Gamification as a Bridge Between Intrinsic and Extrinsic Motivation in Chinese Post-Secondary Education

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Author Note

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Abstract

Self-determination theory (SDT), which focuses on intrinsic and extrinsic motivations, has long been a recurring theme in research and an enduring concern for educators, administrators, parents, and even students themselves. Mainstream research suggests that intrinsic motivation, which refers to inherent interests and enjoyment, are positively related to desirable learning outcomes. However, in China, due to the profound influence of Neo-Confucianism Philosophy, which emphasizes extrinsic motivations in learning, students of Asian ethnicity in the Chinese public educational system often lack the opportunity to be intrinsically motivated. The absence of intrinsic motivations poses risks to students' academic performance and psychological well-being, particularly at university. This absence warrants extra attention from Chinese educators and the public to safeguard future generations by adjusting the balance of intrinsic and extrinsic motivations in the design of the post-secondary education system.

This study aims to explore and identify gamification as a means of bridging intrinsic and extrinsic motivations for Chinese students studying at the post-secondary level. In this research context, gamification is defined as a pedagogy that utilizes game-like experiences to motivate and empower learners through various learning activities. As a pedagogical design with the distinct power to provide continuous motivations to learners, this study wondered whether gamification elements used in Chinese higher education are consistent with SDT's requirements to fulfill the three fundamental needs – autonomy, competence, and relatedness – and could lead to positive outcomes in empirical application.

Engaging with the perspective of teachers within the Chinese adult higher educational system, this research analyzes the possibility of applying gamification based on SDT in the

current test-oriented system, employing a qualitative methodology. Peer-reviewed papers were examined to provide theoretical justifications for integrating intrinsic and extrinsic motivations through gamification. Additionally, this study investigated the actual applications of integrating gamification with contemporary Chinese mainstream pedagogy through semi-structured interviews with four Chinese post-secondary teachers who have implemented gamification in their classrooms, specifically examining the benefits and challenges they navigate during instruction. The results indicated that gamification mechanics could positively contribute to the development of intrinsic motivations directly or to the development of other internalized extrinsic motivations, which are identified as external stimuli which involve the internal recognition process. The improvement in students' motivations was reported to predict inherent interests in learning as well as other desirable outcomes, for instance, students increased control over the learning, a safer learning environment, expression of personal feelings which enabled inner peace, and a close relationship between teacher and students that motivate both parties. In addition, this thesis illustrated the importance of effective management and understanding of gamification by teachers within the pedagogical context. It was based on the theoretical and empirical results, with the understanding that such insights are crucial for the successful implementation of gamification.

Keywords: gamification, Chinese post-secondary education, Self-Determination Theory, intrinsic motivation, extrinsic motivation

Résumé

Résumé La théorie de l'autodétermination (TDA), qui se concentre sur les motivations intrinsèques et extrinsèques, est depuis longtemps un thème récurrent dans la recherche et une préoccupation constante pour les éducateurs, les administrateurs, les parents et même les étudiants eux-mêmes. La recherche traditionnelle suggère que la motivation intrinsèque, qui fait référence aux intérêts et au plaisir inhérents, est positivement liée aux résultats souhaitables de l'apprentissage. Cependant, en Chine, en raison de l'influence profonde de la philosophie néoconfucianiste, qui met l'accent sur les motivations extrinsèques dans l'apprentissage, les étudiants d'origine asiatique dans le système éducatif public chinois n'ont souvent pas la possibilité d'être motivés de manière intrinsèque. L'absence de motivations intrinsèques présente des risques pour les résultats scolaires et le bien-être psychologique des étudiants, en particulier à l'université. Cette absence justifie une attention particulière de la part des éducateurs chinois et du public afin de préserver les générations futures en ajustant l'équilibre entre les motivations intrinsèques et extrinsèques dans la conception du système d'enseignement post-secondaire.

Cette étude a pour but d'explorer et d'identifier la gamification comme un moyen de rapprocher les motivations intrinsèques et extrinsèques des étudiants chinois qui étudient au niveau post-secondaire. Dans ce contexte de recherche, la gamification est définie comme une pédagogie qui utilise des expériences de type jeu pour motiver et responsabiliser les apprenants à travers diverses activités d'apprentissage. En tant que conception pédagogique ayant le pouvoir distinct de fournir des motivations continues aux apprenants, nous nous demandons si les éléments de gamification utilisés dans l'enseignement supérieur chinois sont cohérents avec les

exigences de la TSD pour satisfaire les trois besoins fondamentaux - autonomie, compétence et relation - et pourraient conduire à des résultats positifs dans l'application empirique.

S'appuyant sur le point de vue des enseignants du système chinois d'enseignement supérieur pour adultes, cette recherche analyse la possibilité d'appliquer la gamification basée sur la TSD dans le système actuel axé sur les tests, en utilisant une méthodologie qualitative. Des articles évalués par des pairs ont été examinés afin de fournir des justifications théoriques pour l'intégration des motivations intrinsèques et extrinsèques par le biais de la gamification. En outre, cette étude a examiné les applications réelles de l'intégration de la gamification dans la pédagogie traditionnelle chinoise contemporaine par le biais d'entretiens semi-structurés avec quatre enseignants chinois de l'enseignement post-secondaire qui ont mis en œuvre la gamification dans leurs classes, en examinant spécifiquement les avantages et les défis qu'ils rencontrent au cours de l'enseignement.

Les résultats indiquent que les mécanismes de gamification pourraient contribuer positivement au développement des motivations intrinsèques directement ou au développement d'autres motivations extrinsèques intériorisées, qui sont identifiées comme des stimuli externes qui impliquent le processus de reconnaissance interne. L'amélioration des motivations des étudiants a permis de prédire les intérêts inhérents à l'apprentissage ainsi que d'autres résultats souhaitables, par exemple, un contrôle accru des étudiants sur l'apprentissage, un environnement d'apprentissage plus sûr, l'expression de sentiments personnels permettant une paix intérieure, et une relation étroite entre l'enseignant et les étudiants qui motive les deux parties. En outre, cette thèse illustre l'importance d'une gestion et d'une compréhension efficaces de la gamification par les enseignants dans le contexte pédagogique. Elle s'est basée sur les résultats théoriques et

empiriques, étant entendu que de telles perspectives sont cruciales pour une mise en œuvre réussie de la gamification.

Mots-clés: gamification, enseignement post-secondaire chinois, théorie de l'autodétermination, motivation intrinsèque, motivation extrinsèque.

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Contribution

All the chapters in this thesis are contributed to student principal investigator and writer, Yilin Lyu.

Chapter 1: Introduction

Background of Adult Higher Education in China

According to statistics from the Chinese Ministry of Education in 2022, the population of post-secondary students in China has grown to 46.55 million. The gross enrollment rate in post-secondary education has peaked at 59.6 percent for the relevant age cohorts, marking a continuous upward trend. This enrollment figure is almost 20 times higher than it was in 1980, following the re-instating of the Gao Kao ("Higher Exam," referred to as the Nationwide Unified Examination for Admissions to General Universities and Colleges) in 1977 (Wan, 2006). The increase in student enrollment in higher education can be attributed to the significant growth in the national population after World War II and the economic boom following the “Reform and Opening Up” policy in 1978. This policy aimed to elevate the education level within the national system, fostering better-educated individuals in various research fields to enhance China's global competitiveness (Guo et al., 2019).

While the improvement in the overall education level has yielded positive outcomes, such as producing a more educated workforce, it has also introduced challenges in the Chinese labour market. This is evidenced by the 21 percent youth unemployment rate post-college graduation and the shortage of skilled labor (Chan, 2012). The over-expansion of higher education, especially in the context of a labor force shortage, has led to public and governmental scrutiny of the current design of post-secondary education (Chan & Zhang, 2021). Despite the amendment of the Law on Vocational Education in 2022, which encourages students to pursue skilled labor careers through the attainment of post-secondary education, there is a prevailing pessimistic

attitude among the public regarding the potential impact of this political adjustment on the post-secondary education system.

Furthermore, amidst intense competition in the labor market post-graduation, and the prevalence of a test-oriented education system in contemporary schools, a large population of students in post-secondary institutions are not adequately provided with the necessary educational resources for academic growth and psychosocial well-being (Peng et al., 2022; N. Wang & Morgan, 2009; Wu et al., 2020). Increasing criticism has been directed at the educational quality of Chinese post-secondary education. Students within this system are sarcastically referred to as "high academic grades but low competencies" (Liang, 2016) implying that they excel in exam-oriented evaluations without developing essential critical thinking skills or basic life knowledge. This shortage of skill development impedes new generations from gaining control over their own careers and personal relationships and building independent and healthy personalities needed to thrive in the 21st Century. The anxiety to survive and afford the expensive living costs in cities, coupled with the difficulty of finding comparable job positions and family pressure to marry and contribute to the family, places Chinese youth at risk of mental disorders and setting off a broader health crisis (Shek et al., 2011). Despite almost 20 years of training in the school system, they remain unprepared and extremely vulnerable in contemporary society (Ye et al., 2016). This serves as an unmistakable sign of the failure of the current system, demanding urgent changes in the education we provide.

The Call to Improve the Quality of Education in the Chinese Post-Secondary Education System

Chinese standardized test system for talent selection, established in the Sui Dynasty in 587 A.D., has significantly influenced the structure and societal perceptions of education for over 1400 years (Wang, 2012). This talent selection regulation broke with the history of using noble recommendation to select governmental officials. It promoted equality on the basis of a talent selection regime, and thus has been continuously used by governors in the following dynasties and is still in effect even today, in the Republic of China. In this context, education was seen as the only tool, or more specifically a ladder, to help people gain higher social status. Success in standardized examinations brings political power and economic advancement. These incredible external rewards from education motivate generations of Chinese people devoted to education to win the glory for themselves and their families (Ho, 1994).

