

Artificial Intelligence:

A Reflexive Inquiry into the Usefulness of AI Image Generation
within Art Education via Midjourney

by

Calum Leadbeater

A Thesis Submitted in Partial Fulfillment of
the Requirements for the Degree of
Master of Arts in Art Education
NSCAD University
SMU REB#25-041
September 2025

Thesis Supervisor - Dr. Nicole Lee
Committee Member - Patryk Stasieczek
University Examiner and Chair - Tara Mills

Abstract

This study investigates the reflexive potential of Artificial Intelligence (AI) image generation as a tool for the ideation of conceptual thought in art education, focusing on how emerging technologies reshape creative processes for students and researchers. While AI image generators have prompted widespread debate concerning authorship, originality, and artistic value, their capacity to function as reflexive tools within artistic inquiry remains under-explored. This study addresses that gap by examining how participant engagement with AI imagery, generated via Midjourney, fosters critical reflexivity, stimulates conceptual development, and expands dialogue within art-making and research. Employing a grounded theory methodology, qualitative data was collected through a questionnaire and roundtable with art education master's students in early stages of thesis development. The data set, analyzed through axial coding, thematic recurrence and emergent narratives, suggested that AI image generation provoked unexpected avenues of thought that challenged initial assumptions and encouraged reconsideration of conceptual frameworks, however, AI images were significantly limited by frequent misinterpretation and overtly literal depiction of key terms. In addition, participants had major ethical concerns surrounding authorship, copyright, and prejudice of machine learning systems. The study argues for an art education pedagogy that embraces AI technologies not solely as instruments of production, but as partners in the ongoing negotiation of meaning, perspective, and creativity. Emergent findings suggest that in order for AI image generation to function as a reflexive mirror within artistic/research processes, increased transparency of data archives, categorization hierarchies and algorithmic processes is required. Furthermore, the roundtable emphasized the importance of situating AI tools within a critical pedagogy that foregrounds dialogue, ethical awareness, and self-reflexivity, rather than positioning technology as a replacement for human creativity.

List of Figures

Figure 1: Screen Shot of Participant Questionnaire	48
Figure 2: Record of Participant Involvement	55
Figure 3: Presentation of Data - Participant #1	56-57
Figure 4: Critique Image for Participant #1	59
Figure 5: Presentation of Data - Participant #2	60-61
Figure 6: Critique Image for Participant #2	63
Figure 7: Presentation of Data - Participant #3	64-65
Figure 8: Critique Image for Participant #3	67
Figure 9: Presentation of Data - Participant #4	68-69
Figure 10: Critique Image for Participant #4	71
Figure 11: Presentation of Data - Participant #5	72-73
Figure 12: Presentation of Data - Participant #6	74-75
Figure 13: Critique Image for Participant #6	77
Figure 14: Presentation of Data - Participant #7	78-79
Figure 15: Presentation of Data - Researcher Perspective	80-81
Figure 16: Critique Image for Researcher	82
Figure 17: Axial Coding of Question #4	87
Figure 18: Participant Response to the Usefulness of AI Image Generation	88
Figure 19: Participant Response to Ethical Concerns of AI	89
Figure 20: Wordwall of Participants Initial Reaction to AI Images	91
Figure 21: Wordwall of Key Descriptors of AI Images	91

Abstract	2
List of Figures	3
Dedication and Acknowledgements	7
Disclaimer - On Certainty	9
Prologue	10
Artificial Intelligence and the Artistic Process	10
Classroom Integration and Ethical Concerns	10
Early Research and Classroom Practice	11
Introduction	13
Grounded Theory as a Methodological Foundation	13
Underscoring Creativity	13
Educational Responsibility	14
Initial Catalyst for the Research Study	14
Research Questions	15
Theoretical Framework	18
Conceptual Representation or Misrepresentation?	18
Bias: Human Cognition, Artificial Intelligence, and Reflexivity	21
Kate Crawford’s “Atlas of AI”	24
Context of Data, Image Analysis and Midjourney	27
Internet Development and Privacy Rights	27
Data and Machine Learning Systems	28
Historical Development of Image Analysis	30
Classification Systems and Conceptual Misrepresentation	32
Midjourney - Computation, Datasets and Transparency	34
Contemporary AI Research in Art Education	37
The Emergence of Artificial Intelligence Image Generation	37
AI Solutions and Classroom Integration	38
Art Education and Generative Text-to-Image AI as a Research Tool	40
Human Creativity versus AI Image Generation	41
Visualization of Ideas	42

Methodology	44
The Journey: Finding a Research Method	44
Grounded Theory in Art Education	44
Untangling Dialogue Through Grounded Theory	46
Recruitment and Sampling	47
Data Collection and Triangulation	49
Data Analysis	52
Role of Researcher-Participant	54
Data Presentation	55
Presentation of Images	55
Participant #1- Images and Narrative	56
Participant #2 - Images and Narrative	61
Participant #3 - Images and Narrative	65
Participant #4 - Images and Narrative	69
Participant #5 - Images	73
Participant #6 - Images and Narrative	75
Participant #7 - Images	79
Researcher Perspective - Images and Narrative	81
Limitations and Constraints of Data Collection	85
General Trends, Positions, and Observations	87
Representation: Reflexive or Illustrative?	91
Synthesis of Participant Narratives	93
Ethical Concerns with AI as a Reflexive Process	97
Ethical Positionality as a Measure of Acceptance	97
Minimal Concerns, Positive Outlook	97
Balanced View with Notable Limitations	98
Significant Ethical and Practical Concerns	99
Divergent Ethical Positionalities Shape Engagement	99
Conclusions: Grounded Theories	100
Emergent Findings from Participants	100
Application in Early Stages	101
Collaboration is Key	101
Application Beyond the Arts	102
Latent Conceptual Potential	102
Primacy of Language	103

Implications for the Future	104
Unpacking Data Bias	104
Educate about Ethics of AI	105
Medium Over the Message	105
Values in Art Education	107
Machine Learning with an Artistic Sensibility	108
Integration of Actionable Intelligence	109
Expediency of Change	110
Researcher Reflexivity: A Summary	111
References	114

Dedication

This thesis is dedicated to my daughters Ruby-Mae Cordelia and Hazel Scout. Struggle builds resilience; embrace it. If a surly old curmudgeon like me can pull this off, imagine what amazing things your beautiful hearts and minds will accomplish.

Acknowledgements

I would like to acknowledge the integral support and mentorship of my thesis advisor, Dr. Nicole Lee, whose honest feedback, insightful perspective and constructive criticism greatly improved this research. You encouraged me to take risks and listen to the story that was being told, allowing me to detect trodden paths and gradually weave my way through the dense forest.

I also greatly appreciate the detailed contributions and suggestions from committee member, Patryk Stasieczek, whose expertise and critical eye was invaluable when situating this research. I especially appreciate your wise final suggestion to breathe and put my feet in the water.

I am extremely grateful for the instrumental support and positivity of Tara Mills, who listened when I faltered and helped ground my focus into tangible steps. When I couldn't even conceive of the end, your calm reassurance and sense of humour helped me through. I needed that; thank you.

A heartfelt thank you goes to my friend and colleague, Lesley Chandler, who trudged alongside me throughout her own long journey. Exhausting days, late nights, no parking (again), unending readings, online discussions, weekly meetups, occasional breakdowns, revising revisions . . . finally concluding with celebratory cheers. I can't thank you enough. Mother-of-pearl . . . we did it.

Most importantly, I would like to thank my wife Shannon Bennett, who was my partner in all this. Without your support this would not have been possible. When I needed time, you found it. When I needed an ear, you listened. When I was ready to give up, you suggested I get to work. I owe you more than words can express.

Finally, I would be remiss not to acknowledge AI itself. While you are not a person, you functioned as a tool, a creative provocation, and a methodological partner, compelling me to confront important ethical and epistemological issues central to this thesis. I acknowledge that thanking AI here is also an acknowledgement of the human contributors behind these systems, whose artwork, history, culture and perspectives underpin everything the technology produces.

Disclaimer - On Certainty

While the scholarly voice within this paper may assure you of concrete certainty of the offered conclusions, they are anything but. My own metaphor for this journey is one that sees me wandering through a dense forest, surrounded by thick-limbed trees and chaotic brambles, with sunlight occasionally glimpsing through the canopy. I'm lost with no tools of navigation, trying to determine both direction and destination based on subtleties of terrain, which occasionally lead to emergent trails, hinted at by the faint prints of those who wandered before me. I track broken branches and scuffed tree bark with enthusiastic optimism, only to find myself lost among the boughs and darkness once again. After navigating this wilderness for the better part of two years, I've finally come to a small clearing. A grassy knoll, indistinct in most ways, but with a view of the sky, heat from the sun and a place to sit and rest. This clearing, however, is still surrounded by a vast wilderness which is ever-changing, ever-growing, and largely unexplored. While the landscape remains intimidating and unknown, I can gaze at the horizon and, for a moment, better understand my place in it. I can also see from this vantage point that I don't navigate the forest alone, but note other distant travellers who are boldly undertaking their own journey. When our paths cross, we will share our uncertain discoveries and use this knowledge to best determine future pathways. We will rest for a moment, but then with incremental steps and baited breath, choose to advance back into the wilderness with trepidation and wonder, certain only of the journey. The intention is not to conquer this land, but to give ourselves to it, and emerge.

Prologue

Artificial Intelligence and the Artistic Process

Over the last decade, Artificial Intelligence (AI) has increasingly worked its way into our daily lives, affecting the ways we work and learn. It has earned a consistent presence in high school classrooms, not necessarily by design but by necessity, via increasing student usage. Students often lead the charge in adopting new technologies outside the classroom, leaving teachers to play catch up; this dynamic forces educators to rethink how we engage with rapidly evolving tools like AI. While much attention has been placed on AI's generation of written language, its influence on the visual arts, particularly through image-generation software, is less explored but increasingly relevant.

The implications of image-generation for artists are profound. A striking example occurred in 2022 when an AI-generated image, created using Midjourney, was covertly submitted to a Colorado art competition by artist Jason Allen (Roose, 2022). The work, titled *Theatre D'opera Spatial*, competed in the digital art category at the Colorado State Fair and, only after winning, was revealed to be AI generated. The image in question was created by Midjourney, one of many AI programs, surpassing entries by human artists in terms of quality and meaning. This event sparked significant debate, largely centred on the legitimacy of AI-generated artwork. Yet arguments focusing only on the product overlook a potentially valuable area: the process. Rather than viewing AI solely as a threat of creative authenticity, we might consider how it could serve as a tool to enhance artistic thinking and learning.

Classroom Integration and Ethical Concerns

Within my classroom practice, as a Secondary Art, Film, and Photography teacher, I have

witnessed students grapple with early stages of artistic creation, concept development, spatial problem-solving, and visual ideation. While these struggles are an integral part of the creative process, AI image generators like Midjourney have potential to support rather than replace creative problem solving. As this is a recent technology, at the time of this writing, current literature on the topic appears minimal. My research happens within a unique moment, which feels akin to an educational paradigm shift or social experiment, as students are already using AI extensively, often without guidance from the educators tasked with mentoring them. We have a responsibility as educators to ensure students are equipped with the knowledge and tools to navigate this unknown future.

An anonymous survey conducted through the Junior Achievement “Excellence Through Ethics” program inquired about the frequency of AI usage amongst a single Nova Scotia High School. The results were eye-opening: 63% of students admitted to submitting AI-generated content as their own in the past year, and 100% reported knowing someone who had done the same. These numbers speak volumes about the responsibility that educators bear to teach students ethical strategies for implementation of AI within educational processes.

Early Research and Classroom Practice

My first experiences navigating Midjourney in a collaborative setting involved high school art students at the beginning of a conceptual project. Without a predefined goal, we as a class set out to explore AI's role in sparking and shaping creative ideas. The student task was to brainstorm the way in which conceptual topics could be translated via visual media, with students choosing their own topics, ranging from childhood trauma to struggles of free will, and attempting to visualize these ideas through various media. Together, we entered prompts into Midjourney, refined them, and reflected on the images produced in an effort to better understand this technology.

This process inverted the traditional teacher-student divide, with student perspective during the critique causing me to reconsider the function of AI image generation, as we learned alongside one another as the exercise led us down unanticipated pathways. One such path was a critical analysis of how AI reflects historical and cultural bias; specifically, its tendency toward pro-Western and male-centric visual themes. The images frequently included lighting, architecture, and subjects with seemingly Renaissance or Baroque aesthetics. The open-ended nature of this dialogue reinforced the value of grounded theory, which I had yet to discover, a methodology that embraces emergent insights rather than testing predetermined ideas.

A Research Focus on Conceptual Representation

This study aims to situate this reflexive experience into a broader framework for understanding the usefulness of AI in educational and artistic contexts, specifically how AI can assist in representing conceptual meaning, a dynamic associative process that results in complex human thought (Lindberg et al., 2022). If AI can support this type of thinking, even in a limited way, it could have transformative implications for both pedagogy and practice, becoming a useful tool for teachers, students, researchers and artists.

My personal stance on AI remains conflicted. I have seen it used both ethically and unethically, both creatively and passively (meaning to support or replace student effort). I approach this study neither as a skeptic nor a champion, but as someone learning through trial and error. I recognize that as a white, heterosexual male, I am often reflected in the biases that dominate AI outputs. This makes me more likely to see the value in AI integration over a more marginalized perspective. That awareness underscores my responsibility to amplify voices from diverse cultural, gender, and identity backgrounds—voices often marginalized in algorithmic systems. Grounded theory is employed as a methodology in this study to provide participants with autonomy over their personal experience and narrative.

Introduction

Grounded Theory as a Methodological Foundation

Grounded theory offers a powerful framework, as it prioritizes data-driven insight and allows theories to be generated from participant perspective (Xie & Zhang, 2019, para 6). Rather than confirming existing theories, it builds understanding from the lived experiences of participants, reducing researcher bias and embracing complexity, contradiction, and nuance, which are all key attributes when studying a technology as multifaceted as AI.

As a reflexive methodology, grounded theory also holds the researcher accountable. It requires ongoing self-awareness and critical reflection, particularly regarding positionality and privilege. It does not aim to silence perspectives in favour of neat conclusions but instead highlights multiplicity, which is essential when researching a topic where the stakes are high, the applications are broad, and the ethics are still being written.

Underscoring Creativity

A central consideration of this study is the relationship between creativity, humans, and AI. Margaret Boden's (2003) *The Creative Mind: Myths and Mechanisms* will be the contextual basis for analysis of the creative process, understanding creativity as, "the ability to come up with ideas or artefacts that are new, surprising or valuable" (p. 1). Conceptual spaces, and our ways of exploring and transforming them, can be described by "structures and processes" drawn from AI (Boden, 2003, p. 6). While creativity itself will not be at the forefront of this study, AI enables us to construct emergent theories about representational capacities of image generation, and subsequent reflexivity, via dialogical processes with human participants. This underscores the potential of AI to enhance creative processes.

Educational Responsibility

AI image generation sits at the intersection of opportunity and challenge. It has the potential to inspire, support, and transform the artistic process, but also to undercut it, obscure authorship, and replicate intrinsic bias. In the classroom, educators are not merely teaching content; we are shaping the next generation's ethical and creative frameworks. To ignore AI is to cede that responsibility to those who design and market this technology, resulting in the normalization and blind integration of AI rather than a considered and reasoned approach that keeps the well-being of users a top priority.

This study explores the evolving role of AI in art education, not to ascertain a final answer, but as part of an ongoing, emergent conversation. By focusing on conceptual representation, engaging artistic voice, and adopting a flexible, reflexive methodology, this research seeks to contribute meaningfully to the developing understanding of AI's place in artistic and educational practice. While focused on art education, the inquiry is also rooted in other associated disciplines that can incorporate AI, including but not limited to hermeneutics and computer science.

Initial Catalyst for the Research Study

The initial catalyst that drew my interest in AI with a specific, tangible application was Greer and Blair's (2018) work on how metaphorical language can shape notions of arts-based research and, in turn, the social realities of art education. They found that metaphors used by researchers could inadvertently enable social conditions such as reproducing cultural norms, promoting caution, and polarizing debate. Within academic writing, Greer and Blair traced a widespread use of descriptive metaphors depicting human dangers such as uncharted territory, notably those dealing with contested territory and war. They identified frequent use of metaphor referencing landscape, exploration, and warfare that created a tonal "danger discourse" that altered the context of the intended research (2018, p.1). Greer and Blair maintain that this danger discourse, constructed through metaphorical language, may be limiting and counterintuitive to

the aims of researchers, as intended change or progress is framed as a threat to the very structures and authorities they intend to persuade. When researchers use metaphorical language in academic writing, they risk overlooking whether the metaphor fits the context and tone within the larger meaning of the research.

Research Questions

Intrigued by the premise established in Greer and Blair's (2018) research, I ran several quotes from the article containing metaphorical language, as identified by the researchers, through Midjourney. I wondered if the AI generated imagery would reinforce their claims by visually reflecting themes of exploration, landscape and warfare, intending to push their research on a lateral path to ascertain what metaphorical language could look like as a visual product. The resulting imagery was fascinating, complex, and analytical, reinforcing the metaphorical connotation of danger discourse established by Greer and Blair, and confirming their claims. This activity raised a host of questions concerning possible application of this technology as a reflexive tool for conceptual writing. Their study provoked me to question the possible merits of image generation as a research tool that illuminates understanding of researcher voice and conceptualization in academic writing through visual imagery. I thought if metaphorical language can shape one's ideas of arts-based research, then AI-generated imagery as visual metaphor might also have a similar power to shape these ideas. If AI can produce an image that can literally allow us to view our own thoughts, words, and concepts from another perspective, how might this enhance the reflexivity of our own positionality? How might AI image generation be a useful reflexive tool to reveal hidden meanings, unintended context, and different perspectives on one's thoughts and ideas? From these preliminary questions, my research question became: To what extent are AI image generation tools useful within reflexive

creative processes and the development of conceptual ideation in art education?

Conceptual ideation is heavily dependent on metaphorical comparisons and visual imagery to fuse a concept with a shared cultural context. Arguably, visualization of language can enhance our understanding of conceptual implications as well as our own intrinsic bias and academic positionality. If this is true, then AI image generation can become a tool of the research process, offering a visual perspective on conceptual writing which could open a whole new dialogue and methodology to collaborate and corroborate within art education.

