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Exploring Gamification: Teachers' Attitudes and User Types in STEM, Language, Humanities, and Arts Education

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Abstract

The importance of gamification is increasing gradually, but how teachers apply it in different disciplines remain relatively underexplored. This mixed-method study implemented explanatory design and investigated teachers' gamification attitudes (GA), gamification user types (GUT), and preferred game components across different disciplines. Quantitative data were collected from 362 elementary and secondary school teachers using three instruments: GA, GUT, and Preferred Game Components. Additionally, semi-structured interviews with 20 purposively selected teachers provided a qualitative insight. Results indicate that teachers hold generally positive attitudes toward gamification, especially regarding acquisition and usability. Differences were found in the use of gamification elements, with STEM teachers favoring levels and leaderboards, language teachers using badges and teams, and arts and humanities teachers emphasizing customization. Qualitative data further illustrates how disciplinary background shaped gamification practices: arts and humanities teachers favored narrative and feedback, while STEM educators preferred rule-based elements. Teachers' examples reflected growing curricular emphasis on design-based learning, highlighting the importance of contextualized problem solving in shaping gamified experiences across disciplines. Our results suggest differentiated professional development and discipline-aligned strategies to support sustainable use of gamification.

Keywords: Gamification, Gamification Attitudes, Gamification User Types, Design-Based Learning.

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In recent years, educational environments have undergone a significant transformation, increasingly shaped by the integration of technology and learner-centered methodologies. Among the emerging strategies, gamification has attracted considerable attention for its potential to enhance student engagement, motivation, and participation. Especially in classrooms where traditional instructional methods fall short of capturing students' interest, gamification offers an alternative pathway to reimagine learning through interactivity and challenge. Yet, its effectiveness largely depends on how teachers perceive, design, and implement gamified practices within their pedagogical contexts. Gamification is defined as the application of design elements common to games in settings where gaming is not the primary goal (Deterding et al., 2011), and its educational value has been supported by research highlighting its role in boosting motivation and active learning (Hamari, Koivisto, & Sarsa, 2014; Seaborn & Fels, 2015). Factors such as digital literacy, instructional styles, and institutional support significantly influence educators' attitudes toward gamification (Kapp, 2012), while different user profiles—such as Explorers, Achievers, and Socializers—reflect the varied ways teachers engage with gamified content (Bartle, 1996; Marczewski, 2015; Landers, 2014). To maximize gamification's impact Manske and Hoppe (2016) suggested implementing personalized gamification models that adjust difficulty levels based on student progress. Nicholson (2015) underlined that the importance of motivators, such as meaningful challenges and autonomy, alongside extrinsic rewards. Sailer et al. (2017) discussed incorporating cooperative game elements to enhance peer learning and teamwork. Johnson et al. (2016) stated the value of utilizing advanced digital tools such as simulations and real-time feedback mechanisms to create immersive learning experiences.

Gamification often boosts engagement, but its long-term sustainability has been questioned due to concerns about extrinsic motivation, reward dependency, and superficial participation (Hanus & Fox, 2015; Deci & Ryan, 2017). Teachers frequently encounter challenges in designing meaningful game-based activities that go beyond points and badges. Without sufficient support, gamification may fail to align with deeper learning goals. Therefore, investigating teachers' perceptions, challenges, and design strategies is crucial for developing sustainable gamified environments that foster intrinsic motivation, autonomy, and reflective learning (Nicholson, 2015; Kim et al., 2018).

Gamification has been widely recognized for its motivational benefits in educational settings, but the ways in which teachers adapt and personalize gamified strategies across disciplines remain underexplored. Gamification improves student engagement and motivation (Hamari et al., 2014). The effectiveness of gamification in classrooms depends on how teachers perceive and implement it as suggested by Seaborn & Fels (2015). Certain factors such as previous experience with digital tools, teaching practices and organizational support are known to affect teachers' perceptions (Kapp, 2012). In addition, pedagogical approaches vary among disciplines, and these differences may influence how gamification is perceived and implemented (Reinhardt & Sykes, 2012; Chou, 2019). Understanding gamification as a discipline-sensitive practice is essential to designing effective interventions and teacher training programs (Reinhardt & Sykes, 2012; Chou, 2019).

How gamification is implemented in different disciplines may provide valuable insights into how educators interact with game elements and motivational structures (Tondello et al., 2016; Marczewski, 2015). However, a few studies have examined different user types align with teachers' demographic and disciplinary backgrounds. Mapping teacher profiles to their gamification preferences can facilitate more targeted and meaningful

integration of game mechanics in classroom practice (Landers, 2014). It also opens up new possibilities for designing adaptive gamification that are tailored in different disciplines. Building upon these results, the subsequent section provides a review of the literature on gamification in different disciplines, user types, and challenges

Gamification can lead to significant improvements in students' intrinsic motivation (Deci & Ryan, 2017), problem-solving skills (Kapp, 2012), and overall academic performance (Domínguez et al., 2013). The increasing use of gamification in education has increasingly emphasized the need to consider disciplinary differences in its application. For instance, Mehalik et al. (2008) demonstrated that science teachers often adopt rule-based and progress-oriented practices to enhance conceptual learning. Chou (2019) further argued that while STEM (science, technology, engineering, mathematics) teachers prefer structured systems like points and levels. STEM educators often adopt rule-based systems and structured progression models such as points, badges, and levels, reflecting their alignment with performance-oriented learning environments (Caponetto et al., 2014; Hamari et al., 2016).

In contrast, language and arts teachers are more inclined to use narrative missions, character roles, and open-ended challenges that encourage creativity and emotional engagement (Eseryel et al., 2014; Su & Cheng, 2015). Reinhardt and Sykes (2012) highlighted how language teachers use narrative-driven tasks and role-play to foster communication. In another study, Kangas (2010) explored how art and social studies teachers employ game co-creation and performative elements to support expressive learning. In social studies, gamification has been used to promote critical thinking and civic engagement through simulation games and role-playing activities (McCall, 2011). These findings suggest that gamification is not a one-size-fits-all. These contrasting approaches suggest that gamification practices are not universally applied but are instead adopted to meet the needs of different disciplines.

In addition to disciplinary preferences, the selection of game components plays a critical role in shaping learning outcomes. Using badges and leaderboards primarily drives extrinsic motivation, often resulting in short-term engagement (Deci et al., 2001; Mekler et al., 2017). Conversely, elements like narrative structures, and progress charts tend to foster intrinsic motivation by promoting autonomy, mastery, and a sense of involvement (Deci & Ryan, 2017; Dichev & Dicheva, 2017). Understanding which components are best suited for different learning disciplines may designing effective gamified instruction.