In the 21st Century, advancements in transportation and digital technologies have expanded the talent pool beyond domestic borders, ushering in an era of globalization and changing the game of the Chinese education system. Debates within the Chinese post-secondary community are questioning whether the current educational system, historically focused on extrinsic motivations and controlled behaviors, can provide adequate educational resources for students to grow and learn in the current social context.

The calls for improved education methodology and quality come from all stakeholders, including demotivated students who doubt the relevance of their learning content, parents who are confused about the return on their education investment, and teachers who are highly demotivated due to the distant relationship with their students (Cai, 2013).

Although the standardized-test education regime can be seen as the origin of all these constraints, it is naive and irresponsible to simply say that all we need is to restructure the system and abandon the current regime. The test-oriented culture in China is not merely a political regulation, it also represents the culture and philosophy of Chinese ethnicity and the equity this country is founded on (Pires & Duarte, 2019). In mainland China, more than two-thirds of post-secondary educational institutions are publicly owned. The standards, including curriculum design, institutional structure, and most importantly, assessment methods, require long-term investigation and considerable effort to be adjusted by the Ministry of Education, as they relate to sensitive political questions on educational equality. Consequently, pedagogy becomes a more accessible factor to change those influencing educational outcomes in higher education. How to improve the motivations of learners by introducing meaningful knowledge and fulfilling their needs of development will be the key questions to answer for researchers in Chinese post-secondary education. Instead of advocating for overthrowing the current system, in this research, we hope to find a potential solution to promote the balance of extrinsic and intrinsic motivations provided in the Chinese Higher Education system.

21st Century Learning Science and Motivation Theories

In order to balance the intrinsic and extrinsic motivations to support Chinese students in adult higher education, 21st Century motivation theories should be discussed to provide theoretical foundation. While the study of learning science in the 21st Century has become a comprehensive field, encompassing elements of neuropsychology, digital technology, and sociology, research on learning motivations remains underdeveloped due to its intricate interactions with other social factors. In other words, our understanding of the factors that

stimulate learners' willingness to acquire new information is limited because these factors are highly contextual and sensitive to the environment. Motivational factors that are effective under certain circumstances can hardly be applied to another community (Shen et al., 2022).

Even though humans share similar psychological structures that make basic psychological motivational theories work universally, learning, as a complex behavior, contains numerous processes that are highly context sensitive. This complexity necessitates continuous review and updating in the study of learning motivations, particularly in evolving social environments. For instance, most motivation theories were developed by psychologists in Western countries, which have vastly different social contexts than Eastern countries. In this context, the validity and accessibility of motivational theories in Asia cultural environments are uncertain. Studies of motivation, therefore, must be specified within specific cultural contexts.

Significance (Aim of the study)

In this research, post-secondary education in China will be discussed. China is the second-largest emerging economic power in the world and has a significant impact on the global community by adding talent to international workforces. Despite more than 46.5 million students engaged in post-secondary education and a history of implementing higher education spanning over 2000 years, limited studies have been conducted on learning motivations. Considering critiques from the Chinese public regarding the lack of educational quality provided by post-secondary institutions, this study aims to explore and identify gamification as a means of bridging intrinsic and extrinsic motivations for Chinese students in post-secondary education with the understanding that improved motivation is one means for improving educational qualities including, students' academic achievements and psychological well-being (Ryan &

Deci, 2020). In addition, this new recognition and improvement of educational goals in post-secondary education is an opportunity for our educators to support and foster our next generation in a more inclusive way.

To gain deeper insights into efforts to enhance intrinsic motivations in the Chinese education system, this study examines gamification as a strategy to balance the intrinsic and extrinsic motivations of post-secondary learners. In this research context, gamification is defined as a pedagogy that employs game-like experiences to motivate and empower learners through various educational activities (Deterding et al., 2011). Peer-reviewed literature is examined to provide theoretical foundations for integrating intrinsic and extrinsic motivations through gamification while also exploring their applicability within the Chinese post-secondary context. Specifically, this research analyzes the feasibility of gamification elements, as defined in the literature, to fulfill the three fundamental psychological needs of students – competences, relatedness, and autonomy (Deci & Ryan, 2000), as described in Self-Determination theory (SDT), within the Chinese context.

Supplementing the theoretical exploration described above, this study also investigates the experience of teachers who applied gamification elements in their classroom within the Chinese post-secondary educational system. Through semi-structured interviews with college teachers who have implemented gamification in their classrooms and by examining how they navigate conflicts between intrinsic and extrinsic motivational approaches, this study investigates empirically applications of integrating gamification with contemporary Chinese mainstream pedagogy. By conducting this research, we aim to address the question of whether gamification elements actually used in Chinese higher education are consistent with SDT's requirements to

fulfill the three fundamental needs – autonomy, competence, and relatedness - and could lead to positive outcomes in empirical application.

Viewing this issue through the experiences of teachers, this study anticipates making a meaningful contribution to the broader educational community's understanding of this emerging pedagogical approach and its connections to motivational strategies.

Chapter 2: Literature Review

Motivation has been a widely discussed topic in Chinese education for many years, with roots tracing back to the influential philosophy of Confucianism. Confucius (Kong Fuzi) (551–479 BCE), the prominent founder and philosopher of Confucianism, spent his life teaching students and promoting his educational ideals to policymakers. In the Analects (Lunyu 论语), a text that collects Confucius' perspectives on learning and teaching as recorded by his students after his death (Ames & Jr, 2010), the motivation for learning was categorized into four groups: born to know, learn for knowing, learn for solving obstacles, and rejecting to learn (Analects 16.9, for the full text of Analects in classical Chinese and English translation, see *The Analects - Chinese Text Project*, 2016). From these classical Chinese insights on study motivations, two key categories have been of particular concern to Chinese scholars, educators, and policymakers even in the 21st Century: the self-fulfillment needs for learning and the external rewards brought by learning (Guo et al., 2019).

These concepts are surprisingly similar to concepts in Self-Determination Theory (SDT) based on the Western educational context, which distinguishes between extrinsic and intrinsic motivations (Deci & Ryan, 1985). Self-determination theory (SDT), which posits that "people are inherently prone toward psychological growth and integration, and thus toward learning, mastery, and connection with others" (Ryan & Deci, 2020, p. 1), divides motivation of learning into two categories: extrinsic motivations and intrinsic motivations. Extrinsic motivation stands for the motivations that come from external environments, while intrinsic motivation is the inherent interests or enjoyment of learners (Ryan & Deci, 2020). With the development of SDT, the division between intrinsic and extrinsic motivation is not sufficient to explain complex

human behaviors. In this context, "autonomous motivation," a new concept including intrinsic motivation and "well-internalized extrinsic motivation," has been developed (Ryan & Deci, 2019). In the current SDT, intrinsic motivation still refers to the inherent interests and enjoyment students experience in school related to previous positive experiences. For instance, students who had happy memories of drawing in their family will show intrinsic motivation towards pedagogical content which contains drawing. Notably, well-internalized extrinsic motivation, a new subcategory of extrinsic motivation, refers to external reasons motivating individual behaviors that function through a process involving internal rewards or self-identities (Ryan, 1982). For example, verbal appreciation from teachers and classmates can be seen as a typical internalized extrinsic motivation, where stimuli are external but brings internal happiness and satisfaction to individuals.

The process of "transforming external regulation into internal regulation and integrating those regulations into one's sense of self" (Deci et al., 1994) was then identified as internalization, which played a significant role in SDT to support psychological satisfaction. Fulfillment of the fundamental psychological needs – relatedness, competency, and autonomy (Ryan & Deci, 2019) – was believed to predict a wide array of positive learning outcomes and individual well-being, notably, "thwarting of any of these three basic needs is seen as damaging to motivation and wellness" (Ryan & Deci, 2020, p. 2).

According to SDT, individuals are no longer viewed as passive receivers of stimuli; instead, their motivations exhibit complex patterns influenced by the inherent requirements of self-development. This process does not occur automatically and necessitates "motivations" to support basic psychological needs (Deci & Ryan, 2000).

With the consensus between classical Chinese philosophical perspectives on student motivation and SDT, many scholars have employed SDT as a fundamental theoretical framework to analyze the current poor educational results in the Chinese post-secondary system. They hope to find possible solutions based on this framework.

Self-Determination Theory (SDT)

Self-determination theory posits that the most significant growth for learners is the enhancement of their psychological well-being (Ryan & Deci, 2019) along with the achievement outcomes. In the educational context, by incorporating both intrinsic and well-internalized extrinsic motivations in classrooms, the basic psychological needs of students are addressed, thereby supporting their well-being and academic performance. Paradoxically, attempts to directly control achievement outcomes through extrinsic rewards, sanctions, and evaluations often backfire, leading to lower-quality motivation and performance.

Fundamental Psychological Needs

The three fundamental psychological needs identified by SDT are autonomy, competence, and relatedness (Deci & Ryan, 2000).

