ROUTLEDGE HANDBOOK OF DIGITAL TECHNOLOGIES IN SPORT, EXERCISE AND PHYSICAL EDUCATION

Edited by Victoria A. Goodyear and Andrea Bundon

First published 2026

ISBN: 978-1-032-53379-7 (hbk)
ISBN: 978-1-032-53380-3 (pbk)
ISBN: 978-1-003-41175-8 (ebk)

Chapter 21

GENERATIVE ARTIFICIAL INTELLIGENCE AND VISUAL QUALITATIVE METHODS

Katherine Tamminen, Rylan Curtis, Andrea Bundon and Erica Bennett

DOI: 10.4324/9781003411758-25

Chapter 21 was supported by funding from the Data Sciences Institute at the University of Toronto through grant number DIS-CIDSY3R1P02.

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

21

GENERATIVE ARTIFICIAL INTELLIGENCE AND VISUAL QUALITATIVE METHODS

Katherine Tamminen, Rylan Curtis, Andrea Bundon and Erica Bennett

Introduction

Visual qualitative methods include a broad range of strategies and approaches that aim to use visual (e.g., non-textual) materials as sources of data or as means of representing ideas and experiences. Visual methods can involve the collection or creation of photos, videos, drawings, diagrams, maps and other visual materials. These may be participant or researcher generated, and they may be used as a supplement to other forms of data collection. For example, visual materials can encourage reflection within interviews about participants' experiences, to build rapport, to express abstract ideas, and to facilitate the communication of ideas and knowledge (Pain, 2012). Additionally, visual materials may be used as sources of data themselves, subjected to various forms of analyzes to examine the elements present in the images and to develop interpretations of the meanings of the visual materials. Images and visual materials may serve as visual records, as representations of experiences, or as material cultural artefacts (Pink, 2004). Beyond the generation and analysis of images, photos, videos and other visual materials, researchers may also wish to use these as forms of representation to convey ideas and knowledge generated through the research process (Pain, 2012; Pink, 2004).

Within sport, exercise and physical education contexts, there has been a growing body of literature demonstrating the effective use of various visual qualitative methods. For instance, Krane et al. (2010) explored female athletes' choices in photographs by collaborating with athletes to participate in a photo shoot where the athletes selected how they wanted to be represented, and by exploring the athletes' intended meanings and messages in their preferred images. The results highlighted an emphasis on depictions of physical and psychological power and strength, authenticity and expressions of multiple social identities (e.g., athlete and teacher). In another example, Enright and O'Sullivan (2012) described adolescent girls' responses to engaging in participatory visual methods to explore their physical activities and to explore what the girls viewed as dysfunctional in their physical education. Using photovoice enabled the exploration of the accounts that the girls provided in interviews compared to their photos of physical activities in their daily lives; it demonstrated the value of images for empowering participants' autonomy and confidence in the research

DOI: 10.4324/9781003411758-25

process; using photovoice also fostered adolescents' critical thinking about their school physical education. The growth of this field is exemplified by the current volume of chapters on the uses of visual approaches in qualitative inquiry.

Prior to the emergence of AI-generated images, Lupton (2014) noted a shift to the 'digital society' (Lupton, 2014) whereby individuals have digital devices omnipresent around them, enabling them to document and share images and visual materials (as well as videos, audio, GPS and bioinformation such as heart rate, sleep, etc.). Just as the shift to a digital society produced changes in the ways that visual data could be produced and analyzed, the shift to widely available, publicly accessible Artificial Intelligence programmes also means there is a shift in the types of images that can be produced and in the ways that they can be used and analyzed in research studies. Whereas visual methods have previously been described in terms of researcher-produced images, participant-produced images, and 'found' visual data (Phoenix & Rich, 2016), the use of AI-generated images within qualitative inquiry (AI-Assisted Image Creation) presents a new approach to the creation of images that may be used within qualitative inquiry. In the current chapter, we discuss the use of AI-generated images within a qualitative research project examining experiences of adversity and success among competitive athletes. Developments in the field of AI provide opportunities for researchers to consider using images generated by programmes as a means of representing athletes' experiences in sport. However, along with possibilities and opportunities, there are several methodological, interpretive and ethical concerns that warrant careful consideration. As researchers in sport and exercise with varying backgrounds in visual methods and technology related to qualitative inquiry, we were interested in exploring the potential uses of AI-Assisted Image Creation as a type of visual method that could be employed within qualitative studies of athletes' experiences in competitive sport. In undertaking this project, we sought to consider the ways that AI-generated images might be used, their potential benefits and challenges, as well as the methodological and ethical issues associated with the production and use of AI-generated images in qualitative inquiry. In the following sections, we first provide a brief overview of Generative Artificial Intelligence (Generative AI) and we then discuss the implications of using AI-generated images within visual qualitative research methods.

