

Youth Identity Enactments through Storytelling during Co-design of an Educational Virtual Game World

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Abstract: This paper examines youth storytelling during co-design of an identity-expressive educational game for learning data science. Using interaction analysis of co-design interviews with middle school students, we explore how storytelling allows participants to (a) use existing game elements to position themselves and (b) express their interests and identities through imagined game futures. We argue that analyzing youth's interactive storytelling and identity enactments during co-design can inform the development of game narratives that represent diverse youth. Our findings contribute to the design of inclusive virtual worlds for STEM learning that celebrate youth identities and experiences. We discuss implications for engaging youth voices in the co-design process and creating educational games that resonate with diverse learners.

Purpose

Video games are important contexts for inclusive STEM learning, allowing players to explore and enact identities (Gaydos & Devane, 2019; Gee, 2014). However, designing educational games that connect to diverse players' lives and identities is a significant challenge. Our project employs youth co-design to create "The Isles of Ilkmaar," a virtual world that supports identity-expressive data science learning among diverse youth, particularly gender-expansive youth, cis-girls, and youth of color. In this paper, we explore storytelling as a method for engaging diverse youth in co-design. An initial analysis showed how storytelling within co-design activates youth expertise and imaginations, facilitating a transition from game players to game designers (Radke, et al., 2023). We now look more closely at storytelling episodes to understand youth's shifting positionalities within the co-design context, illustrating how storytelling allows youth to (a) refer to and take up existing game elements as resources for positioning themselves as designers and (b) author and animate imagined new game futures in which they can projectively identify (Gee, 2014) with the player character. By analyzing youth narratives through the lens of positioning, we aim to understand how youth contributions to co-design arise from and reflect the dual positionalities of game designer and future player, contributing to the understanding of how to design educational games that connect to diverse players' lives and identities.

Storytelling and identity in game worlds

We view learning as embedded in sociocultural contexts (Lave & Wenger, 1991), involving shifts in participation and engagement in a community's values, discourse, and tools. To understand how youths' identities and interests are enacted in co-design, we attend to how they recruit and adapt semiotic resources to co-create knowledge with others. We conceptualize identity as dynamic enactments (Gee, 2000) and focus on the relationship between a player and their avatar, which Gee (2014) describes as a projective identity. Gee (2014) argues that video games "create a double-sided stance towards the world (virtual or real) in terms of which we humans see the world simultaneously as a project imposed on us and as a site onto which we can actively project our desires, values, and goals," (p. 94). We aim to identify narrative elements that enable marginalized youth to *project* themselves into the game world - looking to stories, and storytelling, as situated constructions (Young et al., 2015) that create opportunities of agency for marginalized voices (Uğraş et al., 2022). In bringing storytelling to co-design of an educational virtual game world, we join others in the game design field who have sought to engage youth as essential co-designers and content creators (e.g., Benton et al., 2014; Giri, N. 2020; McRoberts, et al., 2019), and aim to contribute to approaches to co-design of inclusive game narratives that represent diverse youth stories, motivations, identities, and interests (Benton et al., 2014).

Methods

We conducted 23 co-design sessions over Zoom with 13 youth participants (ages 10-14) to design "The Isles of Ilkmaar." Participants played initial game versions, explored the game world, and engaged in a mini-game called The Potion Clinic. We prompted youth to tell backstories about the player and creature sickness. We reviewed all recorded sessions, cataloging storytelling moments, and selected two storytelling episodes in which youth told

stories about their chosen avatars, one prompted and one voluntary, for analysis. The first with Beatrix (Latina, female-identifying, 11-year-old) and another with twins Denise and Hannah (white, female-identifying, 11-year-olds). Sessions were audio and video recorded, and participants completed surveys about graphics, art, story, and gaming interests.

