

Perception of Nursing Students and Educators toward Using the Game-Based Learning as an Active Learning Strategy

Maysa Saber M. Ismail¹, Abeer Abd El Fattah Abou Shosha²
Hend Abo Elsoad Ahmed³

¹Lecturer Pediatric Nursing Department Faculty of Nursing - University of Damanhour Egypt

²Assistant Prof. Nursing Education Department, Faculty of Nursing - University of Damanhour Egypt

³Lecturer Nursing Education Department, Faculty of Nursing - University of Damanhour Egypt

Corresponding Author: Maysa Saber Ismel

Abstract: The use of Game-Based Learning (GBL) has been recognized as an active learning strategy that can help students achieve their goals. Engagement in GBL has assisted students in the retention of knowledge, promotion of problem-based learning, and critical thinking skills.

Aim of the study: to investigate nursing students' and educators' perception on the use of GBL as an active learning strategy. An explanatory descriptive mixed-method study design was adopted. The study was conducted at faculty of nursing Damnhour & Alexandria University Egypt. Using the equal allocation method, a convenient sample of 100 undergraduate nursing students registered at pediatric nursing course from Damnhour and 100 from the same department from Alexandria University, beside 30 educators from Damanhour & 30 from Alexandria. The study was done during the first semester of the third year of the academic year (2017-2018). Tools of data collection: Part (I) students' basic data structured questionnaire to identify the students' & educators' personal and academic data. Part (II): three tools were used for data collection. Tool (I): structured interview questionnaire of Nursing Students' & educators' perception on GBL. Tool (II): Competency Level Information scale. Tool III: A structured Focus Group Discussion Guideline. Results: Students and educators perceived GBL as a beneficial and motivating teaching strategy, with statically significantly difference. Educators and students have positive attitudes toward using it. Students had moderately high competence information level.

Conclusion: GBL proved to be a beneficial and motivating teaching strategy; educators and students have a positive attitude toward using it.

Recommendations: Educators continue to use GBL and adequate training to the novel educators on GBL.

Keywords: Active learning, critical thinking, experiential learning, Game-Based Learning, and innovative teaching strategies.

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I. Introduction

A game is defined as an "artificial situation in which players, place in a conflict with one another or versus other forces, are controlled by rules that structure their responses in order to meet learning outcomes and a goal determined by the game" ⁽¹⁾. While, a Game-Based Learning (GBL) is "an instructional method demanding the learner to contribute in a competitive activity with preset rules" ⁽²⁾.

Educational gaming is a type of active learning in which the students are provided information and then extend this knowledge to prompt and pertinent situations (Smith, 2002) ⁽³⁾. By using GBL, students have a chance to experiment with decision making, problem solving, and involving in discussion in an active learning environment ⁽³⁾. According to Kolb (2009) who examined experiential learning, found that learning occurs when students are provided the chance to acquire and apply knowledge, skills and feelings to a direct and relevant setting. The Experiential Learning Theory displays "two dialectically related modes of grasping experience; Concrete Experience (CE) and Abstract Conceptualization (AC) and two dialectally related modes of transforming experience; Reflective Observation (RO) and Active Experimentation (AE)". The Concrete Experience refers to the experience or activity that the learner is participated in. Reflective Observation involves observation and feedback on the experience from different perspectives. During Abstract Conceptualization the learner believes about or analyzes what was observed and Active Experimentation is where the learner acting or planning new experiences ⁽⁴⁾. A different GBL layout has been used as teaching strategies. Types of these formats such as: Games-Based on television shows (Jeopardy, Wheel of Fortune, Who Wants to be a Millionaire, etc.), board games, computer games, video games, crossword puzzles, and query and respond

quizzes. The 2006 Horizon Report identified four types of games: simulations, virtual environments, social and cooperative play, and substitutional actuality games⁽⁵⁾.

Moreover, competence involves a blending of the knowledge, skills, and behavior that a professional needs to have the ability to perform a certain role. Accordingly, competence is sophisticated requiring multiple strategies for assessment and promotion⁽⁶⁾. Commonly, GBL have been noticed positively and advised as a way to induce and magnetize students in learning. The existing generation of college students, known as the Net Generation, tends to be experiential learners; they select to learn by doing, as contrary to learning by listening⁽⁷⁾. However, nursing educators persist to depend on traditional methods of teaching. A game is prepared to be enchanting while at the same time challenging students to activate their knowledge in a various way⁽⁷⁾. Boctor (2012)⁽⁸⁾ states that recognizing and applying "innovative teaching strategies to direct the students' generational diversity is vital for widening students' retention and progress"⁽⁸⁾.

Furthermore, advantages of gaming were noticed from novelty, content competence from review, promoted critical thinking, decreased anxiety, raised engagement, reduced monotony, encouraged fun, and promoterelaxation. Nurse educators, like many other teachers, are usually required to deliver a special curriculum. As well as making learning interesting (Henderson et al. 2005)⁽⁹⁾, the use of different teaching strategies can also foster students' capability. A new attitude towards the concept of active learning methods is supposed to be the base for the growth of gaming as a strategy. However, despite the positive attributes of GBL, potential challenges can also emerge. While enhanced enjoyment and reduction of stress are viewed as constructive aspects, it is also argued that gaming can potentially lead to anxiety and confusion. Additionally, educators have been resistant to apply games⁽¹⁰⁾. Arranging time, cost, time limitation, and great class sizes have been determined as causes for not applying games. Students' dissatisfaction with educational gaming can be related to the confusion of not answering a question correctly, and competition among classmates can be intimidating. Additionally, intensity of time use, a stress creator, an inconsistent evaluation tool, competitive, costly to develop, and relying on orientation and debriefing periods were also disadvantages of applying games^(10, 11).