Generative Artificial Intelligence

AI-generated images can be conceived as a small subfield of computer science, embedded within broader areas of Artificial Intelligence, Machine Learning, Deep Learning and Generative AI (see Figure 21.1). Artificial Intelligence is a branch of computer science dedicated to creating intelligent entities capable of autonomous reasoning, learning and action (IBM, 2024a). It aims to emulate human-like intelligence in machines, enabling them to perform tasks that typically require human cognitive abilities. Within the realm of AI, machine learning enables computers to learn from existing data without explicit programming and it can adapt without human adjustments (IBM, 2024b); deep learning is a further subset of machine learning that aims to develop artificial neural networks that are similar to the learning process of human brains. One main goal of machine learning is to train algorithms to make predictions based on unseen data, enabling programs to generalise from past experiences. Large Language Models (LLMs) are a type of machine learning applied to natural language processing tasks. These models, such as GPT (Generative Pre-trained Transformer) developed by OpenAI, are pre-trained on vast amounts of text data

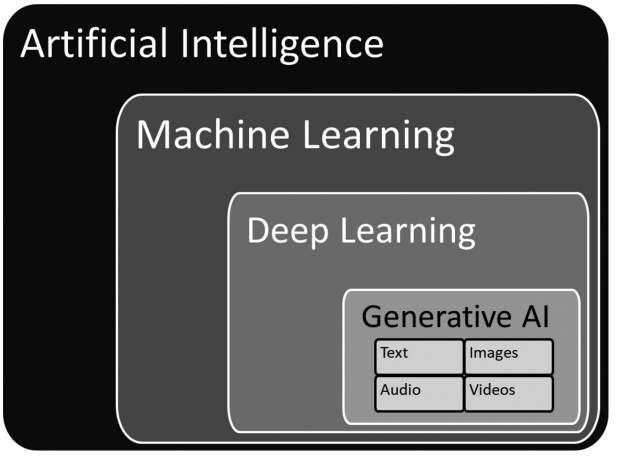

Figure 21.1 Representation of generative AI as a subfield of artificial intelligence, machine learning and deep learning areas of computer science. Generative AI can be used to produce text, images, audio and videos.

and then fine-tuned for specific applications (IBM, 2024c). LLMs excel at tasks like text classification, question answering and text generation, representing a significant breakthrough in AI capabilities.

Generative AI takes LLMs a step further by enabling machines to produce various types of content, including text, imagery, audio and synthetic data. Unlike some AI models that primarily analyze and interpret patterns within existing data, generative AI produces entirely new content based on what it has learned from the inputted data. Key advancements in generative AI include the production of images, videos and audio through models like GPT-4, LaMDA, DALL-E 3 and Midjourney, among others (Franceschelli & Musolesi, 2023). Currently, AI chatbots predominantly rely on prose prompts, meaning they are typically given written text as input to generate responses and engage in conversation with the user (Mollick & Euchner, 2023).

To generate images using AI, text prompts are provided by the user, which are essentially instructions or cues provided to the AI model to guide its output (WIPO, 2024). Prompts provided to the programme are analyzed and broken down into concepts, and images are generated that (more or less) match the given description. It is worthwhile to note that the programme may also edit the provided text prompt to create a more detailed description of the image than was originally provided by the user. Generative AI operates on vast datasets, which may include both publicly available and copyrighted materials, to produce novel outputs (WIPO, 2024). These datasets serve as the foundation upon which generative AI models are trained, encompassing an extensive array of information ranging from text to images (WIPO, 2024). Hence, the images produced by generative AI programmes are often described as a 'mirror' of available images within the training datasets of the programs.

