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The Impact of Digital Gamification on Motivation, Engagement, and Academic Performance in Psychiatric Nursing Education

A Randomized Controlled Study



Ece Alagöz, PhD
Maltepe University



Tuba Çömez İkican, PhD
İstanbul University



Emre Mor, MSc
Koç University

Introduction: Digital Gamification in Education

Origin & Growth

The concept of gamification **was first used in 2008** and, in parallel with the rapid development of digital technologies, quickly became an innovative learning approach that gained worldwide attention.

Xu, 2011; Garrison et al., 2021

Definition

Gamification is defined **as a form of application that aims to increase individuals' motivation, participation, and interest** in the process by using game elements in areas outside the gaming context.

Ferguson et al., 2015

Educational Impact

In educational environments, gamification is increasingly widespread as a strategy that **encourages students' active participation in the learning process, makes the process fun and interactive, thereby increasing motivation and retention towards learning.**

Van Roy & Zaman, 2018; Garrison et al., 2021

Theoretical Framework: Self-Determination Theory

Self-Determination Theory

Autonomy

Encourages active participation & self-direction

Competence

Builds confidence & mastery of skills

Relatedness

Increases intrinsic motivation & belonging

Motivation Classification

01

Intrinsic Motivation

Derives direct pleasure from the learning process itself, the purest form of engagement.

02

Extrinsic Motivation

Driven by external factors such as grades, rewards, or social recognition.

03

Amotivation

Reflects a sense of reluctance or inadequacy; no drive to engage with learning.

Research Problem & Aim

Unique Difficulty of the Field

Psychiatric nursing exposes students to **complex, emotionally demanding clinical situations** that require both technical and interpersonal competence.

Limitations of Traditional Methods

Conventional lecture-based teaching is limited in building clinical confidence, sustaining learning motivation, and ensuring knowledge retention.

Aim of the Study

To determine the effects of digital gamification in psychiatric nursing education on student motivation and course engagement.

H₁ Using gamification in psychiatric nursing education increases student motivation.

H₂ Using gamification in psychiatric nursing education increases student engagement.

H₃ Using gamification in psychiatric nursing education increases student engagement.

Methodology

Quasi-Experimental Study | Pretest–Posttest Control Group Design | Maltepe University,

Sample & Variables

Population	96 third-year nursing students
Sample / group	n = 45 (intervention) n = 44 (control)
Confidence	95%, margin of error 5%, non-response 10%
Indep. Variable	Gamification method (Articulate Storyline)
Dep. Variables	Motivation level, Student engagement

Inclusion Criteria

- Enrolled in Psychiatric Nursing during the academic year
- **Minimum 80% attendance in the course**
- **Had not previously taken Psychiatric Nursing**
- Volunteered to participate in the study

01

Pre-test

Both groups complete scales at semester start

02

Intervention

Experimental: Gamification weekly
Control: Traditional summary method

03

Post-test

Both groups re-complete scales at semester end

Data Collection Tools

01

Sociodemographic Characteristics Form

- ▶ Age, gender, GPA (AGNO), marital & employment status
- ▶ "Would you consider becoming a psychiatric nurse?"
- ▶ "Rate your engagement in psychiatric nursing (1–10)"

02

Motivation & Learning Strategies Scale (MLSS)

- ▶ 7-point Likert scale measuring course-specific motivation
- ▶ Sub-dimensions: Intrinsic & Extrinsic Goal Orientation
- ▶ Additional: Task Value, Control Beliefs, Self-Efficacy, Test Anxiety

03

Student Engagement Scale (SES)

- ▶ 5-point Likert scale across 6 sub-dimensions
- ▶ Valuing · Sense of Belonging · Cognitive Engagement
- ▶ Peer Relationships · Faculty Relationships · Behavioral Engagement

Intervention Design: Weekly Gamification Modules



Module Welcome Screen

- ▶ Topic-specific module per session - consistent format throughout semester.
- ▶ Students accessed via shared link immediately after class
- ▶ Designed to reinforce that week's content through active retrieval

Each week started with an entry screen for that topic - simple, consistent, and immediately recognizable to students.

Multiple Choice Scenario - Therapeutic Communication

Terapötik İletişim v1.4 04:54

Buradan çok sıkıldım. Çıkmak istiyorum. Görüyorsunuz çok iyiyim. Ne zaman çıkaracaklar beni?

En yakın zamanda çıkacaksınız.

Ne zaman çıkacağınıza doktorunuz karar verecek, ben bilmiyorum.

İLERİ >



Multiple Choice Scenario

Students read a real patient dialogue and selected the therapeutically correct nursing response - under a countdown timer.

