Assessment of Nursing Students' Perception Regarding Gamification Elements in Nursing Administration Course

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Abstract

Background: The use of gamification as an educational approach is increasing and is gaining momentum in nursing education. **Aim:** This study aims to assess nursing students' perception regarding gamification elements in nursing administration course. Research design: A cross-sectional descriptive design was used to carry out this study. **Study setting**: the study was carried out at the Technical Nursing Institute in Abbasseya Fevers Hospital in Cairo, Egypt. **Study subjects**: 70 students in the fifth year. **Data collection tool:** Data were collected by using a self-administered perception scale regarding gamification elements with a 31-item covering four dimensions: benefits, expectations, feelings, and teacher. **Results**: Nursing students' mean age was 20.0±0.6, and 45.7% had previous experience with gamification. Students' perception of gamification was high in all dimensions and in the total (91.4%). **Conclusion**: The technical health institutes nursing students have high perception towards gamification elements as an educational approach of the nursing administration course. **Recommendations:** Inclusion of this approach in the educational curriculum of these institutes. Further study is suggested to compare students' perception of the various types of gamified learning interventions.

Keywords: Gamification Elements, Nursing Administration course, Nursing Students, Perception.

Introduction:

Nowadays, students are digital natives as they have grown up in a digitalized world; as such, they can easily handle digital devices and media on a daily basis (**Lampropoulos et al., 2022).** As access to information is instant from any place at any time, a student's way of acquiring knowledge and becoming informed has changed significantly **(Pokhrel and Chhetri, 2021)**. Along with the technological advances, the teaching and learning methodologies and approaches are also evolving to address the new and upcoming educational needs and requirements **(Cook et al., 2021).**

The advance of information and communication technologies significantly affected the current view of pedagogical approaches used in the teaching-learning process, promoting the transformation of repetitive and behavioral approaches to adaptive approaches that includes active participation and collaboration between students **(Berry et al., 2020; Ferriz-Valero et al., 2020; Antón-Solanas et al., 2022).**

The aim of nursing education is to provide the student with basic knowledge, skills, and attitudes in the cognitive, affective, and psychomotor fields. Significant innovations were required in the teaching of these fields **(Inangil et al., 2022)**. Creating active, student-centered learning situations in nursing education is an ongoing challenge for nursing faculty. A strategy widely used to improve learning in online education during the COVID-19 pandemic has been gamification, which applies different game formats to the learning environments (**Nieto-Escamez and Roldán-Tapia, 2021). U**niversity teaching approaches are adapting as educators aim to attain both better learning and more productive teaching. State-of-the-art approaches, such as the use of gamification, seek to strengthen the acquisition of knowledge by engaging students in their own learning process as a response to a traditional approach, thereby gaining greater encouragement and confidence **(Gómez-Urquiza et al., 2019).**

The evidence for gamification in a broader educational setting is increasing **(Smiderle et al., 2020),** and the idea is gaining momentum in the nursing education field **(Ohn and Ohn, 2020)**. There are already universities that use or have used gamification in some of its disciplines. The great majority of studies carried out have as target audience students of higher

education, where most of those studies have as main objective to evaluate the degree of engagement of academics through activities built according to gamification concepts **(Gerber and Fischetti, 2022; Krishnamurthy et al., 2022).**

The nursing staff plays a pivotal role in healthcare, providing essential patient care and contributing significantly to the overall well-being of individuals. Their responsibilities encompass a wide range of tasks, including administering medications, monitoring patients, and collaborating with other healthcare professionals to ensure coordinated and comprehensive care. The dedication and expertise of nursing staff contribute to the effectiveness of healthcare delivery **(Smith and Jones, 2019).**

The Nursing Administration course is a vital component of healthcare education, focusing on the strategic and operational aspects of nursing leadership within healthcare organizations. This course typically covers principles of healthcare management, organizational behavior, financial management, and quality improvement in the context of nursing services **(Marquis and Huston, 2017).**

Researchs has been carried out to evaluate the effectiveness of gamification applications in education on students' learning outcomes. However, contradicting results, implementation in different educational levels, the lack of specific assessment tools, the ad hoc use of gaming elements, and the general reports from scholars that more studies are required in this field reveal a gap in the literature **(Subhash and Cudney, 2018; Zainuddin et al., 2020).**

Aiming at addressing students' new and upcoming needs and requirements, education is transforming by integrating new technologies and technological paradigms into its process more actively **(Burbules et al., 2018).** Despite the potentiality of this educational technology to provide nursing students' learning, there is a lack of clarity to affirm that this strategy is superior to other teaching techniques to develop cognitive skill in undergraduates **(Nascimento et al., 2021)**. Moreover, the way the instructional content is presented is equally important in learning outcomes as it can lead to a decline in performance or knowledge and skills acquisition despite the increase in participation and effort **(Hsin-Yuan Huang and Soman, 2018**).

