Guarded Hope: Opportunities and challenges in using interactive and AI-assisted filmmaking in educational research in South Africa

Sarah Van Borek
Postdoctoral Research Fellow, Faculty of Education, University of the Western Cape
Robert Sobukwe Road, Belville, 7535, Cape Town, South Africa
svanborek@uwc.ac.za

This paper is not from a study in Human-Computer Interactions (HCI) but emerged as having relevance to HCI discourses because of the integration of interactive computer technology with educational research activities and aims around social and environmental justice. Extending conventional discourses on HCI, this paper focuses on relationships of power, place, and participation to story-making and sharing technologies, and how this informs the social impact that technology can make. The paper conceives of a 'Guarded Hope' around tensions in a case study using interactive and AI-assisted filmmaking in participatory research with underrepresented Xhosa girls living in low-resource contexts in Khayelitsha, Cape Town, South Africa, to explore the risks they face collecting water, and the points of resiliency they draw on in their communities to navigate those risks. With the aim of moving towards hopefulness and overcoming guardedness, this paper offers recommendations to address some of the challenges identified.

Interactive film. Generative AI video. Participatory research methods. Educational research. South Africa.

1. INTRODUCTION

This paper is not from a study in Human-Computer Interactions (HCI) but emerged as having relevance to HCI discourses because of the integration of interactive computer technology with educational research activities and aims around social and environmental justice. This past year, I started working with interactive and AI-assisted filmmaking in participatory research with underrepresented Xhosa girls living in low-resource contexts in Khayelitsha, Cape Town, South Africa. While my expertise is in community-engaged creative research methodologies and filmmaking in Sub-Saharan Africa, this was my first time working with interactive film and AI-assisted filmmaking. I chose to work with these methods based on what I refer to as a kind of 'Guarded Hope'–hopeful that these tools would act as digital bridges to amplify the voices and stories of underrepresented populations, contexts, and issues, and guarded in my doubts that these tools were yet adequately equipped to do so with the necessary depth and breadth of local knowledge required, as well as the forms of respect and dignity needed to coincide with this. I emerged from the process of this pilot research-creation project with an even stronger guarded hope, whereby empirical and methodological evidence affirmed reasons to remain both hopeful and guarded for now. This paper seeks to reflect on this tension by sharing details of this pilot project as a case study, and leans into the desire for hopefulness to outweigh guardedness by offering recommendations for addressing the challenges outlined below.

2. POWER, PLACE AND PARTICIPATION

This paper extends conventional discourses on Human-Computer Interactions (HCI) because it focuses primarily on the relationships of power, place, and participation to story-making and sharing technologies, and how this informs the social impact that technology can make. While HCI scholarship is growing in its consideration for sustainability and development challenges (Sharma and Kumar, 2025), HCI institutions which truly seek to build, as per the BritCHI 2026 conference theme, 'Digital Bridges'–beyond regional exceptions such as AfriCHI–require greater efforts to truly centre the knowledge of underrepresented populations, including girls and women in the Global South, and to seriously consider whose knowledge is centered as part of defining impact (Irani et al., 2010). The case study herein detailed builds on an approach that Irani et al. (2010) define as "postcolonial computing...an alternative sensibility to the process of design and analysis...(that) asserts a series of questions and concerns inspired by the conditions of postcoloniality" (Irani et al., 2010, p.1) while

© Van Borek. Published by BCS Learning and Development Ltd.

"understanding how all design research and practice is culturally located and power laden" Irani et al., 2010, p. 2). This also aligns with Shaowen and Jeffrey Bardzell's (2010) proposed feminist HCI methodology, particularly because of: "an empathic relationship with research participants focused on understanding their experiences", "co-construction of the core research activities and goals", and "a commitment to methodology" (Bardzell and Bardzell, 2011, p. 682). Furthermore, the case study herein presented is consistent with Bidwell's (2016) conception of 'Decolonising HCI' in that it does not view Africa as a place of lack and a recipient of technology but rather as a creative designer in harnessing and shaping technology for change (Bidwell, 2016).