In a study done by Montpas (2004)⁽¹²⁾, a Jeopardy review game and traditional lecture were compared to see if there was a difference in achievement and retention of geriatric nursing concepts in associate degree nursing students. The group was divided into a comparison and treatment group. The comparison group was given a pretest followed by the lecture, followed by the posttest. The treatment group took the pretest, received lecture, and played the Jeopardy game, followed by the posttest. In order to assess the retention of the information, both groups were given another posttest two weeks after the original posttest was given. The results revealed that the lecture method produced higher achievement scores but the use of a game demonstrated more retention of the material. Gaming confirmed to be a beneficial teaching strategy^(9, 12).

There is a little research available on the perspectives of nursing educators as well as the students from the same facilities on the applying of GBL. This study will address both nursing students' and nursing educators' perspectives on the application of GBL as an active learning strategy. It will inquire about their experience with the use of GBL and their attitudes regarding the application of GBL in the classroom.

Significance of the study: The existing generation of college students, tends to be experiential learners; they need to learn by doing and through active activities, structure, the use of technology, and co-operative work. Game- Based Learning has been recognized as a method to teach this generation.

1. Research aim and questions

Aim of the study: to investigate the perception of nursing students and educators on the use of GBL as an active learning strategy.

Research Questions:

1. To what extent and for what purpose is Game- Based Learning being used in the nursing classroom?
2. Does Game- Based Learning motivate students to learn? (From both the nursing students' and nurse educators' perspective).
3. What is the nursing students' and nursing educators' overall experience with and attitudes toward the use of Game -Based Learning as an active learning strategy?
4. What are students using GBL' competence information level?

II. Material and Methods

Materials:

2.1 Research design: An explanatory descriptive mixed-method (quantitative & qualitative) was adopted to carry out this study.

2.2 Setting

The study was carried out at Faculty of Nursing Damanhour and Alexandria Universities Egypt. The faculty of nursing has nine different scientific nursing departments including pediatric nursing department. Pediatric nursing is one of the main courses taught for the students enrolled in the third year in each term in the third scholastic year. Each term is consisting of 15 weeks. The clinical training (rotation) is given 12 hours, /week.

2.3 Subjects

Using the equal allocation method, a convenient sample of 200 undergraduate students (100 from each University) in the third scholastic year who were enrolled in pediatric nursing course of the academic year 2017-2018 during the first term. Beside, 60 educators (30 from each University).

2.4 Tool for data collection: included two parts:

Part I: Students personal and academic related data: It was developed by researchers to identify basic students' personal and academic data such as: age, gender, using games, engaging, motivating, beneficial, advantages & disadvantages of GBL. Beside educators personal and teaching related data: age, experience, previous training in GBL, and engaging, motivating, beneficial, advantages & disadvantages of GBL.

Part II: In order to achieve the objectives of the study two tools were used to collect necessary data:

Tool I: structured interview questionnaire of Nursing Students' & educators' perception on GBL, was developed by researchers based on the review of related literature related literature^(11,13) to investigate students and educators' perception toward using GBL, "Nursopardy" game Students' Basic Data Structured Questionnaire⁽¹³⁾: 23 interview questions for students and educators about motivating, level of enjoyment of the game and whether or not the game was beneficial, enjoyment, advantages disadvantages of GBL. A five point Likert scale (1=strongly disagree, 5=strongly agree) was used to obtain data.

Tool II: Competency Information Level for students: 13 Students Structured Questionnaire.

This is self-reported questionnaire, was developed by researchers based on the review of related literature related literature⁽¹¹⁾ to identify basic students' knowledge, preferences, performing nursing care, patients education, prioritize of patient care, developing nursing care plan,....

(1:5) 1= none competent, 5 = high competency level. The scoring system based on 3 point Likert scale with higher score indicating highly competency and lowest competency (1 = low competency n, 2= moderate competency, 3= high competency)(table 1)

The cumulative competency score was ranged from 0 to 15 the scoring system was as follows:

Total scoring system as follow: table (1)

Competency Level Information	
Low competency	(16-40)
Moderate competency	(41-56)
Highly competency	(57-80)

Tool III: A structured Focus Group Discussion Guideline (GBL). Focus group interview was performed to explore main advantages, disadvantages, effective in addressing learning issues related to clinical skill practice, ward management, nursing practice knowledge, critical thinking, and leadership. Challenges and ways to overcome it. It also offered valuable learning in the areas of team work and decision making.

2.5 Methods

Administrative process:

Approval from the responsible authorities was obtained from nursing faculty and pediatric nursing department after explanation of the purpose of the study (from both universities).

Study tool:

- The tools were adapted and developed by researchers after an in-depth review of the related recent relevant literature⁽¹¹⁻¹³⁾ and was sent to five expert in the field of education and pediatric nursing to check content validity. Necessary modifications were carried out accordingly.

- Cronbach alpha coefficient was used to test the tool I ($r=0.801$), and tool II reliability ($r=0.819$) these result indicating that the tools was 80% reliable.

Pilot study:

Pilot study was conducted on 20 (10 %) of students and 6 (10%) of the educators they were excluded from the total number of students to insure the clarity and comprehensiveness of the tool.

Data collection:

The data were collected over a period of three months during the clinical activity of first term of last semester of September- November of the academic year 2017-2018. Self-administered questionnaire was distributed to undergraduate students and educators in Damanshour and Alexandria Universities.

Ethical considerations:

All students and educators were informed about the purpose of the study and given brief explanation; consequently oral informed consent was obtained from each of them.

- The right to refuse to participate or withdraw from the study was emphasized after reassuring students that their answer would have no influence on their grades.
- Data Anonymity and confidentiality were appreciated.