Game mechanics can be considered as another key factor in gamification's effectiveness. Gamification can be categorized into competitive, collaborative, and self-paced models, each of them influences learners differently (Sailer et al., 2017). Competitive gamification tends to appeal to highly motivated students but may discourage those who struggle with competition (Mekler et al., 2017). Collaborative gamification fosters teamwork and knowledge sharing, where problem-based learning is implemented (Faiella & Ricciardi, 2015).

Gamification also presents several challenges. One primary concern is the sustainability of motivation—while gamification can initially engage students, maintaining long-term interest requires well-structured and evolving game mechanics (Hanus & Fox, 2015). Research suggests that poorly designed gamification strategies can lead to extrinsic

motivation dependency, where students aim for rewards rather than focusing on the learning experience (Deci & Ryan, 2017). Another challenge is teacher training. Studies indicate that many educators feel underprepared to integrate gamification effectively into their curricula (De Sousa et.al., 2014). Moreover, some schools often lack the technological infrastructure needed for gamified learning environments (Sanmugam et.al., 2019). Addressing these challenges requires systematic professional development and support (Horn & Staker, 2015).

Gamification can enhance motivation and engagement (Hamari et al., 2014; Deterding et al., 2011), but there remains a gap in understanding how teachers perceive, adapt, and personalize gamification strategies in different disciplines. Gamifications is widely used in STEM education (Ortiz et al., 2016; Venter, 2020). Despite the prominence of gamification in higher education (Ortiz et al., 2016; Venter, 2020), it is important to understand how gamification is translated into different disciplines in K-12 education. Departing from this need, this study explored STEM teachers' ideas and practices to other disciplines' strategies and tendencies. The main research question was: "How do teachers' gamification user types and gamification attitudes differ between STEM teachers and teachers from other disciplines in K–12 education?" In addition to discipline-based exploration, we examined variations based on several demographic characteristics (age, gender and educational attainment) in the quantitative section. Finally, the qualitative section offered a detailed analysis of teachers' practices. Qualitative data discussed how teachers apply gamification in different disciplines.

Method

Research Design

This mixed-methods study employed an explanatory sequential design to investigate teachers' attitudes toward gamification, gamification user profiles, and preferred game elements across various disciplines. In this study, quantitative data are gathered and analyzed in the initial phase, followed by qualitative data collection intended to clarify or deepen the interpretation of the quantitative results. As noted by Creswell and Plano Clark (2011), this design is especially effective when the goal is not only to examine the outcomes of a particular phenomenon but also to explore the underlying perceptions, rationales, or contextual influences that help explain those outcomes. Typically structured in two distinct phases, this approach is often chosen when quantitative results reveal patterns or relationships that require deeper explanation. It integrates the strengths of both methodologies to enhance validity and applicability in real-world educational and social research (Creswell, 2013).

Participants

The quantitative phase of the study employed a survey design, while the qualitative phase involved interviews with teachers who voluntarily agreed to participate. The target population comprised 4,494 K–12 teachers working in a city in Western Türkiye. The sample size was determined using the Raosoft online sample size calculator. Given the total population, a 95% confidence level, and a 5% margin of error, the minimum required sample size was calculated to be 354 participants.

The sample group was selected by a purposive sampling method. Purposive sampling provides rich and detailed data on individuals who are directly related to the research topic, rather than representing the entire population (Patton, 2002). In this study, purposive sampling was used to reach teachers working in different disciplines. Participants were selected from a wide range of disciplines: English (n = 64), Turkish (n = 48), Science (n = 40), Mathematics (n = 38), Social Studies (n = 37), Religious Culture and Ethics (n = 31),

Technology and Design (n = 21), ICT (n = 19), Psychological Counseling and Guidance (n = 15), Music (n = 15), Visual Arts (n = 14), and Physical Education (n = 20). Most of the participants were female (n = 230) and, and there were 132 male participants. 77.6% of the teachers held a bachelor's degree (n = 281), while 22.4% had completed postgraduate education (n = 81). The age distribution revealed that 8.6% of teachers were aged between 20 to 30, 47.8% were aged between 31 to 40, and 43.6% were aged 41 or above.

In the analysis, disciplines were grouped into three categories: STEM Education (Group 1): Mathematics, Science, Information and Communication Technology (ICT), and Technology and Design; Language Education (Group 2): Turkish and English teachers, Humanities & Arts Education (Group 3): Social Studies, Religious Culture and Moral Knowledge, Psychological Counseling and Guidance, Music, Visual Arts, and Physical Education.

The qualitative sample consisted of 20 teachers who were purposefully selected to ensure variation in different disciplines. There were seven STEM Teachers, six Language Teachers and seven Humanities & Arts teachers.

Data Collection Tools

The quantitative data for this study were collected during the fall semester of the 2024–2025 academic year using three instruments: the Gamification Attitudes (GA) Scale developed by İnesi, Gökalp, and Sezer (2022); the Gamification User Types (GUT) Scale originally developed by Tondello et al. (2016) and adapted into Turkish by Akgün and Topal (2018); and the Game Components Questionnaire adapted by Özdemir (2023). The qualitative data was gathered through a semi-structured interview form designed by the researchers.

Gamification Attitudes (GA) Scale

GA Scale, developed by İnesi et al. (2022), comprises 14 items across three sub-dimensions: acquisition, design, and usability. The scale employs a 5-point Likert format (1 = strongly disagree to 5 = strongly agree). In the original study, Cronbach's alpha reliability coefficients were .88 for the overall scale, .87 for the acquisition subscale, .75 for design, and .77 for usability. In the present study, the internal consistency values were higher: .95 for the overall scale, .92 for acquisition, .90 for design, and .92 for usability.

Gamification User Types (GUT) Scale

GUT Scale, originally developed by Tondello et al. (2016) and adapted into Turkish by Akgün and Topal (2018), comprises 24 items across six user profiles: Philanthropist, Socializer, Free Spirit, Achiever, Player, and Disrupter. The scale is based on a 7-point Likert format, ranging from 1 (Strongly disagree) to 7 (Strongly agree). In the original adaptation study, the overall Cronbach's alpha reliability coefficient was .89, with subscale values of .76 for the philanthropist dimension, .79 for the socializer dimension, .72 for the free spirit dimension, .80 for the achiever dimension, .78 for the player dimension, and .71 for the disrupter dimension. In the current study, the internal consistency of the scale was similar, with a Cronbach's alpha of .90 for the overall scale, .78 for the philanthropist dimension, .78 for the socializer dimension, .78 for the free spirit dimension, .81 for the achiever dimension, .82 for the player dimension, .81 for the player dimension, and .80 for the disrupter dimension.