- ▶ Timed format to simulate clinical decision-making pressure
- ▶ Two response options - one correct, one plausible

The timer was a deliberate design choice. In real clinical encounters, nurses cannot deliberate indefinitely.

Drag-and-Drop Matching — Psychosis vs. Neurosis

(Psikoz ve nevroz)

	PSIKOZ	NEVROZ	KELİMELER
Hastalık derecesi			Bölünme Bozuk değil
Benlik işlevleri			Olmayabilir Konversiyon
Benlik sınırları			Belirsiz
Beden imgesi			Gerileme Akturfar
Gerçeği değerlendirme			Vardır Bozuk değil
Hastalığı kabul			Bozma Saplanma
Varsanılar			Genelde normal Brece hafif
Düşünce bozukluğu			Olabilir Yeterli
Bilişsel bozukluk			Yalıtma Somatizasyon İsuma
Topluma uyum			Yap-boz Bozuk
İş uyumu			Yoktur İçeride
Kişilerarası ilişki			Bastırma İçeride
Kullanılan savunma düzenekleri			Varsırma İçeride tutarsız Somatizasyon
			Yer değiştirme
			Bitir

Drag-and-Drop Matching

Students matched clinical characteristics to either psychosis or neurosis by dragging keyword cards into the correct column.

- ▶ More effective than list memorization for complex diagnostic distinctions
- ▶ Promotes comparative reasoning and differential thinking

This format works especially well for differential diagnosis concepts

Fill-in-the-Blank — Types of Depression

Depresyon Türleri

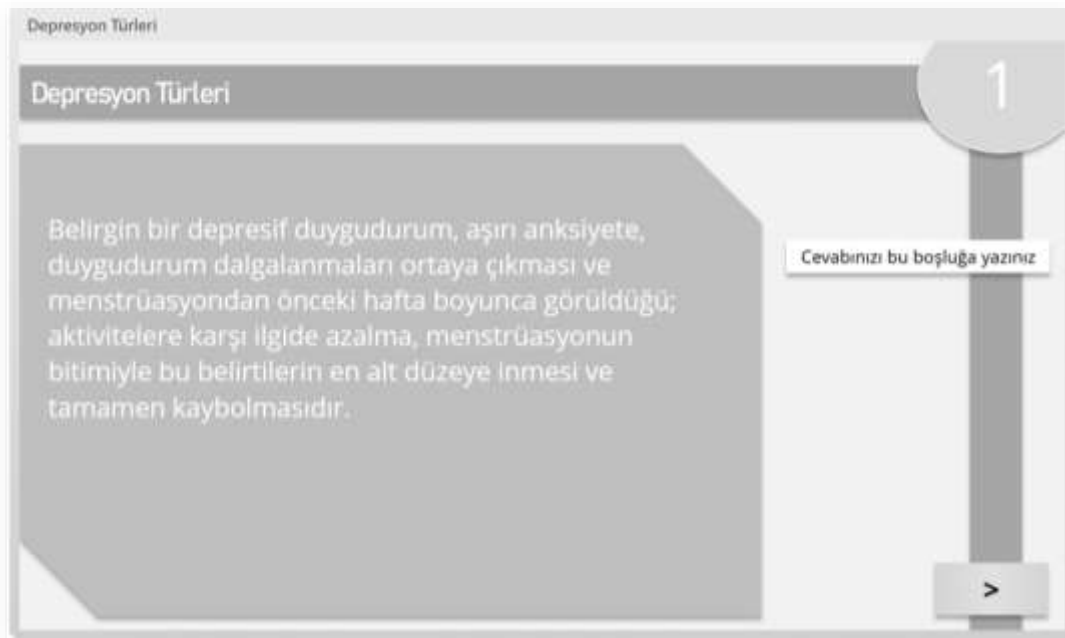
Depresyon Türleri

1

Bellirgin bir depresif duygudurum, aşırı anksiyete, duygudurum dalgalanmaları ortaya çıkması ve menstrüasyondan önceki hafta boyunca görüldüğü; aktivitelere karşı ilgide azalma, menstrüasyonun bitimiyle bu belirtilerin en alt düzeye inmesi ve tamamen kaybolmasıdır.

