

Game-Based Design for Inclusive and Accessible Digital Exhibits

Rebecca Y. Bayeck, Smiti Nathan, and Alex Wermer-Colan

Introduction: The Stakes of Gaming for Digital Exhibits

Libraries increasingly offer both tabletop and video games for loan, but the role that gamification in all its forms (cooperative and competitive, solo and multiplayer, etc.) can play in changing the workings of libraries has yet to be truly discussed. More importantly, games have yet to be widely seen in libraries as a resource and a set of practices and methods for sharing resources, curating materials, spreading information, and teaching complex subjects and skills. Like books, video games are repositories of knowledge and information, learning spaces, and tools for sharing or passing down knowledge. For this reason, researchers argue that libraries can reduce the digital gap by creating an environment for digital video games (Gee 2012). At a time when digital collections and pedagogy are going through unprecedented transformations in infrastructure, computing capacity, and diversity of design, the integration of interactivity, including through game mechanics, into the design of digital exhibits offers the potential to greatly expand the ways libraries can engage their patrons in exploring digital collections.

In this piece, we speculate on the future of libraries through the lens of digital games by exploring what gaming can offer digital exhibitions, exhibit design, and data curation in all its forms. Specifically, this essay explores the gamification of digital exhibits through design thinking and use cases. While traditional modes of exhibit curation and pedagogy have been exclusive to many communities, gaming offers a way of innovating digital exhibits and pedagogy for a more diverse audience. In other words, gaming and gamification, as understood in this paper, make space to explore use cases that consider the audiences that have been excluded from library exhibits and those who may be included through gaming. Specifically, we offer an overview of the many ways that gaming can be used to make more-inclusive digital exhibits for people with diverse backgrounds (e.g., disabled, Lesbian, Gay, Bisexual, Trans, Queer, Intersex, Asexual or Ally (LGBTQIA+), Black, Indigenous, and other minoritized groups).

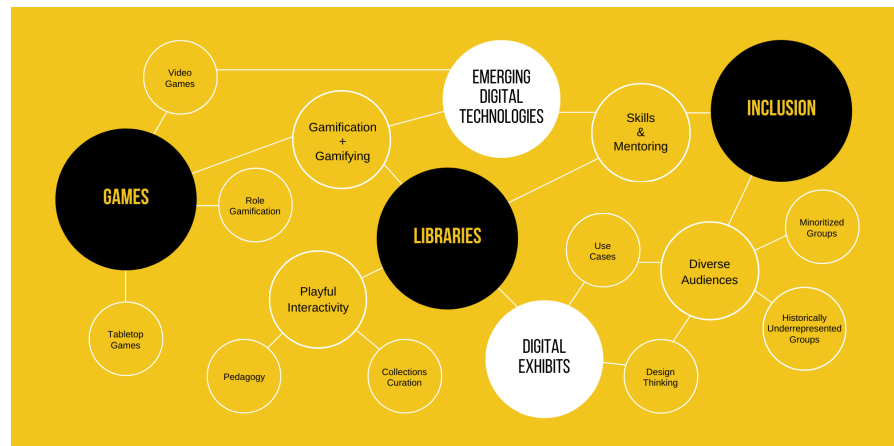


Fig. 1: Mind map of the contents of this contribution.

Libraries' Use of Games for Outreach and Engagement

Video games, though popular, have since their inception embedded issues of diversity. For instance, white and male characters constitute the majority (Richard 2017), while characters from other racial groups are fewer in representation and stereotypically presented (Bayeck, Asino, and Young 2018). By reproducing discrimination and racial stereotypes within society, video games are likely to reinforce exclusion and may not be appropriate learning spaces for libraries advocating for inclusion. Therefore, the following examples focus on the practices, interactions, expertise, and learning that should be generated around digital exhibitions.

- ✦ **Information Literacy.** Analyzing the integration of games by libraries, Kearns, Kirsch, and Cononie (2017) reference *Agoge: The Spartan's Journey*, an information literacy game designed for transfer students. In addition to providing a means for librarians to engage with transfer students, it also enables the assessment of their information literacy skills.
- ✦ **Student Engagement.** Giles et al. (2019) describe a card game developed as a library orientation activity for transfer students; the game was identified as the best tool to reach and meet the specific needs of these students. Through the game, students learn about the library system while having social interaction.
- ✦ **Access to Resources.** Buchanan and Vanden-Elzen (2017) examine the benefits of video games for players and share guidelines for public libraries to integrate such games in their collections.
- ✦ **Virtual Gatherings.** Tools like *gather.town*, a two-dimensional video game for virtual meetings and interactions, are also helpful in hosting team-building events, conference

poster sessions, and other forms of gallery exhibit spaces (Bishoff, Farrell, and Neeser, 2015).

