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Gamification in Academic Libraries: Augmenting Patron Engagement and Information Literacy

Abstract:

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Purpose: This research investigates the influence of gamification on information literacy and user engagement in academic libraries. The emphasis is on the design, execution and outcomes of a gamified intervention intended to enhance interactive learning experiences, patron engagement, information literacy skills, cooperation and competence development.

Design/methodology/approach: A dual-method approach is employed, combining a comprehensive literature review with a qualitative case study. Data are gathered from librarians, library users and participants in gamification initiatives using a structured schedule. The collected data are then examined, categorized, presented and interpreted to fulfill the study's goals. Finally, a systematic framework for the introduction of gamification in academic libraries is proposed, aiming to advance user engagement and nurture interactive learning.

Findings: The research demonstrates that gamification including challenges and competition-significantly stimulates user engagement with library resources, improves information literacy abilities, fosters cooperation and facilitates the acquisition of new competencies. Digital platforms enhance the efficacy of gamification by making library interventions more captivating and accessible. However, the study highlights challenges related to planning and execution, emphasizing the need for a supportive culture and consideration of varied learning styles.

Originality/value: This research investigates transformational relevance of gamification in academic libraries. It proposes four primary concepts for integrating gamification: increasing usage, incorporating growing technologies, obtaining user feedback and managing data privacy. By describing fundamental aspects, primary methods, important implementation areas and intended results, the proposed framework provides as a roadmap for library professionals looking to incorporate gamification into their services.

Keywords: Gamification in Academic Libraries, Library User Engagement, Information Literacy Development, Interactive Learning in Libraries, Gamified Library Services, Data Privacy in Gamified Learning, Future of Libraries with Gamification.

1. Introduction:

1.1 Background: Academic libraries were once perceived as impersonal, static repositories of knowledge, disconnected from the evolving demands of contemporary information-seeking and learning. Today, both the physical and conceptual structures of learning resource centers are rapidly changing due to the pervasive influence of technology. Library collection management and

services are undergoing significant transformations, driven by the adoption of diverse ideas. Within this context, gamification – as defined by Deterding et al. (2011) – refers to the application of game-like components or methods in non-game environments. It appears to be a beneficial strategy for changing physical areas into spaces for inquiry and discovery.

In this sense, students are encouraged to investigate, challenge and engage in competition rather of only employing abstract material in the classroom (Kapp, 2012). They may earn points, badges and even virtual incentives for accessing library resources, communicating with peers and improving their study. This is not a fantasy of the future; this is the wonderful reality of gamification.

Given the above deliberation, by including gamification elements—material like points, ranking, badges, awards, leader-boards, challenges and prizes—into curricula and activities, gamification transforms the process of learning into a fun journey. People are more motivated to do better and be acknowledged in the game, gain some badges and rise up the scoreboard. Korkmaz and Öztürk (2020) found that this strategy provides a stronger feeling of connection and belonging towards the library, while also enhancing user engagement with its contents.

1.2 Significance of Gamification: Gamification is vital in academic libraries as it addresses two main issues: information literacy and user engagement. Nonetheless, challenges and success stories are integral to understanding its potential.



Fig. 1: Transformative Impact of Gamification

Figure 1 illustrates the transformative influence of employing game components on user engagement and knowledge acquisition in the context of information seeking. It provides a comprehensive overview of both achievements and challenges.

1.2.1 Enhanced User Engagement:

Korkmaz and Öztürk (2020) suggest that conventional library experiences may appear stale and uninteresting to newer generations who prefer dynamic digital environments. Gamification introduces additional incentives and enjoyment into the library experience, gamifying information access and research through barriers, challenges and rewards. Users actively participate to progress, earn badges and advance on leaderboards. This approach promotes engagement with library content and instills a sense of responsibility. Reed and Miller (2020) observed that certain categories of library users exhibit a higher affinity for gamified library orientation.

1.2.2 Information Literacy:

In today's information-rich world, students require effective information literacy skills to meet changing needs. However, developing these skills can be challenging and time-consuming (Halder and Jana, 2013). Gamification offers an engaging and effective way to bridge this gap. By integrating information literacy projects with game-like activities, libraries can increase user enjoyment and satisfaction in learning. As users progress and earn points, they are encouraged to strengthen critical thinking, research techniques and source evaluation skills. Through repetition and positive reinforcement, this approach not only fosters participation in information literacy development but also consolidates learning experiences (Deterding et al., 2011). Thus, gamification helps libraries become active communities for exploration, learning and growth in the digital age.