Focus group interview:

- Permission was taken from the faculty to get one classroom to conduct the focus group on nursing educators and students, to investigate nursing educators' and students' perception and challenges towards GBL as an active learning strategy.
- Focus group interview, 30 educators (15 from Damanshour & 15 from Alexandria universities) 15 divided into 3 groups each group. 21 students from both Universities supervised by one facilitator.
- Sub-topics were selected to make up the focus group. Each group assigned one topic as positive aspects to GBL, challenges, barriers, requirements and suggestion to success using open-ended question.
- The facilitator asked questions of the group and allowed time for participants to respond to each other's comments. The focus group guide serves as a "road map" and memory aid for the facilitator.
- Focus group guide will be used for each focus group.
- Role of each one in the focus group:
 - a- The role of the facilitator was to keep the group focused on the topics for discussion. The facilitator assists the group through the discussion.
 - b- The note taker is an observer and does not interact with the group. The notes should include a sense of what each person said; identify how comments were said; and record when transitions occurred from one topic to the next.
 - c- Another educators shared, was responsible for recording the focus group. The recording will be used to create a transcript of the event.
- The focus groups take 60–90 minutes for each group.
- After finishing the focus group the facilitator take the notes from the note taker, recorded focus group and made interpretation for the asked questions.
- Example to the questions: What are your perceptions of GBL positives and negatives, what are your perceptions of challenges facing GBL and its requirements and your suggestions for the improvement of GBL.

Statistical Analysis:

A. Analysis of quantitative data:

1. The collected data were coded and analyzed by using the Statistical Package for Social Sciences (SPSS) software version 20.0.
2. Data was tabulated and presented using various of tests: frequency, calculation of the mean, standard deviation, Pearson Chi square, t tests were used in the analysis, Chi-square and Mont Carlo exact probability test was used to study the significance of the difference between proportions.
3. The cutoff point for statistical significance was $P \leq 0.05$.

B. Analysis of Qualitative Data:

The collected qualitative data were transcribed verbatim (word for word) in order to capture the exact words, phrases voiced by the participants. Proofread (read through for errors) in order to check the accuracy of all transcripts against the audiotape were done. Sensitive information as the accidental use of an individual's name during the discussions was replaced by appropriate participant ID. Findings together with pertinent

quotations were then organized according to the discussed topics. After that, the main categories covering the objective behind the research were formulated and clustered into themes. These themes provided the major heading for the results. Finally, trustworthiness and quality of the qualitative data were ensured by adopting triangulation, member checking, peer debriefing, inquiry audit and thick description strategies.

III. Results

Results of the present study were divided into two main parts:

Part I: Quantitative Results:

Table (2):The students were nearly three quarters females and the rest males their age ranged from 22 to 23 in Alexandria and 21 to 22 in Damanhour University (third year). Their number were one hundred from both Universities. Min-Max (21-23 Year), Mean±SD (21.7±.58). The table shows that 65% of the students in Alexandria University using GBL in their courses regularly, While 82% using it occasionally in Damanhour University. Statistical significant difference was found in both age department and uses Game- Based Learning respectively (P = 0. 001, 0.022, 0.001)

Table (2) distribution of the students according to their demographic characteristics (n=100+100)

Students demographic characteristics	UNIVERSITY				Test of significance	
	Alexandria n=100		Damanhur n=100		Chi square test	P value
	No	%	No	%		
Student's age (Years)						
21	2	2.0	60	60.0	78.63	<.001*
22	86	86.0	35	35.0		
23	12	12.0	5	5.0		
Student's Sex						
Males	23	23.0	27	27.0	0.427	0.624
Females	77	77.0	73	73.0		
Department						
Pediatric	100	100.0	100	100.0	200.0	0.022*
Using Games						
Occasionally	35	35.0	82	82.0	45.495	<.001*
Regularly	65	65.0	18	18.0		

* Significant at P≤0.05

Table (3):the table demonstrated that, 65% of the students from Alexandria University agree, and 53% from Damanhour University also agree that GBL *help in engaging in learning*. Moreover, nearly three quarters (72%) of students in Alexandria University and more than half (55%) students in Damanhour University agree that GBL is *motivating* for learning. Statistical significant difference was found in engaging & motivating respectively (P = 0.022, 0.013). Also, 58% of the students in Alexandria University strongly agree and 51% in Damanhour University agree that GBL are *beneficial* for students. Meanwhile, 58% of the students in Alexandria University and 70% from Damanhour University disagree that GBL *not beneficial*. Statistical significant difference was found (P = 0.025). Half (51%) of the students in Alexandria University using GBL in evaluation and the rest in teaching courses. While all students in Damanhour University using GBL in teaching courses only. Statistical significant difference was found (P= 0.01)

Table (3): distribution of the students according to their opinion in gaming (n=100+100)

The students opinion in gaming	UNIVERSITY				Test of significance	
	Alexandria n=100		Damanhur n=100		Chi square test	P value
	No	%	No	%		
GBL is an engaging way in learning:						
Strongly Disagree	1	1.0	0	0.0	45.495	0.022*
Agree	65	65.0	53	53.0		
Strongly Agree	34	34.0	47	47.0		
Motivating						
Agree	72	72.0	55	55.0	6.234	0.013*
Strongly Agree	28	28.0	45	45.0		
Beneficial						
Agree	42	42.0	51	51.0	1.628	0.203
Strongly Agree	58	58.0	49	49.0		
Non beneficial						
Strongly Disagree	42	42.0	30	30.0	3.125	.025*
Disagree	58	58.0	70	70.0		
Using GBL in						
Teach course material	49	49.0	100	100.0	68.456	<.001*
Other (in evaluation)	51	51.0	0	0.0		