Cevabınızı bu boşluğa yazınız

>



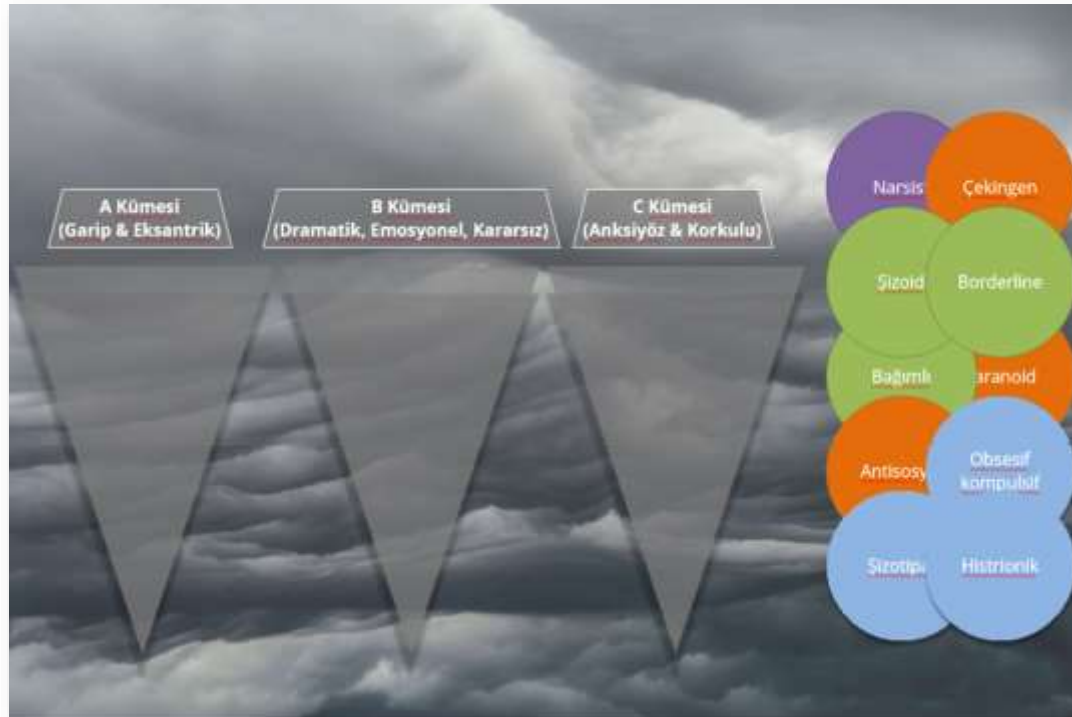
Fill-in-the-Blank

Students read a clinical description and typed the corresponding diagnosis name

- ▶ Targets precise diagnostic terminology and concept boundaries

Free-text favors retrieval over recognition — cognitively, the demanding and effective format for retention.

Cluster Sorting Activity — Personality Disorder Clusters



Cluster Sorting Activity

Students sorted 10 personality disorders into their correct DSM cluster — A (Odd/Eccentric), B (Dramatic), or C (Anxious/Fearful).

- ▶ Reinforces pattern recognition across related diagnostic categories
- ▶ Supports schema formation for overlapping clinical profiles

Sorting across categories is one of the strongest exercises for clinical pattern recognition — exactly the skill psychiatric nurses need.

Immediate Feedback — Results & Review Panel



Instant Score & Review

Upon completion, students immediately saw their percentage score, total points, and had three action options.

- ▶ Students could review individual items to identify incorrect responses
- ▶ Option to retry the module or print results for personal record

Directly addresses the competence dimension of Self-Determination Theory (SDT)

