

Exploring Gamification Strategies for Library Service Design in Chinese Campuses: A Case Study of the Library of Wuhan University of Technology

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Abstract

The purpose of this study is to explore ways to implement gamification strategies in university library services. As a direction for library service design, gamification strategies can create an interactive experience between the library and its users, providing a sense of spiritual pleasure. By integrating gamification into library services, readers can enjoy a better experience when using library services and engaging with their learning environment. The study first reviews theories on gamification strategies in service design. Then, it conducts a case study to identify gamification strategies used in university library services in Europe, America, and China, as well as the current state of gamification models in these services. Based on the basic conditions of the Wuhan University of Technology Library, the study proposes gamification incentive strategies, gamification team strategies, and gamification sustainability and engagement strategies. Design teams then develop gamification library services that connect game elements to students' real-life learning activities. By applying gamification mechanisms to library services, the study suggests that user engagement, retention, and loyalty in university libraries can be effectively increased, while also promoting social interaction and communication.

Keyword : gamification strategies, library service design, Chinese campuses

1. Introduction

The Harvard Business Review suggests that after the product and service economies, the era of the experience economy has arrived. The experience economy is referred to as the fourth stage in the development of human economic life, following the agricultural, industrial, and service economies, or it is described as an extension of services. With the continuous progress of society, people's needs are gradually increasing. Nowadays, people are beginning to pursue emotional and experiential needs, focusing more on the pleasure of service experiences, which ultimately influences user loyalty [1]. As one of the most important service institutions in universities, libraries can be naturally place with great

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emphasis on the importance of user experience. Libraries is not simply providing a variety of services but strives to innovate service design and improve user experience.

Gamification strategies, as a direction for library service design, can establish interactive experiences between the library and its users, bringing a sense of mental enjoyment [2]. Integrating gamification into library services allows readers to have a positive experience while enjoying the library's services and learning environment. It aims to make readers' emotions, intellect, and spirit reach a state of enjoyment and satisfaction, leaving them with pleasant and enjoyable memories, thus providing users with a delightful and satisfying experience [3]. Gamification strategies can also increase the library's traffic and engagement, prevent reader attrition, and help cultivate and maintain the library's user base. Through the case study of gamification service design of university library at domestic and abroad analyzing its service design gamification strategies, we can derive useful suggestion and service design methods that are applicable to The Library of Wuhan University of Technology.

2. Analysis the Gamification Strategies

The core of gamification strategy design is the human being, and it starts from a human-centered perspective, carefully considering the significance of library service design. According to the Art of Play theory proposed by Schiller and Spencer, play is one of the human instincts, and people are inherently endowed with the impulse to play [4]. Play not only brings mental pleasure but also allows individuals to temporarily escape from reality. Therefore, the experience brought by gamification strategies differs from the pleasure derived from reality, as it primarily satisfies mental and psychological needs.

2.1 Elements and Mechanisms of Gamification Strategies

The DMC pyramid framework in gamification, as shown in Table 1, divides gamification elements into three categories: dynamics, mechanisms and components [5]. Dynamic is the foundation, including emotions, narratives, progression and so on, the serves as the driving force behind participants' engagement in the experience. Mechanisms are the basic processes of gamification design experience, which include elements such as challenges, competition, cooperation and rewards. The success of gamification design depends on whether the mechanisms are well-structured. Finally, components refer to the specific manifestations of drive and mechanisms, such as points, quests, achievements, tasks, teams, and so on. The coordination of mechanisms, components, and the rules of the game collectively support gamification as a complete, systematic experience [6].

[Table 1] DMC framework and examples

	Examples	Explanation
Dynamic	emotion, narrative, relationship, progression, constraints...	big picture of the gamification system that has to be managed
Mechanics	chance, challenge, competition, win, states, cooperation...	basic processes that drive the action feedback forward and generate player engagement
Components	gifting, teams, leaderboards, quests, achievements, social graph, points, virtual goods, levels, rules...	specific instantiations of mechanics and dynamics

2.2 The Fun Experience of Gamification Strategies

To systematically study and apply gamification strategies, Nicole Lazarro categorizes the types of fun in games into four categories: Easy, Hard, Social, and Serious. Easy fun is achieved through enjoyable activities that provide emotional release and relaxation, such as the work Learning, where the game difficulty is low and the experience is both educational and entertaining [7]. Hard fun involves facing challenges and deriving a sense of accomplishment from solving problems. Social fun is derived from collaboration and interaction within a team, where enjoyment comes from the social process itself. Finally, serious fun refers to the enjoyment gained from completing meaningful or altruistic tasks, such as helping specific groups of people [8].