My research explores a viable way to utilize image generation software as part of a professional practice, focusing on AI technology as a piece of a process rather than solely a product. Through qualitative analysis of the complex and detailed imagery produced by Midjourney, one can then question whether the images produced align with the intended meaning of the author/s. This process, utilizing AI image generation, can make conceptual sub-text communicated by simple choice of language and metaphor visually apparent. In this work, I examine the usefulness of AI image generation to represent conceptual ideas, through an engagement with participants from within my Master of Arts in Art Education (MAAE) program at NSCAD University. What emerged as a secondary conversation were ethical questions surrounding artificial intelligence, as it became clear that individual perceptions, usage, and acceptance of AI technology were largely informed by ethical positionality.

As artists, if we produce a painting, sculpture, or photograph that fails to communicate our intended meaning, we change it, try again or modify our conceptual focus. This tool would offer artists/researchers/teachers the same opportunity for self-reflection, nuanced consideration, and emergent growth. As artists, we exist in a visual culture, speaking the language of light, design, composition, colour theory, and curation. AI image generation could help bridge the gap between these identities. At the very least, it could be used as a tool of analysis within an

educational context, using generated images as a means of collectively navigating the artistic process. The technological, ethical and educational implications of AI, however, are very complex and require further contextualization within a greater theoretical framework. An open question emerged as a result of the grounded theory methodology: What concerns do artists, teachers and researchers have regarding application of AI image generation software within art education?

This study initially intended to avoid the ethical implications of AI, as it is a vast and complex topic that would complicate my research focus. However, it became apparent throughout this process that it is impossible to separate ethics from AI. Participant analysis and engagement was consistently dictated by their ethical positionality and intrinsic bias, so it became essential to determine participant concerns and how they may be addressed in order to create a better ethical framework for AI application within art education. This required an analysis of machine learning systems themselves, specifically in relation to the processes governing AI image generation.

Theoretical Framework

Conceptual Representation or Misrepresentation?

According to Better Words Online (2025), a *concept* functions as a mental representation that helps organize and interpret the world by grouping individual instances under broader categories. It is a way to organize and better understand the world around us, making sense of complex information and experiences, producing meaning that prioritizes underlying messages and ideas (White, 2023). Applied to image generation, this would suggest, for the purposes of this study, that intrinsic conceptual meaning generated by AI is arguably more important than the characteristics and qualities of the image. From an artistic point of view, the etymology of concept evokes imagery and metaphor. Think of a concept as a seed planted in the mind, as the word shares its root with conception, suggesting a deeply creative and generative act (Harper, 2025). A concept is not just an isolated idea, but a synthesis of elements such as experience, intuition, memory, etc. In my experience, artists often take fragments of thought, emotion, sound, symbol and gather them together as a conceptual whole, i.e., a painting, poem, or performance. A concept is not necessarily the final product but the initial shaping and gradual development of an idea, much like a sculptor working with clay. It is an act or vehicle for gathering and giving form via a process of artistic representation.

Furthermore, for the purposes of the study, the context of concept is largely informed by Byung-Chul Han's (2022) *Non-Things: Upheaval in the Lifeworld*. Han, a South Korean-German philosopher and cultural theorist, reflects on the terrestrial order giving way to a digital order by a constantly expanding infosphere of information. This relates to Han's perception of conceptual meaning, situated as narrative (human) versus additive (computer). According to Han, "only with a 'concept' can the connection between A and B be captured" (p.

34). The term concept, according to Han, aligns with Goethe's Begriff's (2021) notion that:

conceptualizations draw on an expressive power with language to generate sequences of cognitive moves and moments of transitional understanding that stand in close relation to each other and can be gathered in graded series to be saved for further observation, description, reflection, and reconfiguration. (p. 1)

Furthermore, according to Han, the concept forms the frame between fact A and fact B, by which, with the help of C, the connection can be understood (p. 41). Otherwise, the relationship between A and B would be seen as causal but not understood. Machine learning systems potentially exist as this broader framework that serves to amalgamate meaning through smaller reconfigured components. Does the resulting imagery, however, contain reflexive conceptual meaning, or is it simply a strategic classification of unrelated data points that only mirror human cognition? Philip K. Dick explores this question in *Do Androids Dream of Electric Sheep* (1968), in which androids can mimic human thought processes and behavior, but Dick implies it is capacity for empathetic response, not intelligence, that distinguishes humanity. I am not suggesting that AI has an innate capacity for human thought, although that is the goal for some tech developers (Wyre, 2025), but rather focus on the usefulness of AI as a useful reflective tool aiding in human construction of meaning.

According to Daniel Chandler (2006), British visual semiotician, the signifier is the thing, item, or code that we read—a drawing, word, or photo—and the signified is the meaning being expressed by the signifier. Only together do they form the sign, or the conceptual meaning. Referencing Saussure, Chandler describes the mental construct “not to be identified directly with the referent but is a concept of the mind - not a thing but a notion of the thing” (para. 6). In this context, AI image generation represents an assemblage of signifiers, however, the signified is based on the human prompt and the resulting interpretation—processes that AI

guides but does not understand. According to Han, “artificial intelligence is wordless . . . thinking hears, even listens, eavesdrops. Artificial intelligence is deaf. It does not hear that voice” (pp. 39-41). When viewed as a tool that necessitates human intervention and application, the technology has merit. This requires the Merriam-Webster (2025) definition of intelligence as “guided or controlled by a computer; able to produce material from digital signals” (para. 3). When viewed from a human-centric definition of intelligence, “having or showing the ability to easily learn or understand things or to deal with new or difficult situations” (Britannica Dictionary, 2025, para. 1), AI is not intelligent at all. As Han states, “Artificial intelligence, by contrast, processes pre-given, unchanging facts. It cannot provide new facts to be processed . . . it has its own lucidity and decisiveness and yet remains fundamentally different from the self-assuredness of calculative understanding” (p. 41). AI is interdependent, meaning AI systems and humans rely on each other for functionality, performance, and decision making. AI, therefore, can offer conclusions, albeit limited ones, but not synthesized conceptual meaning, as it does not understand the concepts it produces. Understanding in this context means “the knowledge and ability to judge a particular situation or subject” (Britannica, 2025, para. 1). AI can create meaning, but its procedures, coding and algorithms cannot judge it, which is why human dialogue is required to necessitate the conceptual processing/synthesis of the image.

Nicolas Bourriaud’s concept of relational aesthetics, introduced in his 1998 book, *Relational Aesthetics*, offers a distinctive way of understanding meaning in contemporary art by shifting focus away from the object itself (in this case the AI generated image) and towards the interactions it creates between the artist, the artwork, and the viewer. Bourriaud (2002), French curator and art critic, posits that the artist is a catalyst that makes platforms of exchange where art “will be open to dialogue, discussion, and form of inter-human negotiation” (p. 41). The artwork is a site or event where interaction happens; meaning is not fixed or embedded in the

object, but emerges from experience and participation. According to Bourriard (2002), every technical innovation since the Second World War has caused a range of reactions among artists although “the most fruitful thinking, however, came from artists who, far from giving up on their critical consciousness, worked on the basis of the possibilities offered by new tools” (p. 67). Bourriard’s “state of encounter” encapsulates the idea that art is meaningful because it enables, stages or reflects human encounters, not only because it presents a symbolic message or visual form.

Bias: Human Cognition, Artificial Intelligence, and Reflexivity

Bias can manifest in many forms, such as cognitive, social, and algorithmic. Bias is neither inherently positive or negative, it is inevitable, as it is part of the human experience. The distinctions of bias as a term make its utility problematic; for instance, in law, bias refers to a “preconceived notion or opinion, a judgement based on prejudices, as opposed to a decision coming from the impartial evaluation of the facts” (Crawford, 2021, pp. 135). More recent research from Greenwald and Krieger (2006) presents cognitive bias as unconscious attitudes and stereotypes “that diverge from a person's avowed or endorsed beliefs or principles” (p. 951). Researchers have determined bias is not always harmful, in some cases is even adaptive or necessary for efficiency (Blanco, 2017), cultural cohesion (Stewart, 2024), and expertise development (Mangus & Mahajan, 2022). Bias, in the context of this study, will adopt a non-positivist framework focused on meaning-making, experiences, contexts, and forms of interpretation (Dunajeva, 2025), not to be interpreted as a negative or critical aspect of the participant experience, but in order to develop a better understanding of the relationship between humans, AI, and reflexivity. This human contextualization of bias differs from that of AI.

Machine learning systems are the computational core of AI and are designed to inductively generalize from data sets to classify new observations not included in those sets. In such cases, “the term bias refers to a type of error that can occur during this predictive process of generalization”

(Crawford, 2021, p. 134), namely, a classification error that exhibits when presented with new examples. AI bias is theoretically present in the perceived inaccuracies, misrepresentation, and oversimplifications analyzed by participants in this study, although auditing specifics of AI bias is challenging and may also amplify biases present in human-generated data. Bias in AI is largely an extension of the data sets, computational structures, and algorithmic hierarchies established by human programmers. As such, the two types of bias are not disparate. Bias is essential for machine learning systems, just as in human cognition, but can be unintentionally harmful. Ideally, bias should be understood and clarified via reflexive dialogue.

The emergent framework of this study aims to avoid a positivist paradigm of bias (a prioritization of objective data and empirical evidence) to embrace and understand participant data in relation to a subjective reflexivity. Through this reflexive approach, the study will consider the biases embedded in how individuals perceive, interpret, and respond to the world. In this context, reflexivity refers to the practice of critically examining how your own perspective, assumptions, and positionality can shape the research process and its outcomes (Trymata, n.d., para. 1). Bias is then viewed as a lens through which meaning is constructed and reflexivity is the process of engaging with dialogue as a dynamic site of inquiry; in this case, a synthesis of participant intention and perceived AI meaning.

Also to be analyzed in this study is the perceived usefulness of the AI generated images in context of the aforementioned reflexivity. This usefulness will be determined by participants based on the degree to which images reiterated or enhanced intended meaning. Essentially, does the AI generated image reflect or expand the intended meaning of their excerpt? Drawing upon Sara Ahmed's (2019) *What's the Use: On the Uses of Use*, which explores how things get designated as useful, participants' evaluations of the AI generated images will reflect, not only technical considerations, but their own bias and assumptions about language, representation and meaning. According to Ahmed, "use can dismantle and reconfigure worlds" (p. 229), suggesting a deeply reflexive dialogue that can reconfigure perspective. To further paraphrase Ahmed, usefulness,

therefore, is distributed between persons and things, and “in following leads, we can value how we arrive somewhere”, as use brings things to mind and provides another way of telling stories (p. 7). In the context of this study, “useful” refers to emergent participant narratives that deny a positivist paradigm of traditional colonial research methodologies that discount personal bias and subjectivity. This study has presumed usefulness for the application of AI image generation, however, the nature of grounded theory ultimately will allow theories regarding the usefulness of AI to emerge from participants.

Lastly, the process of understanding meaning, specifically in relation to AI image generation, will be considered using the context of hermeneutics. Hermeneutics is the theory of interpretation, especially “concerned with the ways in which humans derive meaning from language or other symbolic expression” (APA Dictionary of Psychology, “hermeneutics”, 2025.). As AI image generation is essentially automated interpretation via statistical correlations, the manner in which AI understands language, symbols, or cultural references is directly linked to its output. This raises a question of authorial intent vs machine output. A human author who inputs a prompt has intent, however, AI output based on algorithm and training data may or may not align with that intent. Hermeneutically, this introduces the gaps between the prompts' meaning to the user, the models' interpretation, and the final images' meaning to the user. Remy Demichelis, of the University of Turin, highlights the deep learning of artificial neural networks as parallel with human interpretation in *The Hermeneutic Turn of AI: Are Machines Capable of Interpreting?* Demichelis (2024) suggests that “interpretation produced by generative AI thus differs from our own in that it is incapable of understanding . . . [interpretation] is rarely formal but comes through feeling” (p. 3). Hans-Georg Gadamer (2004), German philosopher and decisive figure on twentieth century hermeneutics, emphasizes that “understanding is not a mere reproductive activity of consciousness, but rather a dialogical process” (p. 388). As such, hermeneutics is “a conversation with the text” (p. 385), and true understanding occurs when the interpreters' horizon (their culture and historical perspective) fuses with the horizon of the text, leading to new, shared meaning (Malpas, 2022). Understanding in

the context of this study will relate to the dialogue between participants and images, namely the extent to which a reflexive dialogue with the image allows for new or validating understanding of participant research.

A distinction will be made between procedural knowledge and conceptual knowledge. Procedural knowledge refers to images that are an amalgamation of combined parts, that are diffused together as a whole but exist largely as unrelated generative components that are perceived within little to no related meaning. Conceptual knowledge would infer a greater degree of strategic and intentional combinations of layered, symbolic imagery that are able to initiate a reflexive dialogue with the viewer. This separation is largely dependent upon representational competence, which is defined as “the ability to interpret, generate, and switch between different forms of representation” (Edelsbrunner et al., 2023, p. 1). Therefore, in this study, usefulness of AI images will largely be dependent upon the degree of representation competence exhibited by the machine learning system, as perceived by participants.

Kate Crawford’s “Atlas of AI”

Within *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*, Crawford (2021) describes the problematic nature of how we define, classify and consider Artificial Intelligence as “an idea, an infrastructure, an industry, a form of exercising power, and a way of seeing . . . a two-word phrase onto which is mapped a complex set of expectations, ideologies, desires and fears” (pp. 18-19). Crawford’s initial appraisal of AI demonstrates the lack of understanding that the vast majority of the public has regarding AI, which creates a passive acceptance of AI due to the steep learning curve involved with its vast systems. She describes how AI is viewed as a spectral, abstract force, but in reality these are physical infrastructures, meaning computational hierarchies (p. 19), that can and should be understood.

Crawford elaborates, “artificial intelligence is now a player in the shaping of knowledge, communication and power . . . at the level of epistemology, principles of justice, social organization, political expression, culture, understanding of human bodies, subjectivities, and identities: what we are and what we can be” (p. 19). Crawford's insistence on the power of AI to shape knowledge and communication, can also be extended to language itself. Mahmudul Hasan (2024), of the University of Rajshahi, Bangladesh, explores the role of language and communication in English literature, focusing on how words influence meaning, shape perspectives, and express cultural values. Hasan concludes that “language not only enables communication but also plays a pivotal role in shaping identities, influencing thoughts, and transforming perspectives (p. 128). Language categorization is at the core of how AI machine learning assembles imagery based on text prompts. Hasan’s “idea of literature as a mirror of society highlights the importance of setting in revealing social realities” (p. 129), which reflects the imagined reality presented in AI images. This focus on the power of language reiterates Greer and Blair's (2018) focus on metaphor shaping the notions of art education, and by extension, AI systems to control the political and cultural power of language and imagery, in art education and beyond. While Crawford deeply examines and critiques ethical implications of AI on social, political and environmental levels, she nonetheless advocates for an expanding understanding of this technology to understand what is at stake and how to make better collective decisions.

In this vein, Crawford draws attention to the databases used to generate content, such as the National Institute of Standards and Technology’s (NIST) database which is used to test facial recognition software. This database is composed of “mugshots” of alleged criminals, gathered over several decades, in which the subjects had no right of refusal. There is a long history of photographs being used to reinforce harmful stereotypes by framing features in a way that

validates biased narratives. This extends beyond the NIST database to include analog spaces that reflect Western colonialism and dehumanize the body within medical and social spaces. The NIST database, initially intended as a visual record to identify supposed criminals, is now used as a visual data pool for the testing of facial recognition algorithms. According to Crawford (2021), “the NIST mug shot databases are particularly disturbing because they represent a model of what was to come . . . the unswerving belief that everything is data and is there for the taking” (p. 93) This raises ethical questions concerning privacy rights, power dynamics, and political application of data, namely, whose data is being used and how was it acquired? In our modern, technological society, however, the answer to these questions is often that it is everyone’s data and freely acquired, through the simple acceptance of lengthy and unread terms and conditions.

In addition, Crawford draws attention to the fact that artificial intelligence is a proxy for more specific technology such as programmed algorithms, machine learning systems, and data sets. The output of AI, whether text or images, is inherently informed by these systems which are “anything but neutral” (Crawford, 2021, p. 94). Machine learning systems, in the words of Crawford, “represent personal histories, structural inequities, and all the injustices” (p. 94) reflected in the politics that have generated the data sets.

Context of Data, Image Analysis and Midjourney

Internet Development and Privacy Rights

According to Johnny Ryan (2010) in *History of the Internet and the Digital Future*, the Internet began as ARPANET (Advanced Research Projects Agency Network) in the late 1960s, funded by the US Department of Defense, spearheaded by J.C.R. Licklider to “develop the capacity for an integrated network operation” related to ballistic missile and nuclear test detection (p. 25). Initially there was minimal/no focus on privacy, as the system was designed for trust among users, who were part of academic and government circles. Over time, ARPANET saw more universities and research institutions joining the network, as well as introducing email. ARPANET was officially decommissioned in 1989, as the World Wide Web opened the Internet to public use. This was met with a rapid expansion of data collection through cookies (a small block of data created by a webserver) and basic user tracking as public users began to regularly access websites, search engines, and email. Manuel Castells (2002), Professor of Sociology at the University of California, describes in *The Internet Galaxy: Reflections on the Internet, Business, and Society* how the 1990s saw “a number of Internet service providers built their own networks . . . based on a multi-layered, decentralized architecture, and open communication protocols” (p. 12). Essentially the Internet transitioned from a small, closed government network, to a large private business structure.

Throughout the 1990s, data privacy laws were gradually put into place, such as the 1995 EU Data Protection Directive (DPD), establishing core principles like informed consent and fundamental rights concerning data (Data Protection Directive, 2025). Awareness of privacy concerns began growing, especially with data-sharing practices among websites and Internet Service Providers (ISP). By the 2000s, due to the rise of social media platforms such as Facebook, Twitter, and Youtube, personal data such as location, behaviour and preferences was

being collected (Xiph, 2022).