This paper reflects on a study called 'Steps to Water (Justice)' that began as a collaboration between me, a Postdoctoral Research Fellow with the Environmental Learning Research Centre (ELRC) in Rhodes University's Faculty of Education (South Africa) at the time, and a Cape Town-based non-profit organisation (NPO), Black Girls Rising (BGR). The pilot research output from our study, entitled *The Power Beneath Our Feet* (2026), is an interactive AI-assisted film directed by girl members (9-18 years) of BGR based in Khayelitsha, South Africa. The film explores the journeys of girls fetching water amid risk, poor water services, and climate stress, and highlights the points of resiliency they draw on in their communities to navigate these risks, to advance water and gender justice. Through a "choose-your-own-path" film, combined with first-person perspective nonlinear storytelling, we immerse audiences in girls' lived experiences while creating safe spaces for girl-led water solutions. The final film combines actual footage the girls filmed of each other collecting water in their communities, with AI-generated footage representing scenes that the girls scripted based on their lived experiences. The interactive film is hosted on Stornaway's interactive film authoring and hosting platform. The AI footage was generated using Google Veo 3 through a free,1-year student subscription to Google AI Pro. The film is overdubbed in the local language of isiXhosa and subtitled in English, to keep it rooted in the communities from where the stories emerge.

The participatory interactive AI filmmaking methodology engaged girls in six workshops: community mapping, filming, interactive film storymapping, storyboarding, and two feedback sessions. Due to limitations to time, budget, hardware, and software, I handled the AI video prompting, video editing, and interactive film authoring based on the girls' storymaps, storyboards and feedback. This study continues, through my role as Postdoctoral Research Fellow with the University of the Western Cape's Faculty of Education, into a second phase of screening, dialogue and arts-based workshops and events to leverage the pilot film for its potential impact on water and gender justice. The next phase also involves scaling this methodology to girls collecting water in Zambia and Kenya to gauge its efficacy in the broader African context.

3. SOUTH AFRICA AND TECHNOLOGIES: A SUMMARY OF THE CONTEXT FOR THIS STUDY

As a middle-income country, South Africa boasts high-speed fibre internet and has an internationally renowned creative industry. However, South Africa struggles with ongoing political, environmental and socio-economic complexities, and continues to expose various communities to unreliable electricity and internet. Mobile phones are the primary means by which South Africans access technology, but internet is limited to people who can afford high data costs (Hawthorne and Grzybowski, 2024). There are some public Wi-Fi access initiatives, for example through public libraries, however, these are underequipped (Malekana and Chuma, 2025). AI is being rolled out across a diversity of sectors in South Africa, including for positive social change (Chilunjika, 2024), despite the risk of AI worsening inequalities and digital divides (Capraro, 2024), as well as contributing to AI data centers depleting water (Lei et al., 2025) given South Africa is a semi-arid and water insecure country (Olatoye and Fru, 2025).

4. HOPE IN OPPORTUNITIES

Interactive filmmaking was chosen with the hope that, as a method, it would allow us to explore the possibilities of nonlinear storytelling to expand the breadth and depth of lived experiences shared by developing branching scenarios, and to shift power relationships between filmmakers and audiences by engaging audiences in actively making choices as they watch the film and influencing how the story unfolds. This approach did precisely that. Through crafting branching scenario narratives, girls could weave together stories of real risks they face (e.g. kidnapping, physical and sexual assault, armed robbery, car accidents) with stories of ways they navigate those risks (herein referred to as 'resiliency practices'), for example, going to a friend, classmate, neighbour, family member, community centre, or local business as temporary safety. Audiences viewing the film are invited to navigate choices of moving towards 'Risk' or 'Resiliency', similar to how girls would in real life, with the choices authored in such a way that after a risk narrative, the audience will always have the choice to go back in time and choose resiliency instead, thereby underscoring the possibility of alternative actions

and futures. Engaging an audience in a group screening, where a facilitator asks audience members to raise their hands for their preferred choice, presents audiences with opportunities to experience a sense of agency and responsibility.

Incorporating AI-generated video was chosen with the hope that, as a method, it would enable us to audio-visually bring to life lived experience stories in an impactful way that would not otherwise be possible due to a lack of funds for dramatic filmmaking processes (e.g. using actors, sets, wardrobe, etc.), and due to safety risks posed by filming in areas where the stories take place. It would also allow us to adhere to good ethical practices when conducting research with minors where we do not show faces of actual girls, but rather fictional girls generated using AI. This approach indeed proved effective and valuable in doing so, with AI-generated footage enabling us to dramatise both risk and resiliency narratives in visually rich and emotionally impactful ways, thereby bringing our audiences closer to the lived experiences presented in the film.

