From Visualizing to Narrativizing: Powerful Data Storytelling through Non-Player Characters

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Abstract

This paper explores the synergy between Data Storytelling and Learning Analytics by examining the potential of narrative in digital games, specifically focusing on character design and choice design. The authors highlight the significance of non-player characters in conveying data to players, using examples like *Connect With Haji Kamal* and *Façade*. While acknowledging challenges such as the nascent state of LA and the cost of implementing game narrative, this paper encourages interdisciplinary efforts to unlock the narrative potential of digital games for effective learning analytics and data storytelling.

Keywords

data storytelling, learning analytics, data narrativization

1. Introduction

Learning Analytics (LA) is defined as the "measurement, collection, analysis and reporting of [learning] data" [1] and is concerned with the analysis and interpretation of the data generated by different learning environments to support human decision-making [2, 3]. This analysis and interpretation often takes different forms such as dashboards, visualizations, and reports [4]. Unfortunately, these formats have notable limitations. Instructors have reported concerns about LA's role in evaluation, how it may misrepresent student performance, and how it might increase instructor workload [5]. One study found that teacher-facing dashboards met varying degrees of success due to its dependence on the instructor to act upon the data [6]. Another study found that student-facing dashboards were found to not improve engagement or performance [7] or were otherwise ineffective [8]. In the continued search of building effective LA systems, researchers have been exploring Data Storytelling as a means of addressing these and other deficiencies.

Data Storytelling (DS) is a relatively recent approach being used in the field of LA that leverages narrative elements and techniques, often using visual design, for facilitating the interpretation of data. Aspects of DS have been found frequently in the context of digital journalism [9], but have since given rise to numerous implementations of storytelling elements into LA systems [10, 11, 12].

In our attempts to explore complementary considerations for Digital Storytelling and Learning Analytics, we found value in a related medium through which DS and LA can be presented:

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narrative, and more specifically, *narrative in digital games*, which affords an amount of flexibility in how data can be represented due to its multimodal nature.

2. Narrative in Games

There are many perspectives of what "narrative" in games is. Narrative designer Hannah Nicklin describes narrative simply as how one tells a story [13]. In other words, if the story is some chronological sequence of events, then narrative is the manner in which events are arranged and portrayed in the telling of that story. Perspectives from cognitive narratology expand the meaning of narrative beyond just a simple telling of a story: narrative can also be thought of as a way to mentally reconstruct and represent worlds, existing not in the narrative work but rather in the mind of the person perceiving the work [14, 15]. Narrative, especially in games, facilitates meaning-making to help us understand what we're experiencing. Games provide players with ways of interacting with and even participating in a story, directly influencing the narrative [16, 17]. Interacting with and participating in different elements of game narrative, then, are not only critical for achieving learning outcomes in games [18], but also for making sense of the learning journey.

Multimodal representations of narrative in games offer numerous ways of engaging players in interactive experiences where they can feel a sense of agency to make choices and to take further action when the game responds to those choices [16, 17, 15]. Two ways these representations can be achieved are through character design and choice design.

These two types of narrative representation do not have a siloed existence; they are often closely intertwined with each other, as well as another aspect of game narrative, environmental design [19]. In this paper, we do not explore environmental design in-depth, but it is worth noting that environmental design allows a player to make sense of their world by affording opportunities for deep exploration and engagement with representations of spaces and objects. Environmental design not only situates the player within a world, but also the types of characters that inhabit the world and the types of choices there are to make.

The intertwining relationship between character design and choice design has powerful ramifications for learning in games, which we explore in the sections below.

2.1. Character Design

Character design affords players a way to interact with the people, real or virtual, who inhabit the narrative space of a game—that is, the collection of traversable and interactable events, environments, and characters. Players navigate the narrative space by embodying a character and engaging in conversation and interrogation with virtual representations of other characters. The player-controlled character can be a pre-existing character (such as Mario in Nintendo's *Super Mario* series of games [20]) or a character that the player creates from scratch using a character editor (such as in fantasy-based games like Blizzard's *World of Warcraft* [21], or more recently, Larian Studios' *Baldur's Gate 3* [22]). Character dialogue can inform the player about how they are being situated, and who the centered audience is [13]. Information gathered from characters, whether through direct dialogue, behavioral context clues, etc., can hint to the player about what comes next in the story or provide feedback on the player's past actions [23].