3. The Case Study of Gamification Applied in Library Service

3.1 Case Studies in the UK and US

There are also examples of gamification being applied to library and information services in university libraries. Walsh in 2011 reported that Huddersfield University Library in the UK developed a game called Lemon tree which allowed library users to earn points and badges through daily library activities, such as borrowing library materials. The earned badges and points were typically displayed on social media platforms like Facebook and Twitter. Three years later, Walsh explored the potential benefits of using Lemon tree to increase student engagement and academic performance in 2014. Early results of the study showed that students were increasingly using library resources and adopting gamification techniques [9].

Fusich noted that the Henry Madden Library at California State University, Fresno, employed

gamification techniques to familiarize students with library resources and services. The library modified open-source games to integrate previously created information literacy materials. Every week featured different game themes, such as online puzzles, word-guessing games, printed crossword puzzles, and timed video quizzes. Students with the highest weekly scores were awarded prizes [10]. As a result, students were motivated to showcase their skills and newfound knowledge by creating promotional films for the library.

Burke reported that the North Carolina State University Library developed a game called Mobile Scavenger Hunt. This game was inspired by a game called Discover the Future, developed by the New York Public Library in 2012. The mobile scavenger hunt game is typically conducted with a class of 20 students, who are divided into five groups of four. The game takes place in the library's laboratory [11]. A survey conducted after the game was introduced showed that teachers believed the game significantly improved students' awareness of library resources and services.

Smith and Hattinger in 2018 reported that the California State Polytechnic University Pomona Library developed the Poksammon Go AR Library Orientation in 2016. This game introduced students to library resources and augmented reality, providing help whenever students needed it. The app Aurasma was used to enhance the library's real-world effects [12]. Afterward, students were required to complete activity forms and undergo pre- and post-assessments. Gamification was the foundation for increasing interaction between the library and its users. On the other hand, would improve the services provided to users, ensuring that the library would not simply disappear due to the countless innovations in the IT world.

Above all, the application of gamification in library services is not unique to academic libraries, as there are reports of public libraries also applying gamification techniques to library services. However, most or all of these studies come from developed countries.

[Table 2] Case Studies in the UK and US

Institution	Services	Dynamics	Mechanisms	Components
Huddersfield University Library	Lemon tree	To increase student engagement and academic performance	borrowing library materials	points and badges
Library at California State University	open-source games	To familiarize students with library resources and services	online puzzles, word-guessing games, printed crossword puzzles, and timed video quizzes	points

North Carolina State University Library	Mobile Scavenger Hunt	To improve students awareness of library resources and services	team challenge	team
California State Polytechnic University Pomona Library	Poksammon Go AR Library Orientation	To introduce students to library resources and augmented reality	complete activity forms	task

3.2 Case Studies in the China

Falling in Love with the Library: Shelving Madness was a game designed by Tsinghua University Library in 2011 to help readers understand library shelving rules. In this game, players must place books on the correct shelves according to the library's classification system. Escape Room was a multiplayer offline game designed by Peking University Library in 2013, where players form groups of three and work together to solve puzzles. Saving Little Bu: The Vanishing Classics was a game designed by Wuhan University Library in 2015 to encourage readers to explore classic literature. Players advance by answering questions related to classic works of literature from around the world [13].

The Maze of Maps Journey was a game designed by Anhui University of Engineering Library to help freshmen familiarize themselves with and use the library's various resources. Faculty guide freshmen on a tour of the library, explaining the library's collection, resource search methods, and the use of self-service borrowing machines, seat reservation systems, and the Goethe reading machine, among other equipment [14]. There is also a Q&A session. During the tour, freshmen can collect cards at relevant locations and get stamps at various service points. Once all stamps are collected, students can exchange them for gifts.

The self-service multimedia learning platform is an innovative model for freshman orientation at China University of Mining and Technology Library. The library uses virtual reality technology and a B/S model to design a virtual freshman orientation platform based on the library's real-world layout [15]. This platform features animated and plugin-based self-service teaching interactions, a task-driven learning model, and aims to inspire and sustain students' learning enthusiasm, increasing their sense of achievement, interest, and confidence. The goal is to merge resource and service technologies with physical experience.

Running with the Readers is a game designed by Qufu Normal University Library to deepen students' understanding and use of the library. It incorporates basic information retrieval techniques, such as the

Four Corner Classification System and Morse code [16]. Players navigate through various service processes in the library, using different information retrieval skills and knowledge to explore both physical and digital resources, moving between library stacks to complete challenges.

