**4**

# *Level Up!*

## *Making Games Accessible*

Angie Brunk and Dale Monobe

Games are firmly established as a tool in the librarian's toolbox. Gamification of instruction allows librarians to reach more students in instruction both online and in person by creating more engaging library instruction sessions or online tutorials. Library game nights and other programming that includes games allow us to draw more students into the library. Unfortunately, instructional and outreach activities that are not designed with accessibility and inclusivity in mind from the beginning can make students with disabilities feel unwelcome in the library. In this chapter, we will cover some of the foundational aspects of accessible gamification. We will also detail how to prepare for potential accessibility pitfalls and suggest possible remedies.

## Gamification and Disability Literature Review

Looking at gamification through a vocational rehabilitation lens,[1] which strives for the "optimal participation of disadvantaged individuals in society" through career counseling,[2] education, and placement services, four interconnected themes emerge. First, not feeling a part of the social group may cause a sense of alienation and, consequently, a lowered self-esteem and confidence for people with disabilities.[3] Sources of alienation for people with disabilities include experiencing a digital divide,[4] awareness of society's discomfort regarding people with disabilities, and being stigmatized as objects of care.[5]

Second, to help remediate this, vocational rehabilitation advocates and encourages equal opportunity to succeed in school and at the workplace. Finding out in advance if accommodations are needed,[6] modifying instruction to complement different student learning styles[7] such as implementing multisensory teaching,[8] and targeting characteristics of the target group are all recommended.[9] It follows that "libraries should provide training opportunities for all library employees and volunteers in order to sensitize them to issues

affecting people with disabilities and to teach effective techniques for providing services for users with disabilities and for working with colleagues with disabilities."[10]

Third, providing reasonable accommodations for students with disabilities not only helps create an equal opportunity to succeed but also satisfies the law.[11] More specifically:

> Providing equitable access for persons with disabilities to library facilities and services is required by Section 504 of the Rehabilitation Act of 1973, applicable state and local statutes and the Americans with Disabilities Act of 1990 (ADA). The ADA is the Civil Rights law affecting more Americans than any other. It was created to eliminate discrimination in many areas, including access to private and public services, employment, transportation and communication. Most libraries are covered by the ADA's Title I (Employment), Title II (Government Programs and Services) and Title III (Public Accommodations). Most libraries are also obligated under Section 504 and some have responsibilities under Section 508 and other laws as well.[12]

Moreover, if reasonable accommodations are not provided, institutions "can be sued and penalized under the law."[13] And fourth, though required by law for the increasing numbers of people with disabilities,[14] those without disabilities benefit as well. Thus, in a classroom setting, using multi-sensory teaching facilitates learning for all students. This would include using "simple, well-labeled handouts …visual, aural and hands-on experience" as well as a "logical, sequential, lesson plan."[15] And for those who still may not see the benefits for them, it is important to remember that each of us has connections with people with disabilities and "if we do not have a disability now, we may at any time experience a disability."[16]

# Models of Disability and Accessibility

There are several models of disability. For academic libraries, the two most relevant are the traditional medical model and the social model, which arose in the 1970s through critical analysis of the former.[17] Whether consciously or not, the medical model has had a significant presence in higher education. This model views the person with the disability as a problem to be fixed. The emphasis is on function without much attention paid to dignity or to individual needs. It follows that for a person with a disability, "the solution tends to be a cure and/or rehabilitation, the latter, in some cases, requiring segregation into special institutions."[18] One example of how an academic library may focus on the medical model to the exclusion of the other model is the issue of architectural access. Though the college or university may have been granted accreditation approval, access within the library building for people with mobility disabilities may consist of a ride on a freight elevator (which may require the assistance of another), maneuvering through narrow stacks, which again may require assistance), and culminating in a ride up an open warehouse lift, which yet again may require assistance.