2.2. Choice Design

Choice design allows the player to directly participate in and influence the course of the narrative of a game and traverse the narrative space. Choices can be offered both through interacting with the environment, the characters, or both. Narrative choice structures range anywhere from simple (e.g. giving the player obvious choices with little or no room to deviate) to complex (e.g. prompting the player to make a judgment on limited information) [19]. Choices can also be functional or mundane, such as deciding whether to go left or right on a path. Moreso, choices can be designed to allow players to express their feelings, to make moral decisions, to act in the face of dilemmas, and more [24]. One recent example is Northway Games' *I Was a Teenage Exocolonist*, a rich, deep, choice-based narrative game where the player inhabits a young adolescent who is part of a newly-established human colony on a distant planet. Throughout the game, the player makes dozens of choices: expressive choices about what interests to pursue and who to be friends with; moral choices about how (or whether) to help the colony; dilemma-based choices about who to prioritize saving when two characters face mortal peril; and so on. After the player reaches the end of their life in the game, they are given an opportunity to reflect on their choices and are offered the opportunity to start over and relive their life, taking a completely different path if they wish.

In summary, game narrative can be represented in numerous ways, and affords multiple opportunities for player engagement and interaction to facilitate meaning-making. Players can learn by interacting with either AI-controlled virtual avatars or avatars controlled by other people [25, 26, 27], allowing for engagement in such activities as dialogical learning [28], real-time socially negotiated learning [29], and more. Games can also remember the choices that players make as they navigate the choice design system, allowing feedback to be expressed back to the player through characters or the environment. Now that we have examined character design and choice design, we shift our analysis to discuss which elements of game narrative are conducive for powerful data storytelling.

3. The Potential of Data Storytelling Through Game Narrative

Leveraging narrative in digital games has a number of affordances that supports the design of effective learning analytics and data storytelling. In Verbert et al.'s work to investigate the past, present, and future states of LA dashboards, the authors sum up the purpose of LA dashboards as a way to "support better human sense-making and decision-making by visualizing data about learning" [30, p.1]. If we shift the focus from the visualizing to narrativizing, another opportunity emerges to facilitate sense-making and decision-making. This is especially important as researchers have observed shortcomings in the field to provide actionable and theory-grounded learning analytics [31, 30]. Similarly, Echeverria et al. present four principles to facilitate our thinking: Data Storytelling is (1) goal oriented, (2) drives the audience's focus of attention, (3) relies on choosing an appropriate visual, and (4) relies on core InfoVis design principles [10]. Again, by pivoting from the notion of visual to one of narrative, we gain access to a number of strategies and techniques from the narrative design field that may inform our implementations of DS and LA tools. Lastly, in a review of student-facing learning analytics systems, Bodily & Verbert present a list of categories that represent the different purposes of

each system which includes: awareness or reflection, recommendation of resources, improving retention or engagement, and recommending courses [8]. With all of this in mind, a promising narrative element for powerful data storytelling stands out: "non-playable characters", or more commonly, "NPCs."

NPCs can serve many functions in a narrative, from simply "filling out the background," to offering contextual clues through behavior, to providing the player with important information through conversation [23]. NPCs are player-facing virtual avatars that engage players in sense-making by inhabiting the narrative space and interacting with the player while the player interacts with them. NPCs are also a means of personifying the events that have happened in the game [17] by reacting to the player's choices or to other events that have taken place. Crucially, NPCs can be effectively employed as mechanisms for providing context and feedback, which makes them ideal for exploration as vehicles for data storytelling. An initial exploratory step is to analyze existing examples of NPCs from digital games and simulations.

