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Dr. MP Brundha
Assistant Professor, Department of Pathology, Saveetha Medical College, Saveetha Institute of Medical and Technical Sciences, Poonamallee High Road, Velappanchavadi, Chennai, Tamil Nadu, India

Dr. Akshaya K
Graduate, Saveetha institute of medical and technical sciences, Poonamallee High Road, Velappanchavadi, Chennai, Tamil Nadu, India

Correspondence
Dr. MP Brundha
Assistant Professor, Department of Pathology, Saveetha Medical College, Saveetha Institute of Medical and Technical Sciences, Poonamallee High Road, Velappanchavadi, Chennai, Tamil Nadu, India

Use of crazy card games in understanding pathology-research

Dr. MP Brundha and Dr. Akshaya K

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Abstract
Aim: To analyze the use of Crazy Card games in understanding Pathology by a comparative study.
Introduction: The scheme of using games to seize the attention students in the process of active learning is not that really new. Over the past several years, educators have been progressively encompassing various games into their teaching syllabus in an effort to create interactive and fun filled learning environment for students. Although this can be little time taking, interactive, collective and competitive games tend to boost and induce students to actively participate in the process of learning. One such game is using of Crazy Cards in recalling difficult differences between pathological terms.
Materials and Methods: A Sample size of 150 second year undergraduate students was selected by using Random sampling method. The sample population was grouped into two. Group A consists of 75 students, who were exposed to Crazy Card games, Group B consists of 75 students who were not exposed to crazy card games.
Inclusion criteria: Second year Undergraduate students who haven't learnt those topics earlier.
Exclusion criteria: Undergraduate and Postgraduate Student who have previously learnt those topics. Also, students who do not have pathology as their main subject were omitted. Topics for Crazy Card games were taken. Both the groups were made to take tests on the topic and the results were statistically analyzed, compared and thus interpreted.
Result: There is a significant increase in the marks obtained by the students who learned by playing crazy card games. Thus, this kind of teaching methodology proves to have a positive impact on students to study pathology.

Keywords: Academic cards, game based learning, pathology, crazy cards, teaching methodology

Introduction

The term Pathology springs from a pair of Greek words and refers to the study of disease. curiously, in Modern Greek, a Pathologos could be a physician. Pathology represents a basic link between the essential sciences and clinical medication, and between the normal and the abnormal [1, 2]. It is, therefore, central to the study of drugs and makes a literature review relevant to any or all academics and learners. Pathology encompasses tissue pathology, hematology, clinical chemistry, biology, medicine and, more and more, molecular pathology. Boundaries could also be vague because those of laboratory pathology take issue from those of academic pathology. The subject pathology addresses four parts of disease. They are aetiology, pathogenesis, morphologic changes, and the clinical manifestations. In common practice, general pathology is usually involved with analyzing noted clinical abnormalities that are markers or precursors for each infectious and non-infectious illness and is conducted by specialists in one among two major specialties, anatomical pathology and clinical pathology. Additional division's example, Cytopathology, Hematopathology, and Histopathology, Oral Pathology and Forensic Pathology also exits in Pathology.

A game is "a contest that has specific rules and regulations, with the aim to amuse or reward the gamers". Hays (2005) provided the subsequent definition of a game: "A game is associate by artificial means made, competitive activity with a selected goal, a group of rules and constraints that's placed in a very specific context." [3]. Games are interactive, that promotes explicit behaviours like individual management, trial- and-error and constant amendment. Games offer set experiences within which players are involved in advanced problem-solving tasks [4, 5]. Educational games are purposeful activities that embody acts, followed by a definite rule allotted by the teacher so as to serve the emotional and academic psychologically featured goals [6].

They are designed to help students in learning a talent as they play, conjointly facilitate improve their thinking, creative thinking and increase the power to retain information. Scientists believe that instructional games will unlock the scholars thinking and increase the sensation of fun during learning, so cut back the burden of delivered information given by the academician. They conjointly sustain and inspire student's interest in learning [7]. Incorporation of games into education is usually more practical than ancient teaching strategies in enhancing learning motivation, active participation, and concentration among students. Moreover, games will enhance the social skills of scholars similarly as improve their skills in understanding and resolution issues [8]. Active engagement of the scholar following the "learning by doing" theory with active authentic exercise and tasks, produce experiential learning setting that will increase the extent of students' achievements [9, 10].