Findings: Sample Characteristics

89

Participants

n=45 intervention · n=44 control

83%

Female

Reflecting nursing's gender distribution

~99%

Single & Not Employed

Homogeneous sociodemographic profile

~48%

Career Willingness

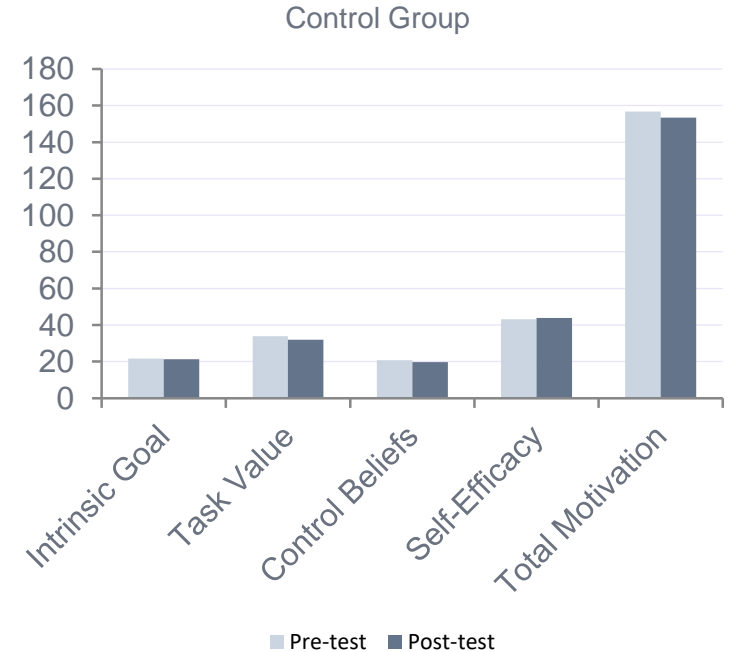
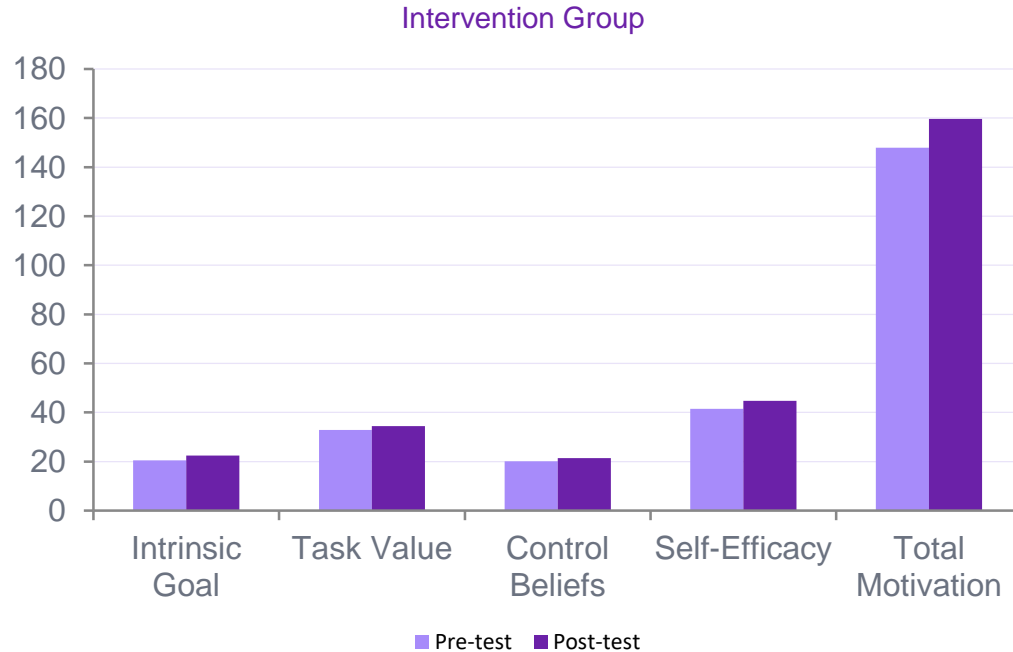
Equal split — interested in psych nursing

Characteristic	Category	Intervention n (%)	Control n (%)
Gender	Female	37 (82.2%)	37 (84.1%)
	Male	8 (17.8%)	7 (15.9%)
Marital Status	Single	45 (100.0%)	43 (97.7%)
Employment	Unemployed	39 (86.7%)	37 (84.1%)
Psych. Nurse Interest	Yes	22 (48.9%)	21 (47.7%)
	No	23 (51.1%)	23 (52.3%)

Groups showed no statistically significant difference in sociodemographic characteristics — ensuring comparability.

Findings: Motivation Scores - Pre-test vs. Post-test

Intervention group total motivation rose by +11.75 pts (+7.9%) while control group declined by -3.27 pts (-2.1%)



Notable improvements in intrinsic goal orientation (+1.98), task value (+1.51), control beliefs (+1.37), and self-efficacy (+3.27).

Findings: Student Engagement - Pre-test vs. Post-test

Intervention total engagement $\uparrow +5.45$ pts | Control total engagement $\downarrow -11.07$ pts — a divergence of $+16.5$ points

Valuing

Intervention: 13.22 \rightarrow 12.76 \downarrow 0.46
Control: 12.66 \rightarrow 11.34 \downarrow 1.32

INT post

CON post

Sense of Belonging

Intervention: 29.44 \rightarrow 32.07 \uparrow 2.63
Control: 31.05 \rightarrow 29.41 \downarrow 1.64

INT post

CON post

Cognitive Engagement

Intervention: 41.18 \rightarrow 43.56 \uparrow 2.38
Control: 40.41 \rightarrow 38.91 \downarrow 1.5

INT post

CON post

Peer Relationships

Intervention: 24.18 \rightarrow 25.64 \uparrow 1.46
Control: 24.84 \rightarrow 23.3 \downarrow 1.54

