ORIGINAL ARTICLE

Put Aside the Traditional Classroom and Use Effective Technology: Puzzles- Entertaining Ideas for Educating Psychiatric Diseases

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ABSTRACT

Background: Using a variety of educational games is one of the most entertaining and effective teaching methods that can be used as one of the educational approaches in the current age.
Aim: To design a program of action games in the form of two-dimensional tables in Psychological Illnesses course, which is effective in learning.
Methods: In this study, the electronic game was designed in the form of crossword tables in Introduction to Mental Illnesses course and Mental Health course. In this style, which was done in the form of a product, at first, the subject matter and general areas of training were taught by the instructor. At aspecialized session after the completion of the course, the content of the course was designed electronically and in the form of an album, presented in the classroom, and then implemented as small groups in the classroom. This method was also used for other groups of public health, laboratory and medical students for the limited topics taught. The total number of students in the health department was 14, in the laboratory sciences there were 15, and in the medicine with limited topics 31.
The method was evaluated in two quantitative and qualitative sections. In the qualitative section, open-ended structured questions were answered qualitatively. Students' experiences from the curriculum, their role in their learning, and positive and negative dimensions of the course were studied. In the quantitative section, a questionnaire with 5 domains and 31 questions was used and its effect on learning was analyzed. The results were analyzed by descriptive and qualitative indices for the extraction of the content.
Results: The results were analyzed in two quantitative and qualitative sections. The quantitative results showed that the highest mean score for the item was the usefulness of the method, transparency and comprehensibility, ease of use, existence of a pure idea for learning, need for accuracy for the learning content, and fun for learning. Many items were also above average. The results of the qualitative analysis also indicated the effect of the method on students' learning and satisfaction. The final results of the research indicated that the use of training games in the form of crossword tables was effective on students' learning and satisfaction. It is necessary to consider the effective design of technology in education, the context of its design, and its effects on learning indicators in different groups.
Keywords: Game in Education, Medical Sciences, Crossword, problem-based learning, problem-solving methods

INTRODUCTION

Providing health services will be possible when students are able to adapt to the growing spread of medical knowledge, the complexities of the clinical environment, and the rapid technological change and its impact on the scientific needs of the community. The potential increase in information is considered a major educational problem; as a result of this information explosion, the highest percentage of goals in each training course is focused on knowledge[1].

Medical science education is associated with the complexities of theoretical and clinical teaching environment. Therefore, in order to achieve successful and effective training, as well as the quantitative and qualitative development of medical sciences, it is necessary to provide a basis for effective educational planning in order to increase the productivity of education[2].

However, the results of the research show ambiguity in the role of instructors and teachers on the one hand, and the role of students, inadequacy of educational situations, and existence of a gap between the clinical situation and the theoretical principles, on the other hand. This issue will exert its effects on the suitability and quality of care services[8,3].

A glance at the developments in the higher education system over the past two decades from the perspective of student population suggests a slight increase in education, lack of attention to the quality of universities, and the absence of efforts to promote it. However, due to increased awareness of the society, the level of expectations of people from the medical staff has increased[9].

The first wave of medical education reform was implemented by Fellsner in 1910-1940s, leading to a systematic approach to medical education which emphasized the importance of educational management and leadership. The second wave of reforms introduced changes in training methods and practices, and the third wave from 1990 to 2000 was influenced by changes and requirements caused by information explosion, increased complexity in the health system, a change in the pattern of diseases and the global population, and increasing health costs. Therefore, with these changes in the educational system, self-centered learning mechanisms should be used in educational planning. This issue is also included in the Third Wave of Medical Education Reform[10].

One of the challenges ahead of medical education is the volume of content and teaching and learning in a coded manner.Another challenge is adult education. When analyzing the meaning of adult education, we found five principles in its conception: (a) continuity and integrity; (b) essential education; (c) freedom of the structure; (d) utility; and e) considering the audience's needs. These principles state that adult education management at both macro-level and at micro- level, as one of the infrastructures of the national education system, requires access to education and improvement of the quality of education[11].Using a variety of educational games is one of the most entertaining and effective teaching methods that can be used as one of the educational methods in the current age[12].

