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A Descriptive Survey of Elementary PE Teachers' Readiness for Gamification

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Keywords

Gamification;
Teacher Readiness;
Physical Education.

Abstract

Gamification in physical education sounds great on paper, but schools often struggle to bring it to life the way modern curricula expect. This study set out to see whether teachers themselves are really ready for it—from what they know, to how they feel, and how they act in class. Researchers surveyed 30 elementary PE teachers in Sumedang Regency, all chosen specifically for this work. Using a solid 5-point Likert scale, the team measured teacher readiness across three angles: what teachers do (behavioral), what they know (cognitive), and how they feel about it (affective). The scores came in high across the board: behavioral readiness at 89.04%, cognitive at 88.05%, and affective at 85.64%. So, teachers aren't the issue here—they're ready and willing. The problem doesn't seem to be resistance or a lack of skill. It's something else. Based on these results, the study suggests a new approach. Instead of sticking with broad, general training, schools and policymakers should invest in hands-on workshops focused on creating real lesson plans and in improving school infrastructure. That's where the gap is, and that's how we can actually make gamification work in PE.

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INTRODUCTION

Teachers must be fully ready for the current educational needs, which include being emotionally open to new trends, having a deep understanding of new teaching methods, and being able to use them well. Teacher readiness is a key idea that needs to be understood in order for new teaching methods to work (Vaiopoulou et al., 2023). Theoretically, contemporary learning methodologies such as gamification have surfaced as effective means to engage the digital generation, contingent upon educators' proficiency in their application (Robberts & Ryneveld, 2022). Gamification is the intentional use of game rules, mechanics, and design elements in non-game settings to make learning better (Christopoulos & Mystakidis, 2023). In Physical Education (PE), it uses a fun way to get kids to do certain things and improve their motor skills (Ferriz-Valero et al., 2023). This approach is theoretically based on Self-Determination Theory (Kalogiannakis et al., 2021), but for it to work, teachers need to meet their own professional needs for competence in understanding the method and freedom in adapting it. They can't just focus on how well their students do.

In reality, elementary school PE teachers in North Sumedang struggle to systematically implement gamification due to various developmental and acceptance factors (Denoni-Buján et al., 2025). When there is a gap between curriculum expectations and teacher capabilities, instructional creativity tends to fade. Previous studies consistently show that while game-based interventions can enhance instructional delivery (Bouchrika et al., 2019; Panjaitan et al., 2025), poor teacher training remains a major barrier to systematic implementation, leaving instructors feeling emotionally and practically unprepared (Raja & Nordin, 2024).

This research is differentiated from prior studies that primarily demonstrated the existence of a readiness gap by conducting a multi-dimensional analysis of its root causes. The significance of this study lies in its comprehensive evaluation of PE teachers' readiness across three critical dimensions: affective readiness regarding emotional openness (Padmadewi et al., 2023; Wines, 2024), cognitive readiness concerning pedagogical concepts (Lee & Hwang, 2022), and behavioral readiness related to field execution techniques (Belda-Medina & Calvo-Ferrer, 2022; Tadjimatova, 2024). Therefore, the research question is: How do the levels of affective, cognitive, and behavioral readiness among physical education teachers manifest in the use of gamification? The aim is to precisely identify specific shortcomings within these dimensions to inform targeted in-service training, based on the premise that these three aspects must be integrated for sustainable pedagogical innovation to take place (Foykas et al., 2025), and obstacles in any of these dimensions will hinder systematic implementation.

METHODS

The research study uses a descriptive survey research design and a quantitative approach. The research design was considered suitable to quantitatively measure teacher readiness using numerical data, as suggested by Creswell & Creswell (2017). The use of a survey research design allows for data collection on a wide population, which is essential for generalization on teacher readiness in the Sumedang region. The research process began with developing the measurement instrument, followed by expert validation, piloting to ascertain validity and reliability, and finally data collection and analysis, as shown on the flowchart according to **Figure 1.**

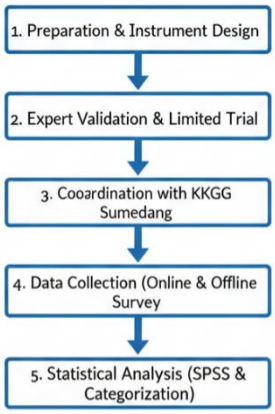

Figure 1. Research procedure flouchart.