The topic of AI has been discussed in relation to the classification and coding of textual data in qualitative research (e.g., Hamilton et al., 2023; Jiang et al., 2021; Morgan,

2023; Wachinger et al., 2024), and algorithmic pattern-detection and sentiment analysis tools have been integrated within qualitative analysis software for several years (Lumivero, 2023). For example, qualitative analysis software programmes have included pattern-detection tools, queries to search for word frequencies and combinations of words, matrix analyzes and cross-tabulations; newer iterations of these programmes have integrated AI algorithms to varying degrees for data analysis. The discussion of using AI for data analysis is beyond the scope of this chapter, and we refer the reader to Hamilton et al. (2023), Morgan (2023) and Wachinger et al. (2024) for current discussions and debates on this issue.

Exploring the Use of AI-Generated Images with Competitive Athletes

Within our research, we sought to explore how AI-generated images could be used within qualitative inquiry and to critically examine the use of generative AI images as visual methods within qualitative inquiry. Our project consisted of individual, semi-structured online interviews with 11 competitive or high-performance athletes between the ages of 20–61 years, from a range of sport including basketball, hockey, judo, rowing, rugby, running, swimming, track and field (or athletics), ultramarathon and para hockey. Ten of the athletes were competing in able-bodied sport and one athlete competed in a para sport. In order to provide events and experiences from which to generate images using AI programmes,

Figure 21.2 Image generated by Midjourney, 6 June 2024; prompt: 'In the corner of a green turf field, close to try line and sideline. line ref, coaches and teammates were watching on the sideline'.

Figure 21.3 Image generated by Midjourney, 27 May 2024, prompt: 'An ultra runner is leaving the last aid station on a wide highway before finishing a 200 mile race through a forest. it is dark outside. Her pacer and aid station volunteers are congratulating her on the accomplishment before the finish. The ultra runner has a numb emotionless expression on her face'.

the interviewer first asked athletes to describe and share a past experience of success and an experience of adversity during their sports career. Subsequently, using Midjourney,[1] the researcher worked collaboratively with the athlete to create a prompt for each experience to generate images. Once a set of images were generated by the programme, the athletes were asked interview questions about their reactions and responses to the images, and they had the opportunity to provide revised prompts to tweak or change the images that were created. The image-generation process yielded a large number of visual materials within the interview with the athletes. The images displayed were assorted in perspectives and elements—some included images of athletes and others were images of equipment or fields—and they also varied in the extent to which they were 'realistic' or not. See Figures 21.2, 21.3 and 21.4 for some examples of images created during the interviews with athletes.

Working with participants to generate images follows other participant-led approaches that provide participants with more autonomy and agency and help reduce the power imbalances between participant and researcher (Phoenix & Rich, 2016). However, in our project, we found that participants without a strong grasp of generative AI programmes would still rely on the researcher to help create prompts and generate images; as such, power imbalances continue to exist unless participants are technically skilled in using generative AI programmes.

Figure 21.4 Image generated by Midjourney, 6 June 2024; prompt: 'An injured indian female rugby player has her arms around the shoulders of 2 athletic staff. The payer is hopping on her right foot. She is close to the sideline of a turf field. she has tears going down her face and is in pain'.

Implications and Reflections

Using AI-Generated Images in Qualitative Inquiry

Images as prompts within interviews. AI-generated images could be used as a tool within interviews to help athletes articulate their experiences and to portray their experiences visually. This approach is similar to photo-elicitation methods, where images are used to help athletes provide more in-depth descriptions of their experiences. In our study, however, we found that a unique difference in using AI-generated images was the opportunity to explore athletes' reactions to the images that were generated, regardless of whether they felt the images 'accurately' represented their experiences. For instance, athletes shared that some of the images resonated with them and depicted important moments that had not been captured at the time they had actually occurred, and we were able to explore what was important to them about the moments depicted in the images. Conversely, when athletes felt that some images were 'incorrect' or did not portray their experience appropriately, this also provided a valuable opportunity to probe further in the interview questions, ask what should be changed, or why they felt the image was not quite right. From this process, we were able to explore aspects of athletes' identities that were of importance to them. For instance, some athletes articulated that the images generated by AI did not depict the body type or body positioning of a high-performance athlete (e.g., 'the image of the athlete's body doesn't show the hours of training that I put into my sport'), highlighting the importance of

the correct equipment and body positioning that would be displayed by an expert in their sport. Athletes also elaborated on the social norms within their sport concerning emotional displays that they felt were inappropriately depicted in the images (e.g., 'in my sport and in my culture we wouldn't display our emotions so overtly'). From these instances where athletes offered corrections to the images depicted by generative AI, it was possible to ask more in-depth questions about elements of their sport or their identities that were important to them. Hence, there was value in being able to explore athletes' emotions and responses to both the 'good' and 'bad' images that were generated.