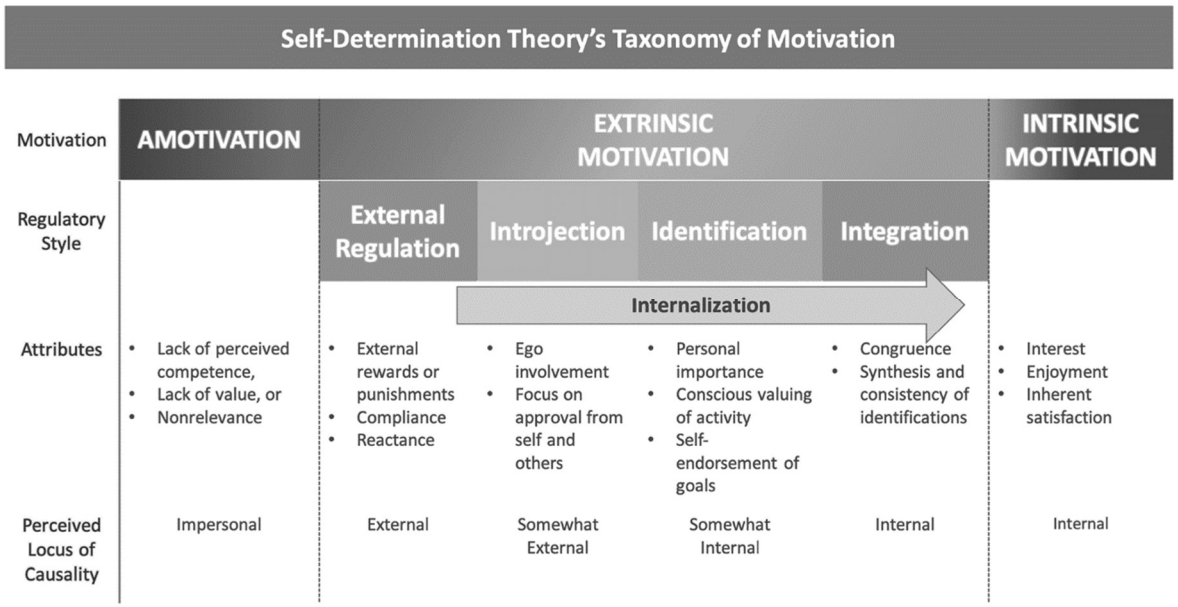
Autonomy involves taking ownership of one's behaviors, primarily influenced by past experiences. When previous experiences are interesting or resonate with one’s values, autonomy increases. In contrast, previous experiences of being controlled undermine autonomy. For example, students who are interested in numbers are more likely to gain a sense of autonomy in learning mathematics, while students who are forced to do calculations to avoid punishment are less likely to feel autonomous. Even when students receive positive rewards, such as toys or gifts, autonomy cannot be fully fulfilled since the behaviors are highly controlled. *Competence*

pertains to the need for a sense of mastery, fostering the belief that one can succeed and grow. A structured learning environment with clear goals and guidance can satisfy this need. For instance, teachers' beliefs about students' learning capabilities were reported to have a positive correlation with students' academic outcomes (Q. Li, 1999), since the competence needs of students who are trusted were encouraged. *Relatedness* refers to the psychological need for connection within the community and the establishment of a sense of belonging. Close relationships among peers, between students and teachers, and supportive school environments contribute to the fulfillment of relatedness (Deci & Ryan, 2000).

To satisfy these three core psychological needs, autonomous motivations are required and controlled motivations need to be avoided. Controlled motivation in SDT refers to external regulation, which includes extrinsic motivation, while autonomous motivation refers to Introjection, Identification, and Integration within extrinsic motivation along with intrinsic motivation (see Fig. 1).

Figure 1

Self-Determination Theory's Taxonomy of Motivation (Ryan & Deci, 2020, p.2).



Taxonomy of Motivation

Intrinsic motivation

As a concept created by SDT, intrinsic motivation was a focal point in the early development of SDT. Technically, intrinsic motivation relates to activities done "for their own sake" or for their inherent interest and enjoyment (Ryan & Deci, 2020). In other words, intrinsic motivation reflects the inner interest in certain processes. In a learning context, intrinsic motivation is associated with the curiosity for specific knowledge and the enjoyment derived from learning.

Extrinsic motivation

It is impossible for people to have interest in everything they need to learn. Some of the boring activities are crucial and useful in people's lives. Extrinsic motivation plays a very important role in developing self-regulation and willingness to conduct unfulfilling or uninteresting activities and is for this reason of considerable value (Deci & Ryan, 1985). Extrinsic motivation refers to behaviors performed for reasons other than their inherent satisfaction (Ryan & Deci, 2020).

The forms of extrinsic motivations can vary across contexts and characteristics. According to Fig. 1, in SDT there are four major subtypes of extrinsic motivation: *External Regulation*, *Introjection*, *Identification*, and *Integration*. The quality of internalization ascends across the four subtypes. *External Regulation* is not involved in internalization, referring to the pure control of behaviors through rewards or punishments, and is therefore also called controlled or non-autonomous motivation. *Introjection* refers to internalization where people "take in" a value or regulation without an internal agreement, usually related to self-esteem or avoidance of guilt and shame. In *Identification*, individuals agree with the value or identify with the value of an activity, thus showing a higher level of internalization and a greater willingness to perform the tasks. Finally, *Integration* represents the highest level of the internalization process, in which a person not only accepts and identifies with the value but also recognizes its consistency with other core interests or values. *Introjection*, *Identification*, and *Integration,* since they perform a certain level of internalization, are called well-internalized extrinsic motivation (Ryan & Deci, 2020). Once used properly in educational settings, they still could satisfy the fundamental needs of students and have beneficial impacts on achievement and well-being.

Review of SDT Studies

The loss of motivation to study of students in schools is not a regional issue; instead, it is a global crisis faced by educators and policymakers. Although internationally, Asian, especially Chinese, students are renowned (and sometimes stereotyped) for their excellent academic grades (Hui et al., 2011), the problem of student demotivation still threatens the well-being of students in schools, albeit manifesting in different forms than students in other cultural contexts. For instance, the demotivation of students could result in low academic achievements and high dropout rates in North America, while in China, it is more likely to lead to problems concerning students' mental health and adverse physiological conditions due to the restrictive implementation of compulsory education laws by the government and other social-cultural conditions which force students to finish their degrees (Hui et al., 2011).

Validity of Using SDT in Chinese Education Contexts

To address the contemporary challenges of student demotivation in Chinese schools and support students in achieving desirable learning outcomes, motivational-focused pedagogy has increasingly played a prominent role in the domain of Chinese education studies over the past decades (Pinar, 2014). This pedagogy examines the legitimacy and suitability of Western educational theories and models imported during the modernization of the Chinese education system (Deng, 2011). Chinese educators have been empowered by modern psychological knowledge to nurture the next generation instead of adhering to the previous pure behaviorism pedagogies learned from the Soviet model of education in the late nineties (Deng, 2011), which focused on providing students with just enough knowledge to pass exams and obtain diplomas. Among all well-recognized motivational theories, self-determination theory (SDT) has been one

of the most widely discussed academic theories (Guay et al., 2008), focusing particularly on students' well-being, and understanding well-being to be a key influencer in evoking natural desires for growth in individuals (Deci & Ryan, 2000). The prominent role of SDT in motivational studies in Chinese educational contexts could be attributed to the similar values it demonstrated as the traditional Confucianism educational philosophy, which is under renaissance and reinterpretation in the 21st Century in China (Makeham, 2020).

Historically, there was controversy regarding whether SDT could universally predict desirable or positive behaviors in individuals as a psychological theory. This was especially true concerning the concept of autonomy, which was thought to vary across different cultures (Bond, 1988; Iyengar & Lepper, 1999; Markus & Kitayama, 2003). However, numerous cross-cultural SDT studies conducted in the last two decades have indicated that SDT can be applied universally, regardless of social and cultural contexts, and can contribute to the well-being of individuals. The cultural context variable lies in the manifestation of different motivations across cultures. For instance, Chirkov et al. (2003) conducted one of the first cross-cultural SDT research on four cultures including South Korea, Russia, Turkey and the United States, finding that autonomy predicted the well-being of individuals regardless of their gender, age and ethnicity. Similarly, Chen et al. (2015) reported that all three fundamental psychological needs in SDT contribute equivalently to university students' performance and well-being in China, the United States, Belgium, and Peru. According to these cross-cultural studies, it is reasonable to conclude that intrinsic motivation, closely linked to the satisfaction of the three fundamental needs, can predict the well-being of Chinese students as well.

Results of SDT Studies in Chinese Educational Contexts

Affirming this notion, findings from Self-Determination Theory (SDT) studies within purely Chinese educational settings align closely with those from diverse social contexts and studies conducted in various Western countries. These findings highlight the crucial role of intrinsic and autonomous motivation in student learning and predict favorable outcomes for students experiencing these motivations.

In 2005, one of the first SDT research studies on Chinese education was conducted by Vansteenkiste et al.. The study reported that autonomous study motivations, including well-internalized extrinsic motivations and intrinsic motivations, were positively related to favorable educational outcomes, including adaptive learning attitudes, academic success, and personal well-being. Conversely, a sole focus on controlled motivations (externally controlled regulations) was reported to be associated with undesirable learning outcomes such as higher dropout rates, maladaptive learning attitudes, and decreased well-being. Additionally, the research indicated that autonomous support from parents positively contributed to better learning adaptability and increased well-being in children, which could be attributed to their subsequent studies of learner autonomy. These research outcomes were consistent with the findings of Deci and Ryan (2020), indicating that cultural differences between Western countries and China have limited influence on the application of SDT as a framework for explaining students' learning outcomes, thus validating the use of SDT in a cross-cultural context.