One such example is the (now defunct) Flash-based short narrative simulation, *Connect With Haji Kamal* designed by Cathy Moore as a training activity for helping personnel in the US Army understand the importance of communicating and relationship-building within the context of different cultures [32]. *Connect With Haji Kamal* uses two NPCs to act as advisors to the player, while the character Haji Kamal also acts as a feedback mechanism when the player makes a decision. These NPCs function in several ways that are similar to the data storytelling principles we outlined above. The two advisor NPCs keep the attention of the player by continually offering advice throughout the simulation (see "focus of attention" in [10]), they recommend courses of action for the player to take based on the reactions of Haji Kamal (see "recommendation of resources" in [8]), and they necessitate decision-making since the player constantly has to choose which NPC's advice to follow (see "decision-making" in [30]). In turn, the Haji Kamal NPC functions as a way to make the player aware of how effective their decisions are in achieving the goal of establishing a working relationship (see "awareness" in [30] and "goal-oriented" in [10]). This feedback gives the player an opportunity to immediately reflect on their decisions and help them think about which advisor to listen to (see [30]).

In the AI-driven procedural narrative game *Façade* [33], the player embodies a first-person perspective character who is invited into the home of a married couple, two NPCs named Trip and Grace. Throughout Façade, the player interacts conversationally with Trip and Grace by typing phrases into a parser. As the evening plays out, it becomes apparent that their marriage is in a fragile state, and their reactions become increasingly tense and emotional. Near the game's climax, one of the NPCs will speak up and say to the player, "I've been listening to what you've been saying," and proceed to describe patterns from the player's words that they noticed. The act of reflecting the player's words back to them draws the player's attention to focus on the NPC who is addressing them (see "focus of attention" in [10]). It also provides the player with an opportunity to reflect on what they said and determine whether their words were helpful or hurtful (see "reflection" in [30]). The "data" in this context is the set of parser inputs generated by the player, and the "story" of that data is conveyed through the NPC's words (summarizing what the player has said) and through the emotions expressed in their face and body language (adding an affective quality to the "report"). The encounter helps the player to make sense of what has happened to Trip and Grace and also make sense of how their behavior affected the chances of Trip and Grace saving their marriage (see "sense-making" in

[30]). In turn, this leads to the player making decisions about how to approach the situation differently on subsequent playthroughs (see "decision-making" in [30]).

Although the two examples described above are not strictly about literal visualizations of data, they illustrate what is possible. In digital games, NPCs have tremendous potential as a way to center data storytelling in a learner-facing way. Everything the player does—how they interact with the environment, what they say to characters, the choices they make in situations—becomes data. And since NPCs are designed to interact with the player, remember what the player has done, and respond to the player, they become a vehicle for reflecting that data back to the player. They become a vehicle for data storytelling.

4. Discussion

This paper demonstrates a number of ways in which elements of game narratives may support and facilitate data storytelling and learning analytics. When presented with this evidence, it is necessary to consider how we might begin to leverage the affordances of game narrative. The authors offer two initial barriers that must be navigated: the relative nascency of the field of LA and the cost of game narrative implementation.

The origin of Learning Analytics can be marked by the inception of its seminal definition [34] and has since seen rapid growth [35]. The maturation of the field has also brought serious issues that need addressing including questions of equity [36], ethical concerns [37], and whether we are serving learners by "closing the loop" [38]. It is no surprise that contending with these challenges might deprioritize the consideration of other disciplines like narrative design or digital games. Data Storytelling has only recently emerged as a space from which techniques and strategies are being drawn [10]. As the field of LA continues to develop, particularly with the added perspective provided by DS, we anticipate more interdisciplinary contributions.

A separate barrier to implementing game narratives that support data storytelling is its cost. Digital games can be expensive to produce and require significant coordination of teams and resources. Video games by AAA studios can cost upwards of $200 million and involve over 200 employees to develop, although a large portion of that is the cost of marketing [39]. Even smaller scale "indie" games can take upwards of 4,000 development hours to complete as reported by one studio [40]. Many games also have technical requirements that require specialized or modern equipment in order for the players to run the software [41]. Researchers in the field of educational and serious games even concede that learning games are complex to make and may not always be the best approach because "[designing games for learning] requires design teams with individuals who have expertise in [cognitive, affective, motivational, and sociocultural] areas, and who can work collaboratively on game design." [42, p.18]. These all contribute to a significant barrier of entry and may warrant hesitation when implementing games as a vehicle for narrative that supports data storytelling. Hannah Nicklin puts it succinctly: "Games are really hard to make." [13, p.22]

That said, these are not insurmountable barriers, and there is no question that an interdisciplinary approach to leveraging elements of game narrative for data storytelling is a worthwhile endeavor. Well-designed NPCs have the power to engage players in meaning-making, to focus their attention on their words and actions, and to provide opportunities for feedback and re-

flection. Well-designed NPCs, coupled with meaningful choice design, can transform player inputs into actionable data storytelling. Future work involves more deeply exploring the digital narrative literature (such as [43], especially the ways that narrative can impact motivational and behavioral aspects of players. It would also be worthwhile to seek out or develop a taxonomy of narratives that could be used for LA and DS contexts.

