

The Natural Accommodation of Interactive Fiction: How Text-Based Games Remove Barriers to Participation

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Creating games in writing courses engages students in an interesting task and leads to meaningful writing and projects. This paper examines an unforeseen challenge in writing courses in which students propose, create, document, test, and then distribute educational games. Embracing game design within writing courses can lead to unintentional exclusion or marginalization of individuals with special needs. Within disability studies a “natural accommodation” is a design consideration that opens a space to people with physical, neurological, or mental health challenges in a way that benefits the entire community. The textual nature of interactive fiction and hypertexts accommodates game designers and players with special needs, naturally. Creative teams can add images, sounds, and other multimedia elements, yet the core philosophy of IF is to include all information necessary to game play as readable text. If we embrace game creation as a teaching strategy, adopting text-based interactive fiction offers an inclusive, engaging, and proven digital composition technology.

Games and Writing Pedagogy

Technical writing courses structured around meaningful community-based projects guide students through the creation of meaningful documents and important processes (Henson and Sutliff, 1998; Huckin, 1997; Sapp and Crabtree, 2002). At the University of Minnesota, our writing program’s community partners suggested that students could create games to teach important life skills to the partners’ clients. The creation of games within a writing course should not be confused with gamification, which uses game-like elements to deliver course content (deWinter and Vie, 2016; Veltsos, 2017). Although my students play and test their games, the writing courses themselves are not gamified. Instead, our goal in writing courses was to teach a variety of professional writing genres grounded with real deliverable products and authentic clients.

Starting in 2004, I began assigning a game project within my courses, particularly my technical communication courses and narrative writing courses. The assignment calls for an educational game appropriate to middle school students. Game projects in my courses require teams prepare business proposals, marketing materials, instructions, update memos, and a playable game. Other teams evaluate these materials during the four weeks. These various documents require different writing styles for different audiences, using a community-based project to create a cohesive writing experience. With local schools, teams have tested their games, revised the games as necessary, and then retested the games.

Teaching writing and rhetoric through game creation might result in board games, active games, interactive fiction, or video games, to suggest a few options. Scholars within game studies, or ludology, suggests that having students create games develops a range of skills we value in writing and rhetoric courses, varying by the type of game students create and for whom the game is designed (Alexander, 2009; Ritter et al., 2014). Testing the games and revising them demonstrates that what we intend as communicators might not be how an audience experiences our creations.

Games and Ableism

Inspired by the classic Jay David Bolter (1991) text *Writing Space: The Computer, Hypertext, and the History of Writing*, I brought hypertext tools into my classes for those wanting to create computer-based games, while other student teams choose to create board games or card games. I did not dictate that students adopt one form of game over another; about half the teams chose computer-based game projects, with other teams creating board games and card games.

For four years, my assumptions about including computer games as an optional assignment went unchallenged. I embraced the writings of scholars interested in technology, particularly Cynthia Selfe (1999, 2004) and Anne Frances Wysocki (2004). My master's thesis and doctoral dissertation research explored technology and writing within marginalized communities. Then, in 2008, two students with different disabilities mentioned the challenges of creating and playing computer games. As technology allowed for more elaborate creations, I had not paused to consider that the resulting compositions were inaccessible to many people.

Ironically, as a person with physical and neurological disabilities, I could not always test and play the games created by students. By once telling a class that I wasn't their target audience so my palsy, processing, and vision challenges should not be taken into account, I was engaged in ableism. As with

other forms of discrimination, those of us with disabilities often reflect the oppression we experience (Melonçon, 2013). In denying the importance of my own limitations, I was missing a learning opportunity.

At that time, student teams used tools similar to Apple's HyperCard, including HyperStudio, SuperCard and what was then Revolution (now Live-Code). Some teams also used Adobe Flash and one used Microsoft Visual-Basic to create games. In-class demonstrations of the *Myst* series of games and *You Don't Know Jack*, both originally created in HyperCard ("Apple's Revolutionary HyperCard", 2014; Lasar, 2012), suggested approaches to game authoring.

The students with disabilities mentioned the emphasis on graphics, sound, and point-and-click play left them unable to fully engage with their teams. These students expected me to recognize the discriminatory nature of computer-based games and expressed, directly, their disappointment in my assignment guidelines. The teams involved rightly argued that games for middle school students should represent inclusivity.

One of the students mentioned being active in an online community dedicated to interactive fiction created using the Text Adventure Development System, TADS. That semester, I allowed the use of TADS by a team of collaborators. The success of that team led me to reflect on what the game project had become. I had embraced digital media without critically reflecting on how it might exclude individuals.