As one of the first critical SDT research studies examining the effects of different types of motivations on students' learning behaviors, Vansteenkiste's study sparked the interest of other researchers in China to identify relative factors that could help students perform better in the

Chinese educational system. Following Vansteenkiste's lead, many Chinese and international researchers began investigating motivation from a Self-Determination Theory perspective in China and its influence on students' learning in the subsequent decade. The majority of the research corroborated Vansteenkiste's findings, illustrating that intrinsic motivation/autonomous motivation predicts various desirable learning outcomes for students, such as continued engagement, creativity, tenacity, academic achievement, and psychological well-being.

However, further studies also highlighted that the complexity of the internalization process in self-determination could be influenced by various factors involved in the learning process. Interestingly, these variables are highly sensitive to cultural contexts and do not align with findings from Western countries. In other words, while the three fundamental psychological needs remain consistent for students from different cultures, the motivations that fulfill each need may vary depending on social and cultural contexts. For instance, Fuligni and Zhang (2004) in their research on approximately 700 urban and rural Chinese students claimed that a sense of family obligation was generally positively associated with better academic motivation among Chinese adolescents. Hui et al. (2011), also indicated filial piety, one of the most important qualities honored in Chinese culture, has been reported to have positive correlations with autonomy and relatedness, thereby influencing the study motivation of Chinese adolescents. The impact of the family was not reported to have such a strong effect or positive relationship with students in different cultures in the study from Hui et al. (2011). However, the understanding that complex social-cultural factors could influence the motivations of students does not challenge the validity of applying SDT in research in the Chinese context, instead, it provides a lens to assess the effectiveness of pedagogical practices. For instance, family relationships are still

extrinsic. However, if they involve personal value and identification in a certain culture then family relationships can also be categorized as autonomous motivation. Therefore, in the following analysis, the classification of motivation needs to be conducted with the understanding of this point.

Desirable Learning Outcomes Brought by Autonomous Motivations

With the different forms of motivation, much research has indicated that autonomous motivation can predict a wide array of desirable learning outcomes, including student engagement, increased creative thinking, better academic grades, and, most importantly, psychological well-being.

As pointed out by Vansteenkiste et al. (2005), a positive learning attitude was one significant desirable learning behavior that was positively influenced by intrinsic motivation grounding in SDT. Research from Sun and Gao (2020) provided evidence for this claim in the context of Chinese college student language learning. Analyzing 169 collected surveys, they found that intrinsic motivation had a positive impact on students' behavioral intention through two intervening variables, perceived usefulness of classroom content and task technology, in the context of mobile-assisted language learning (MALL). The positive relationship between autonomous motivation and positive learning attitude was then further supported by studies on classroom engagement grounded in SDT in the Chinese education context. According to a study by Qiao (2006), middle school students were reported to be more engaged in class when teachers presented autonomous support. These results show that the inherent enjoyment and interests of a student could increase the possibility for them to participate in the learning process by interacting

with teachers, fellow students, and learning content which is consistent with what is claimed in SDT (Deci & Ryan, 1985).

Other than positive learning attitude, academic performance as a quantitatively measurable variable and a long-believed indicator of education quality was also tested and indicated to have a positive relationship with students' autonomous motivation by Chinese researchers. Wang and Guthrie (2004) indicated that intrinsic motivation predicted better reading comprehension for Chinese students, while extrinsic motivation predicted negative learning outcomes expected when connected to intrinsic motivation.

In addition, the key mission of education is to provide students with the power to form self-determination and thus achieve well-being (Deci & Ryan, 2000). Liu et al. (2013) in their research, indicated that autonomous motivation had a significant positive impact on high school and junior high school students' creative thinking. However, the study also pointed out that controlled motivation played an insignificant role in fostering creative behaviors. Notably, parental involvement, as another variable in the study, played a moderating role in the relationship between autonomous motivational regulations and creative thinking, yet the involvement behaviors varied depending on the students' age group—junior high school or high school. Furthermore, Zhou et al. (2009), in their study in the Chinese rural educational context, indicated that autonomous motivations that developed under the support of teachers were crucial to "adjustment-related, school self-perceptions of competence, interest, and choice" of children in eastern collectivist cultures. Huang et al., (2016) provided further evidence of the positive linkage between intrinsic motivation and students' mental well-being by revealing negative

associations between intrinsic motivation and students' depression, based on data from 537 Chinese undergraduate students.

The Counter-Productivity of Strictly Controlled Motivations

The other fundamental finding in SDT research (other than the positive learning outcomes brought by autonomous motivations) is that attempts to directly control achievement outcomes through extrinsic rewards, sanctions, and evaluations often backfire, leading to lower-quality motivation and performance (Ryan & Deci, 2020). This finding was also corroborated by many studies conducted in the Chinese educational context. For instance, as previously stated, overly controlled extrinsic motivations were found to have a positive relationship with undergraduates' stress levels and depression (Huang et al., 2016). In addition, Controlled motivation predicted academic burnout in students, according to Zhang et al. (2013). They claimed that, based on their study with 730 Chinese high school students, distressed students were primarily externally motivated, while well-functioning students were intrinsically motivated.

Future Direction

Other than the consistent results that support Self-Determination Theory, there have been new explorations in SDT research in the Chinese educational context discussing the relationship between extrinsic and intrinsic motivations and their multiplicative effects on students' learning. Liu et al. (2020) indicated that, based on their 3-year longitudinal study of 13,799 students in China, intrinsic motivation had a moderate positive impact on academic performance whereas extrinsic motivation played a detrimental role when students were already highly intrinsically motivated. However, when students were low in intrinsic motivation, it was easier for them to

achieve better grades when they were motivated by extrinsic motivations. Liu et al. (2020) thus concluded that Chinese students, unlike those in Western cultures, could be motivated without the satisfaction of autonomy.

Though the conclusion from this study seems to challenge the SDT theory, it lacks detailed evidence on the definition of extrinsic motivations. The results were still consistent with the SDT theory on the function of intrinsic motivation, but the controversial claim related to the value of extrinsic motivation. The simple conclusion drawn by Liu et al. (2020) ignored the possibility that extrinsic motivations could also support the autonomy of students when they are well-internalized. Additionally, the study merely defined students' learning success based on grades. Even when the final conclusion of this study was arguable, the multiplicative effect of intrinsic and extrinsic motivation revealed a new direction for SDT research, providing an inclusive understanding of the relationships between the two kinds of motivation in Self-Determination Theory, and is worth further exploration.

Summary

Through the previous review of literature on SDT, we can safely conclude that SDT is a valid theoretical framework for analysis in the Chinese educational context as well as in other social-cultural contexts, since the fundamental needs it demonstrates—competence, relatedness, and autonomy—are psychosocially applicable to human beings and work universally. Many studies on Chinese students have demonstrated its universal validity, showing that autonomous motivation predicts a wide array of desirable learning outcomes, while controlled regulations could backfire and lead to poor performance and less well-being among students.

It is also noteworthy that although the effects of motivations in SDT may be consistent across different cultural conditions, the manifestation of motivations and their impact could be culturally sensitive. Therefore, when analyzing the role of certain pedagogical practices, such as gamification in this study, extra attention should be given to the classification of motivations provided by pedagogical practices from a Chinese perspective.

Review of Gamification Studies

Gamification in an educational context was first defined as the use of game elements in a non-game context (Deterding et al., 2011). Although the concept was defined in 2011, the use of gamification in education can be traced back to ancient times when playing was considered a meaningful method of learning. In early childhood, playing and learning are not always clearly separated in children's activities (Samuelsson & Carlsson, 2008). Even in modern public education, gamification is still broadly used without clear academic definitions or awareness by teachers and students in classroom. For instance, teachers may set up leaderboards to motivate students' performance on standardized tests or use badges to reward students for preferred behaviors (Gee, 2005). These are common gamified elements used in education, and computer-based technology has empowered this pedagogical method to be employed in a variety of learning environments. The key affordance of gamification methods is the continuous and pleasurable engaged experience provided to learners, especially when learning can occasionally be boring and difficult for students (Susi et al., 2007).

Therefore, in the research context focusing on promoting engagement in Chinese post-secondary learning environments, we want to see whether gamification could help increase desirable learning outcomes of students founded on the framework of SDT and create new

possibilities for learning, considering academic achievement and psychological well-being, to provide next generation with a supportive environment to inspire them in the 21st Century classroom.

Review of Gamification Studies in Chinese Educational Context

Like gamification studies conducted in other countries, gamified pedagogies and curriculum designs were claimed to predict better student engagement and learning motivations along with other desirable learning outcomes in the Chinese educational context. For instance, Kraus et al., (2020) reported that in a pilot gamified-centered English as a second language (ESL) project, positive reactions from students and teachers were reported, including perceived effectiveness and motivations. Kraus et al. (2020) also pointed out that the adaptation of gamification design based on the Chinese cultural context and refined preparation in applying designs also contributed to the effectiveness of gamified classes.

Exploring the concerns of the effectiveness of gamification, a few researchers noticed that there was a trend of using poorly designed and structured gamification elements in teaching, and that this could lead to failure of expected learning outcomes. Fan et al., in 2023, investigated a total of 112 mathematics games presented in Chinese school textbooks (Grades 7-9). The results showed these textbook games not only lacked consistency with curriculum content but were also designed in an experienced-based way instead of a scientific one. In addition, these mathematical games failed to be consistent with the features of educational games, for instance lacking co-operation design and instead merely aiming to make students solve problems instead of learning mathematics in an inclusive manner.