The study's population includes all Physical Education (PE) teachers in elementary schools within the Sumedang Regency. Due to geographical constraints and the necessity for effective data collection, a purposive sampling technique was employed to select three specific administrative areas: North Sumedang, South Sumedang, and Cimalaka. This selection was intentionally made to provide a specific perspective on semi-urban and rural educational settings, differentiating the research from studies predominantly focused on metropolitan areas. A sample of 30 PE teachers was taken from these specific areas, with help from the local PE Teacher Working Group (KKG). The sample size of 30 was justified based on the widely accepted methodological standard for descriptive quantitative research; according to established statistical principles like the Central Limit Theorem, a sample size of $n \geq 30$ is considered the minimum threshold required for the data distribution to approach normality, thereby allowing for reliable statistical analysis (Fraenkel et al., 2011).

The study used a closed-ended questionnaire with three main parts: cognitive, affective, and psychomotor/behavioral. The cognitive dimension measures how well someone understands concepts (Deterding et al., 2011; Kapp, 2012), the affective dimension measures how motivated they are to teach and how confident they are in their abilities (Huang & Hew, 2018; Ryan & Deci, 1985), and the psychomotor dimension measures how well they can design and run gamified activities (Werbach & Hunter, 2012). Experts and statistical analysis confirmed that the questionnaire was valid. **Table 1** shows that the research found 42 of the 44 items to be valid ($r_{obs} > r_{table}$) and reliable.

Table 1. Instrument Specifications and Reliability Results

Dimension	Indicators	No. of Items	Alpha	Status
Cognitive	Concept, Assessment, Tool Literacy	11	0.894	Reliable
Affective	Self-Efficacy, Ethics, Beliefs	15	0.911	Reliable
Psychomotor	Communication, Flow Design, Feedback	16	0.966	Reliable
Total		42		

The study utilizes primary data obtained through a five-point Likert scale to measure the level of respondents' agreement. Data collection was conducted through online and offline questionnaires given to the selected sample of 30 physical education teachers. The researcher maintained coordination with the PE Teacher Working Group (KKG) in Sumedang to accurately track the mapping of the respondents' participation.

The data processing was done by editing, coding, and tabulation using Microsoft Excel software and IBM SPSS. The descriptive data analysis was used to calculate the mean, standard deviation, maximum, and minimum. The Shapiro-Wilk normality test was used to check normality when $N < 50$. For data interpretation on teacher readiness levels, a three-tier

classification was used on the data set—Low, Moderate, and High—by using a class interval formula. The formula for interval calculation is as follows:

$$i = X_{max} - X_{min}\ \frac{l}{k}$$

Legend: i = Class Interval;
X_{max} = Maximum Score
k = Number & Categories

Figure 2. Claserval formula for categorization.

The results of these calculations formed the basis for the categorization criteria presented in Table

Table 2. Teacher Readiness Score Categorization Criteria

Dimension	Min Score	Max Score	Low	Moderate	High
Cognitive	11	55	11.0 - 25.6	25.7 - 40.3	40.4 - 55.0
Affective	15	75	15.0 - 35.0	35.1 - 55.0	55.1 - 75.0
Phychomotor	16	80	16.0 - 37.3	37.4 - 58.6	58.7 - 80.0
Total	42	210	42.0 - 98.0	98.1 - 154.0	154.1 - 210.0

RESULTS AND DISCUSSION

The study was conducted over four weeks, from early November to December 2025. The data collection process included 30 physical education teachers from elementary schools situated in the North Sumedang, South Sumedang, and Cimalaka districts. The teachers were determined based on the PE Teacher Working Group (KKG). The following sections outline the normality test for data distribution, a statistical description of teacher readiness, and a multidimensional analysis of the data collected relative to various theories of pedagogy.

Before undertaking a normality test on the data collected, a Shapiro-Wilk normality test was performed on the data collected, considering that it had a sample size ($N = 30$). The test was meant to ascertain if the readiness levels of teachers followed a normal distribution.