1.3 Objectives of the Study:

This study investigates the impact of gamification elements on information literacy and user engagement in academic libraries. The specific objectives are to:

- i) Evaluate the efficiency of gamification approaches.
- ii) Examine the impact of gamification on information literacy.
- iii) Investigate how digital platforms may increase gamification effectiveness.
- iv) Identify succeeds and problems in gamification implementation.
- v) Provide helpful intuitions for projects to add gaming components in libraries.

2. Literature Review:

2.1 Gamification Principles:

The principles of gamification can augment user enjoyment in libraries by integrating game characteristics into instructional design. This approach can increase engagement with library services, attract new users and motivate young patrons (Downie & Proulx, 2022; Haasio et al., 2021; Zhou & Yang, 2023). Game components can be applied in various areas, including orientation, current awareness services, library events and user awards, thereby boosting learning and motivation. Libraries can provide customized and interactive services by adopting gamification

concepts, which can be applied to learning materials, library usage and information retrieval to promote student learning and literacy (Reed and Miller, 2020).

2.2 User Engagement in Library:

Several studies have explored initiatives to enhance user interaction in academic libraries. Tait et al. (2016) noted the growing popularity of gamification as a technique to encourage engagement and learning. Korkmaz and Öztürk (2020) evaluated game-based learning activities and found that elements such as challenges, badges and points increased both user interaction and resource discovery. Such interactive approaches are particularly effective among younger users accustomed to digital media. Another study highlighted the importance of autonomy, mastery and purpose in improving motivation and engagement. Libraries that incorporate these concepts can create individualized learning programme with targeted outcomes, enhancing user satisfaction (Gillard et al., 2015). Research also underlines the importance of inclusive, user-centered gamified design strategies that accommodate diverse learning styles. Nurse and Miller (2020) emphasized the need for pleasant, inclusive and student-centered library orientation sessions to increase participation.

3. Methodology:

This study adopts a dual-method strategy to analyze the research topic, exploring how gamification influences user engagement and information literacy in academic libraries. It combines a comprehensive literature review with a qualitative case study.

The literature review examines peer-reviewed articles, conference proceedings and academic publications that meet specific inclusion criteria, converging on research into the effects of gamification on user engagement and information literacy in academic libraries. A systematic search is conducted across databases such as Dimensions, Google Scholar, Scopus and ERIC using relevant keywords.

To analyse specific cases of gamification adoption, a qualitative case study approach is used, offering a detailed analysis of the design, implementation and outcomes of gamified processes. Participants include library users, librarians and individuals directly involved in gamification programme. Data are collected through semi-structured schedule, in-person observations of gamification activities and document analysis, including design concepts and user feedback reports.

Finally, a systematic framework for introducing gamification in academic libraries is proposed, aiming at raising user engagement and support interactive learning. The data are analysed, categorised, presented and interpreted in line with the research objectives.

4. Gamification Strategies in Academic Libraries:

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This section examines in full the different gamification tactics implemented in academic libraries. Refer to Fig. 2 for a graphical depiction of these methods and their components.



Fig. 2: Gamification Strategies in Academic Libraries

4.1 Quest-Based Learning:

4.1.1 *Case Studies:* Practically, quest-based learning structures instructional sessions as missions or quests, which give users with gaming tactics to attain goals. Some academic libraries have effectively incorporated quest-based learning systems to boost user participation. In this sense, certain activities are intended to grow progressively complex over time, promoting ongoing investigation (Yilmaz, Saran and O'Connor, 2014).

4.1.2 Integration of information literacy: Applying information literacy skills to gaming efforts offers various advantages. According to Betts, Fabienke and Farber (2021), it enhances learner activity, engagement and motivation. Besides, Encheva, Tammaro and Kumanova (2020) observed that video game quests offer students with highly contextualized interactive narratives that stimulate role-playing and the development of discipline-specific mentalities and problem-solving abilities. Quest-based learning seamlessly integrates information literacy skills within a game framework, challenging users to critically assess sources, use effective search strategies and evaluate information quality.

4.1.3 Impact on skill development and user engagement: In quest-based learning, participants are driven by the narrative and intrinsic problems of the journey. It has a huge influence on user engagement. The interactive features of this goal assist keep users interested by boosting the amount of time spent examining library materials. Because gamified formats improve the learning

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experience, users are more likely to retain and employ information literacy skills learnt during quests (Lambert, Gong and Harrison, 2016).

4.2 Virtual Escape Rooms:

4.2.1 Design principles: Libraries have constructed digital versions of escape rooms that strive to imitate the actual thing. Incidentally, generating intriguing tales with library-related themes and providing easy user interfaces are all part of important design concepts. In order to "escape" within a given time restriction, participants must solve information literacy-related problems in a virtual escape room constructed by the university library (Zhou & Yang, 2023).