In addition, due to the COVID-19 global pandemic that lasted from 2019 to 2022, many schools were shut down for safety reasons. The reliance on technology-based learning platforms and the negative impacts brought about by the lack of interaction with peers and teachers in virtual learning environments, stimulated scholars' concerns regarding the application of gamification design in techno-educational contexts. Ng and Lo (2022) conducted a mixed-methods research study on the role of gamification in both traditional, dedicated classrooms and flipped classrooms (virtual learning) in Chinese postgraduate business programs. The results showed that gamified traditional classrooms promoted learner achievement, while gamified virtual classrooms were positively linked to learner engagement. Gamification could be identified as a pedagogy that supports sustainable learning in education. Similarly, in a quasi-experimental study conducted on English e-learning for level-3 Hong Kong students, a gamified learning system was indicated to be positively related to students' development of self-regulated learning interests, performance, and strategies (X. Li et al., 2022). The positive impacts of gamification remain consistent in massive open online courses (MOOCs) platforms in Chinese universities as well. Recent research results showed that gamification plays a critical role in improving students' usage of MOOCs and enhancing academic performance (Yang & Lee, 2021).

In general, by reviewing the literature on Chinese gamification studies, we can see consistent positive impacts brought by introducing gamified elements in the teaching and learning process. However, the gamified elements should be designed systematically and consistently with the learning content and environment to provide full effectiveness. The

prevalence of technology-enhanced education has also influenced the usage of gamification and sparked more interest in its role played by Chinese researchers in recent years.

Common Gamification Elements Used in Higher Education

According to Deterding et al. (2011), who approached gamification as a computer-based application, the main elements used in gamification could include reputation, ranks, and levels; self-representation of avatars; competition under rules; teams; parallel communication systems; etc. Though all these game elements make sense in online gaming platforms, the effectiveness and adaptability of each element are still controversial in educational contexts. Some research indicated the key element of gamification should be "points, levels and badges" (Hung, 2017), while others claimed that the process of overcoming obstacles and getting rewards was the fundamental mechanic (Buckley & Doyle, 2016). In addition, though the modern definition of gamification originates in the social media industry (Deterding et al., 2011), the use of technology is not a prerequisite of gamification.

Therefore, since peer-reviewed studies on gamification elements in Chinese post-secondary education are limited, we will recruit the most common gamification elements identified in systematically reviewed studies in a similar context – STEM higher education – from Ortiz et al. (2016). In their studies, Ortiz et al. (2016) pointed out that among a total of 30 peer-reviewed gamification studies in the STEM higher education context, a total of 18 studies used a combination of gamification elements, usually "points, badges and leaderboards, plus other elements such as challenges, levels, avatar, etc." (p. 6553). Notably, seven of the 30 studies isolated certain gamification elements, mostly badges being the only element that was adopted in the educational context solely.

In the following chapter of theoretical analysis, we will analyze this interesting phenomenon of gamification elements used in higher education to see whether it is consistent with SDT’s requirements to provide better learning outcomes and students' well-beings.

Chapter 3: Theoretical Analysis

Before analyzing empirical interview data, this study aims to provide a theoretical overview of the validity of gamification based on the standards of SDT. This overview seeks to determine whether gamification elements can fulfill the three fundamental psychological needs defined in SDT and whether gamification could provide autonomous motivations to help the growth of students.

Analysis of the Most Common Gamified Element in Higher Education

In the systematic review of gamification studies conducted by Ortiz et al. (2016), there was an interesting finding that most studies used a combination of gamification elements instead of isolation of certain ones. Usually, the combination contained points, badges, and leaderboards, plus other elements like challenges, levels, avatars, etc. Only badges were found to be used independently in a few gamification studies. To understand the rationale behind and to test whether gamification could encourage student achievement and well-being, the combination of different gamification elements will be discussed through the lens of the SDT framework to see its validity and applicability.

Basic Components: Points, Badges, and Leaderboards

Points used in gamification typically serve as a quantification system to provide measurable feedback on students' performance. In this system, a student participating in a language course, for instance, will have their performance recorded as a numerical value. Upon meeting certain course requirements, these points will be reflected in both the student's and the teacher's reports. The points system offers students extrinsic motivation, which can have an

internalized aspect as it helps them understand their performance in a tangible and measurable manner. Initially, it provides external regulation through rewards for completing desired behaviors such as attendance, participation, and assignment grades, which are all quantified. These rewards do not necessarily involve internalization, as they are not directly related to the values or interests of the learners. In some cases, points systems are designed for real-time tracking, allowing performance to be reviewed at any time, usually calculated after completing certain tasks. This control over performance outcomes meets the competence needs of Self-Determination Theory (SDT). However, since the points system provides controlled motivation, it could have negative effects on students' achievements and well-being, as suggested by SDT.

The badges system, though it may seem similar to the points system as an external regulation, actually provides almost no external rewards (Auvinen et al., 2015). Ownership of badges usually has no connection with either the final grades of certain courses or any other realistic benefits. Instead, badges are seen as an internal reward for achieving something notable and, most importantly, special. The comparison and competition associated with badges make them a symbol of honor that connects with the internal feeling of being approved by others. For instance, a student who shows the most improvement in test grades in class may be awarded a badge for improvement, even if their overall scores are not the highest in the class. In addition, the honor from badges is a recognition of the personal efforts or values of students thus providing a higher level of internalization. The sense of pride and satisfaction upon receiving the badge, along with the desire to experience that feeling again, represents *Identification*, which turns external rewards into internal regulation and resonates with students' own identifications or values. This element not only satisfies competence by giving students confidence in their ability

but also meets relatedness since they occur in a group setting and increase the sense of belonging as a group member. Autonomy has the potential to be fulfilled as the emphasis on individual values and growth.

The leaderboards element is very similar to points, except it eliminates the format of external rewards. It contains more elements of competence within certain groups and is more socially oriented than the badges system. The leaderboard system falls into the category of internalized extrinsic motivation - Introjection - as it involves ego involvement and has the potential to increase desirable learning behaviors by making students proud of their success or ashamed of their failure. However, it has polarized impacts on students (Singer & Schneider, 2012). Achieving a badge could provide feelings of pride and happiness, while not having one will not necessarily cause negative emotions. In contrast, winning on a leaderboard, though it can bring a sense of satisfaction, being low in rank could be extremely upsetting. For those who rank higher at the top, leaderboards can be very motivational. However, for those who rank at the bottom, this element could decrease students' sense of competence, even though it promotes relatedness by forming a close community in which everyone is involved.

From the analysis of the motivational taxonomy of each element, none of these three elements alone could provide enough types of motivation to fulfill the three fundamental psychological needs. Specifically, the points system is more of a convenient way to manage performance rather than a pedagogical support to increase engagement or motivation. Without proper additional elements, based on the analysis of SDT, the points system has a higher risk of backfiring on students' achievements and well-being because it represents external regulation that limits autonomy through controlled motivations.

The badges system has the greatest potential to provide comprehensive motivations, which could explain its higher proportion of sole application in peer-reviewed gamification studies (Ortiz et al., 2016). In contrast, leaderboards, though they do not emphasize external rewards and punishments and focus on the internalization process of motivating students through egos, have a significant constraint: the effectiveness of motivation can be very polarized among groups.

In general, these three elements provide very different levels of motivation to foster students' achievement and well-being, with badges being the most effective, followed by leaderboards, and then points, based on SDT principles.

Additional Gamification Elements

In addition to badges, points, and leaderboards, the common combination of gamification elements also includes challenges, levels, avatars, and other elements. The inclusion of these additional elements may stem from the perceived failure of the basic three gamification elements to provide sufficient support for internalization. The analysis will focus on whether challenges, levels, and avatars can provide a higher level of internalization or fulfill missing motivations that badges, points, and leaderboards cannot provide, again using the Self-Determination Theory (SDT) framework.

The challenge system used in educational contexts is often delivered in the form of teamwork. These challenges are designed to exceed the current abilities of individuals, encouraging students to form teams and work together to solve a given problem. Completion of challenges often brings significant rewards. In an educational context, this could include a high bonus point for every team member, helping them achieve better final grades in the course. The

challenge system, by design, provides external rewards along with social interactions within the community, thus offering a medium level of internalization in the taxonomy of motivation - Introjection. The primary focus of the challenge system is to fulfill the need for relatedness, which develops social communication and feelings of belonging. Additionally, students are required to tackle obstacles that initially seem insurmountable. However, through practice and teamwork, they can overcome these challenges, which also lays a foundation for the satisfaction of competence by increasing confidence in personal abilities and recognition of individual improvement.

The levels system is very similar to the points system, as it contributes to the motivation of external regulations. The main design difference is that it provides a sense of progress. For example, at a low level, the points are easy to obtain for upgrading, while at a high level, it is much harder to collect resources for upgrading. In general, the levels system provides a low level of internalization and emphasizes more on external rewards. While it could be useful in helping students stay engaged in the process, it lacks the potential to provide autonomous motivation, which is a key aspect of educational support in SDT.

Among all the gamification elements we discussed before, avatars have the highest level of internalization – Integration (Deci & Ryan, 2000). The avatar system provides a virtual representation of a student when immersed in a digital learning environment (Hudson & Hurter, 2016). The design of the avatar not only allows students to connect their learning with their values and identity but also contributes systematically to the overall picture of personal identity. For instance, students using the avatar system need to create a figure based on their personal identity, which does not need to be one hundred percent accurate to their real selves. In this

context, the system breaks the physical limitations and enables students to express their identity and values while engaging in learning. In an in-person educational context, avatars could also be used in the form of role-play, where students use their own identity to express their understanding of learning through the performance of designed characters. The avatar system provides fulfillment of all three fundamental psychological needs for student performance and well-being.