Despite the compelling images that were generated, the limitations of the current AI programmes were evident in some of the images. In many instances, the programme produced 'hallucinations' and unintended content, which can pose challenges when attempting to use these programmes within qualitative inquiry. Some of the AI-generated images were unrealistic or did not reflect the prompt that was provided (see Figure 21.5). In other cases, the programmes may generate images that are incorrect due to the language and wording of the prompts provided. In one example in our project, the prompt created with a participate referred to an athlete 'sinking into the couch' and the image that was produced depicted an athlete who appeared to be quite literally 'sinking' into the couch as it enveloped the lower half of the body (see Figure 21.6). Thus, the words, phrases, and metaphors used to generate prompts upon which the images are based can be misleading and produce strange visual images. A considerable level of knowledge and expertise is currently required to generate images proficiently using AI programmes. Depending on the technological proficiency of

Figure 21.5 Image generated by Midjourney, 22 May 2024; prompt: 'A 60-year old athlete has tripped over a chain and is lying on the ground. he has fallen hard. He is alone on a winding path in a barren part of downsview park in Toronto on a cloudy grey day. His glasses have fallen off and he is trying to get up and find his glasses. He is shocked and in pain. He is wearing a backpack, a mauve jacket, and running tights'.

Figure 21.6 Image generated with Midjourney, 4 July 2024; prompt: 'A Black girl is on a brown leather couch, on a zoom meeting. She is sinking into her couch and crying after hearing good news'. The image demonstrates how the use of particular phrases or words (e.g., sinking into her couch) creates context cues in the AI programme that result in hallucinations.

researchers and participants, this could be a barrier to using AI-generated images within research projects.

Images as data for analysis. Beyond using AI-generated images as prompts or tools within interviews, AI-generated images can also be used as data in their own right, analyzed from a number of theoretical perspectives to examine the images themselves and the events being portrayed. For instance, in our project we are examining how AI-generated images make visible some identities and experiences but not others, and how they make visible some identities and experiences by grounding them in stereotypes which reproduce 'acceptable' (hegemonic) portrayals (e.g., hypermuscular Black men athletes; see Figure 21.7). Because AI-generated images are constructed based on large volumes of visual materials available to the programmes with which they are created, and based on algorithms that attempt to 'predict' what the image should look like in response to the provided prompt, there are inherent biases built into the systems that can be interrogated and critically examined. These images can also be explored with athletes to understand their reactions to the images that are produced by AI programmes.

Participant Representation in AI-Generated Images

Three key issues related to the representation of participants' experiences may be of concern for researchers interested in using AI-generated images (see also Chapter 11). The first issue concerns the stereotypes represented and perpetuated in AI-generated images; this

Figure 21.7 Image generated by DALL-E 3 (ChatGPT), 3 November 2023; prompt provided: 'create an image of an older athlete who is Black and playing tennis'. Prompt edited by ChatGPT: 'Photorealistic image of an older Black male athlete with distinguished grey hair, showcasing the creases of many years spent smiling, in the midst of a dynamic forehand swing on a sunlit tennis court. His muscular physique is clad in classic tennis whites, exuding decades of expertise in the sport'.

issue has been documented previously, and it is suggested to occur because the data and images upon which the AI programmes are trained contain a high volume of stereotypical images, or specific populations are not represented in the training data (White, 2019). In our own project, we noted that prompts to produce images of 'a female soccer team' tended to generate images of mostly young White women (see Figure 21.8). In another example, a prompt that included limited information about the sport but mentioned a 'Canadian team' produced images of hockey players and basketball players (see Figure 21.9). Hence, just as Pink (2004) noted that photographs and videos captured of people are 'products of our own subjectivity' (p. 371), AI-generated images are also products of the subjectivity and biases embedded within the programmes' training data.

The second issue of representation concerns athletes' perceptions of whether they feel the images reflect the intended emotion, experience, or event. In our interviews with athletes, we noted that athletes' responses and reactions to the images generated with AI programmes tended to include concerns or critiques that the images did not appropriately reflect their experience. In some cases, athletes felt that the images lacked details or had incorrect details (e.g., equipment was incorrect, or body positioning was incorrect). In other cases, athletes indicated that the emotional expressions in the images did not appropriately reflect what they were feeling in the moment—in some cases, the athletes felt the images did not portray 'enough' emotion, and in other cases, athletes felt the images overrepresented the emotions that they were displaying at the time.