Significance of the study:

In view of the exponential advances in information technology and the extensive use of computers and smartphones among adolescents and young adults, the use of innovative game-based approaches in education has become most required. Nursing students often consider the nursing administration course as a tough least interesting course with no direct clinical application in their future career, which is in contrary to reality since they will need to apply the principles and foundations of administration daily throughout their professional and personal life. The researcher as a nursing clinical instructor at technical nursing institute hopes that the application of gamification elements in the teaching of the nursing administration course will have a positive effect through stimulating students' thinking, fostering their engagement, facilitating their acquisition of knowledge and mastering skills, along with increasing their motivation and positive perception.

Aim of the study:

This study aim was to assess nursing students' perception regarding gamification elements in nursing administration course.

Research questions

What is the nursing students' perception regarding gamification elements in nursing administration course?

Subjects & Methods

Research design:

A descriptive cross-sectional design was used to carry out this study.

Setting

The study was conducted at the Technical Nursing Institute in Abbasseya Fevers Hospital in Cairo, Egypt, affiliated to the Ministry of Health.

Study subjects

All fifth-year nursing students registered in the aforementioned institute during the academic year 2021-2022 and attending the nursing administration course were included in the study with no inclusion or exclusion criteria their total number was 70 students.

Tool for data collection:

Data for this study was collected by using **Student perception scale regarding gamification elements:**

It consists of two parts:

- **Part (1):** This was included pertaining personal characteristics of nursing students including age, marital status, hobbies, and previous experience with gamification.
- **Part (2):** This was developed by the researcher based on **Cheong et al. (2013)** to measure students' perception of the use of gamification elements in learning. The tool has 31 items categorized into four dimensions: 1) Gamification benefits (6 items) such as "Learning using gamification elements simplifies the complex subjects;" 2) Expectations from gamification (11 items) such as "Learning using gamification elements is an effective method to correct my misconception on the subjects;" 3) Feelings about gamification (7 items) such as "Using a gamification method through my smartphone makes me feel better;" and, 4) Teacher role (7 items) such as "The teacher stimulated my interest in the course matter by using gamification elements."

❖ **Scoring system:**

The tool has 31 items on a 5-point Likert scale. The responses from "strongly agree" to "strongly disagree" were scored from 5 to 1 respectively. The scores of the items of the total scale were summed-up and a higher score indicated higher perception. The total score was divided by number of items, and then converted into a percentage score. The perception was considered high if the total score was 80% or more and low if less than 80%.

Validity and Reliability of the data collection tool:

The preliminary form of the tool was presented to seven experts in nursing administration and from the Faculty of Education and the Arab Academy for Science, Technology and Maritime Transport for face and content validation. Modifications, mostly in the form of re-wording certain items, were done based on their feedback. The reliability was high (Cronbach's Alpha coefficient 0.962).

Pilot study

A pilot study was conducted on seven nursing students representing 10% of the main study sample to test the clarity of language, and the practicability and applicability of the data collection tool. Since no modification was made in the tool, these students were included in the main study sample.

Administrative design

Before any attempt to collect data, official permissions to conduct the study were obtained from Director of Technical Nursing Institute of Fevers Hospital using official channels.

Ethical considerations

An approval of the research protocol was obtained from the Scientific Research Ethics Committee of the Faculty of Nursing, Ain Shams University. The aim, purpose, benefits of the study, and the impact of this study on the students were explained to the Director of the Institute and to students to get their agreement. Moreover, the researcher obtained a verbal consent from each nursing student. They were informed that participation is totally voluntary. They were also reassured about confidentiality and anonymity of any collected information.

Statistical design

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Chi-squared tests were used for analysis of categorical data. Pearson correlations were used in the assessment of the relationships among quantitative variables. To identify the independent predictor of the perception score, multiple linear regression analysis was used. Statistical significance was set at p-value <0.05.

Results:

Table (1): demonstrates nursing students' mean age was 20.0±0.6, ranging from 19 to 22 years. A great majority of them were unmarried (85.7%) and had hobbies (91.4%). Slightly less than half of them reported having had previous experience with gamification (45.7%).

Table (2): shows nursing students' perception of gamification elements was high in all dimensions and in the total (91.4%). The lowest perception was concerning their expectations from gamification (88.6%).