An immediately actionable next step that can be taken is continued analysis of the ways that the functions of data storytelling and NPCs overlap with each other, followed by consideration of how the two disciplines might work together to build types of data storytelling that are highly impactful in their own way.

Ambitious designers of data storytelling might even start building some early prototypes. For interdisciplinary practitioners of data storytelling and narrative design in digital games, the frontier of possibilities is vast.

5. Conclusion

The narrative potential of digital games provides a unique opportunity to complement data storytelling and learning analytics. Whether it be considerations of characters or choices, narrative design in games is a space worth exploring as a means of augmenting our work in delivering meaningful learner insights. This paper has offered a preliminary demonstration of how these storytelling elements may inform feedback, provide opportunities for feedback, or prompt reflection by way of non-player characters. These NPCs serve many of the same functions as visualizations in data storytelling. Although they are not “visualizing” the data in a typical sense, through their "narrativization" they have the potential to reflect similar information about learners by way of dialogue, emotive reactions, and player interactions.

This paper offered an analysis of a single element of game narrative while also presenting some potential barriers to the cost or scalability of this solution, yet we encourage researchers and designers to press onward into finding out more about how game narrative can complement data storytelling. The authors invite readers to continue to explore the space of game narrative as well as other disciplines to improve the effectiveness of learning analytics systems and data storytelling.

References

[1] SoLAR, What is Learning Analytics?, 2023. URL: https://www.solaresearch.org/about/what-is-learning-analytics/.

[2] G. Siemens, Learning analytics: The emergence of a discipline, American Behavioral Scientist 57 (2013) 1380–1400. Publisher: Sage Publications Sage CA: Los Angeles, CA.

[3] A. F. Wise, Designing pedagogical interventions to support student use of learning analytics, in: Proceedings of the fourth international conference on learning analytics and knowledge, 2014, pp. 203–211.

[4] S. Z. Salas-Pilco, K. Xiao, X. Hu, Artificial intelligence and learning analytics in teacher education: A systematic review, Education Sciences 12 (2022) 569. URL: https://www.

mdpi.com/2227-7102/12/8/569. doi:10.3390/educsci12080569, number: 8 Publisher: Multidisciplinary Digital Publishing Institute.

[5] R. Kaliisa, A. I. Mørch, A. Kluge, 'My point of departure for analytics is extreme skepticism': Implications derived from an investigation of university teachers' learning analytics perspectives and design practices, Technology, Knowledge and Learning 27 (2022) 505–527. URL: https://doi.org/10.1007/s10758-020-09488-w. doi:10.1007/s10758-020-09488-w.

[6] C. Herodotou, B. Rienties, A. Boroowa, Z. Zdrahal, M. Hlosta, A large-scale implementation of predictive learning analytics in higher education: the teachers' role and perspective, Educational Technology Research and Development 67 (2019) 1273–1306. URL: https://doi.org/10.1007/s11423-019-09685-0. doi:10.1007/s11423-019-09685-0.

[7] L. Corrin, P. De Barba, Exploring students' interpretation of feedback delivered through learning analytics dashboards, Dunedin, NZ, 2014, pp. 629–633. URL: http://ascilite.org/conferences/dunedin2014/,http://ascilite.org/conferences/dunedin2014/proceedings/index.html.

[8] R. Bodily, K. Verbert, Review of research on student-facing learning analytics dashboards and educational recommender systems, IEEE Transactions on Learning Technologies 10 (2017) 405–418. URL: https://ieeexplore.ieee.org/abstract/document/8010828?casa_token=xHMuCU61iwwAAAAA:u5fJXGLByGAtc479Z9Nd4wtYL-uSNVRa18r7CLoO-VxGIzAzfUpsNf5oam2-PwRUgJCn3BKIelM. doi:10.1109/TLT.2017.2740172, conference Name: IEEE Transactions on Learning Technologies.