Accommodative and adaptive technologies often require significant investments. Interactive fiction, however, is an affordable technology that works with other adaptive tools. TADS and Inform, the two dominant IF authoring tools, are freely available. Inform is available for Microsoft, Apple, and Linux operating systems (Reed, 2011). After the first IF experience went well for the authoring team, I standardized on Inform for computer-based games. Inform generates IF playable on most computing devices.

Interactive Fiction

Graham Nelson unveiled Inform 7 in 2006 and I soon adopted this interactive fiction tool for computer-based games in my courses. I selected Inform because writing IF with this tool requires no programming skills and resembles writing in English. For example, consider this code snippet I use to introduce Inform to students:

"The Library Dragon" by Christopher Scott Wyatt.

The story headline is "A Tale for Readers".

The story creation year is 2018.

The story genre is “Fairy Tale”.

The story description is “A dragon longs to read”.

When play begins: say “You enter the Village Library and stand in awe.”.

The Village Library Entrance is a room. “The foyer opens to various rooms filled with rows and rows of books.”

The Inform programming syntax is called natural-language programming, an extension of what Apple attempted to achieve with HyperCard’s programming language. Unlike other IF tools, students with special needs were able to create games without any assistance, something no other tool had permitted. Using speech recognition software, students and I easily adapted to coding without typing. Inform 7’s program editor is a text editor, accepting commands such as “period quote period new paragraph” to format the code.

Inform 7 allows students to compose IF without learning a complex programming syntax. For students using adaptive technologies, the natural-language programming requires no special adjustments to software or hardware. The punctuation and capitalization within Inform 7 story files resembles other forms of writing, not programming.

Playing IF games requires separate program from the authoring tool. To interact with an IF game, players read a text passage and enter directions at a command prompt. With testing, my students and I discovered that the freely available Frotz and Zoom story file players worked well with Microsoft and Apple operating systems. Text presented to the players is read aloud properly by text-to-speech utilities included with recent operating systems. Entering commands to play the games works well with Dragon Naturally Speaking and other voice recognition applications. Braille screens and keyboards also worked properly for both creating and playing IF works.

Other IF Options

I prefer the label “interactive narrative” or “interactive storytelling” to describe immersive, story-based computer games. However, online communities still use the “interactive fiction” label. Passionate debates about terms continue and are beyond the scope of this paper. Branching games that present choices resembling printed “Choose Your Own Adventure” (CYOA) texts are sometimes called “gamebooks” (Crawford, 2013; Ford, 2016; Miller, 2014; Montfort, 2003). Games that respond to natural language input are called “parser” or “interpreter” games, reflecting the need for the game engine to parse player sentences to determine meaning (Crawford, 2013; Ford, 2016; Montfort,

2003). More visual games, like *Myst*, are sometimes called “point-and-click” games because players navigate the game using a mouse or keyboard to manipulate a pointer (Crawford, 2013; Montfort, 2003). These distinctions matter within some IF authoring tools, such as Quest, which ask authors to select a game type during the writing process. The Interactive Fiction Technology Foundation suggests using “IF” for all narrative-based games, including those with multimedia content (IFTF, n.d.). The IFTF website explains, “Digital interactive fiction is a kind of video game. Video games can have many different focuses, but interactive fiction always focuses on telling a story, and it tells that story primarily with text rather than sound or graphics” (IFTF “Frequently Asked Questions,” n.d.).

Hypertext tools made it feasible to create CYOA games with HyperText Markup Language or any number of flowchart-style authoring tools (Bolter, 1991; Crawford, 2013; Ford, 2016; Miller, 2014; Montfort, 2003). I did consider adopting Storyspace for student projects, because it is a non-linear authoring platform developed by writing theorists Bolter and Michael Joyce. Sadly, it was and remains cost prohibitive and less accessible for users with special needs than the free IF authoring and reading tools. As of 2018, Storyspace 3 is available only for the Apple macOS platform, another limitation for some student teams. The lead developer, Mark Bernstein, actively promotes hypertext authoring and blogs about these tools, co-editing with Diane Greco *Reading Hypertexts* (2009).

Natural Accommodation and Universal Design

As Jay Dolmage (2005) acknowledged, “Universal Design has become a way to talk about changing space to accommodate the broadest range of users, yet consistently overlooks the importance of continued feedback from these users” (para. 15) Space and spatial metaphors in disabilities studies fail to address the breadth of disabilities. For cognitive differences, educators must embrace deeper considerations of Universal Design and accommodation by listening to neurodiverse students, as Dolmage suggests.