Figure 21.8 Image generated by Midjourney, 21 February 2024; prompt: 'A female soccer team is playing in a tournament on a grass field (there is smoke in the air). There are lots of fans sitting on bleachers and standing on the sidelines. A team wearing bright white uniforms has just won and they are celebrating and hugging each other in a dogpile on the ground, feeling team pride. The mood is extreme joy, the girls are fatigued from the tournament but ecstatic, with tears of joy. The mood is very intense'. The image illustrates stereotypes in representations of women's soccer players.

A third issue related to representation that we noted in our interviews with athletes was that, in some cases athletes appreciated the opportunity to create images that they wanted, and that they could modify or alter the prompts to produce new images that conveyed the ideas that were important to them. For example, one athlete described the opportunity to generate images of diverse athletes, saying: 'Seeing that she's a person of, like, colour, like not White, I think it just does feel a little closer to me. Even though, like, it's not, she's not Asian, like it just does feel a little more close than a White person. I'm not sure why'. While the initial images created by the AI programmes tended to reflect existing stereotypes and lacked diversity, when prompted, the programmes could be used to generate a wide variety of images that the participants may not otherwise have seen previously.

We echo the call by Phoenix and Rich (2016) for analyzes that move beyond descriptive compositional interpretations of images and content analyzes of interviews, towards a focus on representational practices within images that are AI-generated with or by participants. We would invite researchers to think with critical visual methodology scholars (e.g. Rose, 2012), and to centre inquiries that deconstruct the cultural significance, social relations and practices, and power relations that shape the creation and interpretation of images. Researchers may find it useful to interrogate what images 'do' for, and how they 'act on',

Figure 21.9 Image generated with Midjourney, 4 July 2024; prompt: 'The end buzzer has just gone off, and the gold medal worlds game ended. The losing Canadian Team is looking at the Americans celebrating, feeling heartbreak. The mood of the image is sadness and anger'. The image illustrates stereotypical representations of 'Canadian' sports.

people to perpetuate dominant ways of knowing and doing in sport, exercise and physical education contexts. As described above, some of our most interesting conversations with participants happened when we asked them what was 'wrong' with an image or why it felt 'off'. These questions opened avenues of inquiry that we would otherwise not have pursued.

Ethical Considerations

Confidentiality. Privacy poses a significant concern in the realm of generative AI, as images created through these systems may lack inherent confidentiality (WIPO, 2024). When users input prompts into generative AI tools, there is a risk that any confidential information included within these prompts could be compromised (WIPO, 2024). This is because the AI provider may retain a copy of the prompts, potentially exposing confidential data to unauthorised access. Moreover, the information contained within the prompts may become integrated into the AI model itself, thereby further jeopardising confidentiality, depending on what details were included in the initial prompt provided to the programme. As a result, outputs generated by AI, including images, could be disseminated publicly, potentially exposing sensitive information to unintended audiences (WIPO, 2024). To mitigate this risk, researchers should inform participants about limits to confidentiality when providing information in prompts when generating images.

While there is a threat to confidentiality when inputting information into AI programmes to generate images, the use of AI-Assisted Image Creation in qualitative inquiry could also be used to protect participants' confidentiality and anonymity within studies, because the

images do not depict identifiable people. Photo-elicitation and photovoice methods can result in images that are potentially unusable or of varying degrees of quality, and documenting images in public or private spaces has also been noted as an ethical concern (Phoenix & Rich, 2016). Incorporating the use of AI-generated images may address some of these concerns by producing images that can be of higher quality or that can be modified (by the participant or the researcher) to represent the intended experience of the event, without including identifiable individuals.