Preferred Game Elements Survey

The Preferred Game Elements Survey was designed to explore the specific game mechanics educators tend to integrate into their teaching practices. The instrument includes 17 game elements frequently used in gamified educational settings (see Table 6). Participants were asked to select up to five elements they had personally used or preferred in their classroom practice. The selection of elements was guided by established gamification frameworks (Werbach & Hunter, 2012; Marczewski, 2015) and adapted by Özdemir (2023) to reflect widely observed applications in educational contexts.

Semi-Structured Interview Form

A semi-structured interview form was developed to align with the objectives of the study. The development process began with a comprehensive review of relevant national and international literature to identify key themes and question formats appropriate for the research context. Based on this review, a draft version of the interview form was created. To ensure content validity, this draft was evaluated by three experts in the fields of mathematics education, science education, and social sciences. Their feedback was used to revise and refine the form, focusing on the clarity, relevance, and comprehensiveness of the items. A pilot implementation was then conducted with a small group of teachers to assess the clarity and applicability of the questions. Final adjustments were made based on the results of this pilot, resulting in the version used in the main study.

The semi-structured interview form consists of four questions and was prepared to evaluate the knowledge, experience, and practices of the participants on and gamification. The form includes questions to understand the educators' awareness of gamification, their practices, and the effects of gamification. To expand on a gamification-based example, teachers were asked to provide an example related to design based learning. The importance of design-based examples continued to increase in recent Turkish curriculum reforms. This is why we asked teachers to focus design-based learning for providing an example (Ministry of National Education, 2024). For instance, arts teachers are now expected to focus on artistic design, whereas STEM teachers are expected to develop digital products (Ministry of National Education, 2024). Due to its growing importance design-based examples were discussed with teachers.

Ethical Committee Decision

Ethical approval for this study was obtained from Uşak University Committee on Research and Publication Ethics in Social and Human Sciences in June 2024 (Approval Number 2024-143).

Data Analysis

Quantitative data were examined using SPSS 24 software. First, the distribution for normality was investigated. Normality was assessed through skewness and kurtosis values. For GA, skewness was −0.885 and kurtosis was −0.136; for GUT, skewness was −0.799 and kurtosis was −0.366. These values fall within the acceptable range (±1), indicating that the data are approximately normally distributed. According to Tabachnick and Fidell (2001), the distribution was normal. Then, descriptive statistics (mean, standard deviation) were calculated. To explore differences across demographic variables such as gender, age, and educational background, independent samples t-tests and one-way ANOVA were performed.

When significant results emerged, post hoc analyses were conducted to determine which groups differed from one another.

To ensure the trustworthiness of the qualitative analysis, multiple strategies were employed. First, the interview data were transcribed verbatim by the first author and reviewed multiple times to ensure accuracy, consistency, and depth of interpretation. An inductive content analysis approach was adopted, in which codes were derived directly from the data rather than imposed through predefined frameworks (Weligodapola & Darabi, 2018). Initial coding was conducted manually by the first author and refined through iterative cycles of review. To enhance credibility and reduce potential researcher bias, a peer debriefing session was held with an expert in qualitative research. Additionally, all codes were independently reviewed by another graduate student to ensure inter-rater reliability.

A total of 47 codes emerged from the analysis of the 20 interview transcripts. These codes were organized into four main thematic categories aligned with the study's sub-research questions: (1) Knowledge on Gamification, (2) In-Class Practices, (3) Impact of Gamification, and (4) Tailoring Gamification. Each theme included illustrative codes that reflected teachers' diverse practices and perceptions. T1 stated "The treasure-hunt narrative creates excitement in the classroom" (T1). This statement discussed the impact from a student perspective and included under the third theme. Same teacher added "I adapt gamified tasks based on students' pace and learning levels" (T1). Later in the interview, the teacher started to discuss how to utilize gamification and this example was grouped under the fourth theme.

Findings

This section included quantitative and qualitative results.

Quantitative Results

In Tabel 1 the descriptive statistics regarding teachers' GA and GUT scores are presented.

Table 1

Descriptive Statistics for GA and GUT Scores

GA Scores			
Variable	**n**	$\bar{x}$	**s**
Acquisition	362	4,41	,65
Usability	362	4,12	,84
Design	362	4,36	,77
GA (Total)	362	4,31	,66
GUT Scores			
Philanthropist	362	6,17	,92
Socializer	362	5,93	1,04
Free Spirit	362	6,19	,91
Disrupter	362	3,58	1,79
Player	362	5,74	1,20
Achiever	362	6,06	1,01
GUT (Total)	362	5,75	,67

The data presented in Table 1 indicate that teachers' overall attitudes toward gamification are at a high level, with a mean score of 4.31 for GA. Among the sub-dimensions, the acquisition dimension ($\bar{X}$ = 4.41) indicated a positive perception of gamification's impact on learning outcomes, while the design dimension ($\bar{X}$ = 4.36) reflected a high level of acceptance regarding its practical implementation. On the other hand, the usability dimension received a slightly lower mean score ($\bar{X}$ = 4.12).

Overall mean score was 5.75 for GUT indicating positive attitude toward gamification. The highest scoring user type is Free Spirit ($\bar{X}$ = 6.19), highlighting a strong inclination for independent exploration and innovation among participants. Philanthropist ($\bar{X}$ = 6.17), Achiever ($\bar{X}$= 6.06), and Socializer ($\bar{X}$ = 5.93) types also indicated high levels, reflecting collaborative and goal-oriented attitudes, as well as a strong desire for social interaction through gamification. In contrast, the Disruptor type ($\bar{X}$= 3.58) remained at a moderate level, indicating a low tendency toward rule-breaking or system manipulation. Overall, these findings suggest that teachers hold predominantly positive views of gamification, with only one user type represented moderately.

Table 2 presented the findings on variations in teachers' GA and GUT scores according to gender.