Table 3. Shapiro-Wilk Normality Test Results

Dimension	Statistic	df	Sig. (p)	Description
Cognitive	0.818	30	0.000	Non-Normal
Affective	0.900	30	0.008	Non-Normal
Psychomotor	0.766	30	0.000	Non-Normal

As seen in **Table 3**, all dimensions have a significance value less than 0.05, which implies a non-normal distribution. This is because of the homogenization of the respondents' data, which is highly skewed to a higher value. However, the study was able to continue with descriptive statistics to identify general patterns of teacher readiness.

Table 4. Statistical Description of Teacher Readiness

Dimension	Min Score	Max Score	Mean ($\bar{x}$)	Std. Deviation	Category
Cognitive	39.00	55.00	48.43	5.41	High
Affective	54.00	75.00	64.23	7.04	High
Psychomotor	62.00	80.00	71.23	7.61	High

In order to compare the results, the average scores were transformed into percentages for the purposes of the study, which will allow for the ranking of the dimension showing the most prominent level of readiness.

Tabel 5. Percentage Comparison of Readiness per Dimension

Dimension	Mean Score	Max Score	Percentage (%)	Ranking
Psychomotor	71.23	80	89.04%	1
Cognitive	48.43	55	88.05%	2
Affective	64.23	75	85.64%	3

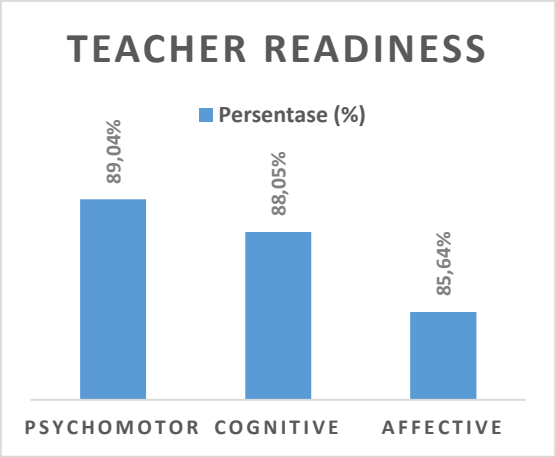

Figure 3. Graphical distribution of teacher readiness percentages across the three measured dimensions.

Cognitive Readiness (Knowledge)

The results revealed that the cognitive dimension of the physical education (PE) teachers in Sumedang has attained a high level of 88.05%, showing that the respondents have moved beyond the level of mere awareness to a comprehensive level of understanding. This high level of cognitive readiness clearly shows that the teachers have moved beyond the level of perceiving gamification as a mere playing activity, but have instead adopted a strategic approach to the incorporation of game mechanisms for the achievement of Serious Learning objectives (Deterding et al., 2011). This is supported by Wu et al. (2022), who argued that cognitive readiness at a mature level is a major predictor of the level of behavioral adoption of educational innovations. Farooq (2025) says that intellectual readiness is a very important part of how well technology can be used in the classroom. This is because the students' mental readiness is a big part of how well technology can be used in the classroom. Without a comprehensive level of understanding of the mechanics of points and challenges, the effectiveness of the incorporation of gamification will largely become a hollow activity (Kapp, 2012). The high level of digital literacy observed among the teachers will enable them to understand the instructional value of the incorporation of technology to enrich the quality of physical education, as argued by Hong et al. (2025). his finding is further supported by the Technological Pedagogical Content Knowledge (TPACK) model, where the integration of pedagogical knowledge with technology-based content is made easier. Baimukhambetova et al. (2025) found that there was a positive link between technological readiness and professional self-efficacy. This means that this level of cognitive maturity will lead to a high level of professional self-efficacy.