Types of educational games are divided into virtual environment simulations, collaborative games, and simulations in the real environment[13].Learning through the gamet has many merits, and one of its main benefits is the rewards inherent in this method because it simply increases understanding of lifelong learning.
Some experts also believe that the educational game is fully consistent with the learning cycle and can be an effective way of transferring learning experiences in the learning cycle with four phases of objective experience, interactive observation,abstract conceptualization and active experimentation. They also hold that the game with its own specific conditions allows for the creation of an active experience in this learning cycle[15].

Game-assisted teaching strategies can be used in large and small learning groups, along with speech teaching techniques, seminars, clinical teaching, and electron microscopy learning[16].Using this method in medical education also comes with several benefits, including provoking active learning and promoting student understanding. It also provides the possibility for more student interaction and enjoyment of class for them[17]. In addition, the use of image, sound and animation will create more diversity and increases the student participation in learning.

Experts indicate that one of the reasons for the success of the game method, as compared with other methods of learning, is creating interactive and participatory learning partnerships[18]. Due to the complexity and similarity of the signs and symptoms of mental illness that has made it difficult for students of medical sciences to learn the content, and because of the large amount of content, we made a attempt to use a variety of two-dimensional tables in a new way, i.e., different forms of designing a mobile application in the form of a two-dimensional puzzle game in the mental illness unit. The purpose of this study was to design a program of action games in the form of two-dimensional tables in Psychological Illnesses course which is effective in learning.

METHOD

In this research, the first step was to provide advice on how to work with the technical and scientific specialty and, after making it feasible, a two-dimensional puzzle method was proposed in the form of a variety of tables. Various studies suggest using this method in training. Thus, at first, a variety of two-dimensional puzzles were considered in the design, and the samples were discussed technically and then scientifically. In this regard, the tables were sorted out from different groups of mental illnesses; then, pharmacological and non-pharmacological drugs in different forms of two-dimensional tables were formulated as conventional tables. Writing important sections in multiple boxes is based on a variety of puzzle game models to create diversity, recreation and motivation along with learning and memorization for learners. Sometimes the disease or drug was written in the form of a table and the specialized content was designed inside it.

After completing the scientific departments, the technical design was created based on converting them to album according to the tables and questions, correcting the answers, and making them accessible to the students at Jahrom University of Medical Sciences website.

In this design, which was developed in the form of a product on the students of the Department of Health through the Mental Health course, at first, the subject matter and general areas of study were taught by the teacher. At a special session after the completion of the course, the content of the course was designed electronically and in the form of a book, and then presented in the presence of others. Then, by checking the correct answers at the end of the table, they checked their performance in the class. This subject, while challenging and appealing to the group work, provided feedback on the students' knowledge of the subject of learning instantly and in the classroom for all students. It also provided the possibility of supplementary explanation by the professor. This method was also used for another group of students with 20 people who passed the Mental Health course the previous year. Their opinions were also examined. It was also used in experimental and medical sciences groups for the limited number of subjects taught (psychosis-anxiety and mood disorders). The total number of students in the health group was 14; in the laboratory sciences it was 15, and in the medicine with limited topics 31.

To evaluate this method in learning and the level of satisfaction, the structured questions were answered qualitatively. Students' experience of the curriculum, its role in the students' learning, and the positive and negative dimensions of the lesson were studied.

In the other part, the effect of teaching method on learning and its indicators was evaluated in a questionnaire with 5 domains and 31 questions. This checklist was prepared by experts, using the same articles[19].