Shannon Walters (2010) argued for universal design in technical writing courses, but much remains to be done. The September 2018 issue of *Computers and Composition* addresses the need to embrace current usability and design best practices. The issue, themed “User-Centered Design and Usability in the Composition Classroom,” omits the word accommodation, in some ways a recognition that good design practices enable greater participation of historically marginalized groups. As I move forward with IF in my courses, the insights offered by Jessie Borgman and Jason Dockter in “Considerations of Access and Design in the Online Writing Classroom” (2018) will shape my approach.

Full participation in classroom activities demonstrates that all individuals are valued. Because programming Inform 7 was possible with tools the students already possessed and had mastered, the IF game creation can be described as a “natural” accommodation. Natural accommodation is a phrase borrowed from architectural design (Dunn and Dunn de Mers, 2002; Domlage, 2008). It describes such features as natural lighting, access ramps, and lever-style door handles that make life easier for all people in a space, regardless of physical abilities. The person using a wheelchair benefits from the ramps, and so do instructors with media carts and students with rolling cases. Natural accommodations are not afterthoughts, what Dolmage (2008) describes as “retrofitting.” Unfortunately, physical accommodations don’t address all disabilities, especially cognitive challenges or neurodiversity. As a neurodiverse person, my physical reactions to lights, colors, sounds, and other sensory stimuli cause me great pain in classrooms and online spaces. Physical accommodations intended for others unintentionally limited my ability to participate.

We must address how naturally accommodating our assignments can be, since many of our courses serve the complete student population of institutions. When our assignments unintentionally emphasize physical or neurological abilities, instead of outcomes focused on writing and rhetoric, we convey to students that their challenges require segregation. Too often we create “separate but equal” assignments when presented with a disabled or neurodiverse student (Pollack, 2009; Seale, 2006).

Natural accommodation differs from universal design, which is the process of considering special needs before and during design of a space, technology, or other accommodation (Burgstahler and Cory, 2010). Not every effort at universal design results in natural accommodation. Though interactive fiction predates most universal design research, yet the technologies work well without significant changes to the game creation tools or the story players. This distinction became obvious when I attempted to use game design tools in my classes that produced fast-paced, graphically-rich games that excluded many students, including some without disabilities.

IF and Inclusion

Accommodation ensures students with special needs have access to an activity, but it does not necessarily make the activity inclusive. A student who used a wheelchair crafted a creative IF work with a team exploring living with a physical challenge. The game was a parody of the 1967 television series *Ironside*. The player (or reader) of the game would have to help Detective Ironside navigate the streets of San Francisco realistically. Steep hills, public transportation, and other challenges were described in prose. The students

used humor to teach about disability, while demonstrating how inclusive the assignment could be.

That semester, most teams chose to create board games. The games designed by technical writing students taught about healthy diets, world geography, and making good choices. The teams consulted official curricula for middle school and explained in their proposals how the games aligned with specific objectives. The *Ironsides* game included science, history, math, and reading unobtrusively.

As the semester concluded, a student observed that the board games required graphic design skills to impress potential players and hypothetical buyers. The IF required “only” compelling writing. Like many writing teachers, I had heard many complaints about the amount of writing in my courses, yet now students were suggesting writing a text was somehow easier than creating visual media.

Unlike the HyperCard or Flash games I had permitted in previous years, the IF project teams didn’t feel compelled to recruit an artist to join their teams. I encouraged the IF teams to concentrate on their narratives, and they exceeded my expectations. The lack of images and sound only led them to write more compelling prose to engage players.

Those first IF experiences did result in self-segregation that I should have avoided. Yet, that segregation also allowed teams of individuals often relegated to minor roles on collaborative teams to lead and dominate game projects. An able-bodied student would not have dared to parody a detective who uses a wheelchair. Able-bodied students wouldn’t have included prose about rolling backwards down the hills of San Francisco. The humor was both self-deprecating and deeply insightful.

The highest grade in that class section went to a team that created a board game. They crafted a solid business proposal and wrote excellent marketing materials. I mention this because the IF team never felt like outsiders or like they were receiving special treatment. In their reflections, they wrote that they had an equal opportunity to participate and were evaluated fairly, receiving no favoritism from a disabled instructor.

Vision- and hearing-impaired students were able to use IF authoring tools and players. Text-to-speech and Braille input devices worked well with IF, as did screen magnification tools. Any IF tool that works with operating system accessibility features or that includes its own accommodative and accessibility features would be appropriate for the objectives in my syllabi.