Game Based Learning (GBL) has emerged from a concept to involve games within the instructional method, going to enhance learning activities through a remarkable media that captures, retains student attention and interest in subject, further as offers intuitive and cooperative surroundings [11, 12]. GBL situations have interaction learners into interactive, problem-solving things that encourage critical thinking, communication, collaboration, and flexibility for useful data acquisition. Additionally, the game-players are typically extremely intended to have interaction within the play activities, driven by the story/goal behind, interactivity and chance to enhance performance through repetition. Hence, game based learing will have interaction and inspire students to actively method instructional content and foster development processes within the kid consciousness, further as improve expertise, self-efficacy, and students' satisfaction in similar learning environments [13, 14, 15].

There is a large type of academic games out there on the market, therefore teachers' selections is of greater significance. Board games are nice in participating students – by providing a playful; however competitive atmosphere, they assist to specialize in content and reinforce the educational expertise. The board itself could be a sensible technique for visualizing data. By playing, pupils will organize the information they have learned into conceptual frameworks, rendering it a lot of concrete. Some board games conjointly need pupils to play in groups, fostering collaboration and problem-solving skills. Board games may be simply incorporated into the program that the bulk of scholars are already acquainted with the board game interface and may simply adapt their recreation skills to a learning context. The greatest advantage of board games is their low price – lecturers won't want any specialized instrumentality and may purchase only 1 game set to be utilized by everybody. Except for using board games as a filler for period of time, lecturers can request that students create board games themselves – check this guide for a few inventive concepts. The only risk within the classroom use of board games lies in organization. Before introducing a board game, lecturers have to be compelled to set up the activity alright so as to protect themselves against potential chaos.

Biggest drawback of digital game-based Learning is it goes without saying-cost. Video games requires electronic equipment, which needs to be purchased prior to incorporating them into the curriculum. Mature teachers might benefit from additional training in order to become tech-savvy enough to manage the gaming experience without any hitches. Technical problems will also require the assistance of a technician, and generate additional costs.

The traditional methodology of reading textbooks is depicted as a normal activity by the scholars, and this could be turned to be loads of pleasant activity by using some innovative techniques. The crazy card is one such innovative technique that has created interest among the students. This was clearly visible among the rating and comments given by the students for this technique. one in every of the scholar delineated "In this methodology of learning, the amount of your time needed for learning is less and it's a lot of efficient", and some students expressed that learning by such kind of card games created more attention and they were able to bear in mind the subject for extended time. Many students felt that this may be far better than the boring lecture. Thus, the necessity of the hour in medical teaching is to shift from the teacher centered normal ways to student centered innovative ways, as a result of the aim of education is not merely making a student literate, but adds clarification thinking, initiation, and self- sufficiency. The crazy card games is one such innovative technique, that was found to be useful in basic cognitive process things beyond the routine methodology of reading texts and this strategy was found engaging by the learners [16].

Games are omnipresent part of life in our culture, and specialists recommend that they will become even a lot of deeply embedded in the upcoming years. Games facilitate individuals develop a disposition toward collaboration, problem-solving, communication, experimentation, and exploration of identities, all attributes that promote success in an exceedingly rapidly-changing, information-based culture. Analysis into the psychological feature and socio-cultural aspects of diversion has exploded in the last decade as individuals have begun to comprehend the potential for game-based learning [17].

Educational games are games expressly designed with academic functions, or that have incidental or secondary academic value. all kinds of games may be employed in an academic setting. academic games are games that are designed to assist individuals to learn regarding certain subjects, expand ideas, reinforce development, perceive a historical event or culture, or assist them in learning a ability as they play. Game types embody board, card, and video games. an academic game may be a game designed to show humans about a specific subject and to teach them a skill. As educators, governments, and parents notice the psychological need and advantages of gaming have on learning, this academic tool has become thought. Games are interactive play that teaches students goals, rules, adaptation, drawback resolution, and interaction, all diagrammatic as a story. They satisfy our elementary schooling ought to learn by providing enjoyment, passionate involvement, structure, motivation, ego gratification, adrenaline, creativity, social interaction and feeling in the game itself while the learning takes place. Students learn through the process of playing the game. By playing a game, students may be able to understand a new concept or idea, take on a different perspective, or experiment with different options or variables. Games provide a context for engaging practice. Through games, students can learn a variety of