The social model, on the other hand, demands functionality but also emphasizes a need to respect dignity, autonomy, and individual needs as much as possible. The social model

views the barrier preventing access as the problem to be fixed. In other words, people with disabilities are "disadvantaged not because of their limitations but as a result of the limitations imposed on them by social, cultural, economic, and environmental barriers."[19]

Let us consider how the two models would solve a common accessibility problem. A person with low vision walks into a restaurant with a menu board fixed to the wall. If the medical model is your frame of reference, expecting the customer's companion or an employee to read the menu out loud would be considered an acceptable solution. However, this solution seriously compromises the person's dignity and autonomy and is terribly inefficient. The customer is forced to display her or his disability in a way that is potentially humiliating and time-consuming. If the social model is employed, the necessity for providing menus the customer can hold becomes clear. Ideally, the restaurant would provide menus in large print and Braille, but this may not be possible. At least providing a high-contrast print menu would allow the person to use whatever adaptive technology he or she carries (magnifying glass or phone app for magnification and/or screen reading) in a manner that is both discreet and dignified. Because libraries share a common desire to be welcoming to all people, we believe the social model of disability most closely aligns with library values.

Research suggests that accessible design is more satisfying for people without disabilities as well as more accessible for those with disabilities. While most data supporting this point relates to accessible web design,[20] there is no reason to think it does not equally apply to accessible learning objects or events.

# Setting the Stage for Accessible Gamification

Libraries are often a refuge for students, whether it is because the library has the longest hours of any building on campus offering computer and internet access or because the student is looking for a quiet place away from a noisy roommate. As such, libraries need to be proactive in ensuring they are welcoming to students with disabilities, which includes knowing if accommodations will be needed.[21] The information outlined in this section is essential to creating accessible instructional games and gaming outreach events.

While it is important for libraries to be proactive, it is also important to remember that respecting a student's autonomy and dignity should be the guiding principle. The only time students are required to disclose a disability is if they are seeking accommodations in their classes or if they work on campus and are seeking accommodations. Further, the information received will be on a need-to-know basis and will not disclose the student's actual disability. For example, Dr. Smith will be told that Susan Jones is allowed 50 percent extra time on all exams. Dr. Smith will not be told whether this is due to dyslexia, ADHD, low vision, or motor control loss that makes writing difficult. Dr. Smith does not need this information. Likewise, library personnel will not know and should not assume the particulars of a student's disability. If you see a student who uses a power chair moving about the library in a manner that suggests she or he is having difficulty finding something,

do not assume the student is looking for the accessible work-station or restroom. Instead, ask the student what he or she needs just as you would ask any other student who showed signs of needing assistance.

If you follow the suggestions below, along with the mentality of proactive communication that allows students who are comfortable self-identifying to come forward and speak up, your library will be well on the way to creating a more inclusive environment and having gaming programs that are welcoming to all.

1. Designate a librarian as your liaison to whichever office on campus is responsible for ensuring the academic needs of students with disabilities are met. This liaison should be your primary contact for issues related to accessibility and disability, even if she or he is not responsible for fixing the problem. If, for example, you are planning a scavenger hunt, which will require access to all areas of the library, keep this liaison in the loop to help ensure that elevators, ramps, walkways, etc. will be accessible or, if they are not, the liaison can help facilitate the creation of alternative accessible routes.

2. Understand that accessibility is a moving target. As technology, pedagogical theories, and philosophies about public services change, the obstacles we may inadvertently throw in our users' way will change. When considering the implications of a change in your library's physical or virtual presence, think about how this change might affect users with disabilities and consider the best way to meet their needs while respecting their dignity and autonomy.

