**Summary**

This dissertation provides a comprehensive overview of the key potential factors influencing the effective implementation of digital gamified learning during the pre-class phase. While gamified learning can stimulate motivation by supporting learners' needs for autonomy, competence, and relatedness, its practical effectiveness remains inconsistent. This largely stems from insufficient preparation during the pre-class design phase, where "one-size-fits-all" approaches are widely adopted. Such designs falsely assume that game mechanics motivate every learner in the same way, disregarding individual differences. Empirical research shows that while some students thrive in competitive environments, others experience anxiety or cognitive overload. Mismatches between game elements and learners demotivate certain students and decrease educational value.

This dissertation argues that digital gamified learning must be viewed not as a ready-made technological tool, but as a pedagogical intervention whose success depends heavily on pre-class design. This preparatory stage consists of two dimensions: diagnosing student acceptance and planning evidence-based instructional design. Student acceptance is a prerequisite for introducing technology. If students do not perceive gamified learning as useful or compatible with their needs, its motivational impact remains short-term. However, teachers often select tools based on personal experience rather than targeted learner analysis. Furthermore, even when students are willing, educational value depends on how game elements integrate with learning objectives and pedagogy. Many failures occur when designers prioritize technological novelty over pedagogical coherence.

To address this gap, this dissertation proposes a comprehensive, two-phase pre-class framework by integrating an extended Unified Theory of Acceptance and Use of Technology (UTAUT) model and the Technological Pedagogical Content Knowledge (TPACK) paradigm. The framework systematically answers four design questions: what to teach, whom to teach, with which technological tools, and how to use them.

**Chapter 2** investigates the factors influencing university students' acceptance of digital games for in-class activities using a Gami-UTAUT model. Balancing learning tasks and gaming tasks is complex, since teachers must satisfy both curriculum requirements and learner preferences. Therefore, the traditional UTAUT model was extended by incorporating two game-specific variables: preferences for games (types and principles) and the learning compatibility of digital games. Prior technology experience was examined as a moderator.

A mixed-methods approach was deployed. Quantitative data was collected via a questionnaire administered to Chinese university students across various disciplines, yielding 600 valid responses. Data was analyzed using structural equation modeling (SEM) via SPSS and AMOS. Qualitatively, semi-structured interviews were conducted with 15 purposefully sampled students representing high, medium, and low acceptance levels to uncover deeper nuances.

The quantitative findings confirmed that performance expectancy, effort expectancy, social influence, facilitating conditions, and learning motivation were significant predictors of behavioral intention. Crucially, the game-specific variables also showed a significant positive impact on acceptance, highlighting the necessity of micro-level adaptation. Qualitative themes emphasized the importance of adaptive game design, technical support, risk management, the active role of teachers, and post-course evaluation. Notably, prior technology experience positively moderated most pathways, except the one between learning motivation and acceptance. This indicates that intrinsic motivation can override a lack of gaming experience, turning inexperienced users into active adopters.

**Chapter 3** examines the relationship between student game element preferences and learning needs within university English as a Foreign Language (EFL) writing classes, aiming to develop teachers' Technological Content Knowledge (TCK). Using the Target Needs Analysis framework and five common game elements (competition, reward, ranking, cooperation, and challenge), this explanatory sequential mixed-methods study surveyed 505 Chinese university students.

The analysis revealed that 87% of students endorsed the motivational effects of gamification on English writing. Among the elements, competition was the most preferred, contrasting with Western contexts where cooperation is typically favored. This underscores the profound impact of educational and cultural environments on gamification. However, while competition was popular, public ranking was the least favored, aligning with current Chinese educational policies aimed at reducing public rankings. Furthermore, around 13% of the students held a neutral opinion towards gamified learning because of their inexperience with the mechanism or they were afraid that it would interfere with their learning.

Regarding learning needs, most students expressed a desire to improve their writing skills but struggled to articulate specific sub-skills, indicating limited meta-cognitive abilities. SEM analysis detected only a low correlation between game element preferences and specific learning needs, suggesting that designing activities based purely on superficial preferences yields limited educational impact. Consequently, instructional design must adopt a broader view of learner diversity, such as player typologies, which is explored in Chapter 4.