important skills. There are countless skills that students can develop through game playing such as critical thinking skills, creativity, teamwork, and good sportsmanship. While playing games, students develop a variety of connections with the content and can form positive memories of learning. Games grab students' attention and actively engage them. Aeducational card game is any game using playing cards as the primary device with which the game is played and knowledge is sought, be they traditional or game-specific. Countless card games exist, including families of related games in education. The crazy card games played with traditional innovations have formally standardized rules that aid students in the process of learning.

The success of game-based learning methods owes to active participation and interaction being at the centre of the experience, and signals that current academic strategies don't seem to be engaging students enough [18]. Expertise with an affinity for games as learning tools is an progressively universal characteristic among those getting into higher education and therefore the force. Game-based learning is an expansive class, starting from easy paper-and-pencil games like word searches all the way up to complicated games. The intrinsic learning method of games is what makes a game pleasant. The progress a player makes in an exceedingly game is through learning. it's the method of the human mind grasping and coming back to know a brand-new system. The progress of understanding a brand-new conception through gaming makes an individual feel a way of reward and motivates the students in learning more eventually.

Most studies on game-based learning have targeted on digital game-based learning. Digital games offer animated graphics and audio effects furthermore as immersive stimulation. Lin and Liu enclosed game mechanisms in typing practice, tantalizing learners to beat their rivals. Though the progress of those learners wasn't considerably bigger than that of learners learning using typical teaching techniques, but their typing skills were considerably higher than before the experiment. Lin and Liu additionally discovered that learners within the game mechanism group spent significantly longer time practicing typing than their counterparts within the regular category, thereby demonstrating that transmission will influence the educational motivation of scholars. Chiang, Lin, Cheng, and Liu explored the influence of varied laptop games on the flow expertise and positive emotions of scholars and discovered that violent games didn't induce violent emotions or conduct in students. Moreover, they found that each violent and non-violent game were capable of eliciting flow expertise and positive emotions. As shown in these studies, digital games will thus enhance learning motivation and will cause arousal of positive emotions in students; but a digital game setting cannot offer face-to-face interaction [19, 20, 21].

This study focuses and analyzes the crazy card game in understanding of pathology concepts in classroom set up.

Materials and Methods

A Sample size of 150 second year undergraduate students was selected by using Random sampling method. The sample population was grouped into two. Group A consists of 75 students, who were exposed to Crazy Card games, Group B consist of 75 students who were not exposed to crazy card games.

Inclusion criteria

Second year Undergraduate students who haven't learnt those topics earlier.

Exclusion criteria

Undergraduate and Postgraduate Student who have previously learnt those topics. Also, students who do not have pathology as their main subject were omitted.

Game preparations

This game was created for topics which differentiate two concepts of Pathology. For example, 'Difference between Exudate and Transudate', 'Difference between Dystrophic calcification and Metastatic calcification'. The differential points of each concept for example exudate and transudate were written individually on totally different pieces of cards. Each card contained a characteristic feature of either concept. Those cards were shuffled, then given to each student and allowed to segregate those cards according to the characteristics of the concepts.

Methodology

In our study, the topic chosen for crazy card games was 'Difference between Exudate versus Transudate' (Table 1). Exudate and transudate are the fluids that leak out from the capillaries during an inflammation. The exudate and transudate differ from each other by various differential characteristic features. Initially both the groups were made to attend a lecture class on the difference between exudate and transudate for 20 minutes. Students usually confuse themselves while learning the differences based on the similar topic. In order to overcome the confusions and to make them understand the differences clearly and to analyze their knowledge on the given topic group A students were thus exposed to crazy card games. The differential points on exudate and transudate were written individually on totally different pieces of cards. Each card contained a characteristic feature of either exudate or transudate. Those cards were shuffled and students from Group A were made to individually segregate those cards separately into exudate and transudate. Group B was exposed only to lecture class for 20 minutes and not to the game. Both groups were then made to take tests on Difference between Exudate and Transudate for five marks and the marks obtained by each student were tabulated. The test results of both groups were analyzed, compared and interpreted statistically and its significance was verified.