In summary, because each type of gamification element is limited in its ability to provide comprehensive motivations to fulfill students' needs, educators may find it beneficial to employ a variety of gamification elements, each with its own emphasis, as a systematic support to foster better education outcomes. Among all the elements reviewed previously, the avatar system has the highest level of internalization based on SDT frameworks, making it a good option for application in higher education contexts, despite the high implementation costs. Notably, there are a few elements that are not effective in providing beneficial outcomes based on SDT, namely points and levels, which focus on external regulation and lack internalization. Given the different focuses of various majors and fields, educators designing pedagogy or curriculum should carefully select gamified elements to provide the best motivation to students in the current demotivational higher education system.

Chapter 4: Qualitative Interviews

The theoretical analysis section justified the validity and applicability of gamification elements based on the framework of SDT. However, as we discussed previously, gamification elements in different cultural contexts could play various roles as motivation. Therefore, it is necessary to analyze the role of gamification in the context of post-secondary Chinese classrooms to gain a comprehensive understanding of its role. In addition, the interviews from teachers can provide a more comprehensive angle for future pedagogical design with gamification elements since teachers are the pipeline between education institutions and students.

Research Methodology

Participants

Four teachers (A, B, C, and D) with experience using gamification in their classrooms were individually interviewed in forty-five-minute sessions on Zoom. All participants were screened through public recruitment conducted by the principal investigator of this study and were selected based on the descriptions of their experience using gamification in their classrooms provided in their application to participate in the research. All four participants are officially registered and certified instructors in Chinese post-secondary educational institutions. Two of them (B and D) are from vocational colleges, and the other two (A and C) are from comprehensive universities.

To ensure varied perspectives and experiences, we selected teachers with diverse backgrounds to examine how gamification practices are influenced by various factors and the role gamification plays in their classrooms, and consequently, its impact. Participants A and B

are experienced educators. Participant A has over twenty-five years of experience teaching accounting-related courses at a comprehensive university and is responsible for specialized courses for accounting majors as well as basic accounting courses open to students from various majors. Participant B has fifteen years of experience teaching automobile maintenance and repair courses at a comprehensive vocational college, primarily supporting students in automotive schools with required courses in their major. In contrast, Participants C and D have less teaching experience. Participant C has been teaching research methodology courses for graduate and post-graduate students at a Custom University (pseudonym) from various faculties for the past five years, focusing mainly on qualitative research methodology education. Participant D has the least teaching experience, with two years of teaching software engineering at a computer science and engineering vocational college. All interviewees are from different schools and regions, teaching different subjects, to provide a broader insight into the role of gamification in post-secondary education in various contexts.

Procedures

Recruitment

The recruitment started with posts on unofficial, mainstream online forums (specifically in the post-secondary teachers' sector) and discussion groups on social media platforms to attract potential candidates. Simultaneously, the student PI sent recruitment emails to the communication departments of higher education organizations in mainland China seeking their assistance in forwarding the recruitment email to their fellow teachers. This recruitment email was circulated within the post-secondary teaching community for one month.

Candidate Selection

Candidates were selected based on their responses to a prompt asking for a brief description of their teaching experience involving gamification. We encouraged applications from individuals with diverse subjects and teaching backgrounds, with a preference for those who have used gamification more frequently in their classrooms. There is no specific requirement for the number of years of teaching experience in this study. A total of twelve applications were received, given the scope of this thesis, four candidates were selected to participate in semi-structured interviews designed to allow participants to provide an orientating perspective on gamification in China.

Semi-Structured Interview

The main data collection method used in this study was a semi-structured interview conducted with four college-level instructors who have used gamification techniques in their practice. The whole process of the interview was audio-recorded and then transcribed. A 14-question interview protocol (See Appendix) was used to guide the semi-structured interview.

Each participant was interviewed once for 60 minutes via Zoom. During the Zoom interview, a personal Windows desktop computer with the built-in recording feature of Zoom was used to capture the audio information. Interview questions focused on the experience of teachers using gamification in their classroom and the affordances and constraints they face when orientating students to autonomous motivations within a traditional Chinese pedagogy system where controlled motivations are emphasized. At the same time few generalized questions on motivations and Chinese post-secondary education were also asked for inclusive information on gamification's adaptability and validity in the Chinese post-secondary education

context. The research design, recruitment email, and interview protocol were submitted to McGill's REB board for approval and all participants signed an approved consent form to participate.

Interview Results

Gamification practices

The most important part of the interviews is the sharing of detailed information about participants' individual experiences using gamification methods in their classrooms. The sections below share their use of gamification in post-secondary education from four participants separately:

Participant A

As an accounting teacher who delivers both professional and basic accounting courses to students from various majors at the university, Participant A implemented gamification practices on an online educational platform. The university where Participant A worked opened a Massive Open Online Course (MOOC) on basic accounting knowledge to help students develop fundamental tax knowledge and be prepared for real-life tax events, as required by the Ministry of Education of the People's Republic of China. Participant A was chosen to design and teach this MOOC, which had more than 1,000 students enrolled each semester. Instead of simply uploading lecture recordings online, as most MOOCs do, Participant A decided to use a gamification design.

The accounting MOOC was designed as a virtual level-up game with the following features:

1. Six major quests that students needed to complete to pass the course.

2. Each quest could be challenged at any time and in any order.

3. Each quest included several subtasks that had to be completed in order.

4. Students needed to achieve a certain completion rate to unlock the next task and ultimately complete all the required quests.

5. Tasks were varied and included reading, videos, practices, and participating in discussions on forums.

In the application of gamification of Participant A, a combination of quests, levels, points, and forums was performed. This can be attributed to the format of the course which is completely virtual and therefore gamification elements become the only mechanics to promote the engagement of students at distance. Based on SDT, having students fully satisfy their psychological needs – competence, relatedness, and autonomy – are perquisites of academic achievement and well-being. The application of a combination of these elements effectively helps most students in the MOOC platform develop competence in their learning abilities through quests, levels and points, while forum activities empower the relatedness of students. Autonomy is thus encouraged for students who feel curious and interested in the newly developed learning platform which is constructed very similarly to their daily entertainment – social media. No controlled motivation was emphasized in the MOOC design thus reducing the risks of backfires.

Participant B

Participant B implemented gamification methods in the automobile maintenance and repair classroom four years ago, supported by Virtual Reality (VR) devices and simulation

software. The course comprised three major components: theoretical knowledge, VR practice, and real automobile practice. The use of VR practice, a gamification mechanic, replaced traditional instructor demonstrations on real automobiles and provided students with more opportunities to practice.

In this setup, forty students in each class were divided into 8 groups. Students wore VR goggles to play a game that involved testing and repairing virtual vehicles. The instructor could track the progress of students and aid by observing warning alerts on the screen when students made mistakes. All the steps taken by students were recorded, graded, and sent to their individual accounts, which could be reviewed on their electronic devices later.

The gamification method used in Participant B's classroom is a technology-enhanced teaching called a VR simulator. This element mainly provides students with intrinsic motivation through its edge design and entertainment characteristics. Students who developed curiosity and enjoyment of the new learning devices were satisfied with their autonomy needs. The competence is met through the practices throughout the learning content. The VR simulator would have also allowed for low-risk failure, allowing students to repeat attempts similar to game play. Relatedness was not very focused compared to the other two in this gamification design while it still provided some internalization on extrinsic motivation by putting students in different groups and making peers watch each other's performance.

Participant C

Participant C implemented gamification methods in weekly seminars for research-focused students to motivate them to engage in learning different research methodologies and to overcome challenges they faced when conducting their own research. The gamification mechanic

employed by Participant C is called "educational drama" which requires students to design and present a short drama based on the learning contents.

For example, when teaching concepts about interview methodology, Participant C would give students 20 minutes to write a small script on certain interview topics they are interested in or practical interview stories they have experienced. Then, they would have an extra 10 minutes to arrange the performance within their group of three or four. The dramas were then presented in front of the whole class and discussed by other seminar members, connecting them to the learning content of that class.

The educational drama performed by Participant C is very similar to the Avatars system while in a format of in-person classroom settings. It empowers students to express their own identities in a safe and limited range which is related to their personal experiences but protected by the form of performance. Students were playing characters they designed involving their own values but without the need to disclose their personal, private feelings or emotions. They had full control over the learning contents and tried to apply the knowledge in their daily life in fun and dramatic ways. This design therefore could help fulfill the needs of the students and empower them to achieve better outcomes.

Participant D

Participant D, a young teacher interested in video games, designed the entry-level software engineering course using a structure like D's favorite game, *Don't Starve*. *Don't Starve* is a survival game that involves teamwork on resource collection and item construction to overcome a catastrophic environment and survive as long as possible.

In D's class, students are divided into small groups and encouraged to "hunt" for resources to build their own software projects. These projects are then tested under challenging conditions at different development stages. In addition to the fundamental resources demonstrated in weekly lectures, D also provides advanced resources for software design on a first-come, first-serve basis. Only a few groups that finish the extra learning contents are eligible for access to the advanced database. Group projects are evaluated based on the stages they pass.

The emphasis of Participant D's design was to fulfill the relatedness needs of students. This gamification element D used in the classroom can be classified as challenges in which learners are promoted to form teams and gather resources to solve problems which seem impossible to overcome. Through the engagement in challenge, learners are supported to develop relatedness through communication and cooperation, while at the same time building competence through utilizing the knowledge they learned when building their own program.