Companies like Doubleclick, later acquired by Google, pioneered behavioral tracking. Hutton and Henderson (2017), establish how users were rarely asked for consent, as privacy laws were vague or non-existent, in *Beyond the EULA: Improving consent for data mining*. Sites like 4chan, Newgrounds, and early Youtube hosted offensive or violent content with little to no filtering. Photographs shared online (for example, MySpace, early blogs, and forums) could become public by default, and many were archived without user knowledge. Victims in such cases had no tools to remove the content or hold uploaders accountable. Many datasets lacked diversity and reinforced racial, gender, and cultural biases; AI systems trained on biased, toxic data perpetuated discrimination. In addition, according to Hutton and Henderson (2017), “data mining is outgrowing existing regulatory and ethical governance structures, and risks violating entrenched norms about the acceptable use of personal data” (p. 16). So, while this study places AI generation at odds with human thought processes, it is important to note that AI programming is fundamentally designed by human hands and structured around human data sources. Ultimately, the strengths and limitations of human beings will also be reflected in AI.

Data and Machine Learning Systems

Critical to an understanding of artificial intelligence is a breakdown of training data sets and the archives they are dependent upon. This involves learning and classifying algorithms that label data points, such as parts of an image, so that they can be best classified for relation to new inputs (Crawford, 2021, p. 96). The more examples, or data, the better predictions tend to be; therefore, acquiring data has become very valuable in the AI industry. The Organization for Economic Co-operation and Development (OECD) released a paper in 2022, titled *Measuring The Value of Data and Data Flows*, in which they conclude that investment in total data assets

was 1.4-1.9% of Canada's total economic value added Business Models (p. 7). In 2024 Jennifer King, privacy and data policy fellow at the Stanford University Institute for Human-Centred Artificial Intelligence (HAI), and Caroline Meinhardt, Stanford HAI's policy research manager, published a report titled *Rethinking Privacy in the AI Era: Policy, Provocations for a Data-Centric World*. There were three main findings : (1) AI systems pose many of the same privacy risks we have been facing during the past decades of internet commercialization and mostly unrestrained data collection; (2) there is the risk of others using our data and AI tools for anti-social purposes, for example “generative AI tools trained with data scraped from the internet may memorize personal information” (Stanford University Institute for Human-Centered Artificial Intelligence [HAI], 2024, para. 4); and (3) data shared or posted for one purpose are being repurposed for training AI systems. All of these findings verify the problematic nature of data collection, theft, and unethical application.

Data is the foundation of predictive analytics, in which AI uses statistical techniques, algorithms, and machine learning models to analyze historical data and make predictions about text prompts (Beyond Technology LLC, 2024). The predictions tend to follow an inductive inference or a deductive inference pathway, determined by the structure of machine learning models, which includes computational systems such as neural networks, logistic regression, and decision trees (Crawford, 2021, pp. 96-97). Human engineers supply data to algorithms, which conduct statistical inferences based upon human affixed labels: if “all of the training images of apples are red and none are green, then a machine learning system might deduce that ‘all apples are red’” (Crawford, 2021, pp. 97). This is an inductive inference, an open hypothesis based on available data, rather than a deductive inference, which follows logically from a premise.

AI technology leaders are striving to achieve the most accurate, detailed, and complex system possible, with many motivations, such as research, software application, and monetary

gain. Success, according to these developers, is generally determined via benchmark competitions such as the ImageNet Challenge, in which systems compete against one another to determine “whose methods can most accurately classify and detect objects and scenes” (Crawford, 2021, p. 98). An inescapable feature of the human condition and, by extension, a problem machines must navigate, is the unfathomable complexity of organizing the world into neat categories. Early AI models explored “rules-based programming that aimed to reduce the field of possible actions by articulating forms of logical reasoning . . . but such rule sets were rarely able to handle [the] uncertainty and complexity” of real world-settings (Crawford, 2021, p. 99). So, at the core of the AI process is a categorized structure, which prioritizes logical deductions, while organizing biased labels into biased categories.

Historical Development of Image Analysis

As this study specifically focuses on image generation, it is necessary to offer a systemic analysis of the processes involved with this distinct form of artificial intelligence. Early facial recognition technology (FERET), developed by the US Department of Defence, compiled a database of 14,126 35mm portrait photographs in which participants signed a release form approved by a university ethics board. Although these images lacked diversity, they are described by Crawford (2021) as “surprisingly beautiful - high-resolution photographs captured in the style of formal portraiture”(pp. 104-105), suggesting an early relationship between artistry and image databases. The rise of the internet and social media has shifted the landscape of data collection, potentially diminishing the prominence of older, more limited research databases like FERET. In an incredibly short period of time, users began uploading countless images to social media applications, essentially giving away their ownership of images in the fine print of the

terms and conditions. There is nothing free about social media; users are paying with their data. On an average day in 2019, approximately 350 million photographs were uploaded to Facebook and 500 million tweets were sent (Crawford, 2021, p. 106). While AI tech developers are frequently and rightfully accused of ethical misuse of data, users who willingly provide data share the same responsibility.

In 2006, Stanford University Professor Fei-Fei Li, a Chinese-American computer scientist known for her pioneering work in AI, developed ImageNet, an enormous image set for object recognition [which extracted] more than 14 million images from the Internet (Li, 2025). In an effort to organize the images, Li “deployed an army of piecemeal workers to sort an average of fifty images a minute into thousands of categories”, with the workers themselves creating categories based on individually perceived objects, places, people, adjectives, etc. (Crawford, 2021, p. 108). These categories reflected human prejudices and cultural biases, which were transferred to AI. Sorting through this large pool of data in this way, though efficient, reproduced racist, sexist, xenophobic language models that reinforced cultural injustices and oppression of marginalized groups. During this period, the term “data” also lost all connection to the very humanity, culture, and context that the scraped images represented—a rhetorical trick used by colonial powers for wealth extraction. As Luke Stark and Anna Lauren Hoffman (2021) argue in *What we do with data: a performative critique of data ‘collection’*, “by speaking of data as a natural resource, a performative narrative is developed . . . and the same colonial practices underpinning exploitation of environmental resources are justified” (para. 11). Over the last several decades, data-sets themselves have largely become publicly available in response to some of these ethical concerns, such as Imagenet (ImageNet, 2025), PASCAL VOC (GeeksforGeeks, 2025) and Common Objects in Context (Lin et al., 2015). However, the models, systems, and meta-value developed by AI conglomerates are very much privatized. The implications of this in

regard to AI image generation are significant, as “the way data is understood, captured, classified, and named is fundamentally an act of world-making and containment” (Crawford, 2021, p. 121). The worlds described by Crawford are very literal in the context of AI image generation, specifically in the manner through which these systems interpret human text prompts and process them into AI generated images.

Classification Systems and Conceptual Misrepresentation

Classification systems are at the core of AI image generation and algorithmic decisions are inherently hierarchical. The confines of the deductive hierarchy can produce bias, which “refers to a type of error that can occur during this predictive process of generalization—namely, a systemic or consistency reproduced error that the systems exhibit when presented with new examples (Crawford, 2021, p. 134). This sensitivity to differences in the training data is referred to as variance. Machine learning systems often attempt to strike a balance between a high bias, low variance model which may under-fit data in an overly specific context, or a low bias, high variance model that results in broad, overgeneralized results. Generalization errors, much like cognitive biases in humans, are inevitable, so this study seeks to ascertain how the variance of Midjourney's algorithms aligns with participant intent. Here, bias, the predictive errors of Midjourney, are not simply technical errors, but open onto human beliefs, stereotypes, and forms of discrimination. Errors in AI processing are similar to assumptions in human cognition, something accepted as fact or true without proof (Cambridge University Press, 2025). Weather forecasts, for example, are based on scientific data and patterns, but due to the complexity of the atmosphere, models make assumptions or approximations to fill in the gaps, which is why these predictions are not always correct. AI processing models operate in a similar way, trying to balance high/low variance of user prompts and language, but relying on statistical patterns

inductively generated from data to assume a statistically likely product. This renders AI dependent on both datasets and processing hierarchies.

ImageNet for instance, in collaboration with a similar language model WordNet, uses a Linnaean classification system, based on the hierarchical taxonomy of Carolus Linnaeus, of nouns and synonyms to establish conceptual relationships in image, for example “the concept ‘chair’ is found under artefact — furnishing — furniture — seat — chair” (Crawford, 2021, p. 137). The assumption is that all user prompts will somehow fall neatly into these categories, however, early versions of this system failed to account for language prompts that had no previous context within the hierarchical structure. For instance, non-binary gender classification was not included as a possible category, which means that non-binary representation is logically unrepresented in models relying on this system. According to Crawford (2021), “the decisions to classify gender in this way are also naturalizing gender as a biological construct, which is binary, and transgender or gender nonbinary people are either non-existent or placed under categories of sexuality (p. 138).

Ultimately, this goes back to the human dilemma of organizing the world in a certain way, despite the range of complexity, variance and divergence that exists; AI suffers from the imposed limitations of human beings designing these systems. This perceived conceptual weakness of language/image generation systems mirrors human limitations that categorize the world based upon limited experience, perspective, and knowledge. AI categories are housed in logic, not concepts, or in the words of linguist George Lakoff, “the concept of an ‘apple’ is a more nouny noun than the concept of ‘light’, which in turn is more nouny than a concept such as ‘health’ (Crawford, 2021, pp. 139-140). These abstract differentiations are easy for a human mind to conceptualize and decipher, but they are very challenging for a system based on logic to distinguish. Midjourney proves capable at representing “nouny nouns” that are literal, such as

the simplistic representation of an apple, though presumably struggles with complex conceptual connections involving abstract nouns, metaphor, and symbolic representation.

Midjourney - Computation, Datasets and Transparency

Midjourney, developed by a San Francisco based David Holz's independent research lab, entered an open beta in July of 2022. Midjourney generates images from prompts, or natural language selections, and offers some of the highest resolution (1024x1024 pixels) available in the market. The company has been recognized as having “the most advanced image generator in our times”, which refers to qualities such as “improved aesthetics, sharper images, increased diversity, and fixed style command” (Fernandez, 2024, para. 7). The company works to consistently improve their algorithms, releasing new model versions every few months. The content generated for this study used Version 6.1, which was updated in July 2024. Midjourney is currently accessible via a Discord bot; using the ‘/ imagine’ command while on a private Discord server.

Midjourney's founder, David Holz, told London technology news website The Register, that “artists use Midjourney for rapid prototyping of artistic concepts to show to clients before starting work themselves” (Wikipedia Contributors, 2025). This directly aligns with the research question at the core of this study in regard to application within art education. Midjourney utilizes Stable Diffusion, a generative AI model that is open to everyone under a permissive license. When a user types a prompt into the ‘/imagine’ commands, advanced machine learning initiates a process involving large language models and diffusion models to generate a detailed image.

According to the Global Tech Council, a global platform focused on providing training and certifications on emerging technology, an understanding of how Midjourney works can help

us understand impacts on various industries. Firstly, the large language model (LLM) processes the text prompt, deciphering meaning and context while converting the words into a numerical vector. Next, the diffusion process starts with random “noise” and iteratively reduces noise to form a coherent image. Training data is referenced from similar images, based on hierarchical language categorization of the machine learning model; this part of the process is known as latent diffusion. Certain words are prioritized based on frequency of statistical combinations which, in relation to this participant study, may be inconsistent with the language the user prioritizes. High performance GPU’s handle computations required for image synthesis, executing algorithmic decisions in iterative steps. This results in four refined images, which users can further upscale or modify. The entire process can also be restarted with different results each time, allowing for repeated combinations of language prompts based on the diffusion process. In the case of this study, participants did not have full access to this process due to constraints related to subscription costs and user access; this is further acknowledged in analysis limitations.

In the case of Midjourney and Stable Diffusion, the training images come from a dataset called LAION-5B, which is a collection of captions and links to 2.3 billion images. According to LAION (n.d.), they are described as a “non-profit organization with members from all over the world, aiming to make large-scale machine learning models, datasets and related code available to the general public” (para. 1). Schuhmann et al. (2022) posits the resulting models show capabilities of strong text-guided image generation . . . and fine tuning of foundational models like CLIP, GLIDE, and Stable Diffusion using the data set” (p. 1). LAION-5B has been accused of toxic content detection, specific for images flagged as NSFW or allegedly relating to child pornography, a consistent issue with data exploitation and lax privacy policies of the early Internet. According to TechPolicy.press, controversial or problematic imagery is introduced into

LAION-5B as data is gathered from the web, with “no human in the loop” (TechPolicy.press, 2024, para. 6). Data acquired via LAION-5B is filtered using Contrastive Language-Image Pre-training (CLIP), an automated content detection system whose designers warned against its own fitness for filtration when they released it. As a public dataset, LAION 5-B is accessible to anyone who chooses to review and critique the billions of images, however, there remains a vague understanding of legal rights regarding these images or exactly how classification is assigned. This complex inquiry requires a judicial perspective as it navigates the complexities of individual privacy policy and copyright laws; typically beyond the scope of the average user. While it appears that steps have been taken to ethically supervise and democratize this data, such as the AI Foundation Model Transparency ACT which was introduced to US Congress in 2023, attempts feel largely superficial and lack the oversight required to effectively navigate this powerful tool, as the speed of development moves quicker than the speed of bureaucracy.

Naik et al. (2024), from the School of Computer Science, University Akurdi Pune, India, address the complex ethical landscape of opportunities and obstacles that Midjourney presents. The paper “stresses the important role of ethics, laws, and validated results in dealing with the potential benefits and issues associated with the growing use of AI” (para. 1). The researchers conclude that AI generated materials can enhance student perceptions of traditional items; however, this presents challenges in picture synthesis and underscores the need for bias identification in already trained models.

Contemporary AI Research in Art Education

The Emergence of Artificial Intelligence Image Generation

This literature review examines how AI technologies, particularly image generation tools like Midjourney, have already influenced art education by supporting creative processes and engaging with idea generation. The first section considers how educators utilize AI to enrich student learning, emphasizing AI capacity to stimulate idea generation, expand artistic perspective, and strengthen creative processes. While Midjourney serves as the primary example, comparable programs are also considered to highlight the range of stylistic and conceptual possibilities AI tools offer. The second section shifts to post-secondary education and research applications, exploring how AI has been employed as a reflexive and conceptual tool in arts-based inquiry. By examining these uses, the review demonstrates how AI not only contributes to classroom learning but also supports broader academic practices, offering models for analysis relevant to this study's methodological approach. Finally, the review addresses concerns surrounding creativity and conceptual depth in AI generated art. It considers whether AI functions merely as a mechanism of prompt engineering or whether it can be regarded as a legitimate tool for artistic expression and meaning-making, akin to traditional studio practices. In summary, this review situates AI's role in art education across three dimensions: as a classroom learning aid, as a research tool in higher education, and as a catalyst for rethinking creativity itself. Together, these perspectives provide the foundation for evaluating the affordances and limitations of AI image generation in navigating conceptual meaning within the study.

AI Solutions and Classroom Integration

James Hutson and Martin Lang's (2023) case study is particularly relevant to this research, as it highlights both the creative potential and the ethical tensions of integrating AI generative tools into art education, offering valuable insight into how students navigate the balance between human creativity and machine assistance. Hutson and Lang introduced students in a digital art course to Craiyon and Midjourney, presenting a compelling case study for integrating AI-generative art tools into traditional studio art classrooms. Their aim was to explore the potential of AI tools in creative practice. Their sample comprised five students in an intermediate-level digital media course at a four-year historically black colleges and universities liberal arts institution, all enrolled in a Bachelor of Arts Studio Art program with a concentration in digital media. Hutson and Lang (2023) sought direct data about the perspectives and experiences of these digital arts students regarding the merits and limitations of AI generative technology in their artistic process. Students were instructed to engage in an iterative process using one of three generative art tools twice—Craiyon, Dall-E 2, or Midjourney—to create an initial concept, followed by manual reconstruction of one of these images using Photoshop. Data measurement employed a mixed-methods approach, including surveys, student-produced artifacts, interviews, and in-class observations. Pre- and post-assignment surveys were conducted to enrich the data, with open-ended questions facilitating further analysis. Results were sorted by demographics, with descriptive statistics calculated for group comparisons. Notably, none of the participants responded negatively to AI; instead, they recognized its utility in idea generation and innovative solutions. While students appreciated AI for structuring and visualizing their ideas, they remained undecided about incorporating such tools into future artistic endeavours, expressing a belief in the superiority of human creativity over machines. While students expressed skepticism in the beginning, they quickly adapted and embraced AI tools, recognizing

their potential to offer novel sources of inspiration and innovative solutions, particularly in conceptual aspects. Hutson and Lang acknowledge the small sample size and suggest the study would benefit from a control group as well. They also raise ethical concerns regarding ownership, authorship, and intellectual property. This study highlights the need for further research about how AI tools foster creativity in addition to how ethical frameworks influence engagements with AI in art education.

Ahmad Faisal Choiril Anam Fathoni's (2023) exploration of AI as a catalyst for creativity and academic integrity in art education underscores the importance of examining not only the opportunities but also the ethical challenges that arise when integrating AI into creative processes. Fathoni presents AI as a tool to foster innovation, creation, and exploration by harnessing AI-based solutions such as text-to-image generators. Employing a qualitative research approach, Fathoni analyzed selected case studies to identify trends, challenges, and opportunities presented by AI technologies. He utilized thematic analysis to identify patterns within the data, emphasizing the need for ethical and responsible usage of AI technologies in educational settings. Fathoni (2023) concluded that AI-based solutions have the potential to "significantly enhance art and design education by promoting academic integrity, fostering sustainable creativity, and preparing students for the rapidly changing digital world" (p. 5). However, he acknowledged challenges related to ethical usage and emphasized the importance of collaboration among educators, students, and technology developers to create an innovative future. Fathoni's findings suggest the need for further investigation of the collaborative creative potential between educators, students and technology, while maintaining academic integrity and a clear ethical framework.

Art Education and Generative Text-to-Image AI as a Research Tool

Janet Reed et al. (2023), from Kent State University, demonstrated how AI generated imagery can foster self-reflection, identity formation, and emotional engagement, offering a compelling model for how similar strategies might be applied within art education to deepen students' critical and creative connections. Reed et al. explored cultural stereotypes and visual representations of the nursing profession, utilizing AI to transform written text into artistic images of varying styles. The researchers sought to examine whether AI education strategies could promote realistic and positive identities within the nursing profession to encourage self-awareness and emotional intelligence. Using an exploratory descriptive qualitative case study design, participants responded to prompts regarding identity in nursing, which were then converted into images using Midjourney. Subsequently, students engaged in collaborative group reflection sessions. Participant reflections and images were analyzed using basic interpretive qualitative research methods, with emerging themes categorized and member-checked for accuracy. The constant comparative method was employed for systematic data analysis, allowing for the development of thematic categories through the comparison of new and previous data.