Table 2

Differences in Teachers' GA and GUT Scores Based on Gender

			GA Scores			
Variable	Gender	N	$\bar{X}$	s	t	p
Acquisition	Female	230	4,42	,68	,339	,07
	Male	132	4,40	,60		
Usability	Female	230	4,18	,81	1,541	,12
	Male	132	4,03	,90		
Design	Female	230	4,37	,78	,410	,68
	Male	132	4,42	,68		
GA (Total)	Female	230	4,34	,67	,841	,40
	Male	132	4,28	,65		
			GUT Scores			
Philanthropist	Female	230	6,21	,92	1,036	,30
	Male	132	6,10	,91		
Socializer	Female	230	5,96	1,09	,677	,49
	Male	132	5,88	,95		
Free Spirit	Female	230	6,20	,95	,164	,87
	Male	132	6,18	,84		
Disrupter	Female	230	3,58	1,83	,030	,97
	Male	132	3,58	1,73		
Player	Female	230	5,77	1,21	,599	,55
	Male	132	5,69	1,18		
Achiever	Female	230	6,06	1,04	-,029	,97
	Male	132	6,06	,96		
GUT (Total)	Female	230	5,63	,85	,519	,60
	Male	132	5,58	,75		

Results presented in Table 3 revealed no statistically significant differences between female and male teachers in terms of their GA and GUT scores. Mean scores for both groups

were generally high across all sub-dimensions, indicating that gender does not have a significant impact on teachers' perceptions or tendencies regarding gamification practices. Generally female teachers had higher scores regarding to GA and GUT. Table 3 presents the findings on variations in teachers' GA and GUT scores according to age.

Table 3

Differences in Teachers' GA and GUT Scores Based on Age

Variable	Age	n	$\bar{X}$	s	F	Meaningful Difference	p
GA Scores							
Acqusition	20-30 (1)	31	4,39	0,53	0,168	None	,84
	31-40 (2)	173	4,44	0,66			
	41 + (3)	158	4,40	0,66			
Design	20-30 (1)	31	4,04	0,65	0,267	None	,76
	31-40 (2)	173	4,15	0,66			
	41 + (3)	158	4,11	0,88			
Usability	20-30 (1)	31	4,35	0,60	3,118	None	,99
	31-40 (2)	173	4,35	0,81			
	41 + (3)	158	4,36	0,77			
GA (Total)	20-30 (1)	31	4,28	0,49	0,111	None	,89
	31-40 (2)	173	4,33	0,68			
	41 + (3)	158	4,30	0,66			
GUT Scores							
Philanthropist	20-30 (1)	31	6,10	,77	2,144	None	,11
	31-40 (2)	173	6,28	0,80			
	41 + (3)	158	6,07	1,05			
Socializer	20-30 (1)	31	5,83	0,79	3,074	2-3	,04*
	31-40 (2)	173	6,07	0,89			
	41 + (3)	158	5,79	1,21			
Free Spirit	20-30 (1)	31	6,06	0,82		None	,17
	31-40 (2)	173	6,28	0,75			
	41 + (3)	158	6,11	1,06			
Disrupter	20-30 (1)	31	3,55	1,84	1,745	None	,87
	31-40 (2)	173	3,63	1,78			
	41 and above (3)	158	3,53	1,81			
Player	20-30 (1)	31	5,83	0,87	0,131	2-3	,00*
	31-40 (2)	173	5,95	1,07			
	41 +(3)	158	5,50	1,35			
Achiever	20-30 (1)	31	6,09	0,82	2,120	None	,12
	31-40 (2)	173	6,17	0,86			
	41 + (3)	158	5,94	1,18			
GUT (Total)	20-30 (1)	31	5,58	0,69	5,943	2-3	,03*
	31-40 (2)	173	5,73	0,70			
	41 +(3)	158	5,49	0,93			

Results presented in Table 3 revealed no statistically significant differences in teachers' GA scores based on age groups. Across all age groups, the mean scores were generally high, indicating that teachers perceive gamification positively regardless of age. This suggests that teachers' attitude toward the benefits, applicability, and design aspects of gamification remained relatively similar among age groups. Teachers aged 31-40 reported slightly higher mean GA scores compared to other groups.

There was a significant difference in teachers' GUT scores ([$F_{(2,359)}$= 5.943 p<.05])., In addition, statistically significant differences emerged in the Socializer ([$F_{(2,359)}$=3.074 p<.05]) and Player dimensions ([$F_{(2,359)}$= .131 p<.05]). In addition, the 31–40 age group received higher scores in all GUT dimensions.

Table 4 presents the findings on variations in teachers' GA and GUT scores according to graduation level.

Table 4

Differences in Teachers' GA and GUT Scores Based on Educational Attainment

GA Scores						
Variable	Graduation	N	X̄	s	t	p
Acquisition	Bachelor's degree	281	4,42	,67	,299	,76
	Postgraduate degree	79	4,40	,57		
Design	Bachelor's degree	281	4,13	,87	1,159	,87
	Postgraduate degree	79	4,11	,76		
Usability	Bachelor's degree	281	4,36	,80	,118	,90
	Postgraduate degree	79	4,35	,68		
GA (Total)	Bachelor's degree	281	4,32	,70	,224	,82
	Postgraduate degree	79	4,28	,65		
GUT Scores						
Philanthropist	Bachelor's degree	281	6,21	,92	1,036	,30
	Postgraduate degree	79	6,10	,91		
Socializer	Bachelor's degree	281	5,96	1,09	,677	,49
	Postgraduate degree	79	5,88	,95		
Free Spirit	Bachelor's degree	281	6,20	,95	,164	,87
	Postgraduate degree	79	6,18	,84		
Disrupter	Bachelor's degree	281	3,58	1,83	,030	,97
	Postgraduate degree	79	3,58	1,73		

Player	Bachelor's degree	281	5,77	1,21	,599	,55
	Postgraduate degree	79	5,69	1,18		
Achiever	Bachelor's degree	281	6,06	1,04	-,029	,97
	Postgraduate degree	79	6,06	,96		
GUT (Total)	Bachelor's degree	281	5,63	,85	,519	,60
	Postgraduate degree	79	5,58	,75		

Results presented in Table 4 presented no statistically significant differences for teachers continuing their graduate education. Mean scores across all sub-dimensions—acquisition, design, use, and overall GA—are very similar between the two groups. Similarly, no significant differences were observed in any of the GUT dimensions. These findings suggest that educational attainment level does not have a significant impact on teachers' perceptions or preferences related to gamification. Both bachelor's and postgraduate degree holders exhibit similarly positive attitudes and user profiles. A closer look at the mean scores reveals a consistent trend. Teachers holding postgraduate degrees exhibited slightly lower mean scores across almost all sub-dimensions of GA and GUT.

Table 5 presents the findings on variations in GA and GUT scores according to discipline.