Table (3): demonstrates that nursing students' perception of gamification elements was only significantly related to their having previous experience with it (p=0.019). It is evident that all (100.0%) of those who had such experience have high perception compared to 84.2% of those who did not.

Table (4): points to statistically significant strong positive correlations among the four dimensions of perception of gamification elements. The correlation coefficients ranged between 0.73 between the dimensions of benefits and teacher role to 0.90 between the benefits and expectations' dimensions.

Table (5): displays in multivariate analysis: having previous training in gamification was the only statistically significant independent positive predictor for nursing students' total perception score. It explains 23% of the variation in this score.

Table 1: Personal characteristics of students in the study sample (n=70)

	Frequency	Percent
Age:		
<21	58	82.9
21+	12	17.1
Range	19±22	
Mean±SD	20.0±0.6	
Median	20.0	
Marital status:		
No	60	85.7
Yes	10	14.3
Have hobbies:		
No	6	8.6
Yes	64	91.4
Had previous experience with gamification:		
No	38	54.3
Yes	32	45.7

Table 2: Perception of gamification among students in the study sample (n=70)

	Frequency	Percent
Perception of the benefits of gamification:		
High	64	91.4
Low	6	8.6
Expectations from gamification:		
High	62	88.6
Low	8	11.4
Feelings about gamification:		
High	64	91.4
Low	6	8.6
Perception of teacher role in gamification:		
High	64	91.4
Low	6	8.6
Total perception of gamification:		
High	64	91.4
Low	6	8.6

Table 3: Relations between students' perception of gamification and their characteristics

	Perception				X^2 test	p-value
	High		Low			
	No.	%	No.	%		
Age:						
<21	52	89.7	6	10.3		
21+	12	100.0	0	0.0	1.358	0.244
Married:						
No	54	90.0	6	10.0		
Yes	10	100.0	0	0.0	1.094	0.296
Have hobbies:						
No	6	100.0	0	0.0		
Yes	58	90.6	6	9.4	0.615	0.433
Had previous experience with gamification:						
No	32	84.2	6	15.8		
Yes	32	100.0	0	0.0	5.526	0.019*

(*) Statistically significant at p<0.05

Table 4: Correlation matrix of scores of perception dimensions scores

Perception dimensions	Pearson correlation coefficient			
	Perception dimensions			
	Benefits	Expectations	Feeling	Teacher role
Benefits	1.000			
Expectations	0.90**	1.000		
Feelings	0.79**	0.88**	1.000	
Teacher role	0.73**	0.82**	0.77**	1.000

(**) Statistically significant at p<0.01

Table 5: Best fitting multiple linear regression model for the perception score

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	4.423	0.059		74.592	<0.001	4.305	4.541
Previous training	0.397	0.088	0.481	4.528	<0.001	0.222	0.572

r-square=0.23 *Model ANOVA: F=20.51, p<0.001*

Variables entered and excluded: age, marital status, hobbies

Discussion:

The aim of this study was to assess nursing students' perception of the gamification regarding gamification elements in nursing administration course. The findings indicate a very high perception of this approach among them. Their perception is only influenced by their previous experience with gamification.

According to the results of the current study, around ninety percent or more of the nursing students had high perception of gamification elements concerning their related expectations and its benefits. This might be explained by the increasing tendency towards digitalization and the use of innovative approaches in education that demonstrated higher effectiveness in comparison with the traditional methods. Moreover, their active role and engagement in the process of learning with more practical applications while in class could have positively influenced their self-confidence, sense of achievement, and their high perception of the benefits of gamification. Moreover, gamification provides opportunities for active and experiential learning, with immediate feedback and performance metrics that can help students identify their areas of strength and areas needing improvement. Similar findings were also reported in a study on nursing students' perception of the use of gamification elements in learning **(Jiménez-Rodríguez et al., 2020).**

In agreement with this, **Roman et al. (2020)** emphasized that game-based learning promotes the development of nursing skills such as teamwork and communication skills. They

concluded that both simulations and serious games are effective teaching methods in nursing education. Meanwhile, and in line with the present study main finding, **Gu et al. (2022)** who used digital badges to increase nursing students' motivation demonstrated significant increases in their managerial skills. Furthermore, systematic reviews and meta-analyses provided evidence of the benefits of the use of gamification elements as an educational approach for nursing students **(Li et al., 2021; Tavares, 2022).**