Understanding of Motivation

In the interviews, all four participants expressed positive attitudes towards the influence of motivation on the learning process of students. And all four interviewees identified increased motivation as a result of their pedagogical designs. Motivation is believed to be one of the most important factors that help students engage in the classroom and interact with the content, teachers, and their peers, as stated by Participant C. According to Participant C, engagement is crucial for students to understand the knowledge delivered within the curriculum design, especially when the content is abstract and theoretical. Participant C noted, "When delivering pure lectures, students get distracted so fast, and you can feel they are just physically present instead of mentally engaged. Things changed when I added special activities in class."

Motivation, whether extrinsic or intrinsic, plays a crucial role in re-engaging students in the classroom and helping them focus.

Additionally, Participant A mentioned that motivation also predicted better final academic performance. They stated, "Students nowadays are generally not interested in learning; some of them just want to graduate and get a diploma instead of really learning something. But if you really get them motivated, they still have great potential to finish the tasks and achieve good grades in the final tests." Participant B affirmed the positive relationship between motivation and academic performance, saying, "Students who want to learn can actually learn better," based on observations of students having better real-time operation scores when they are motivated to practice on VR simulators. Furthermore, Participant D noted that the relationship between teachers and students could vary depending on whether the students are motivated or not. D said: "Usually, I can feel that we are more connected when students are motivated in class. This close relationship is important for students to genuinely listen to me and take my advice even outside the classroom".

In general, participants found motivation lacking in traditional classrooms focusing solely on external regulations and rewards. This finding supports the critique of engagement in Chinese post-secondary education and supports the critique of engagement in Chinese classrooms we discussed in the literature review section above. In addition, motivation is believed to have positive impacts on students' learning outcomes, including more engaged attitudes and behaviors, better academic outcomes, and better student-teacher relationships, based on the interviews.

Understanding of Gamification

Unlike motivation, which is a well-discussed and well-concerned topic in education, gamification is not a well-known concept for most interviewees, except for Participant C, who is a scholar on research methodology and has educational research experience. This was the case despite the clear use of gamification elements in their teaching approaches. Participant C stated, "Gamification is an emerging topic that makes money right now. There are many training institutions outside targeted at child development that claim they use gamification." The other participants showed a more conservative attitude towards the concept of gamification. Participant A and D stated, "I actually don't know if my teaching practices could be called gamification or not, but I saw your recruitment letter that explains what gamification is, and I think mine can fit." Similarly, Participant B claimed that though they have a limited understanding of gamification, this concept was mentioned in the school's curriculum guidelines and teaching requirements.

Although they had limited knowledge of the theoretical definition of gamification, all participants had experienced gamification used by fellow teachers without being conscious of it at the time. Participant A shared an experience from when they were a student, where a teacher rewarded bagels to the best-performing students based on a leaderboard. The teacher gave students different points based on their performances and improvements, and the most improved students received bagels and small gifts as rewards. Participant B witnessed a colleague using role-played scenarios for years to teach students how to perform customer service in the automobile industry. Participant C mentioned the use of role-play methods in most qualitative interview teaching. Similarly, Participant D talked about the award-winning "Murder Mystery Game" used in the innovation and entrepreneurship course at a nearby college. These

observations of other educators and their practices inspired participants to try similar innovative pedagogies in their classrooms.

Affordances of Implementing Gamification

Using gamification in their classrooms has brought many affordances and desirable learning outcomes for students, according to interviews with all four participants. These outcomes include promoting better engagement and academic performance, reducing safety risks, closer student-teacher relationships and, most importantly, generating interest and enjoyment in the learning process of students.

The improvement in intrinsic motivation or inherent interest was the most mentioned and usually, the first affordance reported by teachers, all interviewees in this study claimed to see an improvement in students' interests after the implementation of gamification mechanics in class. Participant A spoke about the increased discussions among students on the learning contents who took the accounting MOOC. Students reported the technique as interesting and recommended other students to take the course in the course evaluations. Participant A was happy to see that change and then also applied these techniques to the MOOC platform in the advanced accounting courses A was teaching, which also received good feedback from students.

"They like to play the VR simulator," said Participant B, "I notice the enjoyed and excited expressions on their faces which are rare to be seen when students are in different learning sections like lecture or even realistic vehicle practice." B believed that the VR simulator emphasizes the entertainment part of learning and is very similar to the daily entertainment of the current young generation. The joyful previous experience of students made it easier for them to have interests in giving it a try in learning contexts. Participant C, as well as others, said that

when participating in the educational drama, students are really excited about the whole situation; not only did they work hard on the design and performance of their own mini drama, but also were so willing to share their thoughts and opinions on others' work. "It almost like you are pumping human souls into their physical body," C laughed and claimed.

Participant C then shared a deep insight into the possible rationales for that change in interest. Participant C said that students in their university mostly lack interest and curiosity in their majors or even the topics they are learning about since the majors and even the career paths are chosen by their parents instead of the students themselves based on the future economic turnback. "Working in national customs institutions is believed to be a perfect job choice considering the work time, salary, stability, and social norms by most parents, not to mention some of them also work in this field," Participant C said. "In this case, the willingness of students is no longer important when considering their career choice, what matters is that families need a child to achieve or maintain the social status of the family, especially when the kid is the only one to count on in future due to the One Child Policy." This perspective from Participant C provided another angle on current demotivation issues prevalent in the post-secondary education system. Participant C's response identifies the social factors related to the malfunction of traditional lectures, while also emphasizing that the key role gamification could play in the class was lack of general attraction to learners. In traditional didactic lectures, there are very limited motivations provided by the educational environment that are internal and related to students' values or identifications. Since the pedagogy is extremely controlled and can hardly promote interests or the environment, the only possibility is connecting to students' interest in the learning contents. Therefore, when students are forced to choose subjects, they have little interest in, it is

highly possible for them to just achieve enough high grades to pass the course instead of actual learning since the only thing that matters is the diploma, which in turn is related to good jobs. Especially when it is in post-secondary education, the competition for higher grades no longer exists, graduation is the endpoint. Insights from Participant C discussed above provide a potential rationale for the current demotivation crisis that has occurred in the Chinese education system. Their insights support the motivational theory – SDT – employed in this study, showing that extrinsic regulation could result in backfires. However, the family obligation issue mentioned by Participant C could be identified as autonomous motivation which students accept the rules without agreement for the sake of family. The cultural importance of filial piety is a key factor making the demotivation issues complex in the Chinese context.

Participant D affirmed the importance of pedagogical innovation in curriculum teaching when students are not sure or have limited interest in their career pursuits. According to Participant D, "Computer Engineering is the head industry that provides good financial incomes to the professionals in the field, and that's why many of my students choose this major even when some of them know nothing about this major." Students who take D's entry-level program engineering course had no or limited interest in this field. Due to the lack of information about this major, and when they cannot achieve good results in the first place, they tend to give up very quickly since they believe that they are not capable of this major. "It happens so often, especially when it's the entry-level course in which that, literally, all people struggle when starting a new field to learn," D explained. D pointed out that considering the education equity it is very hard for students to change their majors because the admission standards (scores in the National Standardized Test) are different depending on majors and universities. Therefore, even when

students are not interested in what they are learning, they have no choice but to finish it. In this context, the disengagement connects with the lack of class participation, no interest in class contents, less completion rate in assignments, or even failure in the course. In other words, family responsibility, and the type of semi-internalized motivation provided in the Chinese context, may lead to program completion, but without a genuine interest in the course material or associated careers that are crucial for educational success.

However, gamification appeared to D as a useful tool to engage these uninterested students: "I see the difference after I used the survival game as my course project structure, the least interested students come to the class and start to learn and communicate with others," D said with a happy tone, "sometimes, the more experienced teachers will just ignore the least interested students, but I know they have the capacities to do well when I can make them interested in what they are learning."

Other than the interests and enjoyments provided through gamification mechanics, a wide array of other affordances was also mentioned in the interviews with participants. Participant A stated that the online MOOC platform gives the freedom for students to access resources, regardless of time limitations and physical locations, which helps them to take advantage of learning at their own pace. "Students are obviously different in their learning abilities," A said, "but it doesn’t mean they cannot learn as well as others, they just need more help." I was glad that the gamification enabled students to take charge of their own studies. The feedback from this platform is instant and clear; it further empowers students to take control of the content of their learning and helps them master tax knowledge and skills. Participant B identified another important issue, which is safety in automobile studies. "Usually, the voltage in the practice

automobile is dangerous and the VR simulator gives students an entirely safe place to try and make mistakes," B explained. B mentioned how the skip of any pre-check or misbehavior could cause injury or risk-of-life consequences, especially considering these risks are present not only for the rookie but also to the experienced engineer. The VR simulator is a better warning and practice learning device to eliminate these risks. Participant C, who teaches a qualitative methodology course, talked about how the playful educational drama brought opportunities for students to connect with each other. C mentioned one of the key challenges when students conduct their research is the absence of communication with fellow students in other fields and depressed feelings due to the lack of personal expression. "During the drama performance, I could see that some of the students were actually performing themselves in the past research obstacles. Drama could encourage them to express themselves in a way that is mentally safe, release negative emotions obtained in certain events, and communicate with a group to gain feelings of belongingness," C said. Similarly, D talked about the close relationship built during the gamification implication and the positive outcomes brought up by that close bond. "We know each other more, instead of just instructor and students, we are friends now," Participant D was quite satisfied with the relationship with students and felt more motivated in the teaching and happier when interacting with students.

The evidence from all the interviews leads to a conclusion that gamification plays a vital role in provoking the inherent interests of students in learning as well as other desirable outcomes, for instance, students' increased control over the learning, a safer learning environment, expression of personal feelings that enable inner peace, and the close relationship between teacher and students that motivate both parties. All these affordances of gamification

applications were strongly associated with their design of fulfilling students' autonomy, relatedness, and competence needs based on SDT. Importantly, the effective use of gamification methods by all participants was also linked to their thoughtful selection and application of gamification elements tailored to their unique classroom contexts, as revealed through the interviewees' experiences in this study.