Table 5

Differences in Teachers' GA and GUT Scores Based on Discipline

GA Scores							
Variable	**Discipline**	**n**	**X̄**	**s**	**F**	**Difference**	**p**
Acquisition	STEM (1)	118	4,27	0,77	4,152	1-2 1-3	,01*
	Language (2)	112	4,49	0,61			
	Humanities & Arts (3)	132	4,48	0,54			
Design	STEM (1)	118	3,92	1,05	5,259	1-2 1-3	,00*
	Language (2)	112	4,20	0,71			
	Humanities & Arts (3)	132	4,24	0,70			
Usability	STEM (1)	118	4,18	0,97	4,614	1-2 1-3	,01*
	Language (2)	112	4,43	0,71			
	Humanities & Arts (3)	132	4,45	0,58			
GA (Total)	STEM (1)	118	4,15	0,83	5,853	1-2 1-3	,03*
	Language (2)	112	4,39	0,59			
	Humanities & Arts (3)	132	4,40	0,50			
GUT Scores							

Philanthropist	STEM (1)	118	6,15	,90	0,516	None	,59
	Language (2)	112	6,12	1,04			
	Humanities & Arts (3)	132	6,23	,82			
Socializer	STEM (1)	118	6,00	,92	0,421	None	,65
	Language (2)	112	5,89	1,19			
	Humanities & Arts (3)	132	5,90	1,02			
Free Spirit	STEM (1)	118	6,23	,93	0,446	None	,64
	Language (2)	112	6,12	,98			
	Humanities & Arts (3)	132	6,21	,81			
Disrupter	STEM (1)	118	3,63	1,85	1,400	None	,24
	Language (2)	112	3,77	1,84			
	Humanities & Arts (3)	132	3,39	1,69			
Player	STEM (1)	118	5,72	1,20	,137	None	,87
	Language (2)	112	5,79	1,25			
	Humanities & Arts (3)	132	5,71	1,16			
Achiever	STEM (1)	118	6,14	,97	1,002	None	,36
	Language (2)	112	5,95	1,11			
	Humanities & Arts (3)	132	6,07	1,16			
GUT (Total)	STEM (1)	118	5,65	,77	,166	None	,84
	Language (2)	112	5,61	,94			
	Humanities & Arts (3)	132	5,59	,75			

There were significant differences in teachers' GA scores among different disciplines ([$F_{(2,359)}$=5.853 p<,05]), as well as in the subdimensions of Acquisition ([$F_{(2,359)}$=4,152 p<,05]), Design ([$F_{(2,359)}$= 5,259 p<,05]), and Usability ([$F_{(2,359)}$=4,614 p<,05]). In these dimensions, STEM teachers reported significantly lower mean scores compared to their peers in Language and Humanities & Arts disciplines. These findings suggest that while teachers across disciplines generally hold positive views on gamification, STEM educators tend to be more reserved, which may not naturally align with the flexible and exploratory character of gamified approaches. Tailored training that connects gamification with problem-solving, design thinking, and inquiry-based methods could enhance STEM teachers' engagement.

In terms of GUT scores, no statistically significant differences were observed between disciplines. However, descriptive trends provide insights into discipline-based tendencies. Humanities and Arts teachers showed relatively higher mean scores in the achiever dimension. In contrast, STEM teachers presented relatively higher mean scores in the free spirit dimension, and language teachers received relatively higher mean scores in the player dimension.

STEM teachers had lower GA scores but, mean GUT scores were higher than other groups. Overall, the trends across user types support the idea that teachers' disciplinary backgrounds shape their gamification preferences. As such, adopting gamification strategies tailored to discipline specific pedagogical cultures could enhance implementation success and teacher engagement across diverse fields.

The descriptive statistics regarding teachers' Preferred Game Elements are presented in Table 6.

Table 6

Preferred Game Elements Selection Frequencies

Game Component	Selected (%)	Selected (n)
Narrative	39.2	142
Rules	34.3	124
Challenge	23.5	85
Feedback	50.5	183
Teamwork	37.6	136
Customization	22.9	83
Points	32.9	119
Level	21.0	76
Badges	22.4	81
Reflection	22.4	81
Social Connection	32.9	119
Integration	18.2	66
Success	29.0	105
Ranking	21.3	77
Personalization	22.9	83
Scenario	22.4	81
Tasks	33.1	120

Table 6 included the selection frequencies of 17 predefined game components based on teachers' responses (N=362). The most selected elements were feedback (50.5%), narrative (39.2%), teamwork (37.6%), and rules (34.3%). Elements such as integration (18.2%) and personalization (22.9%) were among the least preferred. These preferences indicate that teachers are more inclined toward socially interactive components, while score based elements (ranking, personalization, badges and level) were less frequently used. On the other hand, there were differences among STEM, Language, and Humanities & Arts Teachers in their use of certain gamification components. Specifically, STEM teachers reported higher usage of level-based progression, while Language teachers made more frequent use of badges and teamwork elements. Humanities & Arts Teachers reported the highest use of customization features.

Qualitative Results

Following the statistical analysis of teachers' attitudes and user type preferences in gamification, a deeper understanding was sought through interviews. The responses provided by the participating teachers were coded presented four main themes.

The first theme is *Knowledge and Experiences*. Sub-themes and codes under this theme are presented in Table 7.

Table 7
Sub-Themes and Codes Knowledge on Gamification Theme

Theme	Sub-themes	Codes
Knowledge on Gamification	Practical Experience	Combining design-based learning with project-based learning (T1) Using gamification to increase student participation (T3) Performance-oriented (T18) Changing classroom routine (T6)
	Use of Theoretical Knowledge	Student-centered learning through experiential methods (T4) Focus on problem-solving skills (T7) Increasing creativity (T6, T20)
	Preferred Elements	Game Elements (T4, T7) Badges and leaderboards (T8) Using tasks (T4, T13, T17) Using digital environments for gamified instruction (T19) Narrative (T6, T14)
	Challenges	Maintaining student interest with digital tools (T9) Lack of tools (T11, T16)

The interviews started with a general discussion of gamification, and teachers were prompted to discuss a design-based example due to its prominent role in recent curriculum updates (Ministry of National Education, 2024). Teachers were asked the following questions when starting the interview: "What are your ideas regarding to gamification? What are your ideas regarding design-based learning? How can you integrate gamification in design-based learning?".