Two common themes emerged: positive emotional responses to images and the acquisition of knowledge and experience through AI. Participants also reflected on their moral and professional development, noting that the emerging biases were inconsistent with contemporary realities. However, a key limitation of the study was its small sample size, involving only four participants, which lacked demographic variation. It was acknowledged that different types and levels of students may yield varied results.

Researchers concluded that AI as a teaching strategy “promoted students' self-reflections on professional identity and created powerful emotions to make meaningful connections” (Reed

et al., 2023, p. 393). They recommended integrating AI into professional learning but cautioned against ethical considerations and the evaluation of data biases. The success of this study justifies an examination of a similar approach within art education as, theoretically, participants having a greater knowledge of the elements and principles of art may offer deeper and more robust connections. Reed et al.'s findings suggest that AI generated imagery could produce richer insights into identity, emotion, and bias, especially amongst those with formal training in visual literacy.

Human Creativity versus AI Image Generation

Jonas Oppenlaender's (2022) ethnographic study highlights the inherently collaborative and iterative nature of text-to-image generated art, framing AI not as a replacement for human creativity, but as a partner in meaning making. This insight is directly relevant to examining conceptual and reflexive practices in art education. He argues that "text-to-image synthesis lies not in the end product (i.e., the digital image), but arises from the interaction of humans with the AI and the resulting practices that evolve from this interaction" (p. 193). Essentially, Oppenlaender attempts to address whether text-to-image art can genuinely be considered an extension of human creativity, which is directly linked to the reflexive collaboration between humans and AI at the core of this study.

One challenge in Oppenlaender's analysis lies in defining creativity suitably for his study. He explores Csikszentmihalyi's sociocultural model, which emphasizes originality and effectiveness, but favours Rhodes' 4 Ps framework, which encompasses Product, Practitioner, Process, and Press. This broader definition allows for a more comprehensive examination of creativity, focusing on aspects such as the creative iteration process and community involvement in text-to-image art.

Oppenlaender employed online ethnography and a participant-observational approach to gather qualitative data from various practitioner perspectives. He actively participated in the text-to-image process, concluding that interesting images can arise from minimal language inputs or existing text, like song lyrics. Although, the quality of images, as judged by online communities, benefits from strategic prompt engineering, image curation, and portfolio development. Oppenlaender highlights image-level and portfolio-level curation as crucial creative practices in text-to-image generation, emphasizing the collaborative nature of the process between human users and AI. Moreover, Oppenlaender notes the role of chance and practitioners' willingness to adapt prompts during the interaction with AI. Oppenlaender's work points to the need for future research critically reflecting on creativity as a collaborative process between human agency and AI systems.

Visualization of Ideas

Tore Andre Ringvold et al. (2023) position text-to-image generators as a transformative force in art education, comparable to the disruptive impact of photography, highlighting both their potential to expand imaginative possibilities and the need for deeper inquiry into how AI aligns with users' conceptual intentions. They argue that educators must adapt to this emerging technology despite potential implications, emphasizing the need for research to critically examine its applications in art and design teacher education. Creativity is the same, only the context has changed.

Through qualitative exploration and online ethnography conducted over six months, the researchers conclude that text-to-image generation facilitates prefigurative thought processes and offers a training ground for visualizing ideas. This interactive learning process involves an exchange that allows students to “possibly push their own boundaries of imagination” (Ringvold et al., 2023,

p. 6). While acknowledging limitations such as sample size and potential biases in image results, the study suggests that AI visualization tools have the potential to enrich the creative process by providing new perspectives and bypassing creative blocks. However, they also caution that AI may influence the role of creators, potentially shifting it towards that of an art director or composer rather than a traditional artist. This study aims to provide a deeper understanding of the exact types of images that AI can produce, and the specific place they best function during the creative process. For instance, the extent that AI image generation reflects the conceptual intentions of its authors.

Overall, the study underscores the complex interplay between AI and human creativity, highlighting the need for further research to understand and harness the potential of text-to-image generation in artistic and educational contexts. The conclusion is optimistic in regard to the relationship between AI and creative artistic processes. The vast majority of literature concerning AI integration into art education speaks to ethical concerns on behalf of participants. This study aims to identify these concerns more specifically, as well as the extent to which ethical positionality affects utilization of AI technologies.

Methodology

The Journey: Finding a Research Method

As I worked my way through this research process, I came to understand that, despite the a/r/tography underpinnings of my personal philosophy, my methodological framework was far more aligned with a grounded theory approach. This approach was developed in the field of sociology in the 1960s and has moved into the field of Art and Design in recent years, offering potential pedagogical advantages that were previously limited to the Social Sciences. According to Compton and Barrett (2016), grounded theory “respects deductive analytic ways of learning and producing knowledge, even while promoting inclusion of more inductive and adductive approaches” (p. 335). This methodology utilizes an evidence-based approach that generates knowledge aligned with subjective creative processes, highlighting a potential for productive synergies for artists and designers. Grounded theory can “teach useful skills and sensibilities for gathering and analyzing data in a systematic, self-documenting fashion” (Compton et al., 2016, p. 336). As such, this methodology advances a reflexive, participatory dynamic and qualitative data analysis.

Grounded Theory in Art Education

The core objective of this research study is to ascertain the extent to which AI image generation tools are useful in the visual representation and development of abstract conceptual ideas in art education. Given the aims of the study, and the preliminary research regarding the development of this methodology within art education, I use grounded theory to empower participant narratives, as it prioritizes qualitative data and allows diverse perspectives to emerge organically from participants. This approach reduces researcher bias and embraces complexity, contradiction, and nuance, which are all key attributes when studying a technology as multifaceted as AI.

As a reflexive methodology, grounded theory also holds the researcher accountable. It requires ongoing self-awareness and critical reflection, particularly regarding positionality and privilege. It does not aim to silence perspectives in favour of neat conclusions but instead highlights multiplicity. Grounded theory allows the participant experience to diffuse emergent theories, as usefulness is to be determined by participants. Kristjansson-Nelson (2020) emphasizes how this methodology can contribute to the development of theory grounded in empirical data while facilitating a deeper understanding of education practices in media arts. Specifically, Kristjansson-Nelson (2020) maintains that “grounded theory is a powerful method of practice, particularly for researchers aiming to explore complex processes through the perspectives and experiences of others” (p. 1). Grounded theory’s flexible, iterative process and deep engagement with empirical data provide valuable insights for scholars and educators seeking to better understand the role of AI in educational pedagogy.

Furthermore, grounded theory “can teach useful skills and sensibilities for gathering and analyzing data in a systematic self-documenting fashion” (Compton and Barrett, 2016, p. 336). Grounded theory, as a methodology, allows for a more unifying approach to research that is not only applicable within the realm of Art Education but can relate to “the global community of scholars and professionals from diverse epistemological traditions” (Compton et al., 2016, p. 346). The application of AI technology, including image generation, is not limited to solely the Fine Arts, as this technology is also being utilized across fields including education, healthcare, sociology, and design.

This study collected and analyzed qualitative data by way of a questionnaire and roundtable discussion. This approach reinforced and enriched data collection via reflective analysis and open-ended inquiry. To democratize and equalize roles, this included a researcher/participant synthesis in order to establish rapport, trust, and a robust perspective on the topic. Application of AI image generation allowed for unexpected avenues of exploration,

navigating the movement of possibilities that AI presents and untangling the dialogue that emerged as a result. Using this dialogue and open-ended discussion, qualitative analysis of perspectives via concept mapping was necessary to ascertain to what extent AI could be utilized as a means of enhancing reflexive meaning of visual imagery. Data emerged from my personal reflexive experiences as a researcher participant, but primarily from the unfolding of ideas contributed from the participants themselves.

Untangling Dialogue Through Grounded Theory

Kristjansson-Nelson (2020) distinguishes three sub methods within grounded theory, which are (1) emerging, (2) systematic, and (3) constructivist: (1) Emerging design involves completing a research question/s and literature review after the research has taken place, so that emergent theories can be truly guided by the emergent data; (2) Systematic design is “more structured . . . and allows research questions, literature searches and heuristic frameworks to be considered before data collection” (Kristjansson-Nelson, 2020, p. 5); (3) A constructivist approach includes researcher as participant, who forms theory along with participants, “constructivist design places significant emphasis on the researcher’s positionality throughout the process, as the researcher co-constructs meaning through their own personal lens and through the lens of the research participants” (Kristjansson-Nelson, 2020, p. 6).

In this particular study, I chose to utilize a blended systematic-constructivist design. From a systematic perspective, a research question was in place prior to the study but was completely re-written as informed by the emergent data, and a literature review was also completed beforehand. Using a constructivist lens, I was included as a researcher participant, and aimed to co-construct emergent data alongside other participants. The data collection and analysis methodologies applied by Kristjansson-Nelson were used as a benchmark for this study, “with research questions and the literature review developed before data collection, and with a

data analysis process that used open, axial, and selective coding” (p. 8). Data collection and analysis will be described in greater detail in those sections.

Recruitment and Sampling

Grounded theory utilizes purposive sampling, which means that participants are chosen strategically based on having perspective/information/knowledge that is likely to tie directly to the study. Potential participants were contacted via a recruitment email that was sent to students of the Master of Arts in Art Education program at NSCAD University in March 2025. This specific group of people was selected, as they aligned with the demographic in Greer and Blair’s (2018) work, which was the initial catalyst for this research. In addition, these participants were actively engaged in artistic projects, research methodologies and conceptual development related to their thesis, making them purposive candidates. Email addresses were gathered from students registered for MAED 6705 Thesis Proposal and Preparation with Dr. Joshua Schwab-Cartas, and Thesis, in which candidates had individualized advisors. The recruitment email provided a full breakdown of the purpose of the study, voluntary requirements of the participants, and guaranteed the participants confidentiality and autonomy over their process. The study aimed to have three to five participants, however, seven participants responded, and all participants were accepted, as it would provide additional data, and keep a larger sample size should a participant choose to drop out of the study or be unavailable for the final roundtable discussion.

Participants received instructions via email to review their current thesis work and submit three short excerpts for purposes of image generation. The work of Greer and Blair (2018) focused primarily on identifying metaphor and figurative language, and following this direction would significantly limit the number of passages participants could draw from, so I asked them to choose meaningful excerpts regardless of the inclusion of literary devices. Participants were

encouraged, however, to select passages that included metaphor, simile, or symbolic figurative language, and that contained a premise or concept central to their writing. Ultimately, they were directed to choose passages that they considered “meaningful or central to their thesis research”. This opened the range of images produced by the passages and gave participants increased autonomy over their own process. Participants shared three passages ranging from approximately one to three sentences in length, which were drawn from their thesis work verbatim. The participants were randomly assigned a number, utilized throughout the study for organization, publication references, and confidentiality during the group roundtable.

The basic functionality of Midjourney was explained to the participants, although participants did not have direct access to the software. Midjourney allows for a significant amount of user input to inform the image being generated, for example, aspect ratio, art style, composition, subject inclusion, etc. In the case of this study, I intentionally decided to enter the prompts verbatim, as to not inform the nature of the image being generated, as the function of the study is to examine how AI software processes conceptual prompts with open parameters, based on the machine trained algorithms.

Data Collection and Triangulation

After running each prompt through Midjourney, the software produced a panel with four images. For reference, throughout the study, the upper-left panel is referred to as image 1, the upper-right panel is referred to as image 2, the lower-left panel is image 3 and the lower-right panel is image 4. This was explained to participants when referencing images. After the participants’ three images were produced, I drafted a Google Form that was privately shared with each participant. The Google Form included the participants’ written prompts, the AI images produced, and a series of reflection questions about the images in relation to the original

extract. The Google Form also contained a series of final questions to have participants consider the ethics, functionality, and usage of AI within a research context.

Figure 1
Screen Shot of Participant Questionnaire

Section 1 of 2

Research Study - Candidate #1

Thank you for volunteering for this research study involving the use of AI image generation as an analytical tool for deconstructing academic writing in relation to arts-based education.

The written extracts you've provided have been entered as a prompt using Midjourney and, using AI technology, have been rendered into a series of images. For context, when a prompt is entered into Midjourney, the AI software renders a panel of FOUR images. The user then has the option to upscale an image's or add variations to an image's. For the purposes of this study, the original panel of four images created with Midjourney will be the image shared back with each candidate.

The candidate is then asked to examine the images produced, reflect upon them in relation to their prompts and answer a series of questions. The candidate is encouraged to answer all questions, however, may skip any they choose. The candidate is also able to request an upscaled image of any panel from the researcher. In this situation, the upper/left image is #1, the upper/right image is #2, the bottom/left image is #3 and the bottom/right image is #4.

Your AI images have been labelled according to the prompt order provided. They are shared below for your reference. Please review the images, respond to the questions in an open/honest fashion and reach out to me should you have any questions or concerns. (calumlaabester@nrcad.ca)

Thank you.

What is the significance of this extract?
Short answer text

What is your initial reaction to the image produced?
Short answer text

Please describe the imagery and/or tone that stands out to you from the image.
Long answer text

Does this image feel consistent with your intended tone and meaning of written extract? Please explain.
Long answer text

Does the image align with your expectations or offer unanticipated meaning and/or perspective? Please explain.
Long answer text

General Reflection Questions
Please respond to the following questions based upon your general experience.

Consider your research. Do the images generate any additional perspective or insights into your research and/or writing?
Long answer text

If you asked for any upscaled images for further analysis, describe how they extended your inquiry
Long answer text

In your opinion, could AI image generation be useful in a reflexive research capacity?
Long answer text

Do you have ethical concerns about the use of AI in academic research? If so, please explain.
Long answer text

Is there anything else you'd like to comment on for purposes of this study? Please feel free to do so.
Long answer text

Participants were given their original prompt with the generated images and asked the following questions:

1. What is the significance of this excerpt?
2. What is your initial reaction to the image produced?
3. Please describe the imagery and/or tone that stands out to you from the image.
4. Does this image feel consistent with your intended tone and/or meaning of the written extract? Please explain.
5. Does the image align with your expectations or offer unanticipated meaning and/or perspective?

In addition, at the conclusion of the questionnaire, participants were asked general questions to reflect upon the experience as a whole and their opinion of AI in general. Questions included:

1. Consider your research. Do the images generate any additional perspective or insights into your research and/or writing?
2. If you asked for any upscaled images for further analysis, describe how they

extended your inquiry.

3. In your opinion, could AI image generation be useful in a reflexive research capacity?
4. Do you have ethical concerns about the use of AI in academic research? If so, please explain.
5. Is there anything else you'd like to comment on for the purposes of this study? Please feel free to do so.

The open-ended questions encouraged participants to communicate any additional thoughts, questions, or concerns not raised directly in the questionnaire. All questions were short answer, and participants were given the option of skipping any question they did not want to answer. The form was shared with each participant separately with the request to complete and submit the form within a week. To also share/participate in the experience of the study, I selected three passages from my thesis proposal and ran these through Midjourney in the same manner. I then completed the Google Form . All seven participants and I completed this portion of the study and submitted responses for analysis.

Once the Google Forms were submitted, participants were contacted to arrange a final roundtable discussion to add additional perspective to the research study, especially after some time had passed and participants had time to further reflect. Five of the seven participants and I were present for the final roundtable and everyone agreed to have the discussion recorded for research purposes. The final roundtable was approximately 1.5 hours in length, guided by a series of questions, and allowed all participants additional input regarding AI's interpretation of their writing and the subsequent meaning extracted. The open discussion and critique allowed participants to further explore the possible function, merits, or dangers of AI as a research tool. Participants shared their images and received outside feedback from other participants, which enhanced perspectives regarding the usage of figurative language in the context of AI

visualization. This peer critique allowed for the greatest degree of reflexivity and analysis, as participants directly rationalized the intentions in their writing with the AI images. Dialogue was further analyzed via concept mapping for patterns and emergent themes.

It should be noted that although this study highlights image generation as a focal point of reflexive analysis, ultimately written excerpts from participants are paramount to image qualities. Much participant dialogue is centred around qualities of writing and intended meaning through language, which was an unexpected result of this process. In addition, analysis focuses on written and verbal responses to the images, rather than the images themselves. The images themselves serve as a symbolic gateway to aspects of writing central to this investigation.

Data Analysis

Data collected via Google Forms and the roundtable discussion was analyzed via grounded theory methodology, using axial coding to ascertain emerging data. This process integrated statistical analysis of data and trends, while the round table discussion offered additional insight into in-depth perspectives and context. This triangulated approach, in the words of Bush, is one “where strategies or methods are mixed to corroborate one against the other” (Nelson, 2020, p. 23). The exact axial coding technique will be further elaborated upon.

In the context of the systematic-constructivist grounded theory methodology, a working research question focused on the extent to which artificial intelligence could be utilized as a means to visualize, analyze, and understand unintended bias within academic language, and was at the core of this analysis. Prompts and questions presented to participants were largely structured around this philosophical context, however, there was room for open participant input and reflection beyond this focus. To triangulate data, I gathered a range of feedback including participant prompts, generated AI images, a digital questionnaire, and a recorded roundtable.

After participants submitted their questionnaires, they were analyzed to ascertain commonalities in reaction to the AI generated images, essentially open coding for repeated words, phrases and ideas. Qualitative data was broken down, labelled, and categorized to find emergent trends. After reading and reviewing participant responses several times, open coding was used to find common patterns, for example, using colour and charts to better visualize how themes intersected. An axial coding process was used, which involves reassembling data during open coding, linking categories and subcategories to form a coherent framework and identifying central phenomena within participant response. Memos and annotated data sheets were constructed to notate ideas, codes and connections between participant responses.

Axial coding “is the process of relating categories to their subcategories, termed ‘axial’ because coding corresponds to the axis of a category, linking categories at the level of properties and dimensions (Nelson, 2020, p. 16). This is an iterative process that requires the researcher to continuously revisit and reorganize the data in an effort to identify selective codes and emergent themes. According to Nelson, it is important for the novice researcher to remember that grounded theory involves “interplay and movement between methods and processes . . . as it is both iterative and dynamic and is not one directional” (Nelson, 2020, p. 18). In this manner, and informed by a constructivist methodology, I was directly involved in systematic identification of underlying themes in materials, “analyzing these themes and providing an interpretation that augments a theoretical argument” (Nelson, 2020, p. 22). In this case, the data produced completely changed the pre-identified research question and focus of the study.