3. Have a statement about accessibility on your website. Whether it is a policy or FAQ, it should be as visible as information, such as circulation and computer use policies. It should contain the following information:
   – information about any available adaptive technology, such as workstations with screen readers or alternative pointing devices
   – the location of accessible restrooms
   – information about any areas that may be difficult to access and how the situation will be remedied (i.e., "There is no elevator access to the top of the stacks. Please ask for assistance at the circulation desk if you are unable to access these materials.")
   – accessible routes to the building
   – the name and information of the designated contact for accessibility issues should anyone using the library encounter a virtual or physical barrier to access; this contact should hopefully help facilitate the removal of such barriers or be able to provide alternative and dignified access

4. Regarding location information, consider creating a virtual tour of your library, which you can post to your website or social media.[22]

5. Train all personnel who regularly serve in public-facing roles in basic disability etiquette, adaptive technology, and recognizing common barriers. They should also be trained in how to compassionately respond to any expressed concern about a barrier while making sure the designated contact is made aware of this concern.

6. Understand that students are not required to disclose a disability unless they are seeking accommodations, and that for various reasons, students may not wish to make this known. Librarians may, therefore, encounter students who have not disclosed a disability or mental illness to the appropriate office on campus. In these cases, we advise that, where reasonable, decisions be made with an eye toward compassion and being welcoming rather than with a rigid adherence to policy.

Through the implementation of the above suggestions, a library helps create an environment that is noticeably proactive in providing accessibility and, therefore, sets the stage for staff and students to understand that accessible gamification is the norm. The above steps are essential to creating an environment in which accessibility is naturally incorporated into instructional games and planning for gaming outreach events.

# Task Analysis for Accessible Games and Gamification in Libraries

When you begin to consider how to make your gamified programming more accessible, we suggest you begin with a modified task analysis. At its simplest, task analysis is breaking down a task into its various components for the purpose of understanding the demands placed on the person performing the task. Several disciplines use the concept of task analysis. We are most familiar with task analysis as it applies to rehabilitation counseling and usability. For those who wish to delve into the topic further, http://www.usability.gov has a guide to task analysis as well as many other tools for usability. This type of analysis will help you to be more thoughtful about the cognitive and physical demands placed on library users to execute various activities, how these demands affect users with various disabilities, and how you can create educational games and gaming outreach events with the diverse needs of your users in mind.

We often perform everyday tasks such as opening a door without thinking about what we are doing or how someone with a disability, such as a person who uses a wheelchair, would accomplish the same task. We'll use opening a door as an example of task analysis both because it is a common training exercise and because it illustrates how complicated everyday tasks can be.

Steps to open a door:

1. Become aware of the presence of the closed door.
2. Determine which direction the door opens.
3. Approach the door.
4. When close enough to the door, extend your hand/arm to grasp the doorknob.
5. Twist the doorknob.
6. Push or pull the door open.
7. Check for traffic on the other side.
8. Proceed through the door.
9. Close the door.

Now let us consider the possible difficulties inherent in opening the door. For example, someone without depth perception may have difficulty judging the distance to an unfamiliar door. Someone with hand or wrist injuries or nerve damage may have a difficult time grasping the doorknob or twisting it. That is why public places generally have levers instead of knobs—or automatic doors or those big blue buttons that open the doors for you.

Now let us consider an example relevant to gaming in libraries: How might you apply this to planning your library game night? Perhaps you have decided to include a Texas Hold 'Em tournament with a grand prize of a gift certificate to the library coffee shop. As you can see from the example above, a full task analysis of even one hand of poker, let alone an entire game, would take many hours of writing and many pages of text. We do not know any librarian who has time for that. However, you can do a modified task analysis by breaking down major tasks and skills involved so the potential barriers become more obvious and so that this knowledge can guide you toward creating an event that is balanced and inclusive.

Major tasks or skills associated with playing Texas Hold 'Em:
1. Players must grasp multiple cards.
2. Players must pick up and lay down cards.
3. Players must be able to see the cards while holding them at an angle that does not allow other players to see their hands.
4. Players must remember the constituent parts of different hands and the worth of each hand.
5. Players must be able to conceal emotion so that other players cannot guess the quality of their hand.
6. Players must be able to quickly calculate odds to determine if they should continue to play and how much they should bet.