Table 1: Difference between Trasudate and Exudate

Transudate	Exudate
Caused by Changes in osmotic pressure	Damage to capillary blood vessel
implies systemic problem	implies local problem
clear appearance	Turbid in appearance
Low specific gravity <1.015	High specific gravity >1.015

low protein content <30g/l	High protein content >30g/l
Low cellularity	High cellularity
Gives pitting Edema	Gives non-pitting edema
common causes: congestive heart diseases, Hypoproteinemia - renal failure, cirrhosis	common causes: Malignancy Inflammation Chemotherapy and radiotherapy

Data Analysis and Results (Table 2-5)

Null Hypothesis: There is no significant difference between the two groups

Alternate Hypothesis: There is significant difference between the two groups.

Table 2: Mean and standard deviation

Group	Group One	Group Two
Mean	2.793	2.120
SD	1.214	1.153
SEM	0.140	0.133
N	75	75

Table 3: Pass Percentage

Groups	Pass percentage	Fail Percentage
Group A	62.66	37.33
Group B	36	64

Table 4: Number of top scorers

Groups	No. of top scorers
Group A	28
Group B	7

t-test

Mann-Whitney Rank Sum Test

Table 5: Statistical analysis

Group	N	Missing	Median	25%	75%
Col 1	75	0	2.000	1.000	3.000
Col 2	75	0	3.000	2.000	4.000

Mann-Whitney U Statistic= 1916.000

T = 4766.000 n (small)= 75 n(big)= 75 (P = <0.001)

The difference in the median values between the two groups is greater than would be expected by chance; there is a statistically significant difference (P = <0.001)

Alternate hypothesis was accepted.