Examples of Inclusive IF Features

The students suggesting IF for game creation had presented me with an op-

portunity to make my courses more accessible and inclusive. Accommodations should address mobility, auditory, visual, and neurological differences. Though IF works are video games and literature, they offer greater accessibility than image-centric and motor reflex-dependent games.

Mobility and agility barriers presented by most video games exclude students with a range of disabilities. As someone with a palsy, I understand that any class activity that rewards quick reflexes or physical abilities creates an exclusionary, even alienating experience. It is not an accommodation to be score keeper during a mock game show, for example. However well-intentioned, it segregates students on traits, not their progress as writers and critical thinkers.

IF games work well with any input device capable of generating keyboard input, without the need for fast reflexes. Parser, choice, and point-and-click interfaces work with alternative keyboards, eye-tracking, voice commands, and other adaptive technologies. Amazon supports IF via their Alexa line of smartspeakers (“Alexa, Let’s Play”, n.d.) and on their Kindle devices (Inform, n.d.), demonstrating the interactive flexibility of IF input options. One of the most popular Alexa “skills” is *The Wayne Investigation*, a Batman IF work released to coincide with the film *Batman vs. Superman* (Roberts, 2016).

Auditory disabilities include hearing loss and a variety of processing challenges. Auditory processing and sensory processing disabilities make discerning sounds difficult. Most video games allow options to disable sounds, but game designers understand that effects and music enhance the immersive experience of gameplay for most players (Miller, 2014). Auditory cues help players time their reactions to game events. These same sounds can overwhelm individuals with auditory processing differences. Some neurodiverse individuals experience physical pain when experiencing too much auditory input or certain frequencies of input (Pollak, 2009). The text-based nature of IF seldom requires sound; any music, sound effects, or dialogue should appear as text. Some authoring tools, particularly those using web-based technologies, allow for the inclusion of audio files, while reminding authors to describe what the player hears (Ford, 2016).

Vision impairments, like auditory challenges, cover a spectrum of physical and neurological disabilities. There are also neurological conditions, such as migraines and seizure disorders, that make viewing some screens and some computer-generated content difficult. IF traditionally relies on text, though some authoring tools encourage “book covers” and limited, still-frame graphic images (Reed, 2011). Those IF works that feature animated segments rarely feature the fast-paced, immersive graphics of their video game counterparts (Crawford, 2013; Miller, 2014; Montfort, 2003). The authoring system Ren’Py, for example, encourages a graphic novel approach to design, with animation limited to visual transitions between scenes (“What is Ren’Py”, n.d.).

Neurological differences include learning disabilities; sensory processing challenges; seizure disorders; mental health diagnoses; autism spectrum disorders; attention deficit and hyperactivity disorders; brain trauma; and many other challenges related to atypical neurological conditions (Pollack, 2009). The traits of neurodiverse students can present barriers to traditional computer game creation and game play. Also, many neurodiverse conditions co-exist with physical challenges. As the preceding overview of IF illustrates, the composition tools accommodate authors and players with special needs.

People with disabilities face additional expenses to accommodate the challenges they encounter. Special computing hardware and software is yet one more form of exclusion experienced by disabled people. However, IF works can be played on older computers and basic computing devices, such as the Kindle tablets and most smartphones (Montfort, 2003; Reed, 2011).

Conclusions

The natural accommodation of IF surprised me, even though the reason I enjoyed these text-based games during my childhood was that I could play *Zork* or *The Hitchhiker's Guide to the Galaxy* despite my physical limitations. Unlike arcade games, which I struggled to master, I could excel at text-based puzzles. During high school, I had proposed a computer game for my Spanish III final. I developed a text-based maze game, programmed for the monochrome IBM PC computer. Eighteen years later, my university students create more elaborate games without having to master a complex programming language.

Navigating *Second Life* or any first-person shooter presents frustrating barriers to me, yet I ignored these challenges when I brought game design into my courses. I assumed students wanted and would be more motivated by the creation of complex video games resembling popular console titles. Instead, students found text-based IF to be liberating and inclusive.

As professional and technical writing instructors, teaching professional genres and rhetorical concepts remain our primary goals. Teaching programming, illustration, or other complex digital skills is beyond the scope of the courses we teach, generally. We can appreciate that designing IF develops the skills and processes that more complex game designs also require. Interactive fiction projects reveal to students that games are persuasive works, guiding audiences through narratives towards desired outcomes.

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