- ✦ **Collections and Programming.** In addition to using games for library instruction and outreach, Robson, Sassen, and Rodriguez (2020) write about the importance of maintaining a video game collection for student use. Citing the case of the University of North Texas library, the authors explain that having this collection has contributed to student engagement, classroom instruction, collaboration across campus, the development of new programs, and degrees about esports and game design.
- ✦ **Community Outreach.** Discussing the video game *Fortnite*, Anderson (2019) notes that libraries have used the popularity of this game for outreach and engagement. However, libraries can do more with a multiplayer game like *Fortnite* by expanding the virtual experience and providing programs emphasizing collaboration and imagination in real-life settings (Vose 2018).
- ✦ **Social Interaction and Skills Building.** Massively multiplayer online games (MMOGs) create a space for social interaction and relationship building. They can also become a space for informal communication and exposure to individuals with different worldviews and backgrounds (Fox, Gilbert, and Tang 2018). For this reason, Anderson (2019) states that “libraries can embrace the opportunities presented by *Fortnite* and other virtual third spaces to promote connection within the library space” (14).

Based on these examples, to successfully provide gaming services, libraries should a) collaborate with the intended audience and b) enable networking, game creation, education, and community outreach. This is because video games facilitate community building and serve as a catalyst for increased usage of library resources and services. As such, libraries should consider them critically important in meeting the needs of their patrons (Boyle 2018). Therefore, the following section offers some specific articles about the relationship between games and digital exhibits.

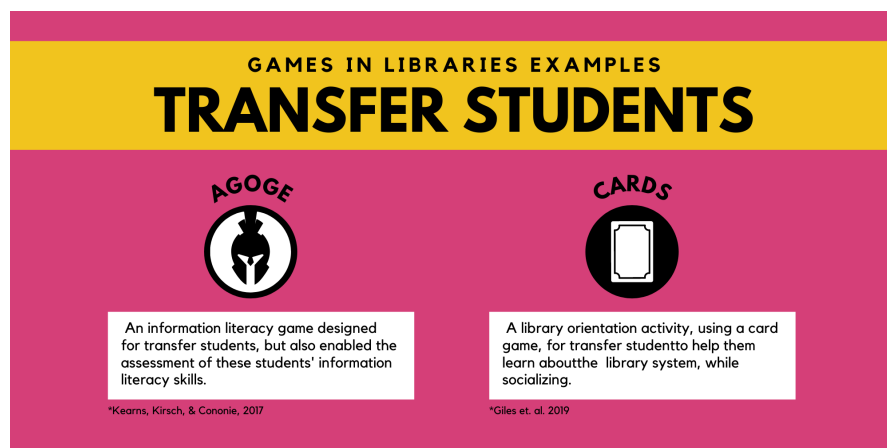


Fig. 2: Examples of games in libraries targeting transfer students.

Games and Digital Exhibits

Regarding games and digital exhibits, most discussions center on museums. In their review of the use of games in museum exhibits, [Paliokas and Sylaiou \(2016\)](#) show that modern museums employ game technologies and applications. Therefore, the following list includes several examples of integrating games in digital exhibits through descriptions of educational games, mini-games, and cultural heritage games.

- ✦ **Educational Games.** Games designed with a learning purpose in addition to serving the purposes of entertainment and profit are used for exhibit navigation and museum exploration of cultural and educational content ([Cai, Van Joolingen, and Walker 2019](#); [Paliokas and Sylaiou 2016](#)). For instance, games were designed to facilitate visitors' exploration of the exhibition in a museum with the inclusion of elements of the exhibition into the game ([Bossavit et al. 2018](#)).
- ✦ **Mini-Games.** [Bossavit et al. \(2018\)](#) approach games and exhibits by offering a framework to enhance visits to museums through the design of mini-games. Indeed, museums are increasingly using interactive games to provide young audiences with learning as well as entertainment during museum visits ([Cesário et al. 2017](#)). The move to virtual environments has allowed museums to offer wider access to their exhibit collections.
- ✦ **Cultural Heritage Games.** Building on the game-based learning literature, [Ćosović and Brkić \(2020\)](#) suggest the design of games that integrate cultural heritage content. Such games connect the museum content with the users, meet their educational needs, and enhance their museum experience ([Ćosović, & Brkić, 2020](#); [Paliokas and Sylaiou 2016](#)). Yet, lacking in these exhibits are the interactions, communities/affinity spaces, or expertise developed around these exhibits.