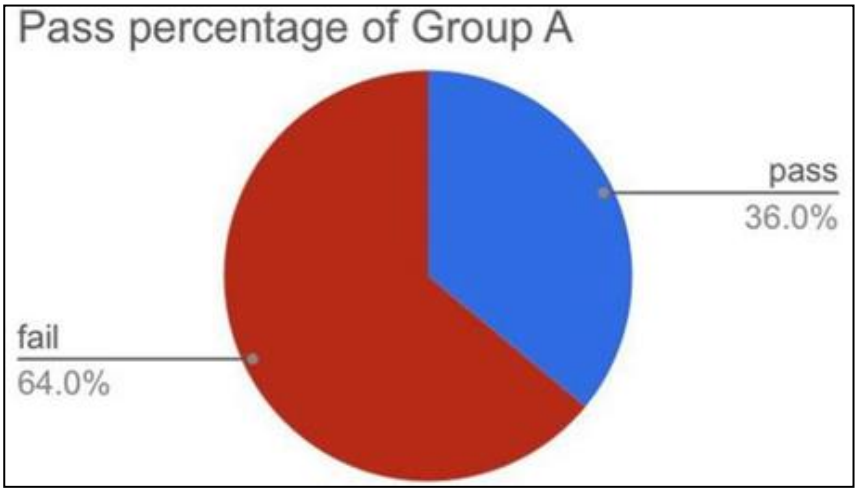

Fig 1: Pass percentage of Group A

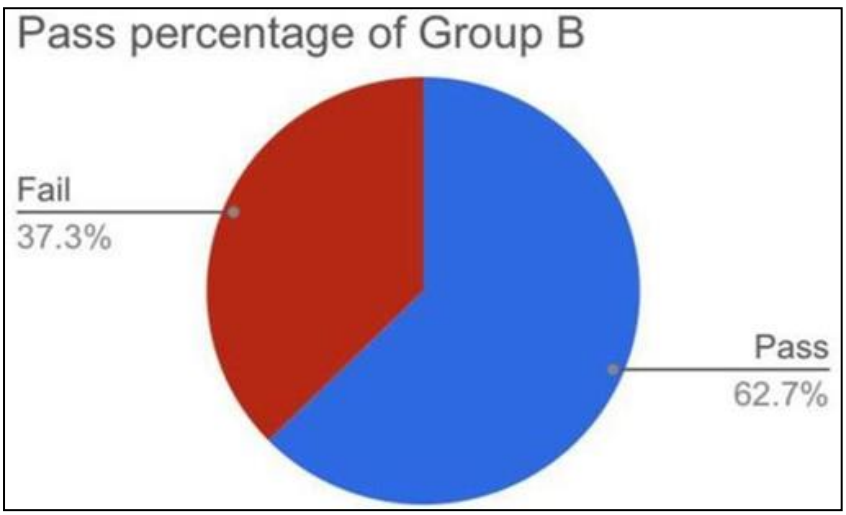

Fig 2: Pass percentage of Group B

Purpose of this study was to see whether or not game-based learning using cards might assist primary school students in the acquisition of information this excited learning methodology. The participants displayed positive attitudes toward the employment of the science cards and felt that the approach contributed to learning. The bulk of scholars accepted this learning methodology and hoped to continue using this approach in the future. The scholars additionally expressed that learning with the academic cards might assist them to gain scientific knowledge which the game-based learning methodology raised their interest in modes of transport and energy.

Mean and variance derived for every construct of the satisfaction scale are conferred in Table 2. The median value is shown in Table 5. For Group A the mean value is 2.79 with a standard deviation of 1.2139. For Group B the mean value is a bit lower than the Group A that are 2.12, and the standard deviation of 1.1532.With these values the statistical analysis, Mann-Whitney Rank Sum Test was done and the p value of less than 0.001 was obtained which showed that students of Group A exhibited systematically positive responses for all constructs. They have also attained notably high scores, indicating that the students have gained information and knowledge by learning with the card games. These results additionally show that game-based learning aroused student interest in learning.

Additionally, the positive influence of the crazy card games in understanding pathology can all be verified by comparing the pass percentage of both the groups. The pass percentage was fixed as per the institutional standard that was 50% of the total marks. As shown in the Table 3 and figures 1, 2, again Group A peaks the pass percentage to 62.66%, while Group B has a pass percentage of 36% that is relatively lesser in comparison. So thus, pass percentage and the mean value of the marks of Group A seemed to be greater than that of Group B. This indicated the positive influence of the game on learning and retaining pathological concepts. The test results of group A and B demonstrate that the card games considerably raised the student's scientific knowledge. From table 3 it is also evident that number of marks that topped the examination was comparatively higher in group A who were made to learn through crazy card games. Eric ZhiFengLiua,b and Po-Kuang Chena's article on game based learning also proved to show positive results similarly [21].

In a classroom scenario, teacher-student interactions and student-student interactions exert a profound impact on learning. Not like interactions in digital games via computers using images and need of technological knowledge as the study ' Hide and Seek in Pathology, A game based learning of Histopathology'[22] although it showed a positive impact on learning and understanding, face-to-face interaction exposes folks to human expressions, physical action, and verbal tones. Thus, academic card games as a medium for game-based learning may enhance the direct social interaction between lecturers and students, furthermore amongst students too. By handling the cards and moving the character items themselves and cooperating with peers through direct verbal communication, students will move with each other and learn merrily from within [23]. Our study is well correlated with this study that the crazy card game is superior than all the digital based games for learning pathology concepts.

In recent years, research on education using card games has made a valuable benefaction to the discipline. Educational card game not only elevated the learning motivation of students but also assisted them in understanding higher conceptual abstractions. The employment of such card games also aids in reducing the test anxiety and promote better learning effectiveness also the learning effectiveness of high-priced equipment for digital games can be matched by using inexpensive or even self-handmade card games [24].

Conclusion

Also, these kinds of games help in instant recalling and retention of concepts, it helps in developing problem-solving skills additionally instant feedback from the practitioners is also possible. Also, now a day's new discovery of digital game-based learning is storming. But no digital game-based learning shows so many advantages such as non-digital games in the process of learning is cost efficient, few prerequisite skills are only required, enhances social interaction and also creates no burden on the learners and teachers in terms of resourcing. On the basis of all our research it can be concluded that such games be used in all fields of learning to make learning effective.

Conflict of Interest

The authors declare there is no conflict of interest.

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