditional classes, which in turn was more fun and increased knowledge retention [7,13]. Teachers also consider games (Lissa, Pulse, Ward, Medication Geriatrics Game®, Nursopardy, Captain Novolin® and Emergency) to be innovative learning tools [15,19,21-23].

Games and gambling education have the potential to provide a new, cost-effective, quality approach that is flexible, portable, and enjoyable and allows interaction with tutors and peers [28].

Discussion

After reading a wide variety and extent of research, it has been possible to provide relevant data and useful information on the application of serious games and the benefits of gambling in health professionals.

The contributions of the different studies to the knowledge of serious games in education have been presented and developed, with the aim of adapting the teaching of the different capacities and learning styles of the professionals, exploring their influence among university teachers, as well as obtaining statistically significant results of the applicability of gamification in the acquisition of knowledge [26].

In the articles reviewed, it is noteworthy that six dealt with serious play applied to students, and ten articles were based on generalities of gambling in education. The benefit of the applicability of serious games is very satisfactory, both at the level of knowledge, techniques and practical treatments and at the level of satisfaction of the professionals [14].

References

- Gilbert JK (1995) Technology education: A new subject worldwide. *Science education* 13: 15-24.
- Nehring WM, Lashley FR (2009) Nursing simulation: A review of the past 40 years. *Simulation & Gaming* 40: 528-552.
- Muñoz CR, Breuer MS An Historical Look at Nursing Simulation.
- Lancaster RJ (2014) Serious game simulation as a teaching strategy in pharmacology. *Clinical Simulation in Nursing* 10: e129-e137.
- Graafland M, Schraagen J, Schijven MP (2012) Systematic review of serious games for medical education and surgical skills training. *British Journal of Surgery* 99: 1322-1330.
- Tandogan RO, Orhan A (2007) The Effects of Problem-Based Active Learning in Science Education on Students' Academic Achievement, Attitude and Concept Learning. *Online Submission* 3: 71-81.
- Baid H, Lambert N (2010) Enjoyable learning: The role of humour, games, and fun activities in nursing and midwifery education. *Nurse Education Today* 30: 548-552.
- Boctor L (2013) Active-learning strategies: The use of a game to reinforce learning in nursing education. A case study. *Nurse education in practice* 13: 96-100.
- Doyle GJ, Garrett B, Currie LM (2014) Integrating mobile devices into nursing curricula: Opportunities for implementation using Rogers' Diffusion of Innovation model. *Nurse Education Today* 34: 775-782.
- Gaudet J, Singh MD, Epstein I, Santa Mina E, Gula T (2014) Learn the game but don't play it: Nurses' perspectives on learning and applying statistics in practice. *Nurse Education Today* 34: 1080-1086.
- Skiba DJ, Connors HR, Jeffries PR (2008) Information technologies and the transformation of nursing education. *Nursing Outlook* 56: 225-230.
- Nevin CR, Westfall AO, Rodriguez JM, Dempsey DM, Cherrington A, et al. (2014) Gamification as a tool for enhancing graduate medical education. *Postgraduate Medical Journal* 90: 685-693.
- Gibson V, Douglas M (2013) Criticality: The experience of developing an interactive educational tool based on board games. *Nurse Education Today* 33: 1612-1616.
- Wattanasoontorn V, Boada I, García R, Sbert M (2013) Serious games for health. *Entertainment Computing* 4: 231-247.
- Chen AM, Kiersma ME, Yehle KS, Plake KS (2015) Impact of the Geriatric Medication Game® on nursing students' empathy and attitudes toward older adults. *Nurse Education Today* 35: 38-43.
- Ranchhod A, Gurău C, Loukis E, Trivedi R (2014) Evaluating the educational effectiveness of simulation games: A value generation model. *Information Sciences* 264: 75-90.
- Crookall D (2010) Serious games, debriefing, and simulation/gaming as a discipline. *Simulation & gaming* 41: 898-920.
- dit Dariel OJP, Raby T, Ravaut F, Rothan-Tondeur M (2013) Developing the Serious Games potential in nursing education. *Nurse Education Today* 33: 1569-1575.
- Boada I, Rodriguez-Benitez A, Garcia-Gonzalez JM, Olivet J, Carreras V, et al. (2015) Using a serious game to complement CPR instruction in a nurse faculty. *Computer Methods and Programs in Biomedicine* 122: 282-291.
- Bamber M, Graven L, Abendroth M, Park H, Grubbs L, et al. (2010) Embedding an unfolding geriatric case exemplar into nursing simulation. *Clinical Simulation in Nursing* 6: e108.
- Cook NF, McAloon T, O'Neill P, Beggs R (2012) Impact of a web based interactive simulation game (PULSE) on nursing students' experience and performance in life support training-A pilot study. *Nurse Education Today* 32: 714-720.
- Stanley D, Latimer K (2011) "The Ward": A simulation game for nursing students. *Nurse Education in Practice* 11: 20-25.
- Chan ZC (2013) A systematic review of creative thinking/creativity in nursing education. *Nurse Education Today* 33: 1382-1387.
- Frieberger P (1992) Video Game Takes on Diabetes Superhero "Captain Novolin" Offers Treatment Tips.
- <http://www.emergency3.de/>
- Sánchez García AB (2015) Use of ICT as a didactic resource in the university teaching of Nursing in the Spanish System.
- Fan K-K, Xiao P-w, Su C-H (2015) The Effects of Learning Styles and Meaningful Learning on the Learning Achievement of Gamification Health Education Curriculum. *Eurasia Journal of Mathematics, Science & Technology Education* 11: 1211-1229.
- Dunleavy D, Nikolaou CK, Nifakos S, Atun R, Yi Law GC, et al. (2019) Mobile digital education for health professions: systematic review and meta-analysis by the Digital Health Education Collaborative *J Med Internet Res* 21: e12937.