Teachers stated hands-on involvement with gamification in their lessons (T1, T3). These teachers report integrating design thinking into project-based activities and using game elements such as points and competition to boost motivation and participation (see Table 7). For example, T1 combines design-based learning with project-based learning to promote active problem-solving. These practices align with Kolodner's (2002) learning-by-design model, which emphasizes iterative problem-solving cycles, and Hamari et al.'s (2014) findings on gamification's motivational benefits. These teachers demonstrated familiarity with applied strategies, they rarely mentioned theoretical frameworks, reflecting intuitive nature of classroom innovation (Bower et al., 2017).

Teachers described gamification as the incorporation of game-like elements into contexts that are not traditionally associated with gaming (T4, T7). Some teachers underlined that gamification supports students' creativity (T6, T20). For instance, T6, an English teacher, stated that gamification helps changing classroom routines. Their responses are consistent with Deterding et al.'s (2011) foundational definition of gamification. Teachers discussed various components during the interviews. These components include badges, leaderboards (T8) and narrative (T14). Teachers (T4, T14) demonstrated innovative practices that integrate content with gamified structures, supporting claims that narrative and task-based mechanics can enhance learning across disciplines (Kangas, 2010). Teachers could define gamification

link to their practices and design-based learning. On the other hand, several teachers mentioned challenges related to sustaining student engagement (T9) or accessing required technology (T16).

Table 8 summarizes Knowledge on Gamification theme based on teachers' discipline.

Table 8

Summary of Knowledge on Gamification Theme Based on Teachers' Discipline

Discipline	Discipline based Summary
STEM Teachers	Rule-based systems, level progression, badges; structured, performance-oriented.
Language Teachers	Gamified writing and communication tasks. Narrative storytelling and collaborative tasks providing engagement;
Humanities & Arts Teachers	Performance tasks and game creation supporting experiential learning.

Gamification strategies adopted by teachers vary significantly across disciplines, reflecting the pedagogical orientations and instructional cultures of each discipline (see Table 8). STEM teachers tend to favor structured and rule-based approaches, utilizing point systems, level progression, and badges to reinforce task-oriented behaviors. Language teachers more frequently employ narrative-based elements, collaborative storytelling, and gamified writing tasks. Their strategies emphasize communication, and student engagement through personalized and immersive learning. This group appears especially responsive to gamification's motivational benefits. Humanities & Arts teachers integrate gamification through game design, and performance tasks. These approaches often prioritize student expression, experiential learning, and audience interaction.

The second theme is In-Class Practices. Sub-themes and codes under this theme are presented in Table 9.

Table 9

Sub-Themes and Codes for In-Class Practices Theme

Theme	Sub-Themes	Codes
In-Class Practices	Collaborative Project Work	Peer collaboration (T1, T7, T12, T16, T19)
	Real-World Problem Solving	Addressing daily problems (T2, T3, T6, T11, T17)
	Iterative Design	Hands-on prototype creation (T1, T6, T8, T18)
	Discipline-Specific Projects	Tasks tailored to disciplines (T4, T9, T10, T14, T15, T20)
	Inquiry	Designing experiments (T5, T8)
	Technology Integration	Use of digital tools (T3, T6, T8, T12, T15, T19)

Teachers' implementation examples reflect various dimensions of how design-oriented approaches are adapted in real classroom environments. The first and most frequently discussed practice was Project-Based Learning (see Table 9). Many teachers (T1, T7, T12, T16, T19) described integrating gamification through project-based tasks that emphasize student autonomy and problem-solving. These projects often required students to tackle real-life

challenges, conduct research, and generate tangible products or presentations (T1). Teachers also underlined the iterative nature in this process (T18).

Engaging gamification in student project-based learning discussed by teachers from different disciplines. Teachers emphasized creating discipline-based projects (T9) to support students' inquiry (T5). These experiences support student engagement and foster higher-order thinking skills (Krajcik & Blumenfeld, 2006). Teachers also underlined the collaborative nature (T2, T5, T9, T13, and T16) of these activities. Teachers promote peer learning and collective design. As T9 mentioned, assigning roles to students during group work enhanced both responsibility and participation. These findings echo the literature emphasizing collaboration (Kolodner et al., 2003).

Teachers underlined using various tools to support gamification. Teachers in this group often used digital platforms and tools such as simulation software, online whiteboards, or interactive design apps to support students. T15, for instance, detailed the use of web-based platforms. These practices resonate with research advocating for the integration of digital tools to simulate real-world and support iterative refinement (Peppler & Glosson, 2013).

Table 10 summarizes in-Class Practices theme based on teachers' discipline.

Table 10

Summary of in-Class Practices theme based on Teachers' Discipline

Discipline	Discipline based Summary
STEM Teachers	Emphasis on prototyping, and iterative problem-solving. Activities include long-term projects, peer feedback cycles, and real-life challenges.
Language Teachers	Focus on collaborative storytelling, narrative design, and writing cycles. Tasks evolve through peer review and reflective revision processes.
Humanities & Arts Teachers	Use of performance-based methods like role-play, and debates. Emphasis on experiential learning and creative expression.

Teachers implement gamification in various activities among different disciplines (see Table 10). STEM teachers incorporate prototyping and iterative refinement in problem-solving. Language teachers design collaborative and narrative-driven tasks that progress through feedback and revision. Meanwhile, Humanities & Arts Teachers employ performance-based experiences through such as debates and role-play. These differences underscore how gamification is implemented in different activities.

The third theme is *The Impact of Gamification*. Sub-themes and codes under this theme are presented in Table 11.

Table 11

Sub-Themes and Codes Impact of Gamification

Theme	Sub-themes	Codes
	Student Engagement Through Competitive Elements	Treasure-hunt narrative to spark enthusiasm (T1)
		Races fostering rivalry (T6)
		Gamified lesson content to sustain attention (T14)
		Quizzes fostering rivalry (T2)
		Score system granting privileges (T7)
		Word-building contests to increase participation (T9)

Impact of Gamification	Creating Reward Systems	In-class digital currency (T5) Physical–digital "reward store" with points exchange (T10) Badges for continuous feedback (T11) Digital platforms tracking scores (T12) Leaderboard for progress (T4, T16) Whole class competitions (T15) Reward-driven task completion that keeps learners on-task (T18)
	Narrative Based Instruction	Time-travel quest through history modules (T3) Narrative with staged missions (T7) Minecraft-based world-building stories (T8) Scenario-driven language tasks (T14)
	Increased Use of Digital Tools	Quiz platforms to deliver instant feedback (T2) Minecraft Education for creative problem solving (T8) Stand-alone gaming apps (T19) Reward trackers (T12) Mixed challenges (T17) Gamified feedback loops (T20)