Possible areas of difficulty for playing poker:
1. People with traumatic brain injury may have difficulty with the memorization involved in successful play.
2. People with hand injuries may not be able to hold and manipulate cards and chips.
3. People with a visual impairment may not be able to see the cards.

As you can see, Texas Hold 'Em could present obstacles to a variety of people. Does that mean you should not include it in your event? Absolutely not! What it does suggest, however, is that you should consider all of your activities holistically and make sure they do not all present the same obstacles. You should also make sure that all students who attend the event have an equal opportunity to win prizes of similar value whether or not they choose to participate in specific events like the poker tournament.

# Accessibility for Active Learning and Gamification in Instruction

Active learning, instructional games, and flipped classrooms all present challenges to students with disabilities. In this section, we describe some broad categories of activities commonly deployed in library instruction, the challenges they present to students with disabilities, and suggestions for accommodating student needs. We conclude this section with a specific example taken from a cookbook of these activities aimed at instruction librarians. Library instruction is rarely the full story but rather the beginning of a conversation. It is difficult to continue a conversation if students feel shut out from the beginning.

Perhaps the greatest challenge for a librarian preparing for an instruction session is knowing whether or not you will encounter students with disabilities in that session. We do not have the luxury of a beginning-of-the-semester notification from the office of disability services. When discussing an upcoming library instruction session with a faculty member, ask if any students in the course receive accommodations. You could also reach out to students in the course by asking the faculty member to forward a message to students in which you describe the activity and invite any students who may need accommodations or have concerns to contact you. However, to cover all your bases and bring your practices more in alignment with the social model of disability, we suggest that you "develop a teaching style that incorporates techniques that meet the needs of various people whether these individuals have disabilities or not…."[23]

## *Let's Start with Generalities*

Game modification rule of thumb:

> An employment-based rehabilitation placement rule of thumb is to try to place a person with a disability back in the same job she or he had with accommodations if needed; if that is not feasible, then try to place the person with the same employer in a different job with accommodations if needed; and if that is also not feasible, then place the person with a different employer with accommodations if needed. Applying this rule of thumb to a classroom game, the instructor should try to accommodate a student with a disability (such as allowing extra time or providing large print instructions); if this is not feasible, then the instructor should change the game to accommodate the student; and if this is not possible, the instructor should find a different game that allows the student to fully participate.[24]

Competition and prizes might be meant in good fun and as a way to gently encourage students to fully engage with the exercises; however, if the competition is too intense, it has the potential to socially isolate students with disabilities. Make sure that competition does not become too fierce and the stakes are not too high. This is true whether students are competing individually or as a team. The last thing a librarian wanting to foster positive

feelings wants to do is create a situation where a student with a disability feels like he or she is holding the team back from a great prize. If students are working in teams, it may be tempting to assume other team members "picking up the slack" is an acceptable accommodation. It is not. Care should be taken to ensure the student is empowered to participate actively and in as similar a manner to students without disabilities as possible. For example, if a student would have difficulty grasping and manipulating a book, then leaving that to one of their teammates would be acceptable as the student would likely require assistance with this under normal circumstances. However, it would not be acceptable to assume, for example, that you do not need to provide an accessible worksheet for a student with dyslexia because one of their teammates would be able to read and write using the standard worksheet. Make sure that everyone who participates walks away with something if you offer prizes—and if not a tangible reward, then verbal rewards, as in positive feedback, can be effective.[25]

Let us pause for a moment to consider academic standards. If a librarian is grading an assignment or teaching a for-credit class, then students with disabilities must be held to the same academic standards, with accommodations if needed, as students without disabilities. However, in cases where the object of the instruction is at least partially to make students comfortable in the library, academic standards are not necessarily relevant to decisions made about accommodations and/or modifications. The prime considerations in these cases should be the dignity and autonomy of all the students and ensuring their experience at the library makes them feel welcomed. Students cannot feel welcome in the library if they are forced to expose their disability or feel singled out or set apart.