In addition to the gamification of exhibits, games have also been exhibited in museums. Analyzing games displayed at the Finnish Museum of Games, [Nylund \(2018\)](#) points to the growing trend in the digital exhibits of games in museums. Specifically, Nylund argues that exhibits of games should cover different aspects of the game including the interactive experience and the context of game development. This trend in the digital exhibit of games is also associated with a larger discussion around the preservation of digital games. Indeed, librarians are wondering whether games should be preserved in the same ways as other analog materials or analog games. Recent innovations in emulation for curation and preservation also provide exciting potential for digital preservation more generally. Yet, the connection between digital exhibitions and games is still not widely discussed, even in museum settings.

Especially as the COVID-19 pandemic limits in-person interactions, as well as visits to libraries and exhibits, this period calls for the re-thinking and redesigning of digital practices for libraries as it pertains to exhibits. Drawing from [Dasgupta et al. \(2021\)](#), we contend that digitization in library environments can democratize access to library exhibitions regardless of the visitor's location, age, race, or background if the accessibility and usability of those digital resources are foregrounded through frameworks and methods which center user engagement.

GAMES AND DIGITAL EXHIBITS

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- BAYECK, WERMER-COLAN, NATHAN 2021

Design Thinking Frameworks for Exploring Gaming for Digital Exhibits

Design thinking can be a helpful framework for libraries, especially those exploring co-creation methods and centering user experiences. Design thinking is an iterative creative problem-solving approach that is deeply human-centered. It is commonly rooted in five key phases: empathize, define, ideate, prototype, and test. The origins of the approach date back to the 1950s ([von Thienen et al. 2017](#)). It has been used and adapted in fields such as design, education, engineer-

ing, and management, and can be especially useful when exploring possibilities at the intersection of disciplines. In thinking about games and the future of libraries, design thinking frameworks could help facilitate a structured process for co-creation, reimagining digital exhibits, and designing for gaming in these spaces.

The application of design thinking in libraries is not new (Bell 2008, Bell 2014, Clarke 2020, Fosmire 2016, IDEO 2015, Library User Experience Community, Marquez and Downey 2016). For example, in 2015, design firm IDEO spearheaded the creation of a toolkit called “Design Thinking for Libraries” (IDEO 2015). The toolkit was formed through experiences that designers had working alongside librarians in 2013-14 from the Chicago Public Library (USA) and the Aarhus Public Library (Denmark). Furthermore, a number of online publications and communities have emerged that frequently touch upon the intersection of design thinking and the library world (e.g., Library User Experience Community and *Weave: Journal of Library User Experience*).

Much in the spirit of IDEO and other design toolkits for libraries (e.g., Marquez and Downey 2016), we propose activities and examples that can be employed and adapted to explore gamification of digital exhibits, specifically regarding the first phase of design thinking: *empathize*. The goal of this phase is to better understand the needs, wants, desires, and perspectives of potential users. When exploring the gamification of digital exhibits, figuring out who to talk to might be a challenge, therefore activities in this phase are largely centered around conducting research about potential users. This research on users is usually conducted through the methods of stakeholder mapping, user interviews, persona creation, and other empathize-phase activities.

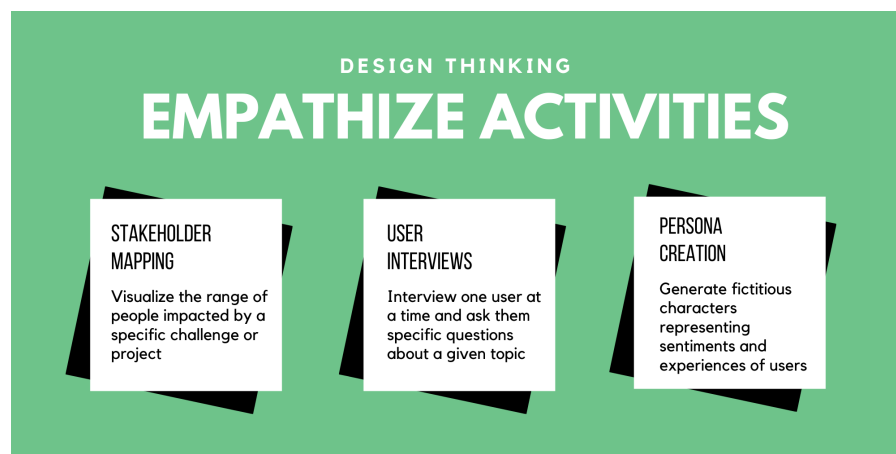


Fig. 3: Empathize-phase design thinking activities for libraries.