Teachers reported that gamification positively impacts classroom dynamics by increasing student engagement, motivation, and participation (see Table 11). For instance, using a treasure-hunt narrative (T1) sparked enthusiasm and curiosity, encouraging students to immerse themselves in the learning process. Similarly, creating races (T6) and quizzes fostering rivalry (T2) promoted a sense of friendly competition. Gamified lesson content (T14) was effective in sustaining attention, especially during cognitively demanding activities. A variety of reward systems were also utilized to maintain motivation: score systems granting privileges (T7), in-class digital currency (T5), and physical–digital "reward stores" where points could be exchanged (T10) provided tangible incentives for participation. Teachers used badges for continuous feedback (T11) and digital platforms to track scores (T12), offering students ongoing insight into their progress. Leaderboards (T4, T16) and whole class competitions (T15) further reinforced a sense of collective involvement and goal orientation. Moreover, reward-driven task completion (T18) was cited as a key factor in keeping students consistently on-task. In addition, word-building contests (T9) encouraged collaborative learning, particularly in language-focused activities. Collectively, these strategies illustrate how gamification can foster a more interactive, motivating, and student-centered classroom environment. These insights resonate with the findings of Werbach and Hunter (2012), who argue that competition in gamification can enhance learning when it is well-balanced and does not overshadow cooperation or inclusiveness. Overall, the teachers' practices illustrate a positive view of gamification's motivational aspect and provide diverse impact when implementing gamification.

The findings reveal prominent ideas in the impact of gamification in classrooms: creating narrative-based learning, and increased use of digital tools. Under the narrative-based instruction sub-theme, teachers employed immersive storylines—such as time-travel quests (T3), staged missions (T7), Minecraft-based world-building stories (T8), and scenario-driven language tasks (T14)—to enhance student engagement and contextualize learning. The use of digital tools was prominent, with educators utilizing quiz platforms for instant feedback

(T2), Minecraft Education for fostering creativity and problem-solving (T8), stand-alone gaming apps (T19), and reward trackers (T12) to monitor progress. Together, these themes highlight how gamification can be strategically designed to promote engagement, differentiation, and effective use of technology in educational settings. Gamification can foster active participation by creating engaging and dynamic learning environments (Domínguez et al., 2013), and teachers used various activities to trigger extrinsic and intrinsic motivation (Hamari et al., 2014; Su & Cheng, 2015).

Table 12 summarizes Impact of Gamification theme based on teachers' discipline.

Table 12

Summary Impact of Gamification Theme based on Teachers' Discipline

Discipline	Discipline based Summary
STEM Teachers	Use of point systems, digital levels, and feedback to promote task completion and motivation. Participation increases through competition and progress tracking.
Language Teachers	Gamified storytelling, team-based challenges, and interactive tasks drive motivation. Narrative and creative elements used to enhance attention and engagement.
Humanities & Arts Teachers	Use of class-wide games, quests, and fun activities to increase participation. Physical Education and Arts emphasize playfulness and social collaboration as motivational tools.

The impact of gamification in different disciplines primarily center on competition to support student participation (see Table 12). STEM teachers often rely on structured, competitive mechanisms such as levels and leaderboards to reinforce goal-oriented behavior. Language teachers emphasize collaboration and creative engagement through narratives and challenges. Humanities & Arts Teachers focused on exploration, and social participation. While gamification generally promotes attention and effort, caution is advised regarding overreliance on extrinsic rewards, as highlighted by some teachers' concerns about superficial engagement.

The fourth theme is Tailoring Gamification. The teachers' responses and classifications related to this theme are presented in Table 13.

Table 13

Sub-Themes and Codes for Tailoring Gamification Theme

Theme	**Sub-themes**	**Codes**
Tailoring Gamification	Personalized Learning	Adapting content to student levels (T1, T2, T8, T11, T15) Tasks suited varied learning styles (T9)
	Interest-Based Scenario Development	Creating entertaining tasks (T3, T5, T7, T12, T18)
	Challenges	Challenges in educational platforms (T4, T6, T9, T13, T19)

Personalized learning emerged as a critical idea among teachers (T1, T2, T8, T11, T15) to tailor gamification (see Table 13). Teachers emphasized the importance of designing tasks and gamified learning paths that support students working at their own pace and in line with their unique learning profiles. For instance, some teachers reported using badge systems or

personal goal-setting tools that allow students to progress independently. T9 specifically underlined embedding tasks aligned with varied learning styles (T9). This approach is rooted in the idea that personalized gamification enhances motivation by aligning learning with students' autonomy (Deci & Ryan, 2017).

Several teachers (T3, T5, T7, T12, T18) highlighted how they incorporated students' real-world interest and discipline-specific inquiries into gamified content. By embedding narrative-driven tasks, creative storytelling, or interdisciplinary missions that resonate with learners' interests, these teachers aim to foster emotional engagement and deepen participation. Such alignment of content with student interests is shown in literature to increase cognitive involvement and sustain long-term motivation (Hamari et al., 2014).

Teachers discussed the use of digital tools in previous themes. When discussing how to sustain gamification, teachers started including more challenges (T4, T6, T9, T13, T19) Some responses also revealed challenges—especially regarding accessibility, device compatibility, and overuse. While digital tools offer scalability and variety, effective integration requires a balance between novelty and pedagogical relevance (Dichev & Dicheva, 2017).

Together, these sub-themes underline that teachers adopt a multifaceted and responsive approach to tailor gamification, striving to personalize their strategies while maintaining alignment with students' individual learning characteristics. The diversity of teacher practices also suggests a growing awareness of how gamification can be adopted, offering students engagement for various learners.

Table 14 summarizes Tailoring Gamification theme based on teachers' discipline.

Table 14

Summary of Tailoring Gamification Theme by Discipline

Discipline	Discipline based Summary
STEM Teachers	Use of digital platforms and personalized progress tracking. Teachers offer customizable tasks and choice-based paths while addressing challenges in aligning gamification with content.
Language Teachers	Planning based on learners' interests and personalities. Gamification includes narrative missions, levels of difficulty, and student-selected activities to boost engagement.
Humanities & Arts Teachers	Flexible, responsive planning that adapts to classroom dynamics. Visual arts and physical education teachers often adjust games based on students' energy and motivation levels.