Scavenger hunts and similar games, which require students to investigate a place or service in the library and report back to the class, can be an effective way to encourage all the students to be active and engaged in the instruction session. However, these activities can present significant barriers to students with disabilities. When planning these activities, consider factors such as the accessibility of the building, clarity of signage, and the time allotted to navigate to distant spots in the library. Also consider how the students will be assigned an area or service to investigate. If you are making the assignment randomly, how do you ensure the student who uses a power chair is not assigned to investigate the special collections area that requires passing through that one really narrow hallway and over three stairs?

Online games and tutorials should be used with caution as many are not fully accessible at best and are often completely inaccessible for students with disabilities. If you use an online game to convey information, make sure you offer substantially the same information in alternative formats that are accessible to students. Guidelines for accessible games can be found in the Resources section of this chapter. Substantially similar information can be provided in the format of a tutorial, a video, or even plain text. The Alliance for New Literacies makes their tutorials freely available and makes sure that they are accessible to all students.

Flipped classroom videos, which are often used in conjunction with instructional games, should be created with accessibility in mind from the beginning. They should be closed captioned and any visual elements should be well described. You should not

assume students will learn important points based on visuals in a video. Text size, color, or contrast may be inadequate.

We will use "Library's Best Beach Ball," an exercise taken from *Let the Games Begin*, a widely available cookbook of library instruction games,[26] as our example of creating a successful and accessible game. In this exercise, students are sent around the library to investigate various locations and services and then sent back to report what they have learned to the class. The locations are assigned to the students by tossing a beach ball and sending students to the location written on the beach ball nearest to where their thumb lands.[27]

## Skills and Abilities Required for this Activity

1. Catching a thrown object
2. Semi precise placement of a digit
3. Sufficient vision to read information on a shiny surface, which may not have adequate contrast
4. Ability to navigate unfamiliar spaces
5. Ability to move freely in a classroom

## Potential Problems

1. Catching a thrown object can prove challenging for people with a wide variety of disabilities affecting vision, physical coordination, or mental health conditions such as PTSD, anxiety or phobias.
2. Reading words on a glossy object or without adequate contrast can be challenging for people with visual impairments or even people with color vision defects, which is fairly common among men.
3. Navigating a new space can be difficult for people with visual impairments, people who use a mobility device, or people who are on the autism spectrum.
4. Not all spaces in all libraries are truly accessible for people who use mobility devices.

While it is still quite possible to use this exercise or one like it, it is advisable to consider these potential problems and alternatives. The object of using the beach ball is to keep things lively and to randomize the spots students are sent to. It is possible to use tools such as a random number or list generators to accomplish this goal, (http://www.random.org offers several options that are free). Even drawing locations from a hat could be useful if assistance is needed, as it can be offered discreetly. A fully accessible virtual tour or tour video of the library highlighting the locations students will visit could go a long way toward making navigation of the space easier for students. The librarian should also consider how she or he would ensure that a student with a disability was not sent to a more challenging part of the library and do so in a way that did not draw undue attention to a student's disability.

Unfortunately, librarians, for various reasons, often find themselves presenting an instruction session with less notice and information than they would like. If you go through the modified task analysis process we've outlined above, you can be prepared to

change plans or modify exercises quickly and gracefully. While it may be appropriate to use an unmodified activity in a classroom where there are no students with disabilities present, we suggest librarians should always be prepared with at least basic modification. As we mentioned earlier, a librarian may not know a student with a disability is in the class until he or she walks into the room to meet the class. As much as possible, the modification should flow seamlessly with the rest of the planned activities.

