

Using Investigative Video Games to Teach Reference Transaction Skills in Interconnected Classrooms

John Burgess and Anna Wallace

University of Alabama, USA

jtfburgess@ua.edu, agwallace1@crimson.ua.edu

ABSTRACT

As online education for the MLIS becomes widespread, one challenge for reference and user services instructors is that traditional active learning exercises used to promote internalization and personalization of reference skills may not translate to online classroom environments where real-time feedback may be more difficult to provide equitably. This article proposes the use of investigative video games to teach critical reasoning skills that are essential for competence in conducting reference interviews and searches. It provides examples of how types of reasoning are used in these video games and how, when practiced, can offer a foundation for further instruction in reference and user services.

ALISE RESEARCH TAXONOMY TOPICS

reference transactions; pedagogy; computer-supportive collaborative work

AUTHOR KEYWORDS

critical reasoning; reference instruction; video games; pedagogy

INTRODUCTION

The reference transaction is a complex interaction that requires extensive instruction and practice to master. Many of the skills associated with a successful reference encounter are behavioral, as described in the Reference and User Services Association (RUSA) Guidelines for

Behavioral Performance of Reference and Information Service Providers (American Library Association, 2013), while competency in others requires complex cognitive and social proficiencies, outlined in RUSA's Professional Competencies for Reference and User Services Librarians (American Library Association, 2017). Viewing the acquisition of complex skills through the perspective of experiential learning theory (ELT) reveals the importance of giving students sufficient opportunities to internalize and personalize relevant learning processes through engagement with action/reflection and experience/abstraction dialectics (Kolb & Kolb, 2009). Providing active learning experiences, paired with timely and rich feedback, is useful for helping students develop complex skills. Examples of traditional active learning exercises for reference instruction include live demonstrations of reference interviews and search techniques, either with the instructor or a student learning partner. These exercises satisfy the action/reflection dialectic by providing an opportunity to perform the relevant skill, paired with individual or collective critique on that attempt, and experience/abstraction dialectic by giving them personal practice with which to contextualize class readings and professional guidelines. Providing critique in a timely manner promotes learning by linking internal feedback processes, which may be thought of as metacognitive awareness of quality of task performance, and external feedback which represents instructor guidance towards a learning outcome (Narciss, 2008, pp. 130–131).

As online education for the MLIS becomes increasingly widespread (Oguz et al., 2018), one challenge for reference and user services instructors is that traditional active learning exercises used to promote internalization and personalization may not translate to distributed, larger, sometimes asynchronous classroom environments where real-time feedback is more difficult to provide equitably. Such a change in course delivery model provides an opportunity to explore innovative pedagogical approaches for teaching reference and user services skills in interconnected, online classrooms. This paper features a conceptual discussion of one such approach, exploring the possibility that commercially available video games that feature investigative themes may be used to develop and reinforce essential search and reference interview skills by promoting students' inductive, deductive, and abductive reasoning abilities. Prior work by Cohen and Portney provides an argument for the utility of video games in teaching complex decision making skills (Cohen & Portney, 2006, pp. 2–3). Further, Nicola Whitton makes a case for using games in higher education (Whitton, 2009, p. 44). The contribution of this paper is considering how games might be used to teach reasoning skills and how those reasoning skills translate to RUSA competencies.

TYPES OF REASON IN REFERENCE WORK

Beginning learners may benefit from the use of simplified conceptual models that reduce the number tasks associated with complex processes. An example of this approach is teaching introductory reference and user services skills by developing students' abductive, deductive, and inductive reasoning skills. Learning how to use these three types of reasoning provides beginning learners with both the kind of process understanding promoted in ELT and a way of connecting theory and practice for many of the RUSA competencies. Investigative video games also employ these types of reasoning, making them candidates for supporting this approach.

Abductive Reasoning

In this model, abductive reasoning is used to test hypotheses related to a user's tacit question. This is the question that, once articulated, adequately summarizes their information need. Abduction captures the constructive nature of understanding the perspectives of others and how that understanding is subject to iterative revision as the interview progresses. Rachel Ivey Clark provides an in-depth discussion of the importance of abductive reasoning skills in library practices. (Ivy Clarke, 2018).