[9] B. Lee, N. H. Riche, P. Isenberg, S. Carpendale, More than telling a story: Transforming data into visually shared stories, IEEE Computer Graphics and Applications 35 (2015) 84–90. URL: http://ieeexplore.ieee.org/document/7274435/. doi:10.1109/MCG.2015.99.

[10] V. Echeverria, R. Martinez-Maldonado, R. Granda, K. Chiluiza, C. Conati, S. Buckingham Shum, Driving data storytelling from learning design, in: Proceedings of the 8th International Conference on Learning Analytics and Knowledge, LAK '18, Association for Computing Machinery, New York, NY, USA, 2018, pp. 131–140. URL: https://dl.acm.org/doi/10.1145/3170358.3170380. doi:10.1145/3170358.3170380.

[11] R. Martinez-Maldonado, V. Echeverria, G. Fernandez Nieto, S. Buckingham Shum, From data to insights: A layered storytelling approach for multimodal learning analytics, in: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, ACM, Honolulu HI USA, 2020, pp. 1–15. URL: https://dl.acm.org/doi/10.1145/3313831.3376148. doi:10.1145/3313831.3376148.

[12] G. M. Fernandez-Nieto, V. Echeverria, S. B. Shum, K. Mangaroska, K. Kitto, E. Palominos, C. Axisa, R. Martinez-Maldonado, Storytelling with learner data: Guiding student reflection on multimodal team data, IEEE Transactions on Learning Technologies 14 (2021) 695–708. URL: https://ieeexplore.ieee.org/abstract/document/9632388/, publisher: IEEE.

[13] H. Nicklin, Writing for games: Theory and practice, CRC Press, 2022. Google-Books-ID: KYVlEAAAQBAJ.

[14] D. Herman, Story logic: problems and possibilities of narrative, Frontiers of narrative, University of Nebraska Press, Lincoln, 2002. URL: http://catdir.loc.gov/catdir/enhancements/fy0709/2001043074-b.html, oCLC: 47623902.

[15] T. Dubbelman, Narrative game mechanics, in: F. Nack, A. S. Gordon (Eds.), Interactive

Storytelling, Lecture Notes in Computer Science, Springer International Publishing, Cham, 2016, pp. 39–50. doi:10.1007/978-3-319-48279-8_4.
[16] J. Murray, Hamlet on the Holodeck, MIT Press, 1997. URL: https://mitpress.mit.edu/9780262631877/hamlet-on-the-holodeck/.
[17] K. Salen, E. Zimmerman, Rules of play : game design fundamentals - New York University, 2004. URL: https://bobcat.library.nyu.edu/primo-explore/fulldisplay/nyu_aleph005068465/NYU.
[18] J. Brenneman, Aligning game narrative and learning outcomes, in: Meaningful Play 2022 Conference Proceedings, Michigan State University, 2022.
[19] B. Suter, R. Bauer, M. Kocher, Narrative mechanics: Strategies and meanings in games and real life, De Gruyter, Bielefeld, GERMANY, 2021. URL: http://ebookcentral.proquest.com/lib/nyulibrary-ebooks/detail.action?docID=6750315.
[20] Nintendo, Super Mario, 1983.
[21] Blizzard, World of Warcraft, 2004.
[22] Larian Studios, Baldur's Gate 3, 2023.
[23] E. Short, NPC characterization, 2003. URL: http://emshort.home.mindspring.com/NPC4.htm.
[24] C. Fernandez-Vara, Taxonomy of narrative choices, 2019. URL: https://clarafv.itch.io/taxonomy-of-narrative-choices.
[25] M. D. Dickey, Aesthetics and design for game-based learning, Digital games and learning, Routledge, Taylor & Francis Group, New York, 2015. OCLC: 886491934.
[26] G. Stahl, T. Koschmann, D. Suthers, Computer-supported collaborative learning, in: R. Sawyer (Ed.), The Cambridge handbook of the learning sciences, Cambridge University Press, 2014, pp. 479–500. doi:10.1017/CBO9781139519526.029.
[27] L. S. Vygotsky, Mind in society: Development of higher psychological processes, Harvard University Press, 1978. URL: https://www.jstor.org/stable/j.ctvjf9vz4. doi:10.2307/j.ctvjf9vz4.
[28] A. Baker, P. Jensen, D. Kolb, Conversation as experiential learning, Management Learning 36 (2005) 411–427. doi:10.1177/1350507605058130.
[29] C. Steinkuehler, Y. Oh, Apprenticeship in massively multiplayer online games, in: Games, learning, and society: Learning and meaning in the digital age, Cambridge University Press, 2012, pp. 154–184. doi:10.1017/CBO9781139031127.016, journal Abbreviation: Games, Learning, and Society: Learning and Meaning in the Digital Age.
[30] K. Verbert, X. Ochoa, R. De Croon, R. A. Dourado, T. De Laet, Learning analytics dashboards: the past, the present and the future, in: Proceedings of the Tenth International Conference on Learning Analytics & Knowledge, ACM, Frankfurt Germany, 2020, pp. 35–40. URL: https://dl.acm.org/doi/10.1145/3375462.3375504. doi:10.1145/3375462.3375504.
[31] Y. Dimitriadis, R. Martínez-Maldonado, K. Wiley, Human-centered design principles for actionable learning analytics, in: T. Tsiatsos, S. Demetriadis, A. Mikropoulos, V. Dagdilelis (Eds.), Research on e-learning and ICT in education: Technological, pedagogical and instructional perspectives, Springer International Publishing, Cham, 2021, pp. 277–296. URL: https://doi.org/10.1007/978-3-030-64363-8_15. doi:10.1007/978-3-030-64363-8_15.
[32] C. Moore, Scenario based training example: Connect with Haji Kamal, 2010. URL: https://blog.cathy-moore.com/elearning-example-branching-scenario/, section: Elearning