* Significant at P≤0.05

Table (4): the table showed that all students using GBL in both faculties have *objectives*. Similarly, students in Alexandria and Damanhour perceived that GBL in application level (41%, 42% respectively), and *analysis level of Bloom Taxonomy* (43%, 42% respectively). Role play, Problem solving and demonstration are the most common *type of GBL* used in Alexandria respectively (37%, 34%, 29%). While in Damanhour demonstration is at first and role play and problem solving are equally (40%, 30%, 30%). 83%, 81% in both Alexandria and Damanhour found GBL fun in learning respectively. Also, 82%, 68% of them respectively found it as a competitive method with Statistical significant difference were (P=.022). Three quarters of students in Alexandria and 63% in Damanhour mentioned that GBL enable them compete with each other. 70% in Alexandria 76 in Damanhour mentioned that equipment needed in GBL is enough. 43% students in Alexandria are using it 3 times monthly while 36 students in Damanhour used it once every month with Statistical significant difference was (P= .038). Regarding advantages and disadvantages table shows that, 40% students in Alexandria mention multiples advantages (Fun , joy , interested , motivated, engaging) , the rest mentioned joy, fun and interested respectively (19%,18%,10%). While students in Dananhour University mentioned Fun, joy, interested respectively (34%, 24%, and 22%). Moreover, 51% students in Alexandria University mentioned multiples disadvantages to using GBL, as need expert 32%, time consuming 24% and 22% need preparation or others .In Damanhour University 17 % mentioned need expert, 8% time consuming and 7% need preparation as disadvantages to using GBL. Statistical significant difference was found in both advantages and disadvantages (P= 0.01). More than half of both Universities mentioned that is accepted method in learning and they are satisfied from using it.

Table (4): Distribution of students according to Game-Based Learning beneficial (n=200)

Game-Based Learning beneficial	UNIVERSITY				Test of significance	
	Alexandria n=100		Damanhur n=100		Chi square test	P value
	No	%	No	%		
Objectives						
Yes	100	100.0	100	100.0		
Bloom level						
Knowledge	6	6.0	6	6.0	0.024	1.000
Comprehension	10	10.0	10	10.0		
Application	41	41.0	42	42.0		
Analysis	43	43.0	42	42.0		
Types						
Role play	37	37.0	30	30.0	2.735	0.255
Demonstration	29	29.0	40	40.0		
Problem solving	34	34.0	30	30.0		
Fun						
Yes	83	83.0	81	81.0	0.136	0.713
No	17	17.0	19	19.0		
Competition						
Yes	82	82.0	68	68.0	5.227	0.022*
No	18	18.0	32	32.0		
Competes						
Other players	75	75.0	68	68.0	1.202	0.273
Game	25	25.0	32	32.0		
Materials available						
Enough	70	70.0	76	76.0	.913	0.339
Not enough	30	30.0	24	24.0		
How often GBL used						
1/month	20	20.0	36	36.0	6.547	0.038*
2/month	37	37.0	32	32.0		
3more/month	43	43.0	32	32.0		
Advantages						
Fun	18	18.0	34	34.0	51.152	<.001*
Interested	13	13.0	22	22.0		
Joy able	19	19.0	24	24.0		
Other	10	10.0	20	20.0		
All	40	40.0	0	0.0		
Disadvantages						
Time consuming	7	7.0	24	24.0	72.089	<.001*
Need preparation	8	8.0	22	22.0		
Need expert	17	17.0	32	32.0		
Other	17	17.0	22	22.0		
More than one	51	51.0	0	0.0		
Assist						
Accepted	51	51.0	58	58.0	1.140	.566
Satisfied	39	39.0	32	32.0		
Not assist	10	10.0	10	10.0		

* Significant at P≤0.05

Figure (1): This figure revealed total competency level information. It was found that the total competency level information was moderately high competence in both faculties respectively (62%, 71%) in students using GBL, with no statistical significant difference was found.

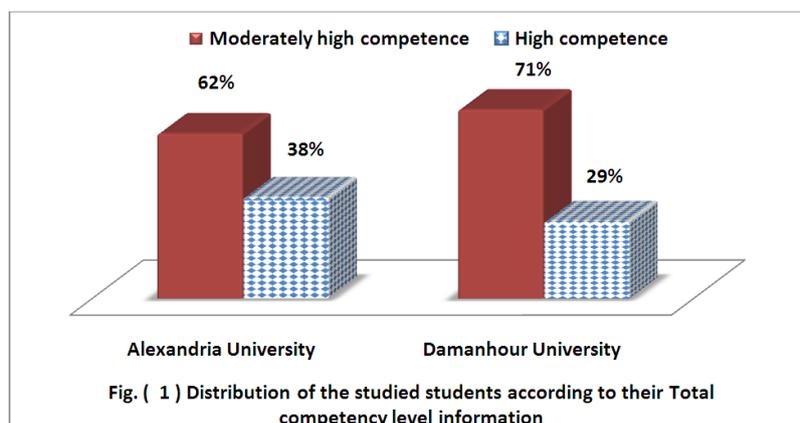


Table (5):explains demographic characteristics of the educators, it was found that 17- 19 of educators in both faculties respectively were under 30 years old, all were females. In Alexandria University were from the following departments as ordered community 14 pediatric 8 education 6 medical surgical 2. In Damanhour University were from the following departments' pediatric 10 critical care 6 Nursing education 5 community health nursing 4 psychiatric 3 and one administration. Statistical significant difference was found were (p=0 .013).The table shows that 63.3% of the educators had experience 5 years and less, followed by 26.7 % had experience 6-10 years in Alexandria University. Similarly, in Damanhour University half of the educators had experience in teaching 5 years and less, 33.3% of the educators their experience were 6-10 years. The majority in Alexandria University and all of educators in Damanhour University teach to undergraduate students only with statistical significant difference was found (p=0.020). The majority of educators in Alexandria University 93.03% and more than three quarters (76%) of educators in Damanhour University get training on GBL. More than half in Alexandria University 53% use gaming regularly, and 50 % of Damanhour educators use GBL occasionally with statistical significant difference was found (p=0.001).