Deductive Reasoning

Deductive reasoning here is a focus on classifying types of information by function to deduce the ideal source to obtain an answer or gather resources. That source may or may not exist, and the library may or may not have access to it, but this categorical understanding of optimal sources gives learners a place to begin based on which kind of information system is likely to return a source of that type. This is an important skill for searchers still coming to terms with the range of resources that are available.

Inductive Reasoning

Induction here is reasoning based on evaluating accumulated evidence. Employed during the search phase of a transaction, inductive reasoning evaluates search results experientially. Using keywords, subject terms, available limiters and filters to adjust the pool of results, the searcher notes which combinations best produce needed results. Unlike the hypothesis testing done in the reference interview, where some degree of intersubjective inference will always persist, the evidence of the search results pool is immediately visible, allowing for rapid revision and testing of approach.

INVESTIGATIVE GAMES

The term game mechanics is used to describe the rules of a game, including how to interact with game interfaces. A video game is an investigative one when its game mechanics allow the player to solve a mystery by finding and evaluating clues. This differs from plotted story games that feature the trappings of the mystery genre, but the game mechanics advance story proceeds through the completion of dexterity-related tasks. Investigative games often avoid stating their game mechanics, making learning them part of the discovery process. They may even obscure the end goal of the game, allowing understanding of the game's purpose to emerge slowly through gameplay. The use of trial and error is another common feature. Through these game mechanics, investigative games serve as exercises for creative discovery, encouraging the kind of hypothesis formation, testing, and classification of resources that is useful in reference and user services work. The interactive nature of these games provides immediate feedback for the learner and does so with a sense of play and visual appeal, which may promote student engagement. The following is a selected list of commercially available video games that meet the criteria of investigative video games, followed by a discussion of how they use reasoning skills.

Her Story

In Sam Barlow's *Her Story*, the premise of the game is that the player must observe digitized VHS footage of a woman being interviewed for a murder investigation over the course of several days, the footage of which is contained in a database. Some of the videos have become corrupted to where the player is only able to see the woman's responses to questions, and the different interviews are truncated and split into video clips that span from a few seconds to a few minutes. In order to uncover the truth behind the murder, the player must type key terms into a search engine to access video clips wherein the word is mentioned. However, the player is limited to viewing the first five clips that contain the keyword. By listening to the woman's responses in each video clip, the player may glean new information that may yield more results in the search engine, and thus piece together the events of the murder (Barlow, 2015).

Return of the Obra Dinn

Lucas Pope's *Return of the Obra Dinn* is a puzzle game that heavily relies on logic-based skills. The premise is that an East India Company's missing vessel, *Obra Dinn*, has reappeared, but the entire crew and passengers are found to be either dead or missing. However, the player has a mysterious compass that, when approaching a corpse, takes them back in time to the moment of death. The moment is prefaced with an audio clip of the final words spoken in that moment, and then the moment is frozen in time, allowing the player to move about the ship to observe every detail, such as the people who were present, where they were, and what they were doing. There were sixty people on the ship and the player has to identify each one by name by cross referencing a ship's log of the crew and passengers along with a sketch. The player also must decipher the ultimate fate of each person: how they died, or, if they lived, where they are now. The moment of death for each corpse in the game is divided up into chapters. The player must discover clues to determine what happened by progressing through the plot in a non-linear fashion, so some chapters might be discovered out of order (Pope, 2018).

Subserial Network

Matilde Park and Penelope Evans' *Subserial Network* is an experimental work of interactive fiction that presents itself in the form of multiple application windows that appear on the player's desktop computer. The player exists in a dystopian world where Earth is populated entirely by synthetic beings that are directed to emulate humans as closely as possible by an authoritative being called The Machine. However, there are seditious synthetics, termed Subserials that desire to augment themselves to directly connect themselves to The Net, which is analogous to the Internet. The player has been recruited by a government organization to search The Net to discover the online communities of Subserials and turn them over to the government. This goal is accomplished by using a search engine to discover websites of online communities and chat rooms where the player might contact certain synthetics by email (Evans & Park, 2018).