4.2.2 *Problem-Solving and teamwork:* Gamification of escape rooms promotes problem-solving and teamwork, which fosters user participation. In this aspect, libraries have witnessed an increase in student cooperation as they solve challenges and conquer hurdles together. Hence enhancing information literacy with a focus on collaboration increases knowledge-sharing and peer-learning (Staneva et al., 2023).

4.2.3 Assessing efficacy of developing information literacy: Virtual escape room completion rates, pre and post assessments and participant comments are employed to analyse how successfully they foster information literacy. Preliminary studies suggest that interaction in virtual escape rooms leads to better information literacy scores, highlighting the potential of this gamification strategy in academic libraries. For example, the evolution of gamification initiatives in Chinese university libraries is focused on increasing user experience and service quality, demonstrating the potential of gamification strategies to promote information literacy (Krishnan et al., 2023).

4.3 Mobile Applications:

4.3.1 Development of mobile applications: Libraries are creating smartphone apps gamifying the learning process more and more. This programme generally contains interactive information literacy training, challenges, quizzes and marketing of information services. There are two most important obstacles to using apps for library services, i.e., storage restrictions and incapacity to use applications offline (Zhao et al., 2023.). Librarians and app designers have to work all through the development of such apps to ensure that their educational goals are met.

4.3.2 Features of information literacy-focused apps: Mobile apps with an information literacy focus feature characteristics such as real-time feedback, interactive training and quiz modules. However, maintaining accessibility, supporting a range of learning methods and retaining content relevance are all issues in app creation. The introduction of gamified components tries to make acquiring information literacy more interesting and accessible. Many issues need to be addressed when

building mobile applications for gamified learning in libraries. One of the most essential challenges is the price of producing attractive and informative games (Zhao et al., 2023).

4.3.3 *Improving user engagement with mobile games:* Gamified learning modules may be accessed anytime, anyplace and encourage lifelong learning. According to Zhao et al. (2023) user engagement and learning outcomes produced excellent results in terms of mobile gamification. Including game components in mobile applications encourages user motivation. It also facilitates engagement with information literacy content, which augments skill development.

4.4 Event-Based Gamification:

4.4.1 *Planning gamified events in academic libraries:* Libraries organise gamified events such as trivia tournaments, treasure hunts and challenge weeks to promote information literacy. Best practices include conducting user experience research to tailor events to different groups, such as students, staff and faculty (Reed & Miller, 2020). Assessing library resources and clearly communicating available services are essential for effective planning (Elkins & Hollister, 2020). Strategic marketing increases event visibility and attendance (Eldermire et al., 2019). Managing volunteer workload helps ensure sustainability (Powell et al., 2018). These events strive to inspire friendly competition and broaden participation within the academic community.

4.4.2 *Initiatives of Library Challenge Week:* There are some examples of successful "Library Challenge Weeks" and related activities. For example, the event named "The Better Starts GO OVER IT!" Adult readers in Western Australia have joined a three-month reading challenge as part of a trial programme. As a result, their achievements were honoured with medals and certificates (Tranfield, Worsham and Mody, 2020). Macdonald (2015) and Anderson et al. (2013) give another example, i.e., "the library service initiatives of a small academic satellite hospital library." The above initiatives included research financing, health literacy training and joint training courses. This illustrates how "Library Challenge Week" and similar initiatives aid readers by providing essential services and reacting to new contexts.

4.4.3 Evaluating event-based gamification on user behaviour: To analyse the effect of event-based gamification, libraries monitor participation rates, gather feedback forms and observe changes in user behavior (Powell et al., 2018). Positive remarks from participants, increasing visitor numbers and more contacts with library staff suggest that these activities help educate information literacy in a pleasant and engaging manner.

4.5 Interactive Learning Zones:

4.5.1 Creating interactive learning zones: Miller (2020) concluded that one of the greatest methods to incorporate gamification in libraries is by performing user research. Understanding

user desires and preferences assists in building successful learning environments. Libraries are increasingly altering their physical environments to create interactive learning zones. These spaces promote group activities and increase learning via gamification and technology.

4.5.2 Adding gamified elements to library spaces: Libraries are converting study rooms and computer laboratories into gamified environments. These sections offer interactive displays, leaderboards and challenges to make learning more entertaining. Since gamification may improve motivation and involvement, its applicability in diverse educational institutions warrants more research (Powell et al., 2018).