RESULTS

In the health group, there was 1 male and the rest students were female. In the group of laboratory sciences students, 5 were male and the rest were female. And in the medical students group, of the total number of students who used the puzzle, 10 subjects were studied, of whom three were male and the rest were female. Qualitative content analysis was achieved by coding and extracting the content, resulting in the following:
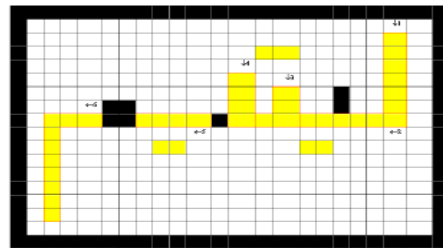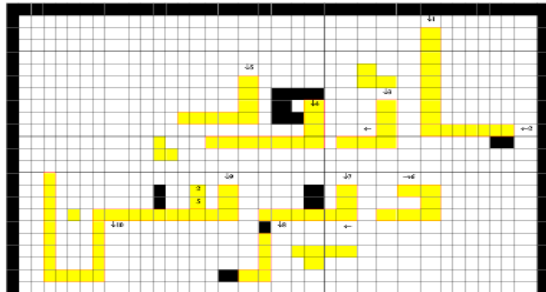
The results showed that the highest average scores were related to the items of the usefulness of the method,

transparency and comprehensibility, the ease of use, the existence of a pure idea for learning, the need for accuracy for learning content and fun for learning. Many items were also above average.
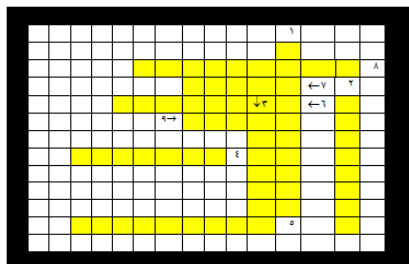
In the field of the game impact on learning, the results of the research showed that game play can have a positive impact on students' learning. This was done in the general group. Considering the additional score for the students participating in the game, it was not possible to compare all the groups and the only comparison in the health department was due to the participation of all students.

Themes extracted in qualitative analysis
- Create a fun and motivational environment for learning
- Create a healthy and team-friendly competition among students
- Increase students' learning and retention

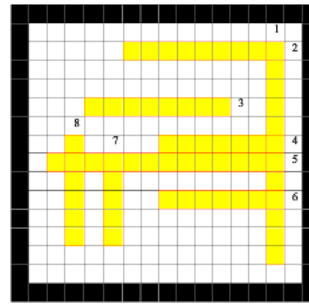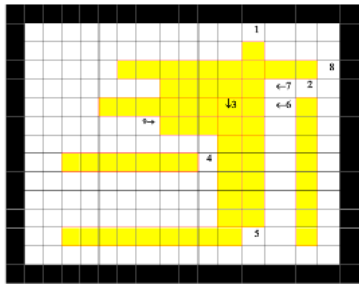| |
| --- |
| - Need to be precise and previous study |
| - Mastery of learning |
| - Increase retention |
| - Being different compared to the traditional education |
| - Nice and effective technology |
| - A good sense of mastery of learning findings |
| - Learning's being hard but being challenging and fun |
| - lack of getting bored with learning |
| - Its potential to be extended to the educational designing the rest of the lessons |
| - Learning from the mistakes of knowledge in understanding the content |
| **weak points** |
| The difficulty of the questions and the need for full mastery of learning content |
| The need for a complete understanding of the content of the course |

Fig. 1: Pictures from puzzle album

داروهای ضد اضطراب

١- شایع ترین عارضه بنزودیازپین هاست.
٢- مهمترین عارضه جدی در مسومیت با بنزودیازپین ها است.
٣- از داروهای بنزودیازپینی کوتاه الاثر است.
٤- از بنزودیازپین های طولانی الاثر است.
٥- این داروی بنزودیازپینی به عنوان شل کننده عضلانی و قبل از آندوسکوپی استفاده می شود.
٦- داروی ضداضطراب بدون خواص خواب آوری و تسکین بخشی است.
٧- عارضه جانبی بنزودیازپین ها که می تواند باعث سقوط و شکستگی در سالمندان شود.
٨- در بیماران با اضطراب و وسواس جبری کاربر بیشتری دارد.
٩- مکانیسم اثر بنزودیازپین ها بر روی گیرنده های .... می باشد.