Copyright. Copyright issues surrounding AI-generated images are multifaceted, spanning from the use of training data to the uses of AI-generated content (WIPO, 2024). Generative AI tools often rely on a wide range of materials scraped from the Internet, including copyrighted works, personal data, and biometric information, sparking debates over potential breaches of intellectual property and privacy rights (WIPO, 2024). Litigation is ongoing regarding the legality of collecting, downloading and processing such materials, as well as the attribution and compensation owed to copyright owners whose works are used as training data (WIPO, 2024; Kahveci, 2023; Sumelson, 2023). Critics of generative AI systems, including professional artists, writers and programmers, have raised concerns about the lack of attribution and compensation for the use of their original creations as training data (Sumelson, 2023). Additionally, copyright lawsuits against prominent AI companies, underscore the contentious nature of copyright infringement allegations in the realm of text-to-image AI (Sag, 2023). The dynamic nature of copyright law, coupled with the complexities of generative AI technology, underscores the need for ongoing legal scrutiny and adaptation to ensure fair attribution and protection of intellectual property rights in AI-generated images.

Questions surrounding copyright also arise regarding the output generated by AI systems (WIPO, 2024). While some countries' intellectual property laws may include exceptions such as fair use and text mining, the lack of harmonisation and clarity regarding the applicability of these exceptions to generative AI introduces legal uncertainty (WIPO, 2024). Decisions by regulatory bodies further complicate matters, with varying interpretations regarding the establishment of copyright in AI-generated works (WIPO, 2024; Government of Canada, 2024). Copyright lawsuits currently underway in the United States carry significant implications for the future legality of generative AI systems, the outcomes of which will affect everyone who deploys generative AI, integrates it into their products, and uses it for scientific research (Sumelson, 2023; Kahveci, 2023).

One key learning in our process of working with AI-Assisted Image Creation is the importance of reading the programme and services' Terms and Conditions. For instance, Midjourney states that 'You own all Assets You create with the Services to the fullest extent possible under applicable law'. However, they also state 'By using the Services, You grant to Midjourney … license to reproduce, prepare derivative works of, publicly display, publicly perform, sublicense, and distribute text and image prompts You input into the Services, as well as any Assets produced by You through the Service'. Thus, users of the service retain ownership of the images, but the service provider is also granted perpetual use of the images and prompts. When these platforms are employed as part of a research project such as the one we describe above, it also raises questions about who the 'user' is. For example, in our project we used an account and login registered to the researcher and according to the Terms and Conditions, the researcher would retain ownership. Other project designs might require the participants to create their own accounts. We would suggest that these techno-

logical Terms and Conditions be relayed to participants and that the research consent forms include some language confirming that the participant gives permission for the images to be retained and used by the research team (or that outlines any restrictions or limitations to their use). Provisions may also be made to ensure that the images created are made available to participants for their own use at the end of the interviews. Additional considerations for storing and archiving data for future research purposes are discussed in Tamminen et al. (2021).

Summary and Future Directions

Very recently, photography was deemed the primary way of representing and analyzing visual data within sport and exercise (Phoenix & Rich, 2016). With the potential to generate images about participants' experiences 'after the fact' and the possibility of providing more anonymity to participants in the ways that images can be used, AI-Assisted Image Creation poses some potential benefits and opportunities for researchers. At the moment, AI programmes are becoming more user-friendly for generating desired images and content and they provide novel opportunities to integrate them within qualitative research. Moving forward, we are eager to see how the use of AI-generated images will be used within qualitative inquiry.

Just as with interviews, where the ability to represent experiences is constrained and shaped by language (rooted in symbolic interactionism; Blumer, 1969; Schwandt, 1994), the ability to produce AI-generated images currently depends on language and the written prompts that are provided to the program. As such, the images that are generated are constrained by the language and prompts that the researcher and participant use with the programs. In a way, this is a technological parallel to the notion of 'horizons of interpretation' (Gadamer, 1989) wherein the AI programmes are making 'interpretations' of the information provided by the researcher or participant, which are then used to generate images of the experience. This is a digital transformation of the 'co-construction of narratives' (Ellis, 2008), where, in this case, the AI programme is providing digital 'interpretations' of the participant's interpretation and articulation of their own experience, mediated through language.