examples.
[33] M. Mateas, A. Stern, Façade, 2005. URL: https://collection.eliterature.org/2/works/mateas_facade.html.
[34] P. Long, G. Siemens, Penetrating the fog: Analytics in learning and education, EDUCAUSE Review 46 (2011) 30–40. URL: https://er.educause.edu/articles/2011/9/penetrating-the-fog-analytics-in-learning-and-education.
[35] R. Ferguson, Learning analytics: drivers, developments and challenges, International Journal of Technology Enhanced Learning 4 (2012) 304. URL: http://www.inderscience.com/link.php?id=51816. doi:10.1504/IJTEL.2012.051816.
[36] A. F. Wise, J. P. Sarmiento, M. Boothe Jr., Subversive learning analytics, in: LAK21: 11th International Learning Analytics and Knowledge Conference, ACM, Irvine CA USA, 2021, pp. 639–645. URL: https://dl.acm.org/doi/10.1145/3448139.3448210. doi:10.1145/3448139.3448210.
[37] D. Tzimas, S. Demetriadis, Ethical issues in learning analytics: a review of the field, Educational Technology Research and Development 69 (2021) 1101–1133. URL: https://doi.org/10.1007/s11423-021-09977-4. doi:10.1007/s11423-021-09977-4.
[38] D. Clow, The learning analytics cycle: Closing the loop effectively, ACM International Conference Proceeding Series (2012). doi:10.1145/2330601.2330636.
[39] E. Gould, Court mistake reveals how much Sony's first-party games like Last of Us 2 costs, 2023. URL: https://www.techradar.com/gaming/playstation/the-cost-of-the-last-of-us-2-has-just-been-revealed-and-its-way-more-than-you-think.
[40] J. Mirabello, How long does it take to make an indie game?, 2023. URL: https://www.gamedeveloper.com/business/how-long-does-it-take-to-make-an-indie-game-.
[41] J. Kirriemuir, Use of computer and video games in the classroom (2003). URL: https://www.academia.edu/8834580/Use_of_Computer_and_Video_Games_in_the_Classroom.
[42] J. L. Plass, R. E. Mayer, B. D. Homer, Handbook of game-based learning, MIT Press, Cambridge, UNITED STATES, 2020. URL: http://ebookcentral.proquest.com/lib/nyulibrary-ebooks/detail.action?docID=6018189.
[43] H. Koenitz, Towards a specific theory of interactive digital narrative, in: Interactive digital narrative, Routledge, 2015, pp. 91–105. doi:10.4324/9781315769189-8.