Following the qualitative analysis of the positions, attitudes, trends, and commonalities for any emergent statistical points of interest, the roundtable discussion, an hour and a half in length, was transcribed and reviewed. It was initially transcribed by using the online application Otter AI. This software uses advanced speech recognition technology to transcribe spoken

language into text, able to differentiate between multiple speakers to construct an accurate group transcription. The software produced a mostly accurate transcription of the roundtable, which was then manually reviewed and refined for accuracy. This qualitative inclusion facilitated rich, narrative-driven data collection, specifically allowing participants to critique each other's images and gain unexpected insights. Research analysis again focused upon open/axial data analysis to identify themes raised by participants; while allowing deeper reflection and dialogue pertaining to participant experience. Analysis also included a dialogue regarding the potential application of AI image generation within educational, non-research based, contexts.

Role of Researcher-Participant

I engaged with this study as a researcher-participant in order to better understand the perspective and experience of participants, however, removed myself from the collective analysis and synthesized participant conclusions. This was done to empower participant feedback and remove my personal bias from the general participant data and conclusions. When synthesizing individual participant narratives, I did include a researcher narrative, as my personal engagement with AI image generation was altered as a result of this reflexive process and participant critique. Furthermore, I included a final researcher reflection in the conclusion, as emergent participant data greatly transformed the focus of my research, including the rewriting of research questions and situating AI participant data within an ethical framework. This change was informed by the grounded theory methodology that seeks to respect and acknowledge emerging participant narratives.

Data Presentation

Presentation of Images

As this paper will frequently reference the images produced by Midjourney, they will be listed here, according to participant #, with the adjoining text excerpt. Each participant had 4 images produced in a grid for each excerpt; detailed individual images will be shown in greater detail and clarity when they are referenced further in the analysis. The excerpts, as presented, were transferred verbatim from the participant into Midjourney and this document. There was no manipulation or prompt directions on behalf of the researcher. The excerpts were only entered once and the first image generation output was used.

Due the constructivist nature of my grounded theory methodology, it is important to include my own reflexive experience as I co-constructed emergent data alongside participants. To keep the emergent participant data apart from my own, I separated my reflexive experience from participant data both in terms of data presentation as well as analysis. I have labelled any personal data and subsequent analysis as Researcher Perspective in order to differentiate from separate participant contributions. My experiences will be explored in the conclusion.

Four participants were able to attend the final roundtable to provide detailed perspectives on their individual experience, with one participant able to respond to the feedback later by email. These participants were also provided an opportunity to critique each other's images, which provided a more robust analysis of the AI generated works. This enriched dialogue and outside perspective proved essential for a constructivist appraisal of the AI images, allowing for a culture of critical reflexivity amongst round table participants. Included with this data presentation is a synthesized narrative for each participant whose voice was heard during the roundtable. This emergent narrative was extracted from their initial impressions/concerns, key thoughts/experiences, a central image critique, and personal implications for AI integration.

These narratives represent emergent theory, diffused into meaning and grounded in the direct experience of participants. All participants who completed the questionnaire are represented in the general data and conclusions, but only those who participated in the roundtable, or emailed a followup reflection, include a synthesized emergent narrative. For those who completed only the questionnaire, the lack of data triangulation via peer input and reflective dialogue did not allow for a confident diffusion of participant perspective.

To summarize, presentation of data will include excerpts, generated images and synthesized narrative of each participant's emergent response to the reflexive process. As some participants were not able to participate in all stages of the research process, a chart denoting each participant's involvement in the 3 stages: (1) excerpt submission, (2) questionnaire, and (3) roundtable, has been included. Participant involvement is denoted by ✓, while absence from the stage is indicated by ✗.


Figure 2
Record of participant involvement

Participant #	Excerpt submission (1)	Questionnaire (2)	Roundtable (3)
1	✓	✓	✓
2	✓	✓	✗
3	✓	✓	✓
4	✓	✓	✓
5	✓	✗	✗
6	✓	✓	✓
7	✓	✓	✗

Participant #1- Images and Narrative

Figure 3*Presentation of Data - Participant #1*

Excerpt #1	Image #1
<p>American philosophy scholar Shannon Sullivan (2002) uses the food metaphor of the “stew” to describe the richness of encounters that can result when we move beyond our own potentially homogenized circles. In the stew, ingredients can be identified but, in their intermingling, the overall flavour of the dish is enriched. Sullivan suggests that to commit to diversity is to invite diverse peoples because we do not know how “broadening” our environments can be enriched by transacting with others (Sullivan, 2002, p. 208).</p>	
Excerpt #2	Image #2
<p>There are a lot of feelings that circulate when we find ourselves in a new place. What produces these feelings and which of these are we responsible for? British Australian feminist writer and independent scholar Sara Ahmed (2014) suggests that we do not simply ‘have’ feelings, we do not possess them, but rather they are shaped by others or by objects. Other bodies, or surfaces, if we perceive others or things as “objects of feelings,” leave impressions on us (p. 16).</p>	

Excerpt #3	Image #3
<p>Sometimes, the language we use to explain is an impediment to learning. Surprises emerge when we demonstrate and allow others to provide the words to explain the process. ‘Mix the flour into the eggs’ has been poetically translated into ‘invite the flour into the eggs’ by a person with dementia, and ‘use your fist to make a well’ has been interpreted as ‘make a volcano’ by another person with intellectual disability.</p>	

Note: Participant #1 participated in the (1) excerpt submission, (2) questionnaire, and (3) roundtable.

A One-Dimensional Rendering

Participant #1 expressed concerns about the limitations of AI-generated imagery, highlighting issues of literalism, lack of diversity, and a narrow interpretation of the written prompts. They felt the images offered a one-dimensional rendering of their work, stating that this output was “not accurate with what the writing is trying to express.” The participant was particularly frustrated by the way the visuals focused too closely on surface-level descriptions rather than engaging with deeper, more nuanced aspects of their text.

Reflecting on Image #3, the participant explained that while the visuals were “focused or zoomed in into the process of pasta making,” they failed to engage with the central theme of the excerpt—namely, that “surprises emerge when we demonstrate and allow others to provide the words to explain the process.” Instead, the images depicted solo, predominantly female figures in

traditional settings, which clashed with the participant's intention of illustrating an inter-relational and inclusive process involving a diverse, un-gendered "we." This misalignment highlighted what the participant identified as AI's struggle to interpret subtlety and subtext.

The imagery's failure to reflect key symbolic moments added to their dissatisfaction. The participant described the pasta-making visuals as feeling "staged and artificial," noting visual inaccuracies such as "too much flour" and unbroken eggs—details that undermined the authenticity of a process they felt deeply connected to. The repeated use of the word "staged" underscored the disconnect; the image, they argued, resembled an advertisement more than a poetic metaphor. A particularly meaningful phrase from their writing—"invite the flour into the eggs," derived from a reinterpretation by a person with dementia—was especially important. Yet the notion of "inviting," a gesture rooted in care and attentiveness, was either missing or only passively represented in the image. Furthermore, the concept of "dementia" was only faintly implied, perhaps through aged hands, but otherwise absent from the visual narrative. The participant remarked that such interpretations "require a stretch on behalf of the interpreter," revealing a fundamental tension between poetic metaphor and visual literalism. Despite these critiques, the participant acknowledged one unexpected benefit. When reflecting on excerpt #2, they admitted that seeing the phrase "objects of feelings" visually placed on a woman's body caused them to question the clarity of their own writing. It led them to reconsider whether their language might be "too abstract," and prompted a review of the original paragraph to ensure it was accessible and clear. This insight suggests that, while AI-generated imagery may struggle to capture deeper conceptual meaning, it can serve as a useful tool for testing the legibility and directness of academic writing.

Figure 4*Critique Image for Participant #1***AI Image generated from Excerpt #2****Descriptors from
Round Table
discussion**



Warm
 Eggs not broken
 A story Reminder
 Grandmothers hands
 Nostalgia Connection
 Generations
 Time
 Beginnings
 Feels wrong somehow
 Process is incorrect
 Commercial
 Photo shot
 Too clean and crisp Stage
 Very literal

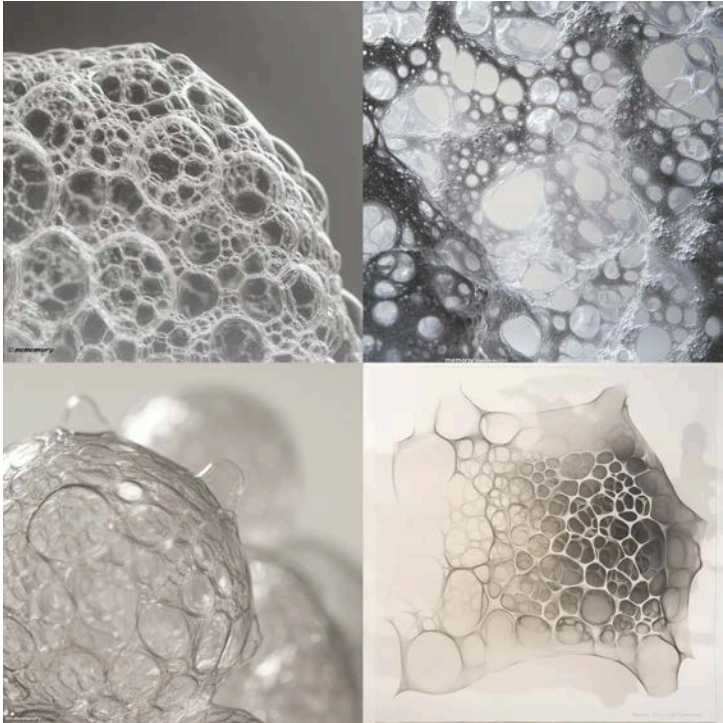
In summary, while the participant found the images misrepresentative and sometimes reductive, the process offered an unexpected opportunity to reflect on their own phrasing and how abstract ideas might be perceived by a broader audience.

Participant #2 - Images and Narrative

Figure 5

Presentation of Data - Participant #2

Excerpt #1	Image #1
<p>In the moments of intra-actions, it felt like knowledge is not ‘constructed’ from experience with the world, but was perhaps a re-knew-ing or recon-naisance of the experience just passed, a reality that shape shifts into each moment of now, and now, and now carrying with it a renewed and updated form reflecting the old.</p>	
Excerpt #2	Image #2
<p>My experiences with art and art education are deeply bound together through time and place. Some of those bonds have held in place unexamined ideas about art, while others anchor my privileged “human” status to the violent inheritances of the Enlightenment. Like ropes left tied around a tree trunk too long they have grown into me. I begin to sense them for the wounds they are.</p>	

Excerpt #3	Image #3
<p>As each bubble structure grew in complexity, the cells at the bottom of the pile became more difficult to see through all of the other cell walls. An opacity developed with structural complexity, like the “memory” of the form becoming dense and at times even collapsing. I began to think of how the breath I merged with these materials were both forming the bubbles and held by them— a chimera of metaphor and agential energy/matter (Barad, 2003).</p>	

Note: Participant #2 participated in the (1) excerpt submission and (2) questionnaire.

A Pseudo ‘Arty-ness’

Participant #2 approached the AI image generation process with a critical lens, expressing strong concerns about the technology’s inability to meaningfully engage with abstract concepts. They felt the images consistently failed to capture the depth and nuance of their excerpts, emphasizing that “it looks like the simplest of ideas were tackled but the more abstract or implied concepts were not attempted.” Across multiple analyses, the participant noted a pattern of the AI latching onto surface-level language—frequently “grabbing” a single word “that isn’t at the heart of [the] idea”—leading to misrepresentations of their intended meaning.

When reflecting on the capacity of the images to provide reflexive insight into their research, the participant remarked, “these images do not capture the sense of intra-connected emergence I was trying to convey. These images are too simple in their visual metaphors.” For

example, in excerpt #1, the participant sought to convey a complex idea about “the material nature of the world and how that matter intermingles to create planets, humans and thoughts.” However, the AI fixated on the word “reflecting,” producing imagery centered around mirrors, double exposure photography, and silhouettes in puddles. These images, while visually coherent, bore little relation to the participant’s intended themes. Interestingly, the participant did not question their own language use—such as the term “reflect”—but instead critiqued the AI’s failure to interpret it within the correct conceptual framework.

In addition to semantic inaccuracies, the participant critiqued the visual and aesthetic quality of the AI-generated images. They likened the output to “first year art school student projects,” describing them as “cliched juxtapositions” and “stereotypical in their ‘arty-ness.’” The black-and-white aesthetic, in particular, was viewed as an artificial attempt to lend the images artistic legitimacy, which the participant felt lacked authenticity.

These concerns were most pronounced in response to excerpt #2, which aimed to explore the participant’s “experiences with art, education, and art education . . . rooted in colonial, capitalist and patriarchal ideas.” Two of the images generated in response depicted female figures bound to tree-like structures with rope—visuals the participant described as “either deeply literal, weirdly sexist images of a woman bound to a tree and somehow integrating with the wood.” They pointed to this as an example of AI’s embedded biases, reflecting a troubling trend in visual media that often casts women as passive victims. The participant used this moment to raise a broader critique about the source data underlying AI models, suggesting that these outputs are shaped by the dominant cultural narratives and biases found in their training sets.

Figure 6*Critique Image for Participant #2*

AI Image generated from excerpt #2

**Descriptors from
Round Table
discussion**


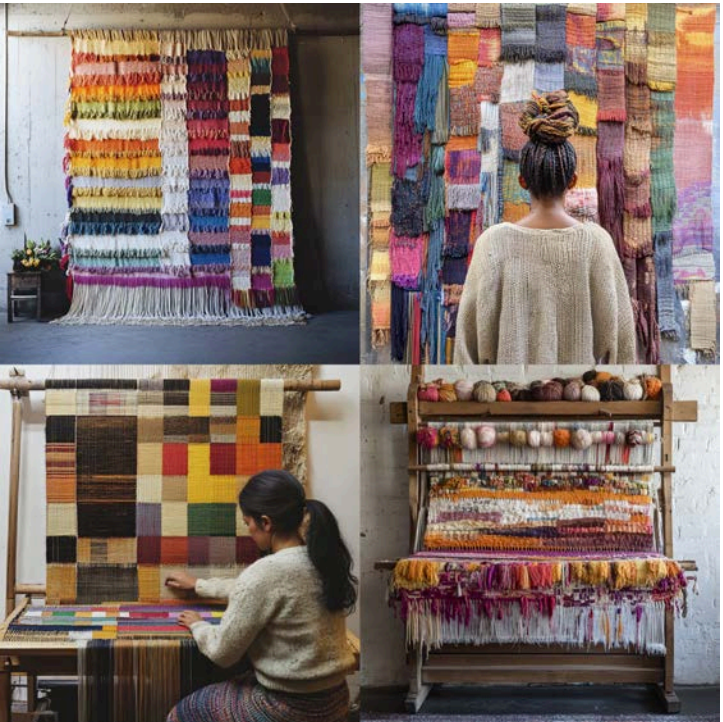
Stunting growth
 Confinement
 Almost torturous
 Restricted
 Tied to a tree Connection
 to nature? Face looks
 wooden Muddy
 Dirty
 Taking ownership Destroy
 at any moment Part of
 nature but stuck in it
 Not positive
 Sinister
 Slightly sensual
 Depiction of women
 Bound
 Human
 Object

In their final assessment, Participant #2 questioned not only the representational limits of AI but also its deeper structural biases. While they did not entirely dismiss the potential for AI to engage with creative work, their critique underscored the need for critical interrogation of both the interpretive logic of the algorithms and the visual culture from which they are built.

Participant #3 - Images and Narrative

Figure 7

Presentation of Data - Participant #3

<p>Excerpt #1</p>	<p>Image #1</p>
<p>Much like the process of learning to weave, learning how to create a master's thesis meant untangling a web of literal and figurative threads into a cohesive fabric. My first experiences with floor looms involved taking them apart, restoring them, replacing their parts, and putting them back together. This experience has influenced how I question the deconstruction and reconstruction of the academic landscape, and how I want to contribute to ongoing conversations of craft, queer identity, and material culture as a researcher.</p>	
<p>Excerpt #2</p>	<p>Image #2</p>
<p>Queerness in weaving is a breaking of the perceived expectations of who a weaver is, an anarchy of craft, and a way of relating to people through radical tactility.</p>	

Excerpt #3	Image #3
<p>Creating cloth requires a significant investment of personal time and energy, which, in response, leads to the formation of unique relationships between people and how they connect to each other. To be queer and weave is to weave while queer, using the relationality of cloth to forge human connections.</p>	

Note: Participant #3 participated in the (1) excerpt submission, (2) questionnaire. and (3) roundtable.

Missed the Metaphor

Participant #3 expressed concerns about the AI's inability to accurately convey the tone and meaning of their excerpts, citing a consistent mismatch between their intentions and the visual outcomes. They attributed these disconnects to AI's tendency to overemphasize trivial words or flatten metaphorical language into generic representations. Their prompts primarily explored the metaphor of weaving as a way to express the deconstruction and reconstruction of materials, queerness, and the research process. However, they felt this nuanced metaphor was repeatedly lost in the generated imagery.

The participant noted early on that none of the images aligned with their intended tone, particularly due to technical and conceptual misunderstandings. In their words, “my knowledge of weaving is more extensive than the generator, and that I am importing my knowledge onto the

images presented to compensate for Midjourney's lack of knowledge of the specifics of weaving." This observation framed much of their critique, especially regarding the AI's simplistic interpretation of weaving imagery. While Image #3 was noted for its "colour [that] stands out, and the idea of a mass of fabric," the participant's overall engagement with tone remained limited, likely because they viewed the inaccuracies as too glaring to move past.

Their critique focused heavily on the technical inaccuracies within the images, particularly how the AI misrepresented weaving tools and processes, and the weavers themselves. They described a "disconnect between the weaving equipment the image generator is striving to represent" and the real-world mechanics and nuance of the craft. This misalignment extended to the conceptual core of the prompt as well: the participant emphasized that the word "anarchy" was central to their metaphor but felt the AI "pulls from words with relative 'equal weight'," leading to an image that lacked conceptual precision. They concluded that the AI had "completely missed the metaphor" of weaving as a representation of queerness, a key focus in their research.