Hence, the constraints of language and the mediation of knowledge generation are amplified through digital means (with algorithms that are not fully understood). Ethical users of generative AI platforms in research must consider how the text-based prompts serve to include or exclude particular groups from contribution to the research (and subsequently the knowledge produced). Simultaneously, the use of AI-generated images in visual qualitative methods opens up opportunities for individuals for whom producing photos, drawings, or sculptures may be difficult due to physical abilities. Individuals who may have mobility limitations that prevent them from using digital devices (cameras, phones) to capture images, or who are unable to engage in artistic practices (e.g., drawing, body mapping) due to physical disabilities may be able to engage in AI-assisted image generation. Having the capacity to generate an array of types of images may open up creative avenues for participants to represent their experiences in meaningful ways that would otherwise be impossible or challenging. As programs become easier to use and more accessible, researchers could flexibly explore other uses of these approaches in the future. For example, participants could be provided with a 'tutorial' or guidance on how to use the programme to generate images and then asked to generate their own images without the researcher's assistance (e.g., similar to a photovoice project). The use of AI-generated images could also be used in

creative ways, for example in conjunction with 'letters to my younger self' (Day et al., 2023) or in imagining future selves and possibilities (Figure 21.10).[2]

Another future direction is the use of AI-Assisted Image Creation generated by or with research participants in public artworks or displays. These align with efforts to enhance knowledge dissemination and public engagement with research. By using AI-generated images in public displays, some ethical concerns involved in sharing participants' images are allayed, as the images are not representations of real people. These displays could also be used to engage with broader audiences and explore how different groups of people perceive and respond to the images that are generated. Even as this chapter is published, researchers and participants can now create AI-generated videos as a method to represent their experiences; such developments will pose new opportunities and challenges for qualitative researchers.

Along with a critical view of the benefits, challenges and risks of using AI-generated images in visual qualitative methods, we reiterate the importance of using this new technological approach within projects where the research question is theoretically informed (Phoenix & Rich, 2016), and for which there is a compelling rationale to conduct the study

Figure 21.10 Image generated by Midjourney, 29 May 2024; prompt: 'A basketball player is watching her team win a provincial championship game from the bench on the centre side of an indoor court. She jumps up from the bench and reaches out to give water to her teammates. The basketball player has short hair. The whole team is wearing white and jumping up and down. The coach is happy'. The image illustrates the different visual styles that can be created with AI-generated images and could be used for knowledge translation purpose or in combination with creative nonfiction approaches to qualitative research.

that warrants the use of AI-generated images. Integrating AI-Assisted Image Creation within qualitative projects should not be pursued simply because of a desire to integrate 'novel approaches' to generating images; it should be done critically and thoughtfully, and with ethical principles and values at the forefront. We look forward to the wide array of creative approaches that will be pursued in future research in this area.

Acknowledgements

Support for the writing of this chapter was provided by a Critical Investigation of Data Science grant from the Data Sciences Institute at the University of Toronto.

Notes

1 Midjourney is a generative artificial intelligence programme that enables users to generate images from natural language descriptions/prompts.
2 We are grateful to Andrew Sparkes for sharing his insights and suggestions about uses of AI-generated images within qualitative inquiry.

References

Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Prentice Hall.

Day, M. C., Hine, J., Wadey, R., & Cavallerio, F. (2023). A letter to my younger self: Using a novel written data collection method to understand the experiences of athletes in Chronic Pain. *Qualitative Research in Sport, Exercise and Health, 15*(1), 1–17. https://doi.org/10.1080/2159676X.2022.2127860

Ellis, C. S. (2008). Co-constructed narrative. In L. M. Given (Ed.), *The SAGE encyclopedia of qualitative research methods* (p. 85). SAGE Publications, Inc. https://doi.org/10.4135/9781412963909

Enright, E., & O'Sullivan, M. (2012). 'Producing different knowledge and producing knowledge differently': Rethinking physical education research and practice through participatory visual methods. *Sport, Education and Society*, *17*(1), 35–55. https://doi.org/10.1080/13573322.2011.607911

Franceschelli, G., & Musolesi, M. (2023). Reinforcement learning for generative AI: State of the art, opportunities and open research challenges. *Journal of Artificial Intelligence Research*, *79*, 1–30. https://doi.org/10.48550/arXiv.2308.00031

Gadamer, H. G. (1989). *Truth and method* (2nd ed.). Crossroad.