# Accessibility for Games as Outreach

Academic libraries are turning to games through both active and passive programming to create a more welcoming environment for students, but without some planning and forethought, the welcome mat may not extend to students with disabilities. Adding a few steps to the planning process for outreach activities using video, board, role-playing, and other games will go a long way toward creating an event that is more accessible and inclusive, as well as fun since young people with disabilities "play for enjoyment …regardless of the meaning that many researchers and experts attribute to the intersection of youth, games and disability."[28]

It is not possible to design a gaming event in which every activity is accessible to all potential participants. Just as not everyone enjoys playing *Dance, Dance Revolution*, or *Call of Duty*, not everyone has the physical dexterity to play Jenga. Just as you would plan a variety of activities for different interests in a gaming night, plan a variety of activities to meet the needs of people with a variety of needs.

Many video games and gaming systems have accessibility settings. When planning an event that uses a video game system, research the settings for your console. See the resources section for a guide on accessible games from the Library of Congress that reviews games and systems for accessibility. Consider adding accessible games to your collection.

Oversized games or playing cards add more fun to an event and provide a dignified option for people who may find them easier to handle or see. Amazon has many oversized games for sale, and most are reasonably priced.

If your campus disability services office, or some other office on campus, has accessible games or gaming technology that you can borrow, see if you can incorporate it into your game night plans. Better yet, if this office knows of students with disabilities who are interested in gaming, ask them, along with other students, to help you plan your game night.

If you are creating your own game for the event, such as a library-related Bingo or a scavenger hunt, design the game with accessibility in mind from the beginning of the design process. Make sure cards are designed with large type and high contrast. Consider offering some of the game materials on alternative paper colors. Present information in more than one format. For example, if calling out Bingo words or numbers, both speak the information and present it on a screen or whiteboard. Consider how people with various disabilities could participate and gain from the activity.

Wayfinding can be challenging in new territories for students with disabilities. Make sure your signage is simple and that it uses high contrasts so that most people can see it.

Have staff or volunteers stationed throughout the event to guide those unfamiliar with the library, people with navigation challenges, and those with significant visual impairment.

Things to consider when planning a successful and inclusive gaming outreach event:

1. Have I planned adequate space for someone who uses a mobility device (wheelchair, scooter, walker) to navigate to each activity station and move in a dignified manner to a place where they can participate?
2. Do I understand the cognitive and physical tasks required for each activity?
3. Have I planned a variety of activities that will allow people with different needs to actively participate in the program?
4. Are all activities planned in parts of the library that are accessible?
5. Do I know how to activate any accessibility setting on the game consoles I am using? Does the person running the video games also know this?
6. Do I have adequate event staff/volunteers to direct participants to various activities?

# Conclusion

Accessibility and inclusive design can seem like intimidating topics. However, designing an inclusive learning game or outreach activity is well within reach of most librarians. Remember to focus on dignity as well as function and to use the task analysis skills many of us already possess in order to imagine the needs of others. By doing so, you will create an environment that is warm, welcoming, and inclusive.

# Resources

This is a small selection of resources we believe are valuable for librarians wanting to make their instructional games and gaming outreach more accessible. Technology and accessibility are always changing, so we hope this chapter has given you the background knowledge and vocabulary to find further resources that meet your needs as they arise.

We believe this guide on accessible games from the Library of Congress is helpful and likely to remain up to date: https://www.loc.gov/nls/resources/general-resources-on-disabilities/video-gaming-accessibility/.

Why reinvent the wheel? The Alliance for New Literacies creates interactive framework based tutorials. All of their tutorials are designed to be accessible: https://newliteraciesalliance.org/.

There are many excellent guides, PowerPoints, videos, etc. that you might want to use for staff training or as a personal refresher. This one is pretty straight forward: http://ability360.org/disability-etiquette-tips/.

If you want to learn more about Universal Design for Learning (design that is usable by everyone) this is a good place to start: http://www.cast.org/our-work/about-udl.html#.W-yH_SdRdsY

# Endnotes

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23. Applin, "Instructional Services for Students with Disabilities," 141.

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