Gamification in different disciplines is shaped by the instructional goals and learner dynamics specific to each discipline (see Table 14). In STEM education, teachers frequently integrate digital tools for tracking student progress and design personalized, choice-driven learning pathways. These approaches aim to support differentiation, although educators often encounter difficulties in fully aligning gamified activities with structured curricular content. In language instruction, gamification is more closely tied to learner-centered planning, with teachers incorporating story-based missions, tiered difficulty levels, and student-selected tasks to boost motivation and language practice. Meanwhile, educators in the Humanities and Arts adapt an adaptive use of gamification, adjusting game structures in response to students'

energy, engagement, and classroom atmosphere. This variation illustrates how gamification is tailored to fit the practices of each discipline.

The following section discussed the findings considering the relevant literature, highlighting both the consistencies and discrepancies, and exploring their implications for practice and future research.

Discussion and Conclusion

The findings of this mixed-method study revealed that teachers' attitudes towards gamification and their preferences for gamification user types were generally positive. These results align with previous studies emphasizing the motivational and pedagogical benefits of gamification in education (Hamari, Koivisto, & Sarsa, 2014; Kapp, 2012). The high scores in the Acquisition and Usability sub-dimensions of the GA indicate that teachers perceive gamification as a useful and applicable strategy to enhance student learning outcomes. However, the Design sub-dimension received slightly lower scores, suggesting that while gamification is well-received, teachers may need more support or training in the creative and structural aspects of gamification design (Kim et al., 2018; Seaborn & Fels, 2015)

The analysis of GA and GUT scores across disciplines suggests that disciplinary background plays a role in shaping how gamification is applied across disciplines. In addition, teachers also reported customized use of game elements. STEM education often relies on structured, outcome-oriented teaching approaches, which may make teachers in these fields more reserved about integrating gamified methods that emphasize playfulness, narrative, or student-driven exploration (Sailer et al., 2017). In contrast Language Teachers and Humanities & Arts Teachers use storytelling, collaboration, and real-time feedback, which support expressive learning (Chou, 2019; Reinhardt & Sykes, 2012). Gamification can support motivation based on individual and contextual factors (Marczewski, 2015). Therefore, teacher training and gamification design should not adopt a uniform model but should instead be tailored to the pedagogical norms and motivational orientations prevalent in each discipline. Aligning gamified strategies with disciplines-specific instruction may increase adoption, enhance teacher engagement, and ultimately support more meaningful learning experiences.

In response to curriculum documents encouraging teachers to incorporate design-based approaches in their instruction (Ministry of National Education, 2024), educators shared a wide range of examples across various disciplines. Notably, teachers' approaches to gamification were also influenced by their sensitivity to students' interests. In this context, the nature of the problems presented to students plays a crucial role in grounding the learning experience in meaningful, real-world scenarios (Hmelo-Silver, 2004; Kolodner, 2002; Mehalik et al., 2008). Delen and Sen (2024) emphasized that the implementation of design-based learning differs across disciplines, which in turn shapes students' learning experiences. Future research may explore how gamification interacts with these disciplinary differences and influences student learning outcomes.

In our study, there was statistically significant variation based on teachers' age. Teachers in the 31–40 age group consistently scored higher than both their younger (20–30) and older (41+) counterparts in multiple dimensions. Specifically, this group showed significantly greater alignment with Socializer and Player profiles, suggesting a strong preference for collaborative and enjoyment-based gamification elements. While these differences were statistically significant, the general pattern observed in the data—a peak in mid-career teachers' enthusiasm for gamification followed by a decline—may point to

important career-stage dynamics. Teachers in their thirties possess a balanced combination of teaching experience and digital fluency, enabling them to experiment with innovative pedagogies while still maintaining engagement with student-centered approaches (Huang & Soman, 2013). In contrast, younger teachers (20–30) may lack the classroom experience to fully implement gamification meaningfully, while older teachers (41+) may be less inclined to adopt novel technologies or pedagogical innovations due to entrenched habits or lower digital confidence (Alsawaier, 2019). These results mirror findings by Marczewski (2015) and Mekler et al. (2017), who argued that social and playful gamification elements particularly resonate with mid-career educators who seek to maintain student enthusiasm and engagement.

In our sample, there were no statistically significant differences based on educational attainment and gender. However, the descriptive results point to a subtle but consistent trend: teachers with postgraduate qualifications reported slightly lower mean scores across all subdimensions of GA and GUT. This pattern may reflect the influence of postgraduate education, which often emphasizes theoretical rigor, critical analysis, and research-based decision-making. As a result, postgraduate-trained teachers may approach emerging pedagogical innovations like gamification with greater scrutiny or reservation, especially if they perceive a lack of empirical depth or long-term pedagogical value in such methods (Dichev & Dicheva, 2017). The findings suggest that professional development and teacher training programs, especially at the postgraduate level—should integrate critical but balanced exploration of gamification, emphasizing not only its motivational potential but also its alignment with principles of deep learning, autonomy, and cognitive development.

Another trend emerged for gender-based variation. Female teachers consistently reported higher mean scores across both gamification attitudes and user types. This trend aligns with existing research. Previous studies reported gender-based differences in gamification attitudes (Alsawaier, 2019). These gender-based tendencies may imply the need for gamification strategies that are sensitive to motivational differences among teachers, thereby enhancing engagement and pedagogical effectiveness.

In summary, our study contributes to a growing body of research emphasizing that gamification should not adopt a one-size-fits-all approach. Rather, effective gamified environments must consider the individual motivational styles of users to avoid demotivation and disengagement (Bergdahl et al., 2020; Toda et al., 2019). Patterns emerged between disciplines underscore the influence of context in shaping teachers' gamification strategies (Dichev & Dicheva, 2017; Seaborn & Fels, 2015). These findings support the argument that gamification should not be applied uniformly across educational contexts. Instead, its components must be carefully selected and aligned with the epistemological and pedagogical frameworks of each discipline (Toda et al., 2019), reinforcing the need for differentiated professional development and support for teachers based on their discipline.

Taken together, the findings of this study are derived from the data collected in a single city, which restricts the geographic and demographic representativeness of the sample. While the results revealed noteworthy trends regarding teachers' attitudes and practices related to gamification, caution should be exercised when attempting to generalize these findings to broader populations. Contextual factors such as school culture, and access to technological resources may influence teachers' experiences with gamification. Future studies involving

larger and more diverse samples across multiple regions would help to enhance the generalizability and external validity of the results.

Moving forward, future research and practice may focus on developing adaptable gamification frameworks that accommodate different disciplinary practices. It is important to understand the differences among teachers when creating professional development programs. Teacher education programs may include practical and reflective training on gamified methods, especially for graduate programs.

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Statement of Researchers

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