INT post

CON post

Faculty Relationships

Intervention: 42.53 \rightarrow 41.62 \downarrow 0.91
Control: 42.68 \rightarrow 38.61 \downarrow 4.07

INT post

CON post

Behavioral Engagement

Intervention: 17.58 \rightarrow 17.93 \uparrow 0.35
Control: 17.25 \rightarrow 16.25 \downarrow 1

INT post

CON post

Findings: Key Correlations (Pre-test, Spearman ρ)

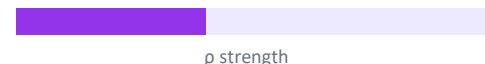
0.395

$p < .001$

Overall

Total Motivation ↔ Total Engagement

Higher motivation consistently predicted stronger overall engagement across both groups.



0.409

$p < .001$

Overall

Task Value ↔ Cognitive Engagement

Students who valued the course deeply engaged more cognitively — a direct SDT alignment.



0.437

$p = .003$

Intervention

Age ↔ Control Beliefs about Learning

Older students in the gamified group showed stronger self-regulation beliefs.



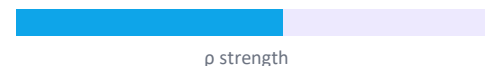
0.555

$p < .001$

Intervention

Psych Course Attachment ↔ Intrinsic Goal Orientation

The strongest single correlation: course attachment was a powerful predictor of intrinsic motivation.



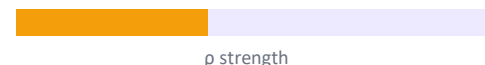
0.399

$p = .007$

Control

Psych Course Attachment ↔ Cognitive Engagement

Even without gamification, course attachment drove deeper cognitive engagement.



Additional: In the intervention group, age also positively correlated with sense of belonging ($\rho = .344, p = .021$) and total engagement ($\rho = .330, p = .027$).

Findings: Gender Differences in Baseline Scores

Female students scored significantly higher than males on multiple sub-scales at baseline ($p < .05$)

Motivation Scale — Significant Differences

Scale	Female	Male	p
Intrinsic Goal Orientation	22.35	18.29	.014
Task Value	34.62	30.14	.037
Control Beliefs	21.24	18.29	.016
Total Motivation	159.41	142.71	.036

Engagement Scale — Significant Differences

Scale	Female	Male	p
Valuing	13.19	9.86	.004
Sense of Belonging	32.19	25	.026
Cognitive Engagement	41.73	33.43	.007
Behavioral Engagement	17.54	15.71	.010
Total Engagement	172.97	147.29	.001

Gender differences were significant at baseline only — post-test comparisons showed no significant gender effect, suggesting gamification reduced the gap.

Discussion

Combating Semester Fatigue

Gamification sustained motivation and engagement when the control group experienced a typical end-of-semester decline — a key practical advantage.

Self-Determination Theory Validated

Game-based elements fulfilled students' needs for autonomy, competence, and relatedness — directly confirming SDT as the explanatory framework.

Cognitive & Academic Gains

Gamification promoted metacognitive strategies, repetition, and elaboration — supporting longer study times, better content perception, and improved self-efficacy.

Gender Dynamics

Female students showed significantly higher baseline motivation and engagement. Gamification helped narrow this gap by semester end.

Age & Autonomy

Older students demonstrated stronger control beliefs and belonging — maturity supports self-directed learning, and gamification amplified this effect.

Conclusion

1 Gamification Outperforms Traditional Teaching

Articulate Storyline-based gamification significantly boosted intrinsic motivation and self-efficacy compared to conventional lectures.

2 Enhanced Cognitive Engagement & Belonging

The intervention actively strengthened cognitive engagement and students' sense of belonging - two dimensions most critical for deep learning.

3 Motivation–Engagement Synergy

Robust positive correlations confirm that motivation and engagement reinforce each other — intervening on one lifts the other.

4 Baseline Differences Matter

Sociodemographic factors (gender, age) shape initial motivation and learning approaches. Gamification is an effective equalizer.

Recommendations for Future Practice & Research



Curriculum Integration

Embed digital gamification tools (interactive tasks, instant feedback, Articulate Storyline) into complex, emotionally demanding nursing courses — especially psychiatric nursing.



Longitudinal Studies

Future research should track the long-term impact of gamified learning on students' actual clinical performance, competency outcomes, and retention rates.



Broader Scope

Expand randomized controlled trials across different nursing specialties and institutions with larger, multi-center samples to confirm generalizability.

Thank You

Questions & Collaboration

Emre Mor, MSc | Koç University

mor.emre@outlook.com

[linkedin.com/in/emremor](https://www.linkedin.com/in/emremor)



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