Knowledge Passport is a booklet designed by the Shanghai Institute of Visual Arts, integrating library activities related to reading. Focused on book borrowing and database usage, it is also linked with library events such as movie screenings, calligraphy, book exhibitions, and book recommendations [17]. Through the Knowledge Passport, readers can track their participation in reading activities. Each time they participate in an event, a stamp is added to their passport.

Book Bank is a department under the Fangcao Society Youth Volunteer Association at the University of Science and Technology of China. It is also one of the management bodies of the book drifting station, with a complete set of regulations and operational mechanisms. Its purpose is to promote the recycling of books and make it easier for students to find the textbooks, teaching aids, and extracurricular books they need. Donors can freely choose to donate books either to the library or to the Book Bank. After receiving donations, the library and Book Bank select suitable books based on the library's resource development principles and needs. Books deemed appropriate are processed and shelved for circulation. Books not selected for the collection are stored in the library's book drifting station and made available for borrowing [18]. These books may also be distributed to new students at the start of the semester or sold through charity sales, with proceeds going toward volunteer activities.

To sum up, campus libraries of Chinese universities are more inclined to use task components to provide gamified services. Besides, the service design focuses more on college students especially freshmen to understand and use the library's collection resources.

[Table 3] Case Studies in the China

Institution	Services	Dynamics	Mechanisms	Components
Tsinghua University Library	Falling in Love with the Library: Shelving Madness	To help readers understand library shelving rules	place books according to the library's classification system	task
Peking University Library	Escape Room	To familiarize library services	group work solve puzzles	task and team
Wuhan University Library	Saving Little Bu: The Vanishing Classics	To encourage readers to explore classic literature	players advance by answering questions	task
Anhui University of Engineering Library	Maze of Maps	To familiarize and use the library's various resources	Journey for freshmen and Q&A session	task

China University of Mining and Technology Library	self-service multimedia learning platform	To create a comprehensive virtual training platform that integrates education	task-driven learning model	task
Qufu Normal University Library	Running with the Readers	To familiarize students with library resources and services	Players navigate through various service processes in the library	task and achievement
Shanghai Institute of Visual Arts	Knowledge Passport	To improve students' awareness of library resources and services	movie screenings, calligraphy, book exhibitions, and book recommendations	badges
University of Science and Technology	Book Bank	To promote the recycling of books	donate books	task

3.3 The Transformation of Library Service by Gamification

According to the cases, the primary goal of campus library services is to address both the material and intellectual needs of the public in order to serve as a vital resource for students and teachers. Gamification provides an innovative pathway to transform library services by fostering a deeper connection between users and library offerings. The transition from being merely attracted to gamification elements to engaging actively with game mechanisms can create a sustainable cycle of participation, ultimately supporting meaningful educational outcomes [19].

Gamification can be designed to directly support educational objectives, such as improving research skills, fostering a love for reading, and enhancing information literacy. For instance, gamified library tasks can incorporate challenges that require users to navigate databases, locate resources, or evaluate the credibility of information, thereby honing critical research skills [20]. Similarly, gamified reading programs—where users earn rewards or badges for completing books across different genres—can cultivate a lifelong passion for reading while broadening literary exposure.

The immersive nature of gamified library experiences strengthens user engagement by aligning activities with both cognitive and emotional needs. For example, interactive games can simulate research scenarios, encouraging users to apply problem-solving and critical thinking skills in a fun and low-pressure environment. These experiences not only promote active learning but also increase familiarity with library tools and resources, empowering students to use them effectively for academic purposes.

Library service design on campuses should also take into account the spatial and contextual

characteristics of the environment. Interactive gamification activities, such as scavenger hunts or augmented reality tours, can guide users in exploring library spaces while learning about its collections and services. This dual approach of engagement and education ensures that users gain practical skills while participating in enjoyable activities.

Moreover, gamification enables libraries to transition from one-way communication to interactive experiences that encourage users to actively participate, think critically, and provide feedback. This approach fosters a sense of community and shared purpose, which is essential for the modern library's role as an educational and social hub. By integrating educational objectives into gamification strategies, libraries can reclaim their relevance in the digital era and position themselves as indispensable centers for learning and personal growth.

As libraries face the challenge of diminishing status as sole public information centers, incorporating gamification thinking can revitalize their role. Not only can gamification enhance user engagement and library outreach, but it can also align library services with educational goals, thereby playing a pivotal role in improving research skills, promoting literacy, and fostering academic success. This integration of gamification with educational objectives ensures that libraries remain vital and innovative spaces for both intellectual and emotional enrichment.