Table (5): Distribution of the educators according to their demographic characteristics (n=30+30)

Demographic characteristics of the instructors	UNIVERSITY				Test of significance	
	Alexandria n=30		Damanhur n=30		Chi square test	P value
	No	%	No	%		
Educators' age (Years)						
Under 30 Years	19	63.3	17	56.7	1.611	0.447
31-40 Years	6	20.0	10	33.3		
41-50 Years	5	16.7	3	10.0		
Educators' Department						
Community health nursing	14	46.7	4	13.3	16.202	0.013*
Pediatric	8	26.7	10	33.3		
Medical Surgical	2	6.7	1	3.3		
Nursing Education	6	20.0	5	16.7		
Psychiatric	0	0.0	3	10.0		
Critical Emergency	0	0.0	6	20.0		
Administration	0	0.0	1	3.3		
Educators' Experience						
Less than 5 years	19	63.3	15	50.0	1.193	0.551
6-10 Years	8	26.7	10	33.3		
11-15 Years	3	10.0	5	16.7		
Educators' Teaching responsibility						
Undergraduate	25	83.3	30	100.0	5.455	0.020*
Post-Graduate	5	16.7	0	0.0		
Educators' Training						
Yes	28	93.3	23	76.7	3.268	0.071
No	2	6.7	7	23.3		
How often educators use GBL						
Never	2	6.7	1	3.3	21.589	<.001*
Rarely	7	23.3	4	13.3		
Occasionally	5	16.7	15	50.0		
Regularly	16	53.3	10	33.3		

* Significant at P≤0.05

Table (6): the table indicated that all educators in both Alexandria & Damanhour University agree that GBL help in engaging, motivating and has benefit in learning. Both educators in Alexandria University 80% and in Damanhour University mentioned that they use GBL in both teaching & evaluation of the students, 63.3%.66% of the educators in Alexandria University mentioned that GBL at knowledge and application level while more than half 53.3% of educators in Damanhour University mentioned that GBL at analysis level of Bloom taxonomy. More than half 53.3% of the educators in Alexandria University mentioned that gaming encourage learning by doing while 43% of educators in Damanhour University mentioned that gaming make learning interested. Statistical significant difference was found (P= 0.013).43.3% of the educators in Alexandria University mentioned that **advantages** of gaming encourage critical thinking & analysis. While 40% of the educators inDamanhour University mentioned that gaming is a fun method in learning. Statistical significant difference was found (P= 0.02).56.7% of the educators in Alexandria University mentioned gaming needs enough materials as **disadvantages** while 36.7% of the educators in Damanhour University mentioned that gaming needs experience educators as disadvantages.

Regarding **students responses** toward gaming in both faculties mentioned that students like it with Statistical significant difference was found (P= 0.020) More than half (53.3%) of the educators in both faculties **describe** gaming correctly completely. The majority of educators from both faculties respectively (83.3% &70%) mentioned that Participants plays as a group. Regarding **location & context** of gaming correct-incomplete 53.3% of educators from both faculties, 53.3% of educators in Alexandria and, 73.3% from Damanhour give **rewards** to students in games as a form of good wards, bonus ...

Table (6): Distribution of the educators according to their opinions in GBL (n=30+30)

The educators opinions in Game-Based Learning	UNIVERSITY				Test of significance	
	Alexandria n=30		Damanhur n=30		Chi square test	P value
	No	%	No	%		
GBL help in learning Engaging						
Agree	30	100.0	30	100.0	-----	-----
Gaming help in learning Motivating						
Agree	30	100.0	30	100.0	-----	-----
GBL is beneficial						
Agree	30	100.0	30	100.0	-----	-----
GBL is Not beneficial						
Strongly Disagree	8	26.7	12	40	1.200	0.273
Disagree	22	73.3	18	60		
Educators Using GBL in what way						
Test review	0	0.0	2	6.7	3.181	0.204
Teach course material	6	20.0	9	30		
Both	24	80.0	19	63.3		
GBL consider at what level in Blooms Taxonomy						
Knowledge	1	3.3	1	3.3	7.055	0.070
Comprehension	2	6.7	3	10.0		
Analysis	7	23.3	16	53.3		
Knowledge and Application	20	66.7	10	33.3		
GBL encourage students because it is						
Interested	6	20.0	13	43.3	8.729	.013*
Fun	7	23.3	11	36.7		
Learning by doing	17	56.7	6	20.0		
Advantages of GBL						
Fun	7	23.3	12	40	14.868	.002*
Interesting	4	13.3	11	36.7		
Learning by doing	6	20.0	6	20.0		
Critical thinking & Analysis	13	43.3	1	3.3		
Disadvantages of Game Based Learning						
Need time	5	16.7	5	16.7	6.711	.082
Preparation	2	6.7	6	20.0		
Expert	6	20.0	11	36.7		
Needs enough materials	17	56.7	8	26.7		
Students ' Response						
Students like it	21	70	28	93.3	5.455	.020*
Positive feedback	9	30	2	6.7		
Educators Description of GBL						
Correct complete	16	53.3	16	53.3	.000	1.000
Incorrect-incomplete	3	10.0	2	6.7		
Correct-incomplete	11	36.7	12	40.0		
Participants plays as						
Individuals	5	16.7	9	30.0	1.491	0.222
Groups	25	83.3	21	70.0		
Location and Context						
Correct and complete	10	33.3	3	10.0	.000	1.000
Incorrect-incomplete	4	14.3	11	36.7		
Correct-incomplete	16	53.3	16	53.3		
Rewards given						
Yes	16	53.3	21	70.0	.000	1.000
No	14	46.7	9	30.0		

* Significant at P≤0.05

Table (7): the table showed that 60% of the educators in Alexandria stated that games help as an experiential learning while 66% of educators from Damanhour University stated that it helps in content transfer .80% of educators in both Universities mentioned that games help as content related and 93.3% of educators in AlexandriaUniversity and 80% in Damanhour mentioned that games help as problem based learning. 80% of educators from both Universities stated that games should have objectives. The majority of educators from both Universities stated that games arechallenging 86.7% and all mentioned that it change students to positive attitudes. With no statically significant difference was found.