Items	Mean	SD	SE
Perceived Usefulness Items (PU)/Measurement			
Using the online gamification system improves my learning performance	3.87	0.81	0.12
Using the online gamification system increases my learning outcome	3.79	0.81	0.14
Using the online gamification system enhances my desire to produce desired result in my learning	3.90	1.30	0.11
Using the online gamification system is useful in my learning	4.30	0.67	0.13
Perceived Ease of Use Items (PEOU)/Measurement			
I find the online gamification system to be flexible to be used	3.78	0.81	0.14
The online gamification functionality and interface is clear and understandable	4.60	1.12	0.12
Interacting with the online gamification system does not require a lot of my mental effort	2.30	1.54	0.2
Overall, I believe that the online gamification system is easy to use	4.03	0.54	0.09
Attitude (A)/Measurement			
I think that using online gamification system is a good idea	4.18	1.23	0.22
I like learning with online gamification system			
I look forward to those aspects of my learning that require the use of online gamification system	3.72	1.34	0.21
Skill Engagement (SKE)/Measurement Online gamification system encourage me in			
Taking good notes in classroom	3.09	1.28	0.21
Listening carefully in classroom	4.81	1.20	0.12
Making sure to study on regular basis	3.21	1.12	0.13
Interaction Engagement (IE)/Measurement gamification system contribute to me in			
Having fun in the classroom	4.03	0.52	0.04
Participating actively in small-group discussions	3.73	1.23	0.22
Helping fellow students	2.89	1.32	0.33
Asking questions when I did not understand the lecturer	2.95	0.65	0.34

Variable	year	Number of students	Mean	sd	T	p-value
Student score	2017	15	16.83	0.97	5.017	0.001
	2018	16	18.12	1.13		

DISCUSSION

The results of this study confirmed the positive impact of this method on learning and indicators such as creating a fun and motivational environment, increasing learning and retention of students, developing mastery of learning, increasing retention, developing a good sense of mastery of learning, findings, challenge, and fun.

The results of O'Leary's study, comparing satisfaction and learning using the traditional method and educational games in the teaching of ectopic pregnancy, showed that most students were more satisfied with the traditional method and that the students' engagement was more than traditional methods, due to enjoying learning in this way[20].
In teaching nutrition through two lecture methods and two role-playing and play techniques, the results showed that the amount of learning was greater in play and play rol[21]. Several other studies have also emphasized the priority of

the method of play over the lecture method[23,22], which emphasizes the positive impact of games on the students' learning and confirms the results of the present study.

In another study, conducted by Selby et al. on the children's developmental education the results showed that this method had a greater impact on dentistry students than lecture technique. However, this method had no effect on the results of skiing[24]. In this research, the role of games was emphasized in the promotion of knowledge. In the present study, the role of the game has been emphasized in the promotion of learning in the quantitative and qualitative study of the results.

In reviewing the role of educational games on students, the results of the three studies showed that this learning method had no effect on the students' knowledge. The researcher suggests further studies with valid designs to confirm the results[25]. The results of this study is not in

the same line with those of the present study and other pieces of evidence.

In the study of Bhoopathi, aiming to review the impact of the use of educational games on mental health lessons, the results of the comparisons from the analysis showed that the students' score increased by 10% using the game strategy. This represents 6 scores higher than those in the control group[26]. The results of this study confirm those of the present study in terms of its impact on learning in the public health group.

Begg believes that the decision to replace the game method in medical science education should be done by taking into account the potentiality and cost-effective potential of the method against costs, time and effort for its development and application of game plays[27].The fact that culture-building in the implementation of new technology-based methods requires attention to a dimension of that field emphasizes the need to focus on the development of this field in the development of recruitment.

Others argue that the use of games in education requires mental adaptation with its usefulness in education. Among these, attention is given to active learning as an educational experience, which appears in the form of thinking at higher levels through the use of effective intellectual processes such as analysis, synthesis and evaluation (28, and 29).
Da Rosa et al. (2000) found that this method reduced thestudents' stress and anxiety and increasedtheir excitement and motivation in their education[30]. The results of this study are consistent with the content analysis of the qualitative results of the present study.

Also, Ecker and others emphasize the role of this method in reminding and improving feedback[31].Others, in using the game in Physiology course, found that this method has a significant role in enriching the learning environment[32]. These results emphasize those obtained by the present study.

Conflict of interest: None to declare

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