Abductive Game Mechanics

Abductive reasoning uses iterative hypothesis testing based on best available information, allowing for useful inferences when not all necessary information is available. One example of this use of reason in an investigative video game are moments in *Return of the Obra Dinn* when a person's death is not observed, so the players must hypothesize about the sequence and cause

of death. The game contains scenarios that are divided up into chapters. Since each scenario presents a frozen moment in time, there can be a short time gap from one character's death to another's. If the player is trying to discover the fates of crewmembers A, B, and C, the scenario might portray Crewmember B being speared, and the player might observe that Crewmember A appears off the side of the ship above the water. The player sees no corpse for Crewmember A, yet Crewmember A disappears between Crewmember B and C's deaths. The player might make the supposition that since Crewmember A was suspended over the water in one chapter, then disappears in the next, they might surmise that Crewmember A fell into the water, therefore, perished by drowning. There is no empirical evidence to determine that drowning was the cause of death, but the hypothesis explains the disappearance of Crewmember A. This abductive reasoning process parallels how students learning reference interview skills can piece together the user's tacit question through observation, interaction, and inference.

Deductive Game Mechanics

An example of the use of deductive reasoning in gameplay can be found in *Subserial Network*. During the course of the game, the player must determine the most probable location of the communities where Subserials gather. Players can deduce those locations by creating for themselves a set of decision-making rules to apply consistently. For example, if the player receives an email from a synthetic being who provides a link to a community chat room, and the player suspects that the synthetic is a Subserial, then it is probable that the community, for which the chat room is created, consists of Subserials. The rule would be if you can prove the Subserial status of the sender, you have reason to suspect locations they recommend. This construction of gameplay rules from principles parallels the construction of the rules beginning searchers create for themselves about where to begin a search.

Inductive Game Mechanics

An example of inductive reasoning in an investigative video games is the clip selection mechanic in *Her Story*. When beginning the game, the search term "murder" is prepopulated in the database search field. Underneath, there are video clips that all have the word "murder" spoken in them. Experimentation leads the player to understand that if they put another word in the database search, it may yield a video clip if one of the game's clips has that specific word mentioned in it. Since no more than five clips are viewable for a given term, players must use synonyms to gain access to other clips. This kind of retrieval through trial and error parallels how beginning searchers learn keyword searching. The presence or absence of clips serves as external feedback to give players a sense for how well they are using the search interface.

DISCUSSIONS, LIMITATIONS, AND CONCLUSIONS

The value of investigative video games as an interactive, simulative experience is that video games are not passively consumed but require the active cognitive engagement of the player. Video games have the demonstrated ability to create immersive simulations where the direct input of a player affects the course of a game and allows players intuitively to use learned skills, while presenting a clear, tangible goal: to complete the game (De Freitas & Neumann,

2009). Video games likewise have the ability to create memorable experiences that can be easily recalled, and can provide epistemic frames for in-game learning, including skill acquisition (Shaffer et al., 2005, p. 110). These kinds of games can be frustrating, much in the way that learning how to search or conduct a reference interview can be frustrating, but when the mechanics and goals emerge, they reward perseverance with a sense of earned accomplishment. Cultivating perseverance to deal with uncertainty and frustration are essential skills for all librarians. Therefore, if a game is genuinely able to teach reasoning skills, it may create moments of the same opportunities for resolving action/reflection and experience/abstraction dialectics in the game as active learning exercises completed in physical classrooms.

Some limitations for this approach include the need to gain buy-in from students that the types of reasoning discussed here translate well enough to RUSA competencies. The distinction between types of reasoning may not be obvious, and so instructors may need to be prepared to provide examples of use in library settings to satisfy both of these limitations. Due to the tropes of the mystery genre, violent or upsetting scenarios may be common in investigative games. To avoid requiring students to engage with upsetting material, use of these games should be optional, a means of supplementing student learning rather than being the instructor's only effort to provide active learning exercises and timely feedback. Efforts to identify games that use investigative mechanics should be ongoing, with preference given to those without violent tropes. Learning critical information literacy practices is an important part of education for reference and user services work but using games that reflect the norms of the dominant culture may limit opportunities to provide experience with these practices. Likewise, the fantastic or science fiction elements in some of these games may create a sense of disconnect in some users.

The abilities to conduct useful reference interviews and to construct efficient and effective searches are essential for reference and user services work but are difficult to teach without extensive repetition and opportunities for immediate feedback. Using investigative video games to supplement other active learning exercises has the potential to close the immediate feedback gap caused by the shift to online interconnected education for the MLIS. The current research is conceptual in nature and additional research is needed to provide evidence that using investigative video games facilitates the learning of reasoning skills, and that those skills promote development of RUSA competencies.

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