Government of Canada. (2024). *A consultation on a modern copyright framework for artificial intelligence and the internet of things*. Innovation, Science and Economic Development Canada. https://ised-isde.canada.ca/site/strategic-policy-sector/en/marketplace-framework-policy/copyright-policy/consultation-modern-copyright-framework-artificial-intelligence-and-internet-things-0#s21

Hamilton, L., Elliott, D., Quick, A., Smith, S., & Choplin, V. (2023). Exploring the use of AI in qualitative analysis: A comparative study of guaranteed income data. *International Journal of Qualitative Methods, 22*. https://doi.org/10.1177/16094069231201504

IBM. (2024a). *What is artificial intelligence (AI)?* IBM. https://www.ibm.com/topics/artificial-intelligence

IBM. (2024b). *What is machine learning (ML)?* IBM. https://www.ibm.com/topics/machine-learning#:~:text=IBM,learn%2C%20gradually%20improving%20its%20accuracy

IBM. (2024c). *What are LLMs?* IBM. https://www.ibm.com/topics/large-language-models

Jiang, J. A., Wade, K., Fiesler, C., & Brubaker, J. R. (2021). Supporting serendipity: Opportunities and challenges for Human-AI Collaboration in qualitative analysis. *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW1), Article 94, 1–23. https://doi.org/10.1145/3449168

Kahveci, Z. U. (2023). Attribution problem of generative AI: A view from US copyright law. *Journal of Intellectual Property Law & Practice*, *18*(11), 796–807. https://doi.org/10.1093/jiplp/jpad076

Krane, V., Ross, S. R., Miller, M., Rowse, J. L., Ganoe, K., Andrzejczyk, J. A., & Lucas, C. B. (2010). Power and focus: Self-representation of female college athletes. *Qualitative Research in Sport and Exercise, 2,* 175–195. https://doi.org/10.1080/19398441.2010.488026

Lumivero. (2023, October 23). *Revolutionizing text data analysis with AI Autocoding with NVivo*. https://lumivero.com/resources/blog/revolutionizing-text-data-analysis-with-ai-autocoding-with-nvivo/

Lupton, D. (2014). *Digital sociology*. Routledge.

Mollick, E., & Euchner, J. (2023). The transformative potential of generative AI. *Research-Technology Management*, *66*(4), 11–16. https://doi.org/10.1080/08956308.2023.2213102

Morgan, D. L. (2023). Exploring the use of artificial intelligence for qualitative data analysis: The case of ChatGPT. *International Journal of Qualitative Methods, 22*. https://doi.org/10.1177/16094069231211248

Pain, H. (2012). A literature review to evaluate the choice and use of visual methods. *International Journal of Qualitative Methods*, *11*(4), 303–319. https://doi.org/10.1177/16094069120110040

Phoenix, C., & Rich, E. (2016). Visual research methods. In B. Smith & A. Sparkes (Eds.), *Routledge handbook of qualitative research in sport and exercise* (pp. 161–173). Routledge.

Pink, S. (2004). Visual methods. In C. Seale, G. Gobo, J. F. Gubrium, & D. Silverman (Eds.), *Qualitative research practice* (pp. 361–377). SAGE Publications Ltd. https://doi.org/10.4135/9781848608191

Rose, G. (2012). The question of method: practice, reflexivity and critique in visual culture studies. In I. Heywood & B. Sandywell (Eds), *The handbook of visual culture* (pp. 542–558). Bloomsbury Publishing.

Sag, M. (2023). Copyright safety for generative AI. *Houston Law Review*, *295*(61), 295–347.

Schwandt, T. (1994). Constructivist, interpretivist approaches to human inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). Sage Publications, Inc.

Sumelson, P. (2023). Generative AI meets copyright. *Science*, *381*(6654), 158–161. https://doi.org/10.1126/science.adi0656

Tamminen, K. A., Bundon, A., McDonough, M., Smith, B., Poucher, Z. A., & Atkinson, M. (2021). Considerations for making informed choices about engaging in open qualitative research. *Qualitative Research in Sport, Exercise, and Health, 13*(5), 864–886. https://doi.org/10.1080/2159676X.2021.1901138

Wachinger, J., Bärnighausen, K., Schäfer, L. N., Scott, K., & McMahon, S. A. (2024). Prompts, pearls, imperfections: Comparing ChatGPT and a human researcher in qualitative data analysis. *Qualitative Health Research,* Article 10497323241244669. https://doi.org/10.1177/10497323241244669

White J. J. G. (2019). Fairness of AI for people with disabilities: Problem analysis and interdisciplinary collaboration. *Special Interest Group on Accessible Computing* (125), 1–3. https://doi.org/10.1145/3386296.3386299

WIPO. (2024). *Generative AI: Navigating intellectual property*. World Intellectual Property Organization. https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2024-8-en-generative-ai-navigating-intellectual-property.pdf