Table (7): Distribution of the educators according to the technique of GBL (n=30+30)

The educators technique of GBL	UNIVERSITY				Test of significance	
	Alexandria n=30		Damanhur n=30		Chi square test	P value
	No	%	No	%		
GBL as Educational process help as						
Content transfer	12	40.0	20	66.7	4.286	0.038*
Experiential learning	18	60.0	10	33.3		
Content related						
Related	24	80.0	24	80.0	0.000	1.000
Not-related	6	20.0	6	20.0		
Content is						
Fact based	2	6.7	6	20.0	2.308	0.129
Problem based	28	93.3	24	80.0		
Has objectives						
Yes	24	80.0	24	80.0	0.000	1.000
No	6	20.0	6	20.0		
GBL is Challenging						
Yes	26	86.7	26	86.7	0.000	1.000
None reported	4	13.3	4	13.3		
GBL change Student Attitudes						
Positive	30	100.0	28	93.3	2.069	0.246
Negative	0	0.0	2	6.7		

* Significant at $P \leq 0.05$

Part II: Qualitative Results:

The qualitative data in the present study can be clustered under the following categorical schemes: **Firstly**, from students & educators perceptive "level of reality of the scenarios in the game, GBL demonstrates team work, critical thinking, and decision making skills ". **Secondly**, challenges facing GBL users from students' & educators' perceptive. **Thirdly**, students and educators recommendation for improving using GBL in the faculty. Adoption of GBL assist students acquires full autonomy and flexibility, beside it is incentives to promote interaction and communication of the students and increase students' retention. From the focus group discussion students perceived GBL as "it's enjoyment, motivating, than other methods, more knowledge retention, novel method, " New generation students prefer to use experiential learning strategies such as simulation and role playing, which might influence their view regarding their learning. **Firstly**, educators mentioned that GBL activities in the educational environment promote " a relaxed, nurturing atmosphere and foster collaboration, and team work among peers and educators". Additionally, GBL "encourage competitive spirit and participation among students", "its fun". While, students stated that "GBL promote knowledge & skills retention and enhance critical thinking and decision making and managerial skills". Students also mentioned that "GBL it's more practice," and "helped synthesize the knowledge." "More positive attitude and makes you enjoy learning," "decreased boredom".

- التعلم باستخدام الالعاب تخلق جو مريح للتعلم و تنشيط التعلم التعاونى بين الطلبة و تعزز روح التنافس بين الطلبة و تشجعه على المشاركة.
- ممتع و شيق يساعد على تخزين المعلومه و المهارات و التفكير الابداعى و اتخاذ القرار و اكتساب المهارات الادارية و يجعل التعليم ممتع و غير ممل.
- مرضى للطلاب و تقوى روح المشاركة و تحفز الطالب و يستخدم فيها العصف الذهنى.
- يفضلها الطالب و يعطى رودود افعال ايجابية باستخدامها.

Secondly, educators mentioned that the main challenges facing educational gaming is "the time consuming in the preparation, limited class time", "Not enough time to explain everything", and "is difficult to employ with larger numbers of students". "Subjective evaluation tool", "expensive to develop". Students stated that the main challenges of GBL are implementation of GBL needs experience & training from both students and educators.

- اهم التحديات و العوائق فى استخدام الالعاب انه يأخذ وقت طويل فى الاعداد و التحضير ، لا يوجد وقت كافى لشرح كل شىء ، و صعب استخدامه مع الاعداد الكبيرة من الطلبة.
- لاتعتبر وسيلة منطقية فى التقويم.
- صعب و مكلف فى التنفيذ.
- الادوات المستخدمة فيها غير كافية.
- محتاج استاذ لديه مهاره و ذو خبرة و محتاج تدريب كثير لكلا من الطالب و الاستاذ .

Thirdly, Students and educators recommended the following: "more preparation and training needed for both educators & students". "Support from the faculty administration by providing adequate places & requirements", "Long class time" "clear pre game instruction & rules", "well designed scenarios in the game" "using an objective evaluation tools or design rubrics ".

- اقترح ضرورة التدريب الجيد و المستمر للطلاب و الاستاذ.
- مساندة ادارة الكلية و دعمها بتوفير اماكن و الادوات اللازمة.

- تصميم و اعداد جيد قبل البدء و تحديد الاهداف جيدا و تصميم طرق التقييم.
- اتاحة وقت كافي للمناقشة بعد استخدام الالعاب كوسيلة تعليمية.

IV. Discussion

Game- Based Learning (GBL) over the last decade has proven to be an effective and preferable learning tool facilitating with “participation, communication, problem solving, and critical thinking”. In order to attain the present generation, educators need to tutor in ways that will improve student learning. The blend of technology and gaming can be ways to achieve this⁽¹⁴⁾. The coming and breakthrough of smartphones and wireless devices has made games, particularly digital games, more accessible and appropriate for gamers, permitting them to take games with them wherever they go⁽¹⁵⁾.

In the current study student participants ranged from 21 to 22 years old, Statistical significant difference was found in both student' age & department. More than half of the nurseeducators'ages in both Universities were under thirty years old. The main areas of teaching for the participants for both Universities were at the undergraduate level. According to Buckingham (2000)⁽¹⁶⁾, young people tend to pay more of their attention to popular fiction. They are likely to lose interest in the subject if they do not get enjoyment from the content. So we should balance between “informing” and “enjoyment” in the teaching process in order to grasp a learner’s attention and motivate them to learn⁽¹⁶⁾. Game-participation did not produce significant boy-girl differences in attitude and cognitive ability scores.⁽¹⁷⁾ Other study showed a significant increase in mathematical achievement, motivation to learn in math class, and attitudes toward mathematics for both boys and girls who played the digital game⁽¹⁸⁾. Another study revealed that Game-playing significantly affected the girls’ and boys’ perceptions of liking or disliking the subject of mathematics⁽¹⁷⁾.

The current study found no statistically significant difference regarding the educators' years of experiences. On the contrary, a research in Sweden found that learning games involve a special mixture of utility and game experience, and the official context which they are to be used in significantly impact on the process of developing and using of games⁽⁷⁾.