The present study results have also demonstrated that a majority of the nursing students had high perception regarding their feelings towards gamification elements as an educational approach for learning. This is quite expected in an era of a boost in information technology where the use of computer and smartphone applications in many daily life activities is widespread particularly in the age group of these nursing students. Hence, the use of gamification is not only of benefit but also is enjoyable and entertaining. Thus, learning becomes more fun than a heavy burden. In congruence with this, a study in Spain reported a positive perception among nursing students towards the use of gamification in learning **(Antón-Solanas et al., 2022).** On the same line, in a study in Spain, the majority of the nursing students reported that they enjoyed learning through playing in gamification **(Rosa-Castillo et al., 2022).**

Furthermore, the majority of the nursing students in the present study had a high perception of the teacher's role in the gamification process. This might reflect their positive experience with their teacher who was well acquainted with the process and practiced the teacher role with high efficiency. In fact, the teacher role in gamification is a cornerstone in its success or failure. In this respect**, Lakhtakia et al. (2022)** clarified that students and teachers share roles and responsibilities with each other, reflected by a shift from a teacher-centered towards a more student-centered perspective. The teacher acts as a guide of students' learning processes, and students act as partners instead of being passive recipients of teachers' decisions and actions. Hence, teachers are expected to enhance learners' participation in the gamification approach **(Nabolsi et al., 2021).** Moreover, the importance of the role of the teacher in gamification has been emphasized as it is the main impetus for their motivation and engagement **(Al-Said, 2023).** However, to be effective, teachers need to be trained in their role in gamification **(Wu et al., 2023).**

In total, nursing students' perception of gamification elements was very high. This could be attributed to their feelings of motivation as well as of achievement during the module as well as the positive impact of the module on their knowledge and practice, giving them a feeling of fulfillment and satisfaction. In line with this, **Liu et al. (2019)** in their comparative study exploring the effectiveness of a gamified learning system versus traditional learning method on the motivation and learning outcomes of nursing students found that those in the gamification group had significantly higher levels of motivation, engagement, and satisfaction compared to those in the control group. They also had better learning outcomes, including knowledge retention, critical thinking skills, and clinical decision-making ability.

Similar findings were also reported from a systematic review investigating the impact of gamification on learning and motivation among nursing and healthcare students **(Smiderle et al., 2020)**. On the same line, a study on nursing undergraduate students in Spain demonstrated improved motivation and perception among them following the use of gamification learning **(Rosa-Castillo et al., 2022)**. Moreover, a qualitative study of Spanish nursing students' perception of gamification demonstrated high perception of its benefits and expectations, in addition to being positively accepted by them as an enjoyable learning approach **(Ropero-Padilla et al., 2021).**

The bivariate and multivariate analyses of the present study demonstrated that students' previous experience with gamification is the only characteristic significantly influencing their perception of gamification as an educational approach. The finding is quite plausible since those students who are acquainted with such technology would find it easier to adopt and would expect to have more mastery during the application of the module. Therefore, those who have experience with gamification may have a better understanding of how to engage with the material and retain information.

The present study has also revealed a significant positive correlation between nursing students' score of perception of feeling towards gamification and their age. Moreover, their total

score of perception had a weak positive correlation that did not reach statistical significance. This could be related to the more maturity and higher academic level gained with age. However, the relation did not persist in the multivariate analysis, which indicates that it was affected by confounding.

Conclusion:

The study results lead to the conclusion that majority of nursing students' perception of gamification elements was high in all dimensions and in the total. The lowest perception was concerning their expectations from gamification. Furthermore, nursing students' perception of gamification elements was only significantly related to their having previous experience. Statistically significant strong positive correlations among the four dimensions of perception of gamification elements. The correlation coefficients ranged between the dimensions of benefits and teacher role and between the benefits and expectations' dimensions. Moreover, in multivariate analysis: having previous training in gamification was the only statistically significant independent positive predictor for nursing students' total perception score.

Recommendations:

- Incorporate gamification elements into nursing administration courses to enhance student engagement, motivation, and practical application of theoretical concepts.
- Implement teacher training programs focused on equipping educators with the necessary skills to effectively integrate gamification into their teaching methods. This includes guidance on assuming a student-centered role, providing immediate feedback, and fostering a positive learning environment.
- Conduct ongoing assessments to monitor the impact of gamification on students' perception, academic performance, and overall satisfaction. This will help in refining and adapting gamification strategies based on real-time feedback.
- Facilitate knowledge-sharing sessions among educators to exchange best practices in implementing gamification in nursing courses. This collaborative approach will contribute to the continuous improvement of gamified learning experiences.
- Further Research: Encourage further research in the field to explore additional dimensions of gamification in nursing education. This could include investigating specific gamification elements, long-term effects on skill development, and comparative studies with traditional teaching methods.

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- No

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