Despite a largely critical stance, the participant offered a few nuanced reflections. They acknowledged being "dismissive" of the images, largely due to their perceived failure to authentically represent labour and process. However, they also admitted to being "impressed by the general accuracy of the depictions" in a broader, non-specialized sense. While the AI imager did not enhance their personal reflection on their research, it prompted them to consider how an outsider might perceive their work. This led them to note the potential value of AI-generated visuals during the "beginning of the research process," particularly for brainstorming or identifying the accessibility of their language. In this way, the experience helped them recognize a need to scaffold their writing more carefully for those unfamiliar with the niche subject matter.

Figure 8*Critique Image for Participant #3*

AI Image generated from Excerpt #1

**Descriptors from
Round Table
discussion**



Overwhelming
Texture Colour
Weave
Lots of colour
Doesn't seem to follow a
ridged pattern
Exploratory
Both random and
organized
Simple wall Unfinished
weave Texture and
colour Bunch of
symbols Doesn't follow
a rigid pattern
Exploratory
Random


In summary, while Participant #3 strongly critiqued the AI's capacity to reflect technical and conceptual specificity—especially within specialized fields like textile arts—the process nonetheless offered insights into how their research might be perceived by non-experts, reinforcing the importance of clarity and accessibility in scholarly communication.

Participant #4 - Images and Narrative

Figure 9

Presentation of Data - Participant #4

Excerpt #1	Image #1
<p>My research explores transdisciplinary methods as both time and space spent dedicated to creativity and exploration. This time and space utilize experiences from our cultures, our existing knowledge and current influences.</p>	
Excerpt #2	Image #2
<p>Art-based research is a vital methodology for both artists and educators, offering a dynamic space for inquiry, reflection, and meaning-making. By engaging in creative processes as a means of investigation, artists and educators can explore complex ideas that transcend traditional academic frameworks. This approach is particularly valuable in educational settings, where learners come from diverse backgrounds, bringing unique perspectives, abilities, and experiences into the classroom.</p>	

Excerpt #3	Image #3
<p>Acknowledging how you learn best and taking opportunities to step back and see or Invision new ways of using information creates avenues of growth and creativity, learning and innovation from your initial perhaps small narrow one-way paths.</p>	

Note: Participant #4 participated in the (1) excerpt submission, (2) questionnaire, and (3) roundtable.

Richness of Divergent Interpretation

Participant #4 stood out among the participants for their openness and appreciation of the AI-generated imagery, showing a reflective and exploratory attitude toward the process. Rather than focusing on misinterpretations or inaccuracies, they engaged with the images as a mirror of their own language and found value in the unexpected visual outcomes. A key insight from the participant captured this self-awareness: “I saw the colour palette immediately and realized my words did not convey the colour palette I envisioned, but only realized this when I saw these images; I knew my vision was not this tone. The more I look at it—the image might convince me that my words created these images and colours.” This comment reflects a central tension noted across participants—whether the AI image should be seen as a detached product of algorithmic misreading or a valid reflection of their own language choices. In Participant #4’s

case, they accepted greater responsibility for their phrasing, which allowed them to extract meaning from the image more constructively.

When asked whether the images met their expectations, Participant #4 offered a balanced critique: “They are interesting for sure. As an artist/educator I tend to critique what I see and argue the ways in which they could fit with my expectations rather than not. So I believe they are not too far off from a place I have described in my extract.” This openness to interpretation led the participant to describe the images as “useful,” elaborating that the process helped them become more aware of the relationship between their language and how it might be interpreted: “Perhaps I will focus on the written works a bit more to ensure initial understanding and how they promote other ideas.” This demonstrates how AI image generation served not only as a reflective mirror but also as a potential writing tool that sharpened their awareness of tone, clarity, and audience perception.

The participant was also able to move past superficial critiques of aesthetics to consider the symbolic and tonal implications of imagery. One image generated in response to their excerpt featured a striking contrast between formal, business-oriented male figures and organic, naturalistic elements. The group noted this image as one of the few with distinctly male depictions and questioned whether these visual elements reflected implicit gender norms. The participant responded reflectively, considering that their mention of “curriculum outcomes” might have shaped the formal, rigid tone of the image. They acknowledged that such language—described as “bureaucratic edu-speak”—could have prompted the AI to draw from stereotypically masculine and systemic visual references. They clarified that while they intended to evoke a sense of “exploring the unknown in a way that was inviting, relaxing and calm,” the AI’s interpretation leaned toward structure and rigidity.

Figure 10*Critique Image for Participant #4*

AI Image generated from Excerpt #1

**Descriptors from
Round Table
discussion**


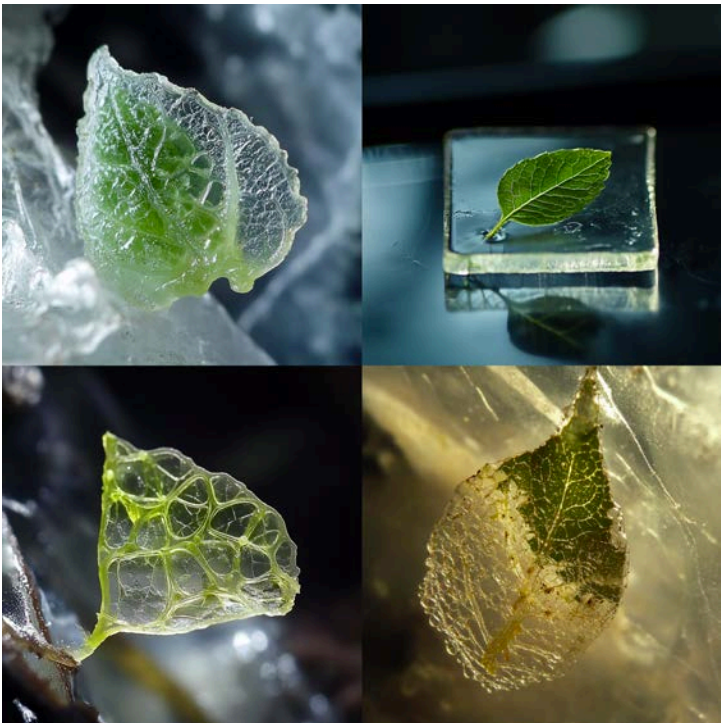
Ideas
 Light bulb moment
 Puzzle being solved
 Idea
 New beginning Metaphor
 for choosing paths
 Ideas
 A way forward
 Possibilities
 Journey through a maze
 Hard to see the way out
 Getting lost in a maze
 Focus on male figure
 Contrast of childhood and
 adult business Moody
 Anxiety inducing Business
 and nature Surrealist

In their concluding reflections, Participant #4 acknowledged the richness of divergent interpretations and the role of personal experience in shaping how images are read. However, they also noted that while the process was insightful, they did not see themselves using AI as a tool for idea or concept generation in the future. Instead, its primary value lay in highlighting how others might interpret their words, making it a useful tool for revision and communication rather than creative inspiration.

Participant #5 - Images

Figure 11

Presentation of Data - Participant #5

Excerpt #1	Image #1
<p>In a way, blowing a bubble is like a collective whisper—the same recycled air breathed by so many creatures throughout millennia, caught in a fleeting globular cage. The bubble momentarily flattens time and space, cradling the exhaled ghosts of fleshy, finned, exoskeletal and fur-covered beings into a shared container. Do you think they get along in there?</p>	
Excerpt #2	Image #2
<p>Maybe Earl is a single plant cell gone awry, one among millions of tiny specs working together to make up a chlorophyll-ed leaf -but when the sun, obstructed by smog, can no longer feed the plants, a single lucky cell took refuge on a discarded piece of plastic. This plastic piece too, felt that it no longer had a use, broken away from the rest of itself. The cell realized then that it did not need the sun, as its chloroplasts began absorbing energy from the plastic itself, multiplying itself as the plastic and plant cell fused into one another.</p>	



Excerpt #3	Image #3
<p>Perhaps there is a way these one-of-a-kind plastic artifacts can be ordered online, marketed as ‘rare collectables’, or loaned out like a library book, or even adopted. This participant is thinking of ways to further extend the life of this object, rather than turn it into something else or eliminate it completely. This begs an unanswerable question: Can a substance as destructive as plastic ever be '[ethically retired]'?</p>	


Note: Participant #5 participated in the (1) excerpt submission.

Participant #6 - Images and Narrative

Figure 12

Presentation of Data - Participant #6

Excerpt #1	Image #1
<p>How do I nourish the various versions of self—the mother, the community organizer, the artist?</p>	
Excerpt #2	Image #2
<p>Using nature as a mentor, I seek to discover wisdom by engaging physically in nature and conveying what I discover through my art practice. Seed pods are rich in symbolism and practical function, making them a powerful metaphor for care work. They embody the protection, nourishment, and eventual release that are central to the roles of a mother, educator, and community organizer.</p>	

Excerpt #3	Image #3
<p>Advocate for creative activities, connection with nature and other human beings as well as a disassociation with capitalistic productivity. Resists the need for constant output or measurable achievements, instead valuing time and process.</p>	

Note: Participant #6 participated in the (1) excerpt submission, (2) questionnaire, and (3) roundtable.

A Critical Friend

Participant #6 found the AI image generation process deeply affirming and creatively stimulating, especially in the early stages of their research. Unlike participants who focused primarily on inaccuracies or misalignment, this participant embraced the images as meaningful extensions of their own conceptual thinking. They described the process as both validating and expansive, appreciating how visual interpretation could reinforce the tone and complexity of their writing.

In response to their first image, Participant #6 described it as “beautiful and complex; vibrant and complex; they offer layers of texture and meanings.” This response underscored their emotional and intellectual engagement with the visuals. They felt the tone of the image aligned well with their written work, stating: “I would say the image does feel consistent with my

intended tone. The question references a deep inquiry and the complexity and warm tone of the images represents beautifully the depth of meaning from the question provided.” These reflections led the participant to feel that their writing was conceptually on track and that their use of figurative language had effectively communicated their intended message. They further described the images as offering “meaning beyond words” and representing “thought they would engage with regularly.” At one point, the participant even referred to the image as “both meaningful and exquisite. A critical friend in some way.”

The participant found that the AI-generated imagery offered not only reflection but also inspiration, opening up possibilities for future creative exploration. While initially moved by the visual beauty of the images, they later re-evaluated them as somewhat “sterile” upon further group discussion. This shift prompted a deeper analysis of how their language may have led the AI to produce such tonal results. The participant reflected: “What have we provided that gives it that tone, colour, etc?”, a question that led them to consider the broader biases embedded in AI, and how those mirror cultural patterns in education, media, and popular discourse. They also commented on how certain phrases, like “frozen in time” and “the dead of the seed,” had unexpectedly introduced a sense of sadness into their own work, especially in relation to the focus on seedpods—an emotional dimension they had not noticed.

These realizations were significantly deepened through group discussion, which the participant saw as essential to the reflective process. They emphasized the value of collective interpretation, noting that the images alone did not generate the same insights: “Reading images as they are presented is something beautiful as it’s a little bit more objective maybe.” This external perspective, they remarked, was “very precious,” offering feedback they might not have accessed on their own.

Figure 13*Critique Image for Participant #6***AI Image generated from Excerpt #1****Descriptors from
Round Table
discussion**



Intentional
 Curated
 Direction
 Different, but in the
 same place Evolution
 Care
 Holding onto a seed
 Starkness
 Studio shots
 Very clean
 Lifeless
 Rebirth
 Optimism
 Opportunity
 Objective
 Organized
 Dryness - drying
 Preservation
 Ceramic in nature
 Fragile
 Optics of living Preserved
 but beautiful Frozen in
 time
 Artful
 Literal

In final reflection, Participant #6 described the process as a valuable generative tool, particularly because they were at the beginning of their research journey. They believed the images helped open new paths of inquiry, and while they acknowledged that the experience may have felt different at a more advanced stage, it served as a powerful catalyst for early-stage conceptual development. Hence it should be noted that application of AI tools for generative purposes might be best suited for early idea formation rather than late stage revision.

Participant #7 - Images

Figure 14

Presentation of Data - Participant #7

Excerpt #1	Image #1
<p>Toys, therefore, are powerful tools that embody cultural teachings and can foster spiritual and cultural healing. For the Mi'kmaq community, toys should do much more than provide entertainment - they should serve as mediators of identity, teaching children to see themselves as part of a larger, living, interconnected world.</p>	
Excerpt #2	Image #2
<p>These objects can “enact stories,” and in the case of Mi'kmaq children, they have the power to breathe life into ancient stories and teachings, bringing them into the present. This kind of engagement is vital for fostering cultural pride, as it allows children to see themselves reflected in the objects they interact with, thus promoting identity formation rooted in the cultural values of their people.</p>	



Excerpt #3	Image #3
<p>Linen also reflects Indigenous resilience. It's both strong and soft, like the land that nourishes us. Flax, the plant linen comes from, grows, is harvested, and then returns to the earth, completing a natural cycle. Working with linen reminds us of this connection to the land—where care, patience, and renewal are at the heart of everything. Like the land, linen carries the strength and continuity of life.</p>	


Note: Participant #7 participated in the (1) excerpt submission and (2) questionnaire.

Researcher Perspective - Images and Narrative

Figure 15

Presentation of Data - Researcher Perspective

Excerpt #1	Image #1
<p>AI technology is often demonized for its ability to mimic and bastardize the act of human creation, however, this perspective primarily concerns the product, rather than the process. As a teacher of visual arts, I've witnessed students struggle with their artistic process, conceptual brainstorms and solving spatial design problems.</p>	
Excerpt #2	Image #2
<p>Essentially, I intended to push their research on a lateral path, to ascertain what metaphorical language could actually “look” like as a visual product. The resulting imagery was fascinating, complex and analytical; in addition, the images seemed to strongly reinforce the metaphorical connotation of danger discourse</p>	

Excerpt #3	Image #3
<p>An interesting result of this open process was that we learned together and the discussion led us down avenues we did not anticipate, including the emergence of unintended bias and connotations of specific aspects of art history, in particular a pro-Western and male-centric bias.</p>	

Note: Researcher participated in the (1) excerpt submission, (2) questionnaire, and (3) roundtable.

A General Optimism

I approached the process with a generally positive attitude, viewing the experience as a valuable opportunity to gain insight into how written research might be visually interpreted. I was particularly interested in how language could shape or influence visual products, though was uncertain about how literally AI would interpret key terms from my writing. In response to the first AI-generated image, I remarked that it “may be taking the word ‘perspective’ and interpreting it too literally . . . but the tone generally fits with what I was hoping to convey.” I kept a cautious open mind moving forward, noting both the limitations and the unexpected alignment with tone that this image presented.

I found the second image more evocative and emotionally charged, describing it as “dark, with the figures appearing incomplete or lost. There is a bit of anguish here . . .”. I noted a divergence between the image and my original intent, stating, “ I didn’t think my phrasing and

language was quite this visceral.” Despite the unexpected emotional intensity, the image caused me to reflect on my word choices, such as “danger,” “complex,” and “fascinating”, as possible contributors to the AI’s interpretive direction. Did I need these words? Were their tones suitable to the point I was trying to make? I viewed the images as an extension of the metaphorical language that was selected, and concluded that I made those comparisons without intention, but rather because the “metaphor fit”.

Figure 16

Critique Image for Researcher Perspective

AI Image generated from Excerpt #1



**Descriptors from
Round Table
discussion**

Dark
Sci-fi
Dystopian
Depression
Anxiety
Lost
Cerebral
Struggle
Not connected Same
place, but not
connected
In your head
Isolation Internal
Dreams Journey
Landscape and
Architectural

This process caused me to pause and reconsider my specific words/phrasing, appreciate the tonal implications of the generated images and how it reflected my own writing. Although I maintained many of the same criticisms of other participants, such as overly literal and cliché image components, as well as ethical concerns of data sampling, I remained open to further integration of AI into my professional practices.

Ultimately, I questioned some aspects of the images that felt inconsistent with my writing and felt the overly literal interpretations made for superficial reflexivity. Still, the outputs were valid interpretations rooted in my own language. This led to thoughtful considerations, especially during the roundtable, of how certain tonal qualities, such as darkness or ominousness, might be embedded unconsciously in my vocabulary. During the group critique, discussion primarily focused on the first prompt and generated meaningful dialogue regarding my situatedness in the research process, as someone who, at the time, felt isolated and lacked positive support structures as I navigated my thesis.

Limitations and Constraints of Data Collection

As with all studies, there were some limitations with data collection. The primary limitation regarding the AI generated images was that participants did not have access to Midjourney to generate the images themselves. This was initially my intent, however, Midjourney changed their access policy and non-paying users are no longer permitted to use the AI, even when invited into a Discord chat by a user who is a paid subscriber. Had participants been coached in how to use the software with access to run and manipulate their own text prompts, the process likely would have been much more engaging and meaningful, as the AI can essentially produce an unlimited number of images. As it was, I had to enter the text prompts and then share the first series of generated images with the participants. Participants had no autonomy over this portion of the process, which potentially limited the types of generated images they may have found meaningful. While it would have been possible to run prompts through Midjourney several times this would have produced a much larger data set. Too great a data set would have made analysis on behalf of participants overwhelming—a limitation in the processing capabilities of human beings. As such, the study relied on the first generated images for analysis, which introduced a degree of serendipity, as they may or may not have been representational by chance. Alternate diffusions of images may have produced alternate results. Participants were only provided relatively small and compressed images to analyze, and while they were given the option of requesting larger, upscaled versions, no participant submitted this request.

Participants were potentially limited in time and focus on the study, as they were selected based on their involvement in the thesis writing process and therefore were all deeply engaged and committed at the time of the study. All interested participants submitted prompts for the

study and received the generated images and an invitation to engage with the next step in the process. Unfortunately, Participant #5 was not able to participate beyond prompt submission, as the research timeline coincided with their own thesis revision and defence. Therefore, seven of the eight participants completed the questionnaire and provided data for the first stage of reflexive analysis. These participants were given a suggested timeline to spend on analysis of their images; this was done remotely to accommodate participants; it's uncertain exactly how much time and consideration went into their responses. The roundtable discussion followed two weeks later; regrettably, three participants were unable to attend, again due to circumstances surrounding their own thesis development. These participants who were unable to continue with the roundtable did express regret and assured me it was due to personal circumstances and not due to aspects of the study itself. Participants were advised they could contribute final thoughts and reflections via email, however, only one participant was able to follow up with a written reflection. A significant limitation is the removal of these perspectives from the roundtable.