Constraints of Implementing Gamification

Aside from the benefits brought by the application of gamification, a few constraints were also reported by interviewees, although limited when compared to the reported affordances.

Participant A mentioned that students could skip lectures or not pay enough attention to the videos or readings provided on the MOOC platform. However, A also pointed out that with the development of AI technology and other information technology, the MOOC platform the university used had been updated with certain functions to deal with these issues.

Participant B was optimistic about the usage of the VR simulator in class and thought there were no constraints regarding the usage of gamification.

Participant C indicated that the educational drama pedagogy used in the research methodology course was a mature technique used by instructors in sociology and anthropology in European universities. The only constraint that came to C's mind was the potential pressure it could put on more introverted students.

Participant D talked about the lack of updates on hardware and software on department devices, which could limit several applications and the expected outcomes of gamification in a virtual context. These limitations suggest broader concerns around access and equity in education.

In general, participants in this study showed positive perspectives on the constraints of the application of gamification and believed they do not overshadow the benefits brought by gamification. All argued that the constraints identified could be dealt with through the support of technology development and instructors' careful attention.

Advice for Future Gamification Integration

Regarding more generalized interview questions, a few participants shared their opinions on the future of gamification as a teaching method used in the Chinese post-secondary education system. "The key point is changing the public view on education, especially higher education, as the only pathway to individual financial success," B pointed out. B suggested that the government and schools should take more responsibility in fostering the younger generation to have inner peace. B also mentioned the lack of communication with parents and the tense relationships in families could be important obstacles for current young people to overcome in finding their own career paths and being genuinely appreciated by others for their hard work. The presence of these obstacle harms their motivation to learn and grow as individuals.

D also mentioned the conflict between parents and students, indicating that it could be caused by differences in value systems and opinions on education. "It is inevitable that students who are born in the social media era will have fights with their parents, who see social media activities as useless and a waste of time," D said. "Even for me, sometimes my parents get upset with me when I play video games, which in their opinion is connected to the corruption of the spirit," D claimed that the development of applied technology in education, especially in a gamified environment, could be challenging considering the stigmatization of video games in China.

To summarize these insights from the participants on the future of gamification in the Chinese post-secondary education system, we can tell that the social norms regarding video games in the middle-aged generation have a strong influence on the future development and adoption of gamification. At the same time, the government and schools should take the lead in giving back personal choices to students themselves and help them develop wholesome personalities. The promotions of gamification elements, especially technology-enhanced elements in post-secondary schools by the government could be seen as a pilot for more inclusive higher education for Chinese youth.

Chapter 5: Conclusion and Discussion

Conclusion

Under the threat of widespread demotivation in learning, the Chinese post-secondary education system faces serious challenges. The traditional curriculum and pedagogical designs, which extend patterns from primary-level education and are mainly text-oriented, fail to provide sufficient resources and a benign environment for the inclusive growth of younger generations. This study investigated the validity and applicability of gamification, a widely proven pedagogical methodology related to higher motivation and engagement, in the Chinese post-secondary context to provide students with a good balance of intrinsic and extrinsic motivation and to foster comprehensive growth. In this research, we adopt careful theoretical analysis and qualitative interviews to draw conclusions about the potential of gamification elements in Chinese higher education to be consistent with SDT's requirements to fulfill the three fundamental needs – autonomy, competence, and relatedness - and thus lead to positive educational outcomes.

Based on the theoretical analysis, to foster the achievement and well-being of students, intrinsic motivation and well-internalized motivation are crucial as they fulfill the three fundamental needs: relatedness, competence, and autonomy defined by Self-Determination Theory, whereas the sole application of external regulations often backfires (Ryan & Deci, 2020). The analysis of the most-used gamification elements in higher education – a combination of elements (Ortiz et al., 2016) - provides consistent support for this argument. Singular gamification elements were shown to fail to fulfill all three needs. The combination of points, badges, and leaderboards, plus other elements like challenges, levels, avatars, etc. was mostly

used in gamification with a rationale to provide comprehensive motivations to satisfy all three needs. The three basic elements, points, badges, and leaderboards, provide very different levels of internalized extrinsic motivation to foster students' achievement and well-being, with badges being the most effective, followed by leaderboards, and then points, based on SDT principles. The points system is an external regulation that cannot be used alone; otherwise, it will backfire and can only fulfill the need for competence. The leaderboard system is slightly better as it engages students' egos, but the results could be polarizing. The badge system has the greatest potential to satisfy all three needs and is therefore frequently used in gamification studies in higher education (Ortiz et al., 2016). Notably, among the additional elements, avatars could support highly in the internalization process. The challenges system is also quite effective, involving teamwork relatedness and students' competence. However, the levels system is more external and should be used with other more internalized gamification methods. In general, a thoughtful selection of gamification elements that adhere to the principles of SDT and focus on the internalization of students is positively linked to outcomes such as higher engagement and better achievements in higher education. The theoretical analysis showed the validity of applying gamification in post-secondary education classrooms.

The qualitative interviews conducted in Chinese post-secondary education extended and contextualized the findings from the theoretical analysis. They revealed that teachers recognize the significant role motivation plays in educational quality. While many teachers were unfamiliar with the concept of gamification, they nevertheless chose teaching strategies in their classrooms based on observations or experiences of positive outcomes related to similar pedagogies. The application of gamification brought positive outcomes, including promoting better engagement

and academic performance, reducing safety risks through challenges presented in VR, improving student-teacher relationships, and, most importantly, generating interest and enjoyment in the learning process for students. This finding supports the argument of SDT, showing that autonomous motivation predicts positive learning outcomes. Even students who initially lacked interest in the learning content could be intrinsically motivated by the pedagogical format and other internalized extrinsic motivators. Constraints on the use of gamification reported by teachers were not related to student motivation but rather to management issues, including the need for better performance assessment methods and the costs of implementing gamification in the classroom. Based on the interview results, we can conclude that in the Chinese post-secondary education context, gamification is applicable in fostering students' intrinsic motivation and other well-internalized motivators to achieve desirable learning outcomes.

In conclusion, this study provides evidence that the careful use of gamification in Chinese post-secondary education provides students with a good balance of intrinsic and extrinsic motivation. The theoretical validity and empirical evidence from teachers in Chinese post-secondary schools support the validity and applicability of gamification in this context.

Discussion

While this study aimed to provide a comprehensive understanding of the relationship between gamification and student motivation in the Chinese post-secondary context, its findings offer an orientating perspective for future inquiry and may not be representative of the national higher education system. The study's data is limited, with only four participants, making it difficult to determine whether their experiences can be generalized to the broader Chinese higher education landscape.

Moreover, motivation is closely linked to social contexts. As mentioned in the "Future Advice" section of the interview results, student demotivation is a social issue that extends beyond the educational system. It remains uncertain whether gamification can be effective in vastly different social environments. While psychological theory may apply universally, the manifestation of mental needs can vary.

Additionally, the selection of gamification elements plays a significant role in the kinds of beneficial outcomes possible. As discussed in the theoretical analysis, certain gamification elements may only partially satisfy fundamental psychological needs, and some may even lead to negative outcomes when used in isolation. Therefore, it is crucial to have a comprehensive understanding of pedagogical and curriculum design when implementing gamification, and to select elements that complement the system's weaknesses. This consideration is reflected in the interview reports, where all interviewees reported using gamification for only thirty percent of their teaching, supplementing it with other teaching methods.

The future direction of Chinese gamification studies could focus more on technology engagement, given the global trend toward promoting digital literacy and the increasing investment by the Chinese government in educational technology. Future research may explore whether gamification can remain effective in this technological landscape and how virtual technology can enhance the effectiveness of gamification in education.

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Appendix

Interview Protocol

Thank you very much for participating in the interview on gamification. The purpose of this interview is to gather insights and opinions on gamification as a teaching method, its applications, benefits, and potential drawbacks within the Chinese educational system. Your responses will be used for research purposes only, and your identity will remain anonymous. Please feel free to provide as many details as you can. Let's get started!

Background Information and Teaching Experience

- What subject do you teach?
- How many years have you been teaching?
- What are the ages of your students?

Understanding of Gamification

- Have you ever heard of gamification before or had similar experiences in your past educational experience?
- How would you define gamification in your own words?

Understanding of Motivations

- How do you view motivation as an element in students' learning?
- What do you believe encourages students to grow and learn?
    - How do your educational practices relate to this belief?
    - How can you identify whether a student is motivated or not?

Application and Benefits

- Can you share your experience with gamification? How did you apply this pedagogical approach in your classroom?
    - What inspires you to use gamification as a pedagogy in your classroom?
    - What are some gamification designs you have come across that you found particularly effective? What made them stand out?
    - How does gamification impact motivation (intrinsic or extrinsic?) and behavior change, based on your observations?

Challenges and Concerns

- What challenges have you faced during the application of gamification?
    - What is the most significant challenge throughout the entire process, including design and application?

User Experience

- Could you please describe several notable moments while applying gamification?
    - How do you feel in those moments?

Generalization Questions

- In your opinion, how can gamification be used to enhance learning and education?
- After the entire process, what are some essential elements that should be considered when designing a gamified system or experience?
- What advice do you have for teachers who want to use gamification in their classrooms?
- How do you think teachers and schools can overcome challenges when incorporating gamification into their strategies?