Stakeholder Mapping is often used in design thinking challenges to help visualize the range of people affected by a specific challenge or project (i.e., stakeholders). While it might be tempting to conduct research on a narrow category of users (e.g., patrons, personnel), identifying a broader set of initial stakeholders will help support a more robust exploration. In a recent article, tech ethnographer and sociologist Tricia Wang offers a critique of the popular design thinking activity, “How might we...”. One of Wang’s points is that sometimes the best people to solve a problem might not be in the room with you, especially if design teams use such a prompt as a lens to solve a problem during the “empathize” phase. Instead, one of the prompts Wang suggests using is “Who should we talk to?,” to foster a more inclusive and conscientious co-creation practice (Wang 2021). Furthermore, stakeholder mapping can better inform subsequent design activities, including those mentioned in this article (i.e., user interviews and personas).¹

User Interviews are a popular method in which a member of the design team interviews potential users. Unlike other interview methods, such as group interviews or focus groups, user interviews typically interview one user at a time and ask them specific questions about a given topic (Pernice 2018). User interviews were successfully employed by the University of Technology Sydney and greatly impacted their final result when they employed a design thinking approach to improve user experience with library signage (Luca and Narayan 2016). The University of Michigan’s MTagger User Experience interviews offer a library-specific example of the types of questions and analyses a targeted user interview entails (Schultz and Solomon 2008). It is important to note the frameworks for user interviews often directly borrow from ethnographic methods, which in the context of user experience derive many of its practices from digital anthropology. Andy Priestner and Matt Borg’s edited volume details numerous examples of applying ethnographic methods in a library context (Priestner and Borg 2016).

Persona Creation is also a useful activity for libraries. Personas are fictitious characters that represent key sentiments and experiences of a user, or group of users, based on research. Personas can be a powerful design tool because they can help designers remember who they are designing for, as opposed to designing for oneself or another user population. Alex Sundt and Erin Davis created personas to center the user in multi-scalar design decisions at the Utah State University Libraries (Sundt and Davis 2017).

In addition to the above listed methods, there are a number of empathize-phase activities that libraries can employ as they explore gamifying digital exhibits. However, the key is to spend intentional time researching and empathizing with potential users and stakeholders in order to design the best gamified digital exhibits.

¹ The Life Design Log offers an example of three types of stakeholder mapping exercises, all of which could be adapted for library design teams interested in exploring who to talk to (Nathan 2020).

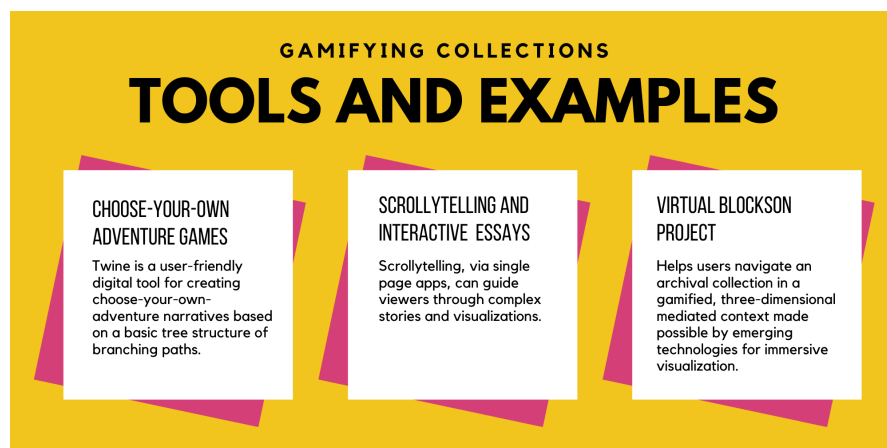


Fig. 4: Tools and examples of gamifying collections in libraries.

Designing Gamified Digital Collections

Within this context of the changing nature of library curation and the emerging role of game-based design, we also explored examples of gamified digital exhibits and their potential for improving access to digital exhibits for diverse audiences. Extending beyond [library classification systems for games](#), we demonstrate how libraries and academic institutions can deploy games as a medium and method. We discuss a few key tools and designs in this section, including 1) choose-your-own-adventure games with software such as Twine, 2) the use of scrollytelling and interactive guided essays for exploring topics and data (e.g., Ben Schmidt’s “[A guided tour of the digital library](#)”), and 3) the [Virtual Blockson](#), a 3D game simulating archival and primary source research on the African diaspora.