4. The Gamification Strategy in the Library of Wuhan University of Technology

The Library of Wuhan University of Technology is a member library of National CALIS, a member library of CASHL, a research-level document collection unit of Hubei Province, and an excellent library of Hubei Province, with a ministerial science and technology novelty search workstation of the Ministry of Education. As a newly built library in 2012, the Library of Wuhan University of Technology can provide a variety of modern information service facilities [21]. The design of the Library of Wuhan University of Technology gamification services require to develop gamification library services that link the components of the game to students' real-world learning activities. Technologies like AI and VR (Virtual Reality) can be used to create virtual environments, paired with game tools, to offer students a more realistic, immersive experience and enhanced service perception within a defined space, such as self-service multimedia learning platforms.

4.1 The Gamification Incentive Strategies

A successful gamification strategy depends on timely and frequent feedback. Real-time feedback

allows users to understand how well they are performing, provides benchmarks to help them adjust their behavior, and boosts their intrinsic motivation. External rewards can diminish users' intrinsic motivation and are best used for activities that are not inherently interesting. The gamification design should aim to make content and experiences intrinsically rewarding, while finding ways to transform external motivations into internal ones that can be integrated, internalized, and harmonized. Examples include activities such as Library Points, Knowledge Passport, and Book Reviews to Promote Reading.

4.2 The Gamification Task Strategies

Currently, users prefer to engage in service activities with specific goals, where they can form teams and collaborate with peers to achieve common goals. A successful gaming strategy requires participants to coordinate attention and resources, engage in rich and positive social interactions, and pursue meaningful collective goals. Library gamification service task needs to encourage students to form self-motivated groups with similar interests, where they collaborate, support one another, and compete to complete tasks while enhancing their individual abilities. Activities like Running with the Readers and Escape Room encourage readers to form teams and participate in these games.

4.3 The Gamification Sustainability Strategies

Excellent gamification strategy make it easier for users to accept good advice and develop positive habits. The satisfaction users gain from playing games is an unlimited renewable resource. The library's gamification service team needs to involve students in the design process, lead a team of designers, and seek stable, high-return strategies. By offering enduring, rich, and secure incentives, the library can guide users toward enjoying the game and appreciating the roles they play. Through multiple simulations and verifications, the system can be continually refined. Activities like Library Points, Knowledge Passport, and Book Reviews to Promote Reading can be held over the long term, with the gamification service adjusted and updated based on user participation and feedback.

4.4 The Gamification User Engagement Strategies

To ensure sustained interest and prevent novelty fatigue, the library's gamification services should incorporate mechanisms such as periodic updates, introduction of new challenges, and evolving narratives. For instance, gamified programs can feature seasonal or thematic updates tied to academic calendars, holidays, or global events to keep the content fresh and relevant. Additionally, introducing progressive

levels of difficulty or unlocking new features as users achieve milestones can provide a sense of accomplishment and encourage continued participation. Evolving narratives, such as storylines that unfold over time or are influenced by user choices, can create an immersive and dynamic experience that maintains users' curiosity and engagement. Regularly soliciting user feedback and incorporating their ideas into updates can also foster a sense of ownership and community involvement, further motivating long-term participation. By adopting these strategies, libraries can transform gamification from a temporary novelty into a lasting and impactful component of their service offerings.

5. Conclusion

In summary, applying gamification mechanisms to library services can effectively increase user engagement, retention, and loyalty in university libraries, while promoting social interaction and communication. This has significant implications for the harmony and sustainable development of libraries. In this regard, this paper presents research on the gamification experiences in library services and has achieved some key findings. First, it provides a detailed explanation of the theory of gamification including its concepts and operational mechanisms, and offers an in-depth analysis of gamification theory, leading to a more comprehensive understanding of the subject. Second, it categorizes the gamification strategies currently employed in library services at Wuhan University of Technology with three types such as the gamification incentive strategies, the gamification task strategies and the gamification sustainability strategies. Third, it provides a reference framework on gamification strategies in library services.

While gamification has the potential to create closer social bonds, more active social networks, and a positive campus environment, it is essential to acknowledge and address potential challenges. The implementation of gamification strategies may involve cost implications, technological barriers, and accessibility concerns, which must be carefully considered during planning and execution. Additionally, the interdisciplinary nature of gamification, involving psychology, education, technology, and design, offers a rich ground for further exploration. By integrating insights from these fields, libraries can better design gamified experiences that are inclusive, impactful, and sustainable.

Gamification is impacting and changing our life at an unprecedented speed. Libraries must seize the opportunity to apply gamification ideas to the teaching, service and work of libraries, stimulate the vitality of libraries, improve the service level of libraries, and create a better future for libraries. As Jane McGonigal said that games will not lead us to the downfall of civilization but they will lead us to

the re-invention of civilization. If designers genuinely try to harness gamification, reality word can be better.

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