5. GUARDEDNESS IN CHALLENGES

Interactive filmmaking was approached with some guardedness about who would get to design it, who would be able to watch it, and, therefore, who would be able to benefit from involvement in its creation and/or its presentation. As a first-time interactive filmmaker, I found the Stornaway interactive film authoring online software relatively user-friendly. Being browser-based, its users do not need desktop software and can build interactive films, including uploading videos, directly from their smartphones. However, it does require reliable electricity, and stable internet, including internet signal that is strong enough to upload video files and stream the film during playback of your work-in-progress. Furthermore, complex interface design settings are much more easily accessed using a larger screen from a laptop, desktop or tablet. While the interactive choice buttons that the audience interacts with can be made into any language by the film author, Stornaway's dashboard and editor require English language and computer keyboarding competencies. These requirements meant that interactive film authoring would not yet be feasible for many of the girls I was working with. To support that bridge, I developed a low-tech, offline, hands-on approach to interactive film storymapping, using paper, pencils and tape, to teach girls interactive film storymapping and to allow them to develop their nonlinear stories, including mapping how branching scenarios would link. These storymaps then guided me to do the technical aspect of interactive film authoring online. In terms of presenting or viewing the interactive film, because of our aims around social and environmental justice, we convened community screening events and workshops in venues with sufficient electricity and internet so that audience members did not require individual access to these.

AI-generated video was approached in a guarded way because, as a technology whose knowledge base is primarily driven by Western and colonial contexts (Theresa, 2024), we were concerned that the video materials generated would not only be insufficient for our storytelling needs but reinforce stereotypes of Africa, African peoples, and women and girls, and that would contradict with our study's main goals. The process immersed us in the very challenges we first anticipated, showing us that much work still needs to be done in this area to improve these technological tools' potential in the long run. In workshops screening the draft film to solicit participants' feedback on the AI-generated footage and video editing, participants identified inaccuracies and stereotypes with character faces, hairstyles, wardrobe, languages, accents, props, and locations. To name a few examples: dialogue of Xhosa (South African) people typically generated Nigerian or American English accents; unless described in great detail, clothing was stereotypically traditional, ethnic, and more typical of West African contexts; hairstyles were sometimes those better suited to European (fine, thin) hair, or by default all people in a scene were bald; and houses were sometimes mistakenly drawn from upper class suburbs. With much creative problem-solving, including proactive and prolific use of original, context-specific reference images and extremely detailed text-prompting (essentially training the video model to better meet our needs), and tolerating some of the still-imperfect-but-less-offensive AI-generated footage, we were able to work with AI-generated video to achieve our project goals. A further guardedness in using AI for a water justice project is around the heavy water footprint of AI data centers (Haider et al., 2024). I applied strategies for being as efficient as possible in generating AI footage, for example, by meticulously archiving and repurposing effective text prompts and reference images, with this water footprint in mind.

6. RECOMMENDATIONS FOR INCREASING HOPE

With the aim of moving towards hopefulness and overcoming guardedness, I conclude by offering recommendations to address some of the challenges previously identified. In the South African context, particularly to align with technology use primarily on smartphones, and with limited electricity and Wi-Fi, I recommend that technologies for AI video generation and interactive filmmaking and streaming work towards solutions which are: mobile; offline-first; low bandwidth; trained by locals sharing local knowledge to move

away from stereotypes, including wider bandwidth for using reference images and sound to help users localise the platform, thereby increasing efficiency in AI-generation and reducing the water footprint; to incorporate more local languages at both the platform interface and produced media levels; to incorporate more filmmaking knowledge, for example, about camera angles, editing techniques, and film production workflows, into the tools so that end users can come with low-to-no prior filmmaking experience and still produce impactful works; and, essentially, more opportunities for tools to receive feedback from end users to shape the technology as it is being used. Furthermore, robust tools and platforms should be owned by Africans, and any training AI models through tool usage should generate income for users and acknowledge contributions to the generative AI knowledge project.