We used microanalytic methods of interaction analysis (Goodwin, 2007a; Jordan & Henderson, 1995) to trace talk and action within youth storytelling episodes. To analyze how youth's positionalities shifted during storytelling, we focused on youth's *production formats* of *author* and *animator* (Goffman, 1981) to track shifts in *footing* or the alignment of speakers to themselves and to others present (Goffman, 1981) as well as the recruitment and deployment of story and game features (e.g., avatars and creature sickness) as *substrates* for *co-operative action* (Goodwin, 2017). Together these theories supported an analysis of how youth used these talk and action as well as game components as resources to imagine future design possibilities and enact identities as imagined future players and/or designers.

Findings

Dynamic enactment of identities in response to design constraints

In this episode, we examine how Beatrix engaged in storytelling during her second playtesting interview. After exploring the game world, the researcher asked Beatrix about her game preferences, and Beatrix responded by expressing her interest in games that allow players to create their own characters and origin stories:

[1] Beatrix: ((Moves avatar out of the potion room while responding)) I like the ones where you get to like. Make your own origin story, and you get to like design, your character. And if it's going to be like chaotic or good, or stuff like that."

The researcher then prompted Beatrix to create a piece of an origin story for her current avatar. In response [2], Beatrix temporarily stopped playing and used her mouse to circle the avatar on the screen, indicating a shift in footing from player to designer:

[2] Beatrix: Well, um, ((Stops playing)) I feel like this person ((Uses mouse to circle the avatar on the screen)) would have come from the future because of the boots and the like ((Beatrix makes small circles around the arm bands of the avatar)), the things, the pieces on the arms. So maybe it came from the future or a far land, and it wanted to see what life was like here, or something like that, ((Returns to gameplay, scanning another creature for a few seconds, then stops again and uses mouse to point at the avatar again as she continues her story)) but I feel it would have something to do with like them, being from well, them ((Resumes play)) not being from this town or from this time?

Beatrix authors a story about the avatar coming from the future or a faraway land, basing her narrative on the avatar's accessories [2]. As the episode continues, the researcher asks Beatrix to imagine herself as the avatar and consider what the character might want to do in the game world. Beatrix responds by suggesting that the avatar would enjoy exploring and building their own shop or business, where he could trade with other players and creatures [3]. This idea aligns with Beatrix's previously expressed interest in having a personal house or shop in the game, as indicated in her earlier interview and survey responses:

[3] Beatrix: ((Stops playing as she begins to respond)) I feel like they would also like to explore and then build like their own little shop ((Wiggled mouse off to the side in the black area of her screen)), where they can trade with other players and other creatures. Or they could build, like, their own business, whether it's like a fishing business. Another clinic, or something like that. I feel like that's what they would want. ((Resumes play))

Across this episode, Beatrix's actions and responses demonstrate her enactment of designer and imagined future player identities. As a player, she expressed interest in designing her character's traits. When asked to create an origin story, Beatrix shifted footing from player to designer, pausing gameplay and using the avatar's art as a design constraint to create a background story that extends the narrative and is coherent with the existing art. Her mouse movements in the black part of the screen index her ideas about the avatar's possible future activity, further evidence of her designer identity enactment [3]. When prompted to imagine herself as the avatar, Beatrix's response about player shops connects her gameplay interests to those of the imagined character. Her reference to "other players" and mouse gestures pointing to yet-to-exist game world areas while imagining player-owned shops and businesses show her shifting footing into an imagined future player position. That is, she extended the

narrative in a way that was not constrained by the existing art but instead, we infer, aligned with how she wants to play the game. This moment highlights how the imagined future player positioning supports the expression of her gameplay interests, in contrast to her avatar origin story, which did not correspond to this identity enactment.

Game player choice and identities expressed through a co-operatively built narrative

In this episode, siblings Denise and Hannah engaged in collaborative storytelling during their first co-design interview. After exploring the game world, the researcher prompted them to share a story about why the creatures are sick. The siblings paused their play, indicating a shift from player to designer.

[1] Denise: All right. So I'm thinking, maybe like there's a witch that put a curse over the land. And so like, everybody's getting sick except for you. Cause like, you're a human like, that's a rare race. So basically like, I guess so, which doesn't know that you exist, or something like, basically, the land is like going under disease. And so like you could travel across the land to defeat the witch, and then everybody would not get sick OR like, you could just stay here and make, basically get more money and stuff.

[2] Hannah: ((While sibling shares, Denise continues to pause their play)) Or like there could be this weird disease in the land, because, like, maybe, the islands are kind of have, like the special magic that's connecting them. ((Denise shifts their body toward sibling, whispers ohh)) And that magic is dying and the creatures are connected to the magic, and that's why they're getting sick. ((Denise whispers oh and leans head back)) So either you help heal the Islands and the people. OR you go to the source that's destroying the magic and defeat it. [3]

Denise authored a story in which a witch's curse is causing disease [1]. In her story she recruited the game's sick creatures as a substrate which she builds upon with her new narrative. She proposed divergent gameplay possibilities, suggesting that the player could either travel to defeat the witch or stay and earn money. Denise's use of both character-oriented and player-oriented "you" pronouns indicates her enactment of an imagined future player role while sharing her story. Hannah co-operatively built upon Denise's disease narrative, connecting the disease to a dying magic that connects the islands and creatures [2]. Like Denise, Hannah authored multiple play possibilities for imagined future players, maintaining healing or stopping the disease as central to both choices. Subsequently, the siblings constructed an origin story for their avatars as time travelers, creating a story coherent with the avatar art, like Beatrix. They co-operatively develop the story, with Denise shifting from "they" pronouns as a designer [3] to "you" and Hannah's use of "we" pronouns as imagined future players:

[3] Denise: They traveled for time ((Holds arms up)), and they can't fix like. And their time machine got broken. So what they have to do is like basically go across the land and like, try to fix it. You can make friends who will give you parts and stuff like that.

[4] Hannah: Or like we could do this thing ((Brings their avatar to join Denise's avatar in the potion room)) where we were like in the future. Right now. The world is very, very sick, ((Denise resumes play)) and it's about to collapse so like there's like this person that we trust very well, and they're like YOU SHOULD GO BACK IN TIME ((Denise smiles)) and fix this thing before it ever happened. So they send us back in time, and the time machine breaks.

Across these turns [3 & 4], again, Denise and Hannah's narrative construction expressed various possible game motivations and activities, such as defeating enemies, earning money, and healing creatures and lands. The siblings' shifts in positioning from designer to imagined future player were evident in their pronoun usage and game play (bringing theory avatars together in the potion room [4]) as they recruited narrative and game features as substrates for co-operative storytelling. By enacting these roles in relation to the co-operatively constructed disease narrative, the siblings asserted their epistemic design authority of multiple pathways of play choice and the expression of their interests.

Discussion and significance

Our analysis reveals that youth enacted player and designer identities during storytelling in co-design interviews. Their shifts in positioning supported different contributions to co-design. We interpreted youth authoring of stories constrained by existing game elements as design work that may or may not express their own interests. In contrast, we viewed their enactments of imagined future players as a projective identity enactment (Gee, 2014) that allowed

them to more freely express their interests as part of game design. For instance, Beatrix's engagement illustrated how, during co-design, participants dynamically take on roles of player and designer in ways that are responsive to tensions between predefined game elements and players' personal interests. Denise and Hannah demonstrated narrative construction was a co-operative process, with each sibling recruiting parts of the other's stories as substrates for building game stories that created opportunities for them to identify with the player character, and imagine making decisions or taking action that aligned with their identities and interests. This sheds light on how co-operative storytelling can open space during co-design for multiple player identities.

Distinguishing between identity enactments is important for designing identity-expressive educational games, as it helps identify game design ideas that are likely to engage youth identities. Our analysis reaffirms storytelling as a promising co-design method for fostering identity-expressive and engaging game environments by empowering youth to author and animate their own game futures. It also reveals how existing designs can both enable and constrain the stories youth tell and how youth deploy shifting identity enactments to navigate those designs. By allowing youth to project their identities and interests into virtual environments during co-design, storytelling can be used to design and build inclusive, engaging, and identity-expressive learning environments for diverse youth populations.

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