With Midjourney, there are limitations regarding the algorithm used by the image generation software, biases in the data pool being used to generate images and possible image restraints; these concerns were built into the study, and participants were encouraged to consider them throughout the process. That said, the uncertain nature of Midjourney's image generation did create some problems in terms of which words, phrases and concepts the algorithm selected to focus on during the image generation process. The results of the study may have proved different with the selection of an alternative image generation software, so there may be room to study the strengths and limitations of different machine learning models to produce conceptual visualizations in the future.

Another potential limitation was the participants' preconceived notions and biased position in relation to AI, as there seemed to be a correlation between how the participant felt

about AI going into the study and the level to which they viewed the technology as a useful reflective tool. While this was expected, this generally encouraged two distinctive positionalities on behalf of participants. Some participants who were strongly biased against AI and heavily entrenched in their own research viewed the problematic nature of images as inherent to AI, rather than originating in their language selection, metaphorical extensions and phrasing. The dialogue for these participants prominently criticized structural biases within AI, without extending the reflexive dialogue to the structures and composition of their own language selection. Participants who displayed less intrinsic bias against AI were much more likely to see reflexive usefulness in the generated images and attribute their own writing as at least partially responsible for the images generated. In hindsight, using a double-blind approach would have resulted in more objective results, as it became quite clear that a strong ethical bias was present within most participants. In this case, there could be a second group who receive images digitally crafted by human artists, based upon an interpretation of the text prompt.

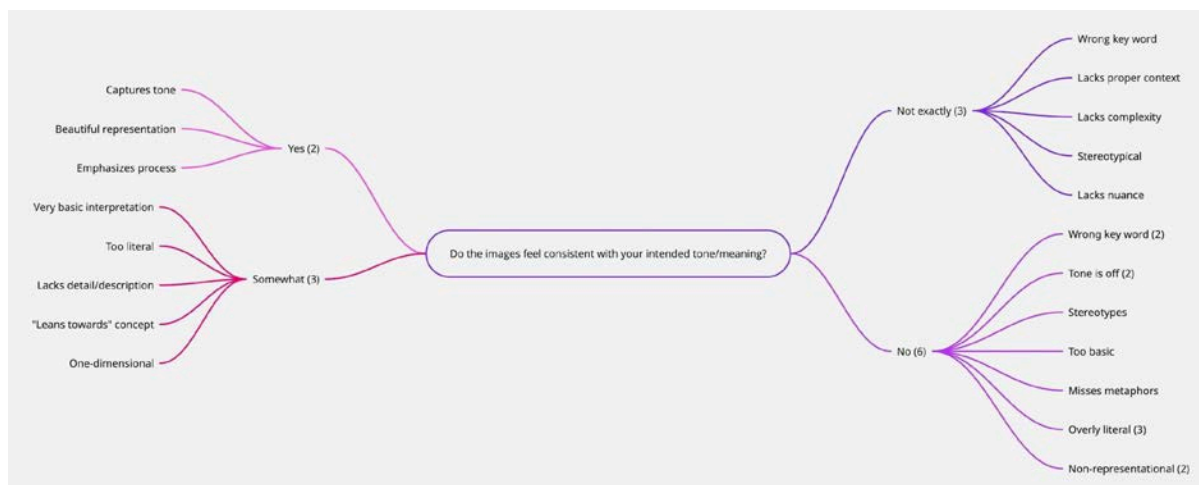
Lastly, due to the previously mentioned processing limitations of the research, the sample size of the study required a limited number of participants to produce a manageable volume of data. This creates some assumptions in terms of generalizability of results. While the narratives of the candidates reflect their experiences, they may not be applicable to the general population.

General Trends, Positions, and Observations

In the spirit and philosophy of grounded theory, the conclusions presented via participant feedback considerably shifted the focus of this study. Whereas the initial research question concerned the ability of AI image generation to aid in the identification of bias via visual metaphor, it became apparent that the initial research question made considerable assumptions regarding the ability of AI to depict metaphors and figurative meaning. The most telling piece of data was the response to prompt analysis question #4: Do the images feel consistent with your

intended tone and meaning of the written extract? When considering this question, broadly speaking, participants answered no roughly two thirds of the time. When the data was further coded to provide thematic context to this response, several coded groupings appeared. Repeated key terms that were flagged included criticisms of the images being “too literal, one-dimensional, lacking nuance, non-representational and missing metaphors”. This feedback would appear consistent with criticisms of machine learning systems being built upon categorial structures that are predicated on the most basic components of language, such as nouns.

Figure 17
Axial Coding of Question #4



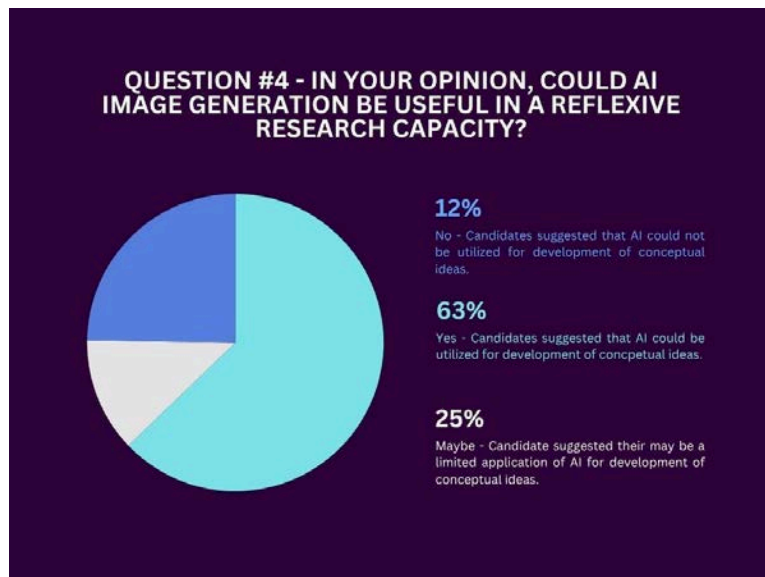
The inability for machine learning systems to accurately synthesize conceptual ideas was mirrored by participants' responses, describing the generated images as “basic, with abstract or implied concepts not attempted” or as “making sense, but not representational of the prompt”. That said, one third of the time, participants did find the images useful, describing images as “meaningful”, “exquisite” and “enabling me to see what I’m trying to say”. These data points then suggested that AI had some potential, albeit limited or contextually dependent, to generate conceptually meaningful imagery. Thus, the research focus of the study was shifted in response to this emergent theme, and more fundamentally focused on the ability of AI image generation systems to represent conceptual thought at all.

In addition, despite the many specific criticisms of the AI images themselves, when asked

when AI had potential as a reflexive tool, only one participant said that it did not. Five of the eight participants strongly implied that AI image generation had merit as a potential reflexive tool, as it

Figure 18

Participant Response to the Usefulness of AI Image Generation

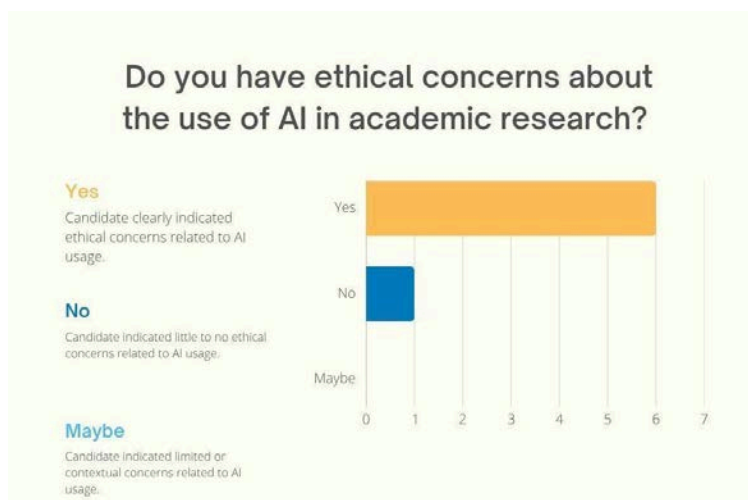


was accessible, available and non-judgmental” and provided capacity to “clarify thoughts and expand meaning”. This was surprising considering the previous critiques of the images to convey tone, concepts, and figurative meaning. In terms of limited application, two of the participants, who were also amongst the most critical of their generated images, felt that AI still had application potential for researchers/artists/educators “on a broad scale for preliminary reflective research, but not at a large and in-depth scale” or “for high school or undergraduate students working at introductory levels”. This was surprising, as I presumed these candidates would refute any application of image generation technology, but it appears that they viewed usefulness only in a generalized or preliminary context. This suggests that use of this technology is very much relative to a specific context and procedural inquiry that requires nuanced knowledge application on behalf of the users involved, echoing Crawford’s (2021) earlier sentiments that “rather than asking where AI will be applied merely because it can, the emphasis should be on *why* it ought to be applied” (p.

226). Participant responses would suggest the answer to this question is early in non-specialized creative processes and so “students can quickly generate ideas” when struggling. Although, as participant #2 pointed out, AI is “a double-edged sword in the sense that it could be a benefit or it could take too much of the struggle out of art that makes us enjoy its products despite their imperfections”. Participants largely felt that the best application of AI was outside of artist or research processes, which benefit from the messiness of creation. It is also worth noting that participants were at a mature stage with their research topics and were likely less open to misinterpretations of their work as a result. They may have been more open to AI as a tool if they were just beginning idea formation.

Six participants expressed ethical concerns regarding the development and application of AI technology. When mapping emergent concepts, the most frequent concerns were related to accurate representation of traditionally underrepresented groups and questions of copyright/ownership of both image data banks and generated images. This seemed to reflect a very cautious acceptance of AI technology among participants, uncomfortable with the lack of transparency on behalf of the major AI stakeholders. Ethical positionality indicated participant acceptance of AI.

Figure 19
Participant Response to Ethical Concerns of AI



overt conceptual connections were limited at this stage, this initial reaction suggested that there was meaning generated between participants and the images, resulting in varied terminology being used as descriptors. While I would describe this dialogue as early stage development, the usage of complex and varied terminology would suggest reflexivity of participants in relation to the AI generated images, whereas, if the images were void of meaning, there would have been no reaction at all.

The question then emerged of whether the images, and therefore the dialogue, were predicated on illustrative or conceptual knowledge. Illustrative knowledge refers to images that are an amalgamation of combined parts that are diffused together as a whole but exist largely as unrelated generative components with little to no related meaning. Conceptual knowledge would infer a greater degree of strategic and intentional combinations of layered, symbolic imagery that are able to initiate a reflexive dialogue with the viewer. This juxtaposition of meaning is directly related to the machine learning model at the core of Midjourney and dictates its capacity for a process that produces conceptual meaning. The diffusion process is algorithmic and relies on logical computation of categorical language/image models. Fundamentally, the inquiry becomes a question of just how useful the machine learning model interprets prompts—a question at the core of every AI system. More specifically, how useful are AI generated images at eliciting conceptual reflexivity on behalf of the participants? Usefulness is determined by participants themselves. This is where participant responses become much more critical and polarized. In order to strengthen participant positionality further, within a grounded theory framework, their individual experiences are triangulated within their questionnaire, the roundtable, and the image/s themselves.

Synthesis of Participant Narratives

One of the major benefits that emerged from the roundtable was the ability to have the

whole group collaboratively review and confer when analyzing images—offering peer perspectives and interpretations of the generated images. This allowed for unpacking of both participant as well as machine learning bias, as individuals considered their reactions with greater scrutiny, and unpacked the perceived processes behind the AI generated images. For instance, attributing prompt interpretations to hierarchical structures of word associations in AI algorithms but also allowing participants to consider their own metaphors, phrasing, and word choice. It was anticipated, and encouraged, that participant analysis would be biased towards their own perspective, however, having the opportunity to have another participant directly critique the same image from an outside perspective was surprisingly essential to unpack additional tone and meaning.

During the collaborative roundtable, the direct feedback of interpreted tone, imagery and symbolic messaging led to synthesis of diverse perspectives. Most participants openly took ownership of their images/prompts as the conversation developed, although this was voluntary, and generally took place when their contributions and intention were beneficial to the dialogue. The participants seemed to become more receptive to the images and the meaning produced when hearing it from a fellow student, artist, and researcher. The transcript was reviewed for consistency in reflection, shared experiences, and collective interpretations. A few themes that emerged from the qualitative data include:

1. A reflexive AI process is potentially more effective at the beginning of a creative task, during preliminary brainstorming and idea generation.
2. A collaborative dialogue involving humans benefits image analysis, as outside perspectives make for robust and reflexive critiques.
3. Application of image generation may better serve non-artist researchers, as expert knowledge of artistic techniques contributes to fixation on image quality.

4. Ideas, and therefore conceptual thought, can be generated via dialogue with AI.
5. Language, more than imagery, emerged as the primary force shaping meaning.

These critical insights will be briefly reviewed to consolidate contextual application and implications regarding AI as a reflexive tool. Of particular importance is the additional peer analysis piece, which suggests that having an external analysis of the images completed prior to the participant's own examination of the images is essential to AI's usefulness as a reflexive tool.

Participants consistently communicated some trepidation surrounding AI, especially regarding replacing the artistic act of creating. When reflecting upon the conceptual nature of the images, participants remarked “the images were too literal”, “not personal at all” and “something that you would also see on a blog or magazine; felt very glossy, kinda like a commercial obligation”. Participants described struggling to connect personal meaning to the images as they lacked authorship despite the fact that the visuals were sometimes impressive and beautiful while still feeling overwhelmingly impersonal, commercial, and overproduced. Participant #4 described the images as “distant and impersonal; quite the disconnect from what . . . which makes sense because they are pulling from things so abstract and very disconnected from my intentions”. Aptly put, the divide between participant intention and image meaning was described as the difference “between the book and the movie”. Despite these strong critiques, Participant #4 also commented on how the impersonal nature of the images may be reflected in their writing, “. . . and then I worry, is this how my audience sees it, sees my words? . . . and since we are looking at it as a tool, how can I change this?”, suggesting that there could be a next step of revisitation. This comment also highlights the potential of AI as a reflexive tool for conceptual development, albeit in the appropriate context. It should be noted that the synthesis of these perspectives was limited to a relatively small sample size, suggesting

the results may have been different with an alternative group, and that application of these conclusions in context of a general population is problematic.

Ethical Concerns with AI as a Reflexive Process

Ethical Positionality as a Measure of Acceptance

One of the clearest indicators of participant acceptance of the reflexive AI process was their ethical positionality in relation to image generation. While ethical stance did not necessarily equate to full acceptance, it did inform the degree of openness participants had toward AI integration. Participants generally fell along a spectrum, ranging from cautious optimism to critical skepticism, based on their ethical concerns and perceived limitations of the technology.

Minimal Concerns, Positive Outlook

Participants who viewed the process with a greater degree of optimism voiced fewer ethical concerns overall. These individuals generally saw AI as a useful tool with promising future applications, not only in research but across broader domains of Art Education. Their openness to the process was informed by a belief that AI could support or even enhance their work. Despite their optimism, these participants did not entirely dismiss ethical challenges of AI integration. They noted issues concerning ownership and authorship of AI-generated content; for example, participant #6 remarked, “I love many images provided in this research, I can’t convince myself in requesting any . . . these images do not belong to me, therefore I cannot use them”. The roundtable discussion also generated consistent concerns regarding algorithmic bias, lack of transparency in data mining and profit driven motives for AI development. In their questionnaire, participant #7 described AI as “super helpful” in the conceptualization process, but also noted concerns about “plagiarism and inaccuracy, especially when working with Indigenous topics and information”. This participant regrettably could not attend the roundtable

due to commitments surrounding their own thesis process, so could not elaborate further. Their feedback does suggest that even those accepting of AI do so with valid lingering concerns; nonetheless these concerns were typically seen as manageable or secondary to the potential benefits of the technology.

Balanced View with Notable Limitations

Some participants adopted a more cautiously critical stance, acknowledging both the potential and limitations of AI in arts-based research contexts. While they were not outright dismissive of AI, they highlighted important boundaries for integration of AI, specifically regarding limitations of depth and complexity. Participants expressed concern over AI's inability to grasp nuanced or context-specific knowledge, especially for advanced academic work. For instance, participant #2 suggested AI may be best suited for introductory or preliminary work, stating that the process may be useful for "high school or undergraduate students working at introductory levels", as a means of generating early ideas. This is partially due to the misrepresentation of cultural perspectives and lived experiences, likely marginalized from algorithmic categorization and data structures. Participant #3 emphasized AI's problematic portrayal of labour and tactile practices, citing a lack of niche knowledge and the risk of overgeneralized or misleading depictions, specifically in reference to their conceptualization of queerness. These participants saw some utility in AI, especially for general or early-stage reflexive work, but were skeptical of its ability to contribute meaningfully at the master's or doctoral level.

Significant Ethical and Practical Concerns

Participants who were highly critical of their AI-generated images expressed significant ethical, social and technical concerns, often rejecting the process outright. For these individuals, AI posed more risks than benefits. Key concerns included invasion of privacy through the construction of recognizable human faces and characteristics, distortion of meaning when AI layered text or objects over existing imagery, and lack of regulation and politicization of AI technologies. In addition, participants highlighted environmental consequences of AI infrastructure, such as high energy requirements and necessity of physical server infrastructures that create an enormous environmental footprint. Furthermore, participants questioned the motives of AI developers who are perceived as having profit motives that outweigh other ethical concerns, including issues of copyright, consent and subliminal messaging. Despite their criticism, a few participants still admitted to using AI tools for minor daily tasks, albeit minimally and only when developed by socially responsible companies. Ultimately, these participants question the legitimacy of AI in advanced research, arguing that “the ends are not worth the means”.

Divergent Ethical Positionalities Shape Engagement

Across the spectrum, ethical positionality played a central role in shaping participant engagement with the reflexive AI process. While some saw AI as a helpful tool with manageable concerns, others perceived it as inherently problematic and unsuitable for meaningful academic or creative engagement. Despite this divergence, a shared awareness of AI’s limitations and risks emerged, suggesting that a critical engagement rather than blind acceptance characterized participant interaction with AI technology.