7. REFERENCES

Bardzell, S. and Bardzell, J. (2011). 'Towards a feminist HCI methodology: social science, feminism, and HCI', *CHI Conference on Human Factors in Computing Systems (CHI'11),* Vancouver, British Columbia, Canada. 7-12 May, 2011, pp. 675-684. *Published by Association for Computing Machinery (ACM), 07 May 2011.* https://doi.org/10.1145/1978942.1979041

Bidwell, N. (2016). 'Decolonising HCI Interaction Design Discourse: Some considerations in planning AfriCHI', *XRDS: Crossroads, The ACM Magazine for Students,* 22(4), pp. 22-27. https://doi.org/10.1145/2930884

Capraro, V., Lentsch, A., Acemoglu, D., Akgun, S., Akhmedova, A., Bilancini, E., Bonnefon, J., Brañas-Garza , P., Butera, L, Douglas, K.M., Everett, J.A.C., Gigerenzer, G., Greenhow, C., Hashimoto, D.A., Holt-Lunstad, J., Jetten, J., Johnson, S., Kunz, W.H., Longoni, C., Lunn, P., Natale, S., Paluch, S., Rahwan, I., Selwyn, N., Singh, V., Suri, S., Sutcliffe, J., Tomlinson, J., van der Linden, S., Van Lange, P.A.M., Wall, F., Van Bavel, J.J., and Viale, R.. (2024). 'The impact of generative artificial intelligence on socioeconomic inequalities and policy making', *PNAS Nexus,* 3(6), pp. 1-18. https://doi.org/10.1093/pnasnexus/pgae191

Chilunjika, A. (2024). 'A review of the risks, challenges and benefits of using Artificial Intelligence (AI) technologies in public policy-making in South Africa', *Social Sciences Journal (SHE Journal)Online) Artificial Intelligence Social Sciences, Humanities and Education Journal (SHE Journal),* (53), pp. 393-41. https://hdl.handle.net/10210/512650

Hawthorne, R. and Grzybowski, L. (2024). 'Narrowing the "Digital Divide": The role of fixed and mobile infrastructure', *Journal of Economics & Management Strategy,* 34(4),pp. 797-1037. https://doi.org/10.1111/jems.12622

Haider, S., Rashid, M., Tariq, M.A.U.R., and Nadeem, A. (2024). The role of artificial intelligence (AI) and Chatgpt in water resources, including its potential benefits and associated challenges, *Discover Water,* 4(13). https://doi.org/10.1007/s43832-024-00173-y

Irani, L., Vertesi, J., Dourish, P., Philip, K., & Grinter, R.E. (2010). 'Postcolonial Computing: A lens on design and development', *CHI Conference on Human Factors in Computing Systems (CHI'10),* Atlanta, Georgia, USA, 10-15 April, 2010, pp. 1311-1320. Published by Association for Computing Machinery (ACM), 10 April 2010. https://doi.org/10.1145/1753326.1753522

Lei, N., Lu, J., Shehabi, A., and Masanet, E. (2025). 'The water use of data center workloads: A review an assessment of key determinants', *Resources, Conservation and Recycling,* 219(108310): pp. 1-12. https://doi.org/10.1016/j.resconrec.2025.108310

Malekana, M.D., & Chuma, K.G. (2025). 'Strengthening service delivery to support information needs of users at Springs Public Library in South Africa', *South African Journal of Libraries and Information Science,* 91(2), pp. 1–10. https://doi.org/10.7553/91-2-2436

Olatoye, T.A., and Fru, R.N. (2025). 'Water security and livelihoods in the arid zones of South Africa: a human geography approach to rural education and curriculum development', *Frontiers in Education,* 10(1621476): pp. 1-12. doi: 10.3389/feduc.2025.1621476

Sharma, V,. and Kumar, N. (2025). 'Sustainability, Development, and Human–Computer Interaction', *CHI Conference on Human Factors in Computing Systems (CHI '25),* Yokohama, Japan. ACM, New York, NY, USA, April 26–May 01, 2025, pp. 1-21. Published by Association for Computing Machinery (ACM), 25 April 2025. https://doi.org/10.1145/3706598.3713663

Theresa, A. (2024). African AI Art - an ethnographic study into the portrayal of Africa in StableDiffusion', *Media University Visual and Media Anthropology Journal,* 8, pp. 1-21. https://www.media-university.de/index.php?t=1&f=2024/08/media-university-visual-and-media-anthropology-journal-issue-8-2024_african-ai-art.pdf