The present study revealed that using GBL help in *engaging* and *motivating* in learning. Statistical significant difference was found regarding engaging & motivating respectively. Half of the students in Alexandria University using gaming in evaluation and the rest in teaching courses. While all students in Damanhour University using GBL in teaching courses only. With statistically significantly difference. Consistency, GBL has been identified as motivating in a different ways. It motivates problem solving, motivates engagement in learning (Royse & Newton, 2007)⁽¹⁴⁾, and motivates student learning. Similarly, nursing students in the study in Pennsylvania⁽¹³⁾ found GBL as a motivating way to learn or review course materials. One student felt it provided a various methods to study, stating it, “opens up different avenues” to studying and another student felt it is “absolutely” motivating and fun. One student felt that “motivation comes from wanting to learn the material” not from engaging in a game but sharing in the game can be motivating to others. Also, the nursing educators felt positively about gaming being a motivating way to teach or review course materials. Similarly, Lucero and Arrasvuori’s (2010)⁽¹⁹⁾ Playful Experiences framework (PLEX) provides a context for grasp player motivations by considering for twenty two categories of playful experiences in games. The PLEX framework is an instrument for game designers, and also sets insights into motivation in games⁽¹⁹⁾. There has been a contradictory body of research around violent video gameplay and aggression. While some researchers have linked violent video gameplay to increased arousal and aggressive emotion in players and desensitization to violence, there has also been research propose that aggressive outcomes post-gameplay are lower compared with other forms of media (e.g. Sherry, 2001)⁽²⁰⁾. Some studies have also found no relationship between violent video gameplay and violent behaviors (e.g. Ferguson et al., 2008)⁽²¹⁾, and research by Peña and Hancock (2006)⁽²²⁾ discovered that the majority of the chat messages within a violent video game were really positively valence, contrary to what might be expected. These varied and often conflicting studies propose that there are difficult ways in which games create affect^(21, 22).

Regarding to *beneficial* of GBL the current study revealed that both Universities agree that GBL are beneficial for students, with statistical significant difference. GBL generate a beneficial learning environment by requesting students to participate in query and respond scenarios that motivate students to retain information. Experiential learning gives a quick feedback to students and educators to measure how much information is being grasping and where progression can be made on concepts that were less understood. There are a number of steps that need to be taken in the assessment of GBL before they can be considered efficient⁽²³⁾. According to Abigail W (2011)⁽²⁴⁾ many experienced educators have found the use of games in their face-to-face classroom teaching assists to remain student interest with the topic content. Consistency, a study done to analyze nursing and medical student perceptions of PAIN-ME-FREE as a useful education instrument for geriatric total pain management. Nursing students either agreed or strongly agreed that the game was innovative and significant to their healthcare education⁽²⁵⁾.

The current study showed that all students using GBL in both Universities the gaming has *objectives*. Furthermore, students in Alexandria and Damanhour perceived that GBL in application, and analysis level of

Bloom Taxonomy. From educators' perspective, it was found that 66% of the educators in Alexandria University mentioned that GBL at knowledge and application level while more than half of educators in Damanhour University mentioned that GBL at analysis level of Bloom Taxonomy. More than half of the educators in Alexandria University mentioned that GBL encourage learning by doing while 43% of educators in Damanhour University mentioned that GBL make learning interesting. Statistically significant difference was found. These results may be attributed to the nature and type of each game place the game in different level in Bloom Taxonomy. Also, role play, problem solving and demonstration are the most common type of gaming used in Alexandria respectively. While in Damanhour demonstration is at first and role play and problem solving are equally. Both Universities found GBL fun in learning and **competitive** method with statistically significant difference. Three quarters of students in Alexandria and 63% in Damanhour mentioned that GBL enable them compete with each other. Moreover, 70% in Alexandria 76% in Damanhour mentioned that equipment needed in GBL is enough. 43% students in Alexandria are using it 3 times monthly while 36% students in Damanhour used it once every month with statistically significant difference.

Serious research in what could be considered highly cognitive VIEs (virtual interactive environment) has been assisted through a long history of VR (Virtual Reality) and gaming efforts by the comparative media lab. Indicates the ranking of a score earned by the evaluation of a video game on the higher order thinking evaluation rubric⁽¹²⁾. Any video game scoring 15 or higher is highly probable to encourage higher order thinking in its users. Note that for a game to be ranked in the upper range of the scale. This is established on the assumption that a video game should have to exhibit much evidence of higher thinking characteristics to actually be a game that reinforces higher thinking^(11, 13). Inconsistency, some educators believe that gaming does not allow students to think at higher levels and one educator stated that games do not allow students to "think critically"⁽¹⁴⁾. This is oppositely with the current study.

Regarding **advantages** of GBL from students' perspective the results revealed that, 40% students in Alexandria mention multiple advantages of GBL as (Fun, joy, interested, motivated, engaging). While students in Damanhour University mentioned Fun, joy, interested respectively. From educators' perspective, the results indicated that all educators in both Alexandria & Damanhour Universities agree that GBL help in engaging, motivating and has benefit in learning. More than half of the educators in Alexandria University mentioned that GBL encourage learning by doing while 43% of educators in Damanhour University mentioned that GBL make learning interesting. Statistical significant difference was found. More than half of the educators in Alexandria University mentioned GBL needs enough materials as **disadvantages** while 36.7% of the educators in Damanhour University stated that GBL needs more educators' experience. In this light, main **advantage** of "using GBL was the enforcement of the students' learning, enjoyment, and interest". Educators are motivated to blend technology and innovative teaching strategies, such as gaming, into the classroom to meet the needs of the existing generation of students (Bayer-Hummel, 2010)⁽²⁶⁾. Another study, mentioned that GBL was innovative and creative face-to-face classroom games reported on in the literature which are used in nursing/midwifery student education⁽²⁴⁾. Use of Games in Face-to-face Classroom Teaching in Nursing and Midwifery Education⁽²⁴⁾. Similarly, in a study the results revealed that participants who played the digital game involved with more animated, and experiential features scored significantly higher than the lower-complexity digital game group as well as the traditional paper-and-pencil group on the learning outcome tests. Moreover, in contrast to many previous studies, use of these digital games was not found to affect learning motivation and attention."⁽²⁷⁾ Moreover, in a study on student perception on games advantages were review of course content, provides a variety of learning strategy, positive learning environment-fun, motivating, competitive environment. From educators' perceptions were reinforcement/review of course content, active learning strategy, increases participation level, teamwork, cooperation, positive learning environment-fun, motivating, engaging, competitiveness⁽²⁴⁾. Other researchers stated gaming instruction has the advantages of adding innovation, diversity, immediate feedback, safety, fun, attentiveness from novelty, content mastery from review, improved critical thinking, reduced anxiety, increased involvement, decreased boredom, learner involvement, real-world problem solving, interaction, motivation, and enhanced relaxation⁽²⁸⁾.