**Chapter 4** presents a systematic literature review focused on identifying the types of student information used to build user profiles for tailored gamified learning, mapping onto Pedagogical Content Knowledge (PCK). Guided by the PRISMA statement and utilizing a hybrid database and a snowballing search strategy, 31 empirical studies were systematically analyzed. Extracted data was coded into learner, player, personal, and contextual information.

The findings showed that player information (e.g., Hexad and BrainHex typologies) was the most frequently used metric to build individual profiles. However, the psychometric reliability and structural validity of these popular gaming models are repeatedly questioned, indicating they require localized calibration depending on the educational context. In contrast, despite personal information having shown itself to be more reliable, it has remained underused.

The review also revealed an extreme lack of content-driven adaptive gamification. Current practices severely neglect tailoring mechanics to the specific learning content. Because gamification is fundamentally designed to improve academic performance, balancing the game and learning dimensions is critical. Contextual information (devices, online vs. in-person settings) was rarely incorporated into profiles despite its heavy influence on learning behaviors. Furthermore, most studies relied on a single information type rather than multidimensional profiles. Regarding data collection, static instruments (questionnaires) heavily outnumbered dynamic behavioral tracking. This reliance on static data might be tied to the complexity of automated tracking tools, low teacher AI literacy, and a lack of institutional training.

**Chapter 5** shifts from data requirements to the mechanisms of systematic deployment, focusing on Technological Knowledge (TK) and Pedagogical Knowledge (PK). A systematic literature review analyzed 43 peer-reviewed papers published between 2013 and 2022 to categorize tailoring approaches and game elements.

The review identified three primary tailoring approaches: personalization (one-time adjustments based on static data), adaptation (continuous, real-time modifications based on dynamic interaction), and recommendation (suggesting content based on similar user profiles). Game elements were classified into five functional clusters: performance (rewards, feedback), personal (challenges, goals), social (competition, cooperation), ecological (time pressure, choice), and fictional (narrative).

A key finding is that more than half (56%) of all the examined articles were still in the preparatory stage of creating user models, which highlights a significant gap between gamified class design and classroom implementation. Among implemented systems, dynamic adaptation was more prevalent than static personalization. For game elements, the performance cluster was the most widely applied due to its direct feedback, while the fictional cluster remained underutilized despite its pedagogical value. This chapter serves as a bridge, converting empirical insights into practical guidelines for TPACK-inspired instructional design.

**Chapter 6** synthesizes the findings, highlighting the dissertation's core theoretical and practical contributions to digital gamified learning. Unlike outcome-based research, this work emphsizes the pre-class phase as the primary determinant of gamification success.

First, it proves the necessity of personalization. By dismantling the assumption that game mechanics motivate all students equally, the systematic analysis shows that gamification is not a universally effective tool. Its efficacy is bound by learner characteristics and macro-contexts. This perspective helps prevent over-generalization and supports the creation of context-specific learning environments. Second, it expands technology acceptance theory by incorporating game-specific variables (game preferences and learning compatibility) into the UTAUT model. This integration significantly enhances the explanatory power of technology adoption frameworks within complex educational settings, establishing learner acceptance diagnosis as an essential design prerequisite. Third, it offers a cohesive theoretical framework that bridges the literature gap between student acceptance (UTAUT) and instructional design (TPACK), unifying them into a coherent, two-phase pre-class model.

Moreover, this dissertation has several important implications for teachers, schools, and students within gamified learning environments. First, teachers must avoid selecting gamified tools based solely on technical access or personal preferences. Pre-class diagnoses of acceptance and learning needs are essential. Teachers should transition from passive users of technology into active creators of learning experiences, which requires professional development programs to focus heavily on enhancing their TPACK competencies. Second, schools must provide institutional and organizational support. Because tailored gamification is time-consuming, schools need to supply design support teams, learning analytics tools, and sufficient planning time to prevent gamified initiatives from becoming superficial or unsustainable. Third, students must act as active participants rather than passive subjects. Since the accuracy of pre-class diagnostic surveys and feedback systems depends entirely on self-reported data, students should reflect honestly on their learning needs and game preferences, viewing diagnostic participation as an opportunity to actively shape a student-centered learning environment.