4.5.3 Evaluating interactive learning zones: Students have reacted well to interactive learning zones, exhibiting a stronger readiness to utilize them for group study and information literacy development (Reed & Miller, 2020). Libraries monitor the performance of these spaces using statistical data, user surveys and qualitative comments.

5. Challenges and Considerations in Gamification Implementation:

5.1 Planning and Resource Allocation:

Gamification in academic libraries necessitates careful resource allocation and planning. Libraries need to evaluate their personnel competence, available funds and technology infrastructure. The process of creating captivating gamified content might take a lot of time and may need for collaboration from academics, IT specialists and instructional designers (Downie & Proulx, 2022).

5.2 Inclusivity and Accessibility:

Although gamification can increase user engagement, it is necessary maintain that all users can take part, irrespective of their skill level or background. This includes developing exercises that take into account a range of learning preferences and skill levels in addition to offering alternate formats to people with impairments. Both digital and physical gamified experiences should adhere to accessibility requirements (Haasio et al., 2021).

5.3 Data Privacy and Ethics:

There are significant ethical and privacy concerns with the gathering and use of user data in gamified systems. Informed consent must be obtained, data gathering procedures must be open and data protection laws must be followed. There should be no consequences for users who choose not to participate in data tracking (Zhou & Yang, 2023).

5.4 Sustaining Engagement:

It might be difficult to sustain long-term user enthusiasm in gamified tasks. To keep experiences interesting and current, libraries should ask for user input, create new challenges and update

content on a regular basis. Additionally, it's critical to strike a balance between intrinsic motivators like curiosity, mastery and social connection and extrinsic rewards like badges and points (Korkmaz & Öztürk, 2020).

6. Proposed Framework for Gamification in Academic Libraries:

Following figure 3 depicts the proposed framework for implementing gamification in academic libraries. It explains significant components, including core principles, gamification tactics and application areas. By combining event-based activities, mobile applications, virtual escape rooms and interactive learning spaces, the framework promote user engagement and information literacy. It also prioritises technology, user feedback and data privacy to assure sustainability.



Fig. 3: Gamification Framework for Academic Libraries

6.1 Foundational Elements:

- Library Goals & Objectives: Define explicit objectives for gamification, such as strengthening information literacy, increasing user engagement and encouraging interactive learning.
- User-Centric Approach: Understand the needs and preferences of students via surveys, feedback and user research.
- Supportive Culture: Nurture a good atmosphere where students and staff adapt gamification as a learning tool.

6.2 Core Gamification Strategies:

Event-Based Gamification: Organize library events, challenges and contests to promote participation.

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- Mobile Applications: Use library applications with gamified features like badges, prizes and progress monitoring.
- Virtual Escape Rooms: Design digital problem-solving exercises that foster cooperation and critical thinking.
- Quest-Based Learning: Implement interactive challenges where users gain points by accomplishing library-related activities.
- Interactive Learning Spaces: Transform study environments with digital displays, leaderboards and game-like aspects.

6.3 Key Implementation Areas:

- > *Technology Integration:* Utilize developing technologies like as AI, VR and interactive platforms to boost gamification.
- User Feedback & Continuous Improvement: Collect and evaluate feedback via surveys and observations to develop gamification tactics.
- > Data Privacy & Security: Ensure the safety of user data, particularly in digital gamified contexts.

6.4 Expected Outcomes:

- > Enhanced User Engagement: Increase engagement with library materials and activities.
- Improved Information Literacy: Strengthen users' capacity to find, assess and apply information efficiently.
- Skill Development: Foster teamwork, problem-solving and digital literacy.
- Sustainable Learning Environment: Create a lively and stimulating library atmosphere.

This framework offers a methodical strategy for incorporating gamification into academic libraries, assuring its success in increasing learning and user engagement.

7. Conclusion:

This study covers several gamification approaches used in academic libraries. These include eventbased gamification, mobile applications, virtual escape rooms, quest-based learning and interactive learning environments. The study reveals that these approaches promote information literacy and user engagement. They also offer a more pleasant and dynamic learning environment.

This research offers four major ideas for integrating gamification in academic libraries. First, the rising usage of gamification will further improve information literacy and user engagement. Second, developing technologies should be included in the process. Third, user feedback should be gathered in numerous ways and utilised for continual development in e-learning. Fourth, data privacy management must be a concern, particularly in virtual contexts.

The proposed framework offers a roadmap for academic libraries seeking to implement gamification effectively. By focusing on clear objectives, inclusive design and ongoing evaluation, libraries can harness the power of gamification to meet the evolving needs of their user communities and remain vital centers for learning in the digital age.

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