Moreover, students in Alexandria University in the current study mentioned multiple **disadvantages** to using GBL. As it needs experience, need preparation and time consuming. Statistical significant difference was found in both advantages and disadvantages. From educators' perspective the disadvantages were gaming needs enough materials and more experiences and debriefing. More than half of both Universities mentioned that it is accepted method in learning and they are satisfied from using it. Consistency, Henderson (2005)⁽⁹⁾ study stated that disadvantages of using games were creates stress and embarrassment when improper answers given. Can hinder evaluative learning competition and can be seen as threatening. Cost increases difficulty in assessing individual competencies when teams are involved. Besides it requires special preparation which can be time consuming. Furthermore, it also needs instruction, and background reading outside of the game to offer a successful technique⁽²⁹⁾. In a study GBL from Students' perspective were: Instructor framework and use, offers a variety of learning style, engagement level of students. From Educators' perspective were logistical factors- class

sizes, class time, preparation time, lower levels of learning, diminished engagement levels, educator comfort level or experience with gaming, student dissatisfaction-learning style, embarrassment, competitiveness/lose focus⁽¹³⁾.

In the current study, the total competency level information was moderately high competence in both faculties respectively, after using GBL, with no statistical significant difference was found. It may attribute to in both faculties they were not used highly technological types of games as problem solving, video games or role play. Inconsistency, in a study revealed that there was a significant difference in students' perceptions of competence between pre- and post-instruction. The gains were all positive with students indicating an increase from moderately low competence before instruction to high competence after instruction⁽¹¹⁾. There are certain types of games that are capable of teaching specific core competencies better than others, such as Logic and Inference Conflicts which have a high potential for teaching Synthesis skills; and there are a handful of core competencies such as software programs or tailoring content for audiences that games are not capable of teaching - training⁽³⁰⁾.

Regarding *using of GBL* in education, educators in both Universities mentioned that they use gaming in both teaching & evaluation of the students and its helpful strategy. During study and the game of Jeopardy was used as the review game in the course. The tests used were not comprehensive and only included a section of the material. Students were given two exams, one prior to the review game and one following. The study revealed that test scores were significantly better for those who participate in the Jeopardy review game. The researchers advised that review games should not be used as a substitute for regular instruction and used only as a review⁽¹³⁾. Similarly, another study on the effect of teaching grammar using games. The study revealed that, game application is recommended to be adopted by English teachers. It also confirms that students' attitude positively toward grammar lessons.⁽³¹⁾ Furthermore, in another study found that the video-diary method is one of the evaluation methods which could potentially improve the quality of games in education by understanding the gamers' preferences⁽³²⁾.

The present study also showed that educators in Alexandria stated that GBL help as an experiential learning while educators from Damanshour University stated that it helps in content transfer. The majority of educators in both Universities mentioned that GBL help as content related and majority of educators in both universities mentioned that GBL help as problem based learning & should have objectives. Also, they stated that GBL are challenging and it change students to positive attitudes. With no statically significantly difference. It is may be attributed to the fact that educators in both faculties use GBL regularly in practical rotation and found it supportive and assist students without knowing its name. They used it as a case study or problem solving which is a type of game. In this light, educators have long noted that GBL reinforce higher levels of student interest and promote *positive attitudes* toward the subject matter⁽³³⁾. Furthermore, GBL makes a positive influence on the teaching/learning process. It can be used as a context for formative assessment. It also used as an assessment instruments require to fully capture the learning that may be happening in the games⁽³⁴⁾.

Finally, Using Game based Learning has a beneficial on education and a valuable educational tool.

V. Conclusion & Recommendation

Game- Based Learning proved to be a beneficial and motivating teaching strategy; educators and students have a positive attitude toward using it. Students in Alexandria University using GBL in evaluation and teaching courses. While all students in Damanshour University using it in teaching courses only with statistical significant difference. The use of GBL generally simulates student enjoyment and fun. Additionally, students had moderately high competence information level. GBL has many advantages and disadvantages. Advantages were Fun, joy, interested, motivated, and engaging from students and educators perceptive. Educators added GBL encourage learning by doing. While disadvantages from students perceptive GBL needs experience, need preparation and time consuming. Disadvantages from educators perceptive were it needs enough materials and more experiences and debriefing from. There are many ways to overcome challenges facing using GBL and improve it. It would seem that Game- Based Learning makes a positive participation to the learning process.

Based on findings, the study recommended:

- 1- Educators continue to use Game-Based Learning as one aspect of their teaching and evaluation.
- 2- Adequate training to the novel educators on Game –Based Learning techniques, preparation and uses.
- 3- Game-Based Learning training content can be designed and developed in ways that effectively achieve intended learning outcomes.
- 4- Introduce more competency skills in GBL scenarios to elevate competency level.
- 5- Rotating team leaders if possible or using smaller groups to permit for more contribution from individual students.
- 6- Adequate time to debrief following the Game –Based Learning activity, and to allow time to discuss rationales for proper responses.

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