Choose Your Own Adventure with Twine

In the fall of 2020, with the return to campus imminent despite the ongoing COVID-19 pandemic, a graduate student named Cait S. Kirby created a [Twine story](#), entitled “September 7, 2020,” to confront attendees with the possible narrative outcomes of their return to campus. Twine is a user-friendly digital tool for creating choose-your-own-adventure narratives based on a basic tree structure of branching paths. The use of Twine to explore the COVID-19 pandemic’s effects on the return to campus was an innovative way to mediate the academic experience and offers an example of how libraries can think about digital storytelling when bringing campus student activism into the light.

Engage in Interactivity with Digital Scrollytelling

Recent innovations in web 2.0 technologies suggest the potential for digital storytelling to embrace the interactive and multimodal nature of the web browser, providing readers with a sense of agency in ex-

ploring and developing a story out of data, as well as offering novel experiences through gamified features. Through devices like the increasingly pervasive trend of “scrollytelling” (the fusion of scrolling and storytelling, where commentary and visualizations transform through the reader’s process of swiping/scrolling on the screen), these single page apps guide the viewer through complex stories and visualizations. The *New York Times* has published some good examples, including an exploration of self-portraiture, featuring close-ups of [a single work of art](#) and [a 3D recreation of the space and history of the Tulsa massacre](#). Ben Schmidt’s work for HathiTrust, “[Creating Data: A guided tour of the digital library](#),” also exemplifies the potential for interactive storytelling to help audiences explore digital libraries at scale.

Experience a Simulated Archive with The Virtual Blockson

Unlike scrollytelling designs that enable users to navigate a screen with new gestures for animating content and moving through exhibit spaces and narrative paths, the Virtual Blockson attempts to recreate the Blockson Collection’s reading room, inviting the user to learn about the history of the collection’s development while being introduced to archival etiquette and research methods focused on primary source literacy. The VR module is being designed to introduce students to the process of exploring an archival space, guiding them through the onboarding to the technology and the space, and the process of calling for various items. The module takes advantage of the virtual space to offer gamified ways of exploring objects beyond what is normally possible in a physical space, such as mapping a series of photographs of Philadelphia onto a virtual map of the city. As articulated in Jasmine Clark’s blog post, “[Progressing Towards an Accessible VR Experience](#),” the Virtual Blockson also takes seriously the need to adapt virtual reality to be accessible for students with diverse learning backgrounds and styles.

Each of these gamified digital exhibits seek innovations in digital technologies and pedagogical and curatorial practices to create digital exhibits that are accessible and inclusive to a wider audience than would be possible through physical modes of access or traditional media and web 1.0 digital technologies. Other recent trends, such as the use of Quinn Dombrowski’s [Animal Crossing: New Digital Humanities](#), a project which adapted the popular Nintendo video game to host virtual events during the pandemic also demonstrate this investment in bringing games and community engagement into digital exhibitions. Other events, including talks on remediating digital collections, demonstrate the growing appeal for game environments to serve as a medium for community-building, crowdsourcing, digital publishing, and information sharing.² For instance, rather than using a series of images on a webpage with related metadata, employing interactive storytelling methods that implicate the viewer in deciding

² In the vein theorized by Benjamin Stokes in his recent book, *Locally Played: Real World Games for Stronger Places and Communities* (2020).

the process of viewing the source materials or subject matter and their context within broader historical narratives and technological contexts is preferable.

GAMIFYING DIGITAL COLLECTIONS FOR INCLUSION AND ACCESSIBILITY

"...the popularity of games in the twenty-first century has turned gaming into a new language, and gameplay into a form of expression adopted and practiced by thousands today... integrating or adopting this new language, or form of expression already used by so many, will create greater access to digital collections and exhibits...."

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Conclusion

Drawing on literature in game studies and in the field of library science, we highlighted multiple examples of gamified exhibits and explored the gamification of digital collections by conceptualizing games as spaces that can teach us about the design of digital exhibits that are created with inclusion and accessibility in mind. We argue that a gamified approach to the design of digital exhibits can enable greater access to digital collections for audiences that are often excluded from traditional approaches to exhibits and that the popularity of games in the twenty-first century has turned gaming into a new language, and gameplay into a form of expression adopted and practiced by thousands today. For this reason, we contend that integrating or adopting this new language, or form of expression already used by so many, will create greater access to digital collections and exhibits to even more people.

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