Conclusions: Grounded Theories

Emergent Findings from Participants

There are several key findings that underscore the potential of AI image generation as an educational resource and advocate for further research in this area. Firstly, existing research supports the idea that AI image generation can enhance the human creative process by offering new opportunities and perspectives that often lead to unexpected and serendipitous outcomes. It is crucial to recognize Midjourney as more than just a tool for producing a singular final product; rather, it should be viewed as a potential part of the artistic process. This technology expands the role of a “traditional” artist beyond technical skill, encompassing broader roles such as director, composer, and curator of conceptual meaning. Thus, it holds merit and potential as a creative tool within the arts. Secondly, research suggests that AI can provide innovative solutions and foster conceptual design within the classroom. Although students may initially be skeptical of unfamiliar technology, they quickly adapt and recognize its value, particularly in idea generation, although human creativity is still perceived as distinct and superior to AI equivalents. Given the inevitable impact of this technology in education, educators must devise strategies for its ethical and responsible integration to effectively enhance art and design education. The importance of developing an ethical framework that allows students to understand the processes behind AI, and transparency regarding datasets, is fundamental in this context. Lastly, at the university level, AI image generation shows promise in facilitating self-reflection and moral/ethical professional development. Unfortunately, research into its application and utilization remains limited, often relying on small sample sizes and demographics. There is an urgent need for further research into AI image generation across various disciplines, particularly within art education.

Application in Early Stages

Among participants, it was generally agreed upon that using AI image generation as a reflective tool was most beneficial during early stages of idea/project development. Current AI machine learning systems lack the nuance required for replication of conceptual thought, with symbols, motifs and metaphors being overly simple, literal, or cliché. However, as a means to gain perspective, inspiration, or creative direction, the images produced had potential to persuade participants toward avenues they did not previously consider, or confirmed paths they were already on. The more specialized the research focus, the less likely that the conceptual frameworks will be present within AI algorithmic structures and data hierarchies, therefore, the images tend to offer minimal reflexivity for advanced or specialized topics. It should be noted that participants were deeply entrenched in their research at this stage in the process, which may create a bias that would be resistant to outside criticism.

Collaboration is Key

While opinions regarding AI did not drastically shift from beginning to end, it was clear that a collaborative analysis of the images allowed for greater extraction of tone, symbolism, and latent meaning. On their own, participants were biased by their intentions and viewed inconsistencies with images as mainly problematic; however, with additional perspective, they were able to defend, elaborate, or reconsider ideas. Several participants reflected that they now considered their work differently or had fresh ideas generated because of the reflexive process. Therefore, AI integration serves a collaborative function amongst artists during peer critiques and dialogues, especially when used during earlier stages of the creative process. The roundtable confirmed that a holistic and robust perspective can emerge from constructive dialogues.

Application Beyond the Arts

While initially considering a background in the arts as a strength, it could be argued that an expertise in visual literacy and knowledge of artistic processes was actually a barrier to reflexivity. Participants focused on the bland aesthetics and artificial nature of the images generated, immediately discounting any intrinsic meaning they could extract. This speaks to limitations of AI image generation software, which lacks the authenticity of human created artwork; for example, participants noted inconsistencies with textures, lighting, and technical processes. These niche inconsistencies frequently became central to participant analysis, which could not be separated from tonal or symbolic implications related to concept. As a result, it became apparent that AI generated images as a reflexive tool may better serve non-arts-based disciplines, as discussed in the literature review. An audience less intimate and dependent on artistic processes may find different value in AI generated images. That said, artists should still be integral to the conversation about how AI generated images are utilized, especially in art education. It would seem that simple reflexivity may belittle the artistic sensibilities of art educators, and therefore, application would better serve more complex artistic purposes that reflect on the nature of AI itself.

Latent Conceptual Potential

The central consideration of the study was how AI could depict conceptual meaning in AI generated images and whether meaning could be utilized as a reflexive tool by participants. Conceptual meaning derives from dialogue between two actors, in this case a human and a machine learning system. While the images produced were largely divergent from the intended symbolic meaning of the participants, one participant remarked that an image reminded her of

“her Grandma’s hands” and how much she wished she had taken a photograph of them before she passed away. That is a thought, in their words, that would not have arisen without examining these images. As such, conceptual meaning and considerations can be extracted via dialogue between humans and AI, however, it requires the wisdom, empathy, and lateral connections of the organic human brain. This finding would be consistent with Bourriaud’s relational aesthetics, which emphasizes meaning as a product of participant interaction and experience. AI is, at its core, a system of logic, and as such, is limited to inductive assemblages, useful in the right context and in collaboration with humans.

Primacy of Language

One of the most surprising outcomes of this research was the realization that language ultimately played a more decisive role than the images themselves. While the study approached the subject through a visual framework, it became clear throughout the process and in subsequent conversations that the writing carried a deeper impact than image composition. Conceptual dimension emerged not through the image alone, but in how language framed, distorted, or elevated the visuals. In retrospect, the conversation was less about aesthetic experience and more about the linguistic construction of meaning. This shift revealed a subtle but powerful bias - that language can anchor, direct, and even override visual interpretation. This realization wasn’t anticipated at the outset, otherwise, the topic would have been better incorporated into participants’ responses and final critical dialogue.

Implications for the Future

Unpacking Data Bias

There were several comments about the specificity of the participant's research as being in contrast with the hyper-generalized image visualization data that Midjourney was likely pulling from. This limitation is reflected in the earlier research from Han (2022) and Crawford (2020) in which the algorithmic process used by AI is critiqued for its rigid, non-conceptual framework and categorized data hierarchies. Due to the lack of transparency, or overwhelming open transparency, it is challenging to fully understand the systems at the core of these vast, largely unfiltered data sets, and the categorical organization applied to them. The high/low variance algorithms struggle to achieve a balance when computing prompts steeped in conceptual meaning, introducing perceived data bias, or errors, which reduce the reflexive capacity from the perspective of participants.

Participants also suggested that their experience in the study may have been different if they had direct access to Midjourney to edit/revise their own prompts, yet, participants were aware that this could lead to them seeking images that reinforce their own point of view, rather than expanding their perspectives: “is it me, editing and changing it, to produce an image I want?”. This process would be potentially counter-intuitive to challenging our existing biases but participants unanimously suggested that there is “value in exploring it (that process)”. If given this opportunity, participants may have had a back and forth dialogue with Midjourney, revising their writing to reflect an ideal aesthetic image or visual translation. This reflexive process may have made the experience more meaningful for participants and increased autonomy and engagement. Regardless, having participants interact with these systems more directly is a natural next step in AI integration. In this way, participants may be able to determine their own applications, finding niche functionalities this study overlooks.

Educate about Ethics of AI

The study clearly suggests that one's ethical positionality in relation to AI greatly influences perception, application, and interpretation of AI generated images; therefore, it is critical to educate the public about the mechanisms behind these systems. In addition, consistent ethical concerns were raised, such as the source of the images, citation of Midjourney, ownership of the images, coding of the algorithm, and cultural/gender biases, summarized by a participant as “whose artwork are they stealing from?” Companies that develop these AI tools need a much higher degree of transparency and oversight regarding the data used to train their machine learning systems and present information in understandable terms. Alleviating concerns on behalf of users to ensure that privacy and ownership rights have been ethically addressed and that artists have been compensated for their contributions would go a long way to establishing a healthy, working relationship with AI. Overall, although there were occasional glimpses of further research application and analytical reflexivity, participants remained highly critical of the fundamental nature of AI systems and will likely remain so until these ethical concerns are addressed. An ethical conversation regarding the problematic nature of AI should be an integral part of how this technology becomes integrated in art education, involving students, researchers and educators. As this technology becomes a normalized part of our educational culture, so too should the dialogue regarding ethics of AI.

Medium Over the Message

Midjourney was selected as the source of generation for this study due to the perceived high quality nature of the images. It was assumed that the artistic background of the participants, specifically their role and experience as artists, teachers, and researchers, would cause them to

value the visual imagery and artistic reproductions of the AI images. Also, participants' knowledge of design language, such as elements and principles of art, was thought to enhance the depth of their analysis, although they were not asked explicitly to do this in order to encourage dialogue toward the conceptual rather than technical. Due to their knowledge of art and design processes, participants were focused on critiquing, deconstructing, and refuting the technical aspects of the images produced. Participants would consider deeper, intrinsic meaning of the images when encouraged by each other, but this required them to see past the inadequacies of the commercial AI depictions. Participants noted that future application of image generation reflexivity may be more suitable to disciplines outside of art, in which participants value the content of the images over the quality of the images. Another way of thinking about this occurrence is in relation to Marshall McLuhan's *Understanding Media*, suggesting that the medium through which information is delivered shapes human experience more profoundly than the content it carries, as "the medium shapes and controls the scale and form of human association and action"(pp. 7-9). Being consciously aware of their own perceived "over-analysis", Participant #4 noted that AI image generation would better serve researchers "like a scientist or philosopher; another researcher to see how they feel about it". While this avenue has merit, it is important to note that AI image generation was largely built upon exploited artists whose work was stolen in the first place, so we must ensure that serious consideration of AI image generation includes artists and art education specialists who lead the discussion. In addition, participants perceived the role of the artist as a contributor to artistic discourse, while diffused images lack the authenticity of meaning reflected in the imperfections of a challenging artistic process. While future research can perhaps incorporate perspectives from outside the realm of art education, AI research can also take on new forms within art education by drawing upon structures and processes of AI image generation to reflect upon the

nature of AI itself.

To this end, we can draw inspiration from artists who incorporate AI into their artistic process more strategically, like Canadian artist Sougwen Chung, whose work explores the intersection of technology, robotics, and the arts. Chung's work uses hand and technologically-reproduced marks to explore communication between people and machines, "compelled by the human capacity to anthropomorphize our relationship with machines" (Sougwen Chung - Artist Profile, 2025, para. 2). Turkish-born artist, Refik Anadol harnesses large data sets and utilizes advanced algorithms to transform them into mesmerizing visual and auditory experiences. Anadol's work navigates "displacement, or the way that machines are so much into us that they make us disconnect from space . . . the other is AI, which can put us in a much richer quality of thinking" (Refik Anadol - Artist Profile, 2025, para.8). These two artists demonstrate rich avenues of exploration for application of AI within artistic processes. There are many more avante garde artists whose work serves as inspiration for additional research into creative application of AI within art and art education.

Values in Art Education

During analysis of participant feedback, a number of patterns and emergent themes involved articulating underlying beliefs, priorities, and principles valued by participants. One such emergent theme was a high value placed on personal agency within artistic processes, as noted by participant #3: "I wonder if we have issues because we are in art education; we feel we owe something to the world to create our own visuals because we are artists". The emphasis on ethical responsibility to create original work highlights a broader commitment to authenticity, self-expression and ownership in creative practice. Participants expressed a sense of duty to resist over-reliance on AI that may compromise the intent behind their artistic/research

decisions. This ethical stance reflects a deeper pedagogical concern about the role of the artist as a contributor to artistic discourse rather than merely a conduit of aesthetic content. Namely, the process, as valued by participants, is of utmost importance to creative practices, and the quick efficiency of AI image generation cheapens that process. For many artists, the significance lies as much in the creative struggle as in the finished piece. The imperfections of human art accurately reflect the imperfections in humanity, while AI images feel unnaturally polished.

Machine Learning with an Artistic Sensibility

The computational mechanisms and underlying structure of datasets play a foundational role in shaping the outputs of machine learning systems, particularly in the generation of visual content from textual inputs. These systems are not inherently autonomous in their interpretive capacities; they are developed and trained by human programmers who define and encode the relationships between linguistic elements and visual representations within curated datasets. This human-mediated process of classification, often guided by heuristic models and taxonomic hierarchies, establishes the parameters within which the AI operates.

Participants in this study consistently reported that the images generated in response to their written prompts were overly literal, lacking the capacity to engage with the figurative, metaphorical, or subtextual layers embedded in their prose. Such limitations are directly attributable to the current design of machine learning models, which prioritize statistically probable associations over interpretive or symbolic nuance. The failure to adequately render metaphorical meaning reflects the constraints of a system trained primarily on surface-level relationships rather than deeper semantic or cultural contexts. One possible avenue for addressing this shortfall would be the active integration of artists, writers, and other creative

practitioners into dataset curation and model training processes. By involving individuals with domain-specific knowledge of metaphor, symbolism, and aesthetic representation, developers could enrich the relational structures within training data, enabling AI systems to engage more meaningfully with the layered dimensions of human expression.

Integration of Actionable Intelligence

A final implication of the study is that AI tools belong in a particular actionable realm of making lists, summarizing text, correcting grammar, etc. AI images, according to participant #3, “have the potential to offer a different layer of criticality to how others may interpret the research, but they are so focused on very specific elements that are often inaccurate; I’d never be able to use them . . .”. This is a perspective that frequently emerged: the images being an accessory to the participants’ research rather than a tool contributing directly to the research process. As such, AI systems lend themselves well to non-conceptual tasks requiring organization, however, in terms of conceptual reflexivity, are not yet at a point of useful application. These facets of actionable intelligence would include brainstorming, simple graphic design, organization, and outlines. All of these functions fall in line with the linear, inductive systems at the core of AI image assemblage, rather than the lateral, unpredictable pathways of the human mind. This emergent finding brings to mind Ursula Franklin (1992), whose arguments in *The Real World of Technology* resonate with the concept of AI as an actionable tool. Franklin, a Canadian metallurgist, researcher, author and educator, emphasizes that technology is not just hardware, but a system of practices and relationships, including how information is produced, shared and acted upon. Franklin warns against information overload without meaningful application, so actionable intelligence in this sense requires contextual understanding, ethical

reflection, and autonomy to act, which are trademarks of holistic systems. Prescriptive systems, by contrast, have “little latitude for judgment . . . perform to narrow prescriptions . . . what is right is laid down beforehand, by others” (Franklin, 1992, p. 23). To summarize, individuals must have the freedom, context, and capacity to use information meaningfully.

Expediency of Change

In the span of time between the initial proposal and final draft of this thesis, the nature of AI, and our relationship with it, has changed significantly. During the ideation stage of this draft, AI was on the fringes of art education, often covertly utilized by students for easy assignment completion. Now AI has moved from the fringes to become the focal point of professional development, to have generative software officially endorsed by centres of education and widely embraced as part of regular teaching pedagogy. The expediency of change related to technological progression and cultural adoption of AI makes the results of any study relatively applicable only to the period in which the research was conducted. This makes the future of AI research problematic, as the rate of AI development far outpaces production capacity of human researchers. AI systems have gradually been adopted and worked into official policy documents, such as the International Baccalaureate Program, who recently released a document outlining two key principles that should be followed:

1. Did the student use AI to help them learn? If so then it is acceptable.
2. Did the student use AI to pretend they did something they did not do? Then this is not acceptable.

The distinction between these two principles is process versus product. An implication of each is that AI is here now, and we must learn how to ethically navigate it so we can pass this knowledge along to our students. Essential to this process is an understanding of the affordances

and limitations of AI within the context of art education. AI seems to excel in early, broad stages of artistic creation, but weakens when applied to the complexity of rigorous conceptual ideations and niche contextual research. Provided users appreciate the differences between these contexts, and apply machine learning systems accordingly, the human mind will continue to have a central role in conceptual artistic and research oriented tasks. Significant human intervention is also required to address the ethical implications of AI image generation structures such as data sets, categorization methods, taxonomical hierarchies, privacy/copyright concerns and ethical implications. Only when these AI systems are presented in an ethically transparent fashion will artists, researchers, and teachers feel confident in incorporating them into their practices. Thus, the organic human brain, with its own affordances and limitations, will continue to remain at the forefront of creative processes, with artificial intelligence only offering a limited supporting role, at least for the time being. This is true for now, but expediency of change within systems of AI suggest that any conclusions from this study are only relative to this very moment, making future research into the evolving systems of AI paramount.

Researcher Reflexivity: A Summary

The fact that my inquiry into this topic began with a single research question that intentionally avoided ethical discourse and specifics behind the AI image generation process should be an indication of the extent to which my focus has changed. My initial intention was to explore the use of AI image generation to highlight inconsistencies of metaphorical language in research, sidelining any conversation surrounding ethics of AI in favour of a laser focus on application of AI. In fact, I originally had a section in this thesis justifying why ethics was not going to be considered, unpacked, or even acknowledged outside of a singular mention, as the complexity of the topic was not something I could contend with. Once participant feedback began to roll in, it became apparent

that there could be no dialogue surrounding application of AI in art education that did not involve a myriad of ethical concerns. To avoid ethics was not only impossible, but irresponsible.

As this realization set in, I came to appreciate that my perceived intentions and aims were irrelevant in this conversation, and I needed to let the participants do the talking. I decided to ground the analysis with those individuals who generously donated their time and attention to this study and to centre my analysis around THEIR narratives. It turns out that in addition to a robust dialogue concerning ethical concerns of AI, participants were also highly curious and critical about why Midjourney produced the images it did. Whether admiring or abhorring these images, participants mused upon where they came from and why they looked this way. This resulted in an unexpected avenue of research to situate this study in the context through which machine learning systems produce imagery and, by extension, how meaning is produced by both humans and machines. I came to appreciate AI machine learning systems not at odds with human creativity, but something built upon the foundations of human history and culture, for better and worse.

As a result, when considering creativity as teacher, artist, and researcher, I believe the word has been somewhat romanticized as a mystical process inherent to the arts. Margaret Boden (2003), in *The Creative Mind*, argues that creativity is a phenomenon that can be explained, replicated through artificial intelligence and dependent on conceptual spaces that govern rules and constraints. According to Boden, creativity works within these conceptual spaces (exploratory), but the most radical creativity occurs when we alter conceptual spaces (transformational) (pp. 6-7).

Transformational creativity is what artists excel at: questioning normative perimeters to produce innovative ideas and new perspectives. Currently, AI seems to be largely relegated to the exploratory frameworks of algorithms, archives, and data hierarchies; however, as a tool, it has opened new conceptual spaces for meaning to be co-constructed alongside humans.

As a result of this study, I still see a place for AI in art education, as containment has already been breached whether we like it or not. We have a responsibility to thoughtfully consider the *when* and *why* surrounding how we use AI. For my part, in the future, when I make a calculated decision

to use AI within my classroom, it will always be accompanied by a conversation regarding the ethical implications related to the humans, environment, and systems AI is built upon. When I choose not to use AI, it will be to encourage myself and my students to embrace the struggle of the creative process which, I believe, is just as meaningful as the final product. Despite the artistic potential of AI, I am anxious of a future in which the perceived value of human creativity becomes secondary to AI efficiency. As systems beget systems, with human artists in danger of becoming the exception rather than the rule, we should remember that while AI may expand the artist's reach, it should never replace the artist's voice.

References

- Ahmed, S. (2019). *What's the use? On the uses of use*. Duke University Press.
- AIArtists.org. (2025). *Refik Anadol – Artist profile (Photos, Videos, Exhibