International Society of the Learning Sciences

Exploration as Relationship: An Axiological Shift For Native Youths' Relationships With Digital Storytelling Technologies

Chasity Mayo, Breanne K. Litts, Dallas Haws, Christina Morgan, Tifiny Mills
Chasity.mayo@usu.edu, Breanne.litts@usu.edu, Dallas.haws@usu.edu, christina.morgan@usu.edu, Tifiny.mills@usu.edu
Utah State University

Eileen Quintana, Analysa Allison, Natalie Billie, Shoshana Begay
eileen.quintana@nebo.edu, shoshana.begay@nebo.edu, analysa.allison@nebo.edu, natalie.billie@nebo.edu
Nebo Title VI American Indian Education Program

Abstract: Across sociotechnical learning environments, such as with digital storytelling, Native youth often navigate histories of harm in their relationship with technologies, especially as they begin to develop a personal relationship with these tools. In this paper, we look at Native youths' explorations with digital technologies as a core tenet of relationship building. We view exploration as *a space between,* specifically in regard to how Native youth self-determine and (re)shape their relational configurations with using digital storytelling technologies to represent their ideas and their community. We examined 17 Native youths' initial engagements with digital technologies to understand how they begin to develop relationships with digital technologies through exploration. Findings provide evidence that Native youth explore digital technologies across technical and contextual configurations. Insights from this study expand our understanding of how Native youth explore the *space between* configurations of their ideas and their community as they develop digital storytelling projects.

Objectives

Indigenous communities in the United States have a complex relationship with digital technologies, often because these technologies dismiss their cultural, technological, and rhetorical sovereignties (Morgan et al., 2025; Winter & Boudreau, 2018). This is done through gatekeeping and blackboxing knowledge, withholding and limiting decision-making power, and developing and distributing both software and hardware that unreciprocates what it takes from the land (Morgan et al., 2025, Litts et al., 2021). Digital technologies are designed artifacts, meaning that they are imbued with the values of the dominant culture in which they are designed (Benjamin, 2019) and oftentimes ascribe to Western views of time and relationship. Thus, technologies are both a process and a product of culture (Bang et al., 2013) and have both produced and reinforced harmful stereotypes of Native Americans. These harms extend into data misrepresentation and abuse, access-related issues, and exclusion (Dalton, 2002; Drabiak-Syed, 2010). In community research with Indigenous youth, it is important to be aware of these harms and consider the ways in which Native youth relate to and interact with digital technologies, particularly in the context of learning.

One way that scholars have examined and considered Native youths' relationship to digital technologies is through the practice of storytelling. Both Indigenous and non-Indigenous scholars working with Indigenous communities advocate for the integration of Indigenous practices and knowledges, such as storytelling, into educational contexts. The practices of storytelling are vital for cultural sustainment and revitalization, as stories both shape and are shaped by Native youth (McCarty & Lee, 2014). Storytelling is a sacred and intimate practice and the stories shared carry values and histories (Archibald, 2008). Within digital storytelling, there is a desire to support Native youth's self-determination in terms of who, how, and what stories are told (Litts et al., 2025). Storytelling is also an enactment of sovereignty, self-determination, and self-education (Brayboy, 2005) and is an abundant source of healing that promotes the well-being and self-determination of Native youth, especially as they (re)story historical and ancestral narratives about their communities (Litts et al., 2025).

Guided by the significance of stories, we examined how youth explore in relation to digital storytelling and digital technologies. We conceptualize exploration as a relational configuration of the space between *ideas* and space between *people* (Tuck, 2009). From this frame, Native youth explore the *space between* creating and sharing stories with digital technology as a relational configuration with their ideas and with their community. In this study, we are guided by the research question: *How does exploration support Native youths' relationship with digital storytelling technologies?* Specifically, we look at two dimensions of exploration — technical explorations and contextual explorations. Technical explorations constitute the ways that Native youth explore the specific

 © ISLS

affordances of digital storytelling technologies. We devise technical explorations into three categories — time, sound, and visuals — and examine how these serve as the foundation for establishing a wholistically connected relationship. Contextual explorations refer to where the explorations took place and how the context, such as what cultural activity youth were participating in or the land on which the workshop took place, was directly connected to the stories that Native youth explored. Contextual explorations also showcase how Native youth made their care for their community, their culture, and the land visible through storytelling. The contribution of this work is to invite an axiological shift toward viewing exploration as a tenet of building relationships, particularly those that Native youth build with digital technologies and simultaneously with their community, their culture, and the land.

Theoretical framework

The space between

Our theoretical framework looks at exploration as the *space between ideas* and the *space between people* (Tuck, 2009). This space between ideas and people (Tuck, 2009) guides our understanding of exploration as a relational configuration. In our study, we operationalize this configuration as how Native youth explore and self-determine their relationship with using digital storytelling technologies to represent their ideas and their community. This framing helps us follow the two configurations (ideas and people) that Tuck (2009) identifies as core to understanding Indigenous frames of relationship.

To extend these conceptualizations of *the space between,* we draw on two established theoretical threads to frame the importance of exploration for relationship: liminal space (Hogue, 2019) and third space (Bang, 2010; Gutierrez et al., 1995; Gutierrez et al., 1997). Hogue (2019) applies the concept of liminal spaces to STEM education for Indigenous youth by sharing that liminal spaces are places where "we can communicate about and accept different ways of knowing, learning, and being" (Hogue, 2019, p. 2). Instead of using liminality to refer to a physical learning environment, we draw on liminal spaces to capture the essence of being in transformation. Liminality reflects the transitional elements of exploration, where you are transitioning through different phases of an idea as you refine and craft a vision. The third space is a similar concept, discussed by Bang (2010) and Gutierrez and colleagues (1996; 1997). In the learning sciences literature, the third space acts as a place where "alternative and competing discourse and positionings transform conflict and difference into rich zones of collaboration and learning" (Bang, 2010, p. 7). Here we pull at the theoretical threads of the third space to reflect how the tensions that exist because of the complex history underlying digital technologies can be transformed into opportunity for Native youth. To summarize, *the space between* people and ideas acts as both a liminal space and a third space, as they shift us epistemologically toward regeneration and change. In this sense, the spaces between people and ideas are not viewed as gaps or deficits, but instead are spaces where new relationships and ways of being are possible (Tuck, 2009).

Methods

Project context

Our team of educators, artists, designers, and researchers follow a community-driven design research process (Quayle et al., 2023) where community partners guide the goals and outputs of our collective work. This work happens in the context of an established Native Education program that includes regular afterschool workshops throughout the school year, field experiences to nearby cultural sites, and an annual month-long summer camp. Through our community-driven process, we worked as a team to identify opportunities to support youth engagement with cultural learning and explore ways to integrate technology in the program's existing structures and rhythms. In our exploration of technology integration, youth received iPad Pros equipped with various digital media software to support digital art, animation, and media creation. These softwares included Procreate, iMovie, and 3D Lidar scanning.

Data collection and analysis

In this paper, we examined data across the Native Education program from June 2024 to February 2025. This includes data from 17 Native youth participants who consented and assented to participate in the research. Specifically, we focus on each youths' earliest explorations with the technologies, which correlate to their first or second attendance at workshops. This resulted in 20 engagements of exploration across this study. Data are the creations and stories that were explored during the workshops, which included Procreate animations, Procreate drawings, iMovie snippets, and hand-drawn storyboards.

In analysis, our team completed first cycle thematic coding (Saldana, 2011) focused on identifying the *space between* ideas to understand youths' first encounters. Many of youths' first encounters were centered around understanding the technical capabilities of the digital storytelling technologies. As such, we identified three configurations of technical explorations through analysis: with time, with visuals, and with sound. In the second round of analysis, we looked across these technical explorations to examine how youth were also exploring the *space between* people by considering the broader cultural and community contexts in which they happened. These configurations were discussed across members of the team to establish resonance (Medico & Santiago-Delefosse, 2014) in our interpretations.

Findings

Technical explorations

We identified three configurations of technical explorations: with time, with visuals, and with sound. These refer to the ways that Native youth explored the specific affordances of digital technologies. The range of software Native youth explored offered different affordances (i.e., iMovie affords audio and sound effects and Procreate affords visual changes through brush texture, color, and size.), which provided youth a wide landscape for technical exploration. *Explorations with time* included youth participants experimenting with medium elements such as slow motion, stop motion, and the frames per second. For example, one youth participant, Madelyn (age 8 at time of data collection), demonstrated exploring with time by experimenting with slow-motion features in iMovie to capture the bushes and rocks in a local landscape. In another example, a youth participant, Ted (age 10 at time of data collection) demonstrated exploring through time by experimenting with the frames per second in Procreate to create flashing effects in their animations. *Explorations with visuals* included youth participants experimenting with colors, brush textures and sizes, stacking video effects and filters, and leveraging artistic principles, such as perspective and composition. Many youth experimented with visuals by iteratively erasing and recreating drawings that ranged from detailed to doodling and scribbling, and even practicing cursive. For example, Jane (age 8 at time of data collection) compiled multiple rainbow colored splattered and airbrushed doodles into a Procreate animation; the doodles are made with various brush textures. In another example, Ruby (age 6 at data collection) used a rainbow of colors in a Procreate animation to signify the colors captured within a sunset. *Explorations with sound* included the use of voiceovers, imported music, and sound effects to convey specific informational or emotional aspects of stories. These experimentations mostly took place within iMovie. For instance, one youth participant, Joseph (age 12 at time of data collection), imported the song "Electric Pow Wow Drum" by The Halluci Nation to use as background music for videos taken at a community Powwow. In another example, a youth participant, Raya (age 11 at time of data collection), narrated her own story by adding informational voiceovers to her hand drawn images and videos. These technical explorations are where Native youth built their own understandings of the specific capabilities of these digital storytelling technologies and how these technologies can tell specific aspects of their stories in lesser or greater detail.

Contextual explorations

In our analysis of how youth explored the *space between people,* we identified three configurations of contextual explorations through which youth explored relationships: with their community, with their culture, and with the land. These contextual explorations highlight the importance of recognizing how the process of storytelling is shaped by the physical, educational, and/or cultural environment in which the technical explorations took place. For example, two youth Hannah and Aaliyah (both age 12 at time of data collection) explored their *relationship with their community* by conducting interviews with peers and community members to create a video on how to survive middle school. In another example, Madelyn (age 7 at time of data collection) explored her *relationship with her culture* by capturing rock art during a land-based field experience during which she learned from Tribal Knowledge Holders about the cultural significance of the rock art and how this art connects to her own ancestors. As a last example, Aaliyah (age 12 at time of data collection) explored her *relationship with the land* by taking a series of photographs of the sky, the local river, the surrounding mountains, and blooming flowers during a land-based field experience focused on water. She connected these photographs with a Diné (Navajo) poem about walking in beauty. Collectively, these three relational configurations demonstrate how youth explored the space between people through their initial engagements with technology.

Conclusion

Since digital technologies function as a process and product of the dominant culture, they have historically caused harm to Native communities (Winter & Boudreau, 2018). These harms include the dismissal of their sovereignties,

data abuse and misrepresentation, withholding and limiting knowledge-making power, and more (Bang et al., 2013; Benjamin, 2019; Dalton, 2002; Drabiak-Syed, 2010; Morgan et al., 2025). It is important to acknowledge these harms and complexities when using digital technologies for storytelling with Native youth (Litts et al., 2021). In this paper, we pose exploration as a core tenet of relationship that helps support Native youths' wholistic connections with digital storytelling technologies. We pull on the ideas of liminal space and third space to frame the *space between*, where we expand on Tuck's (2009) work of relational configurations between people and ideas. We operationalize these configurations to look at how Native youth explore and (re)shape their relationship with using digital storytelling technologies to represent their ideas and their community. Our findings contribute nuance to *the space between* with two relational configurations: technical explorations and contextual explorations. As Native youth engaged with technical exploration, they simultaneously deepened their contextual explorations as being in relation with their community, their culture, and the land. This is because technical explorations took place within contextual explorations, which means that Native youth were interacting with their community members, exploring the land, and/or participating in cultural activities whilst simultaneously learning about the affordances of the digital storytelling technologies.

Our findings further two insights: the importance of context for digital storytelling practices and the importance of exploration for (re)shaping relationships with digital technologies. While technical explorations are important to the sovereign relationships Native youth build with technology (Winter & Boudreau, 2018), the contextual explorations further our understanding of the importance of grounding technical explorations in context. For example, field trips to a nearby mountain, which is a sacred piece of land, resulted in youth telling stories expressing how to preserve rock art. In another field trip to a local river, where we focused on technically exploring composition and perspective, youth told stories about how to walk in balance with nature and how to recognize the beauty all around you.

When considering how exploration supported youths' relationship with digital technologies, we found that exploration serves as an important space for Native youth to enact self-determination, which is also a core value of the Native Education program itself (Litts et al., 2025). In this study, Native youth showed us that exploration exists in synchrony with, and in some ways extends, the already established ways of being in their Native Education program. These ways of being are also theoretically extended through our understandings of liminality (Hogue, 1997) and the third space (Bang, 2010; Gutierrez et al., 1995; Gutierrez et al., 1997), which emphasize (a) reframing tensions and (b) practicing new ways of learning and communicating. As Native youth navigated learning new skills with the technology, they also practiced new ways of being in relation to digital technologies themselves. Thus, the conceptualizations of *the space between* shift our understanding of transitional elements of liminality. Instead of being viewed as deficits or gaps, these transitional spaces are where Native youth explore their ideas and (re)shape their relationships, especially those to digital technologies (Tuck, 2009). This insight contributes to our understanding of the design of sociotechnical learning environments with an invitation to consider these *in between* spaces as a significant element over the design process.

References

Archibald, J. A. (2008). Indigenous storywork: Educating the heart, mind, body, and spirit. Vancouver: UBC press.

Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity.

Bang, M., Medin, D., Washinawatok, K., & Chapman, S. (2010). Innovations in culturally based science education through partnerships and community. In New science of learning: Cognition, computers and collaboration in education(pp. 569-592). New York, NY: Springer New York.

Bang, M., Marin, A., Faber, L., & Suzukovich III, E. S. (2013). Repatriating indigenous technologies in an urban Indian community. *Urban Education*, *48*(5), 705-733.

Brayboy, B. M. J. (2005). Toward a tribal critical race theory in education. *The urban review*, *37*(5), 425-446.

Dalton, R. (2002). Tribe blasts 'exploitation' of blood samples. *Nature, 420*(6912), 111–111.

Drabiak-Syed, K. (2010). Lessons from Havasupai Tribe v. Arizona State University Board of Regents: Recognizing group, cultural, and dignitary harms as legitimate risks warranting integration into research practice. *Journal of Health & Biomedical Law, 6*, 175–225.

Gutierrez, K. D., Larson, J., & Kreuter, B. (1995). Cultural tensions in the scripted classroom: The value of the subjugated perspective. Urban education, 29(4), 410-442.

Gutiérrez, K. D., Baquedano-López, P., & Turner, M. G. (1997). Putting language back into language arts: When the radical middle meets the third space. Language arts, 74(5), 368-378.

Hogue, M. (2019, July). Two-Eyed Seeing for Both Ways Knowing: Using Digital Technology to Create Liminal Spaces for Indigenous STEM Success. In *Discussions on University Science Teaching: Proceedings of the Western Conference on Science Education* (Vol. 2, No. 1).

Litts, B. K., Searle, K. A., Brayboy, B. M., & Kafai, Y. B. (2021). Computing for all?: Examining critical biases in computational tools for learning. British Journal of Educational Technology, 52(2), 842-857.

Litts, B. K., Haws, D., Morgan, C., Quintana, E., Allison, A., & Mills, T. (2025). Self-Determined Storytelling: Native Youths' Digital Restorying Practices in an American Indian Education Summer Camp. In Rajala, A., Cortez, A., Hofmann, R., Jornet, A., Lotz-Sisitka, H., & Markauskaite, L. (Eds.), Proceedings of the 19th International Conference of the Learning Sciences - ICLS 2025 (pp. 1734-1738). International Society of the Learning Sciences.

McCarty, T., & Lee, T. (2014). Critical culturally sustaining/revitalizing pedagogy and Indigenous education sovereignty. *Harvard educational review*, *84*(1), 101-124.

Morgan, C., Litts, B. K., Tehee, M., Haws, D., & Brayboy, B. (2025). Honoring sovereignties through technology within indigenous community research partnerships. Journal of Computing in Higher Education, 1-17.

Quayle, K., Morgan, C., Litts, B. K., Yan, L., & Haws, D. (2023). Community-Driven Design: A Reorientation to Designing Tools for Learning With Communities. Proceedings of the 17th International Conference of the Learning Sciences-ICLS 2023, 1322–1325.

Saldana, J. (2011). *Fundamentals of qualitative research*. Oxford university press.

Tuck, E. (2009). Re-visioning action: Participatory action research and Indigenous theories of change. *The Urban Review*, *41*(1), 47-65.

Winter, J., & Boudreau, J. (2018). Supporting self-determined indigenous innovations: Rethinking the digital divide in Canada. Technology Innovation Management Review, 8(2).

Acknowledgments

We are thankful to the youth participants who chose to share their stories with us. We also express our gratitude to the CLASP Collaborative, who continues to offer intellectual, relational, and spiritual support for this work. This material is based, in part, upon work supported by the National Science Foundation under Grant No #1943630. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.