Affective Readiness (Attitude and Motivation)

In the affective domain, the level of readiness was 85.64%. Although it is the lowest among the three domains in terms of statistical results, it is categorized as "High" since it is a level of emotional acceptance of innovation. The minor decline in the affective domain might be due to the phenomenon of technical anxiety or administrative pressure related to innovation (Jay et al., 2025). However, the major share of teachers showed enthusiasm and was motivated by their belief that gamification is a powerful motivator of students' intrinsic motivation through the satisfaction of basic psychological needs (Ryan & Deci, 1985). The traditional teaching methodologies face the problem of motivating students in a contemporary world, and the move to gamification is seen as a vital antidote to the problem of motivating students' engagement (Ferraz et al., 2024). This is the major driver of change since without affective readiness, innovation is reduced to administrative coercion without any real content. Teachers also believe that gamification is a sustainable model of motivation through instantaneous feedback and competition (Huang & Hew, 2018; Manescu, 2025), and when combined with cooperative learning strategies, it is seen to produce a particularly positive impact on motivation in both practice and training (Flores-Aguilar et al., 2025).

Psychomotor/Behavioral Readiness (Action)

The psychomotor domain recorded the highest readiness score at 89.04%. This implies that PE teachers in Sumedang are highly adaptable. The implication is that PE teachers are the kind of people who present a kinetic impulse to transform theory into action. This is similar to the view of Werbach & Hunter (2012), who argued that it is possible to organize learning into systematic flows through the use of game elements. A high level of behavioral readiness is important since gamification of PE requires effective managerial skills to transform physical education into a game without losing the essentiality of physical activities. Park et al. (2025) said that gamifying physical education well requires skills to turn it into action-centered instruction. Vrcelj et al. (2023) asserted that the crucial determinant of students' success often resides in practical digital skills rather than theoretical comprehension. A Directed Motivational Current (DMC) is what makes people deeply engaged (Shoaib, 2021). This is because they are ready to go. Bharti (2023) says that the teacher becomes an experience designer to make sure that the students never get bored with the activities.

Holistic Readiness and Institutional Implications

This study shows physical education teachers in Sumedang are more than ready—almost perfectly so. Psychomotor readiness comes in at 89.04%, cognitive at 88.05%, and affective at 85.64%. These numbers aren't just strong; they're exceptional across all areas. Compared to what older research said, this is a big shift. Raja & Nordin (2024) and Denoni-Buján et al. (2025) pointed to poor teacher training and weak conceptual understanding as the main roadblocks for gamification. That picture no longer fits Sumedang. Here, the teachers have clearly moved past that gap. In fact, this matches what Nielsen et al. (2024) found—these educators have reached "digital maturity." Cognitive, affective, and psychomotor skills are working together, creating a robust ecosystem of readiness. Because our results indicate that teachers already possess strong buy-in and behavioral capability, they are positioned as powerful tools for promoting educational innovation, which corroborates Alabbasi (2018) previous assertions. Consequently, based on the high readiness scores obtained in this study, we argue that the major obstacle in Sumedang has shifted away from teacher literacy toward the robustness of institutional infrastructure. This empirical shift strongly supports the recent findings by Sambo et al. (2025). and Ukgoda (2025), who noted that even when teachers are digitally mature, the lack of technological availability and systematic support systems continues to hinder implementation. Therefore, to unlock the potential for a more innovative form of physical education, the high willingness and capability observed in our data must be met with adequate

facilities, confirming the synergy model proposed by Michel & Pierrot (2023) and Ateş & Gündüzalp (2025).

CONCLUSION

This study finds that PE teachers in Sumedang Regency are very ready to use games in their lessons. They demonstrate robust, multi-faceted readiness in their psychomotor execution, cognitive comprehension, and affective disposition. This study contributes to the existing literature by presenting empirical evidence that, in semi-urban and rural contexts, physical education teachers are proactive early adopters of game-based learning methodologies rather than passive recipients. Importantly, the consistently elevated readiness levels indicate that the principal obstacle to systematic implementation is no longer teacher resistance or insufficient conceptual understanding; consequently, forthcoming professional development and infrastructural support should transition from fundamental introductions to advanced, context-specific instructional design. This study recognizes its limitations, particularly the use of a purposive sample of 30 teachers from specific areas, which may restrict generalizability, and the dependence on self-reported questionnaire data, which could lead to social desirability bias. Subsequent research ought to utilize longitudinal observational studies to ascertain if this self-reported readiness effectively correlates with enduring, observable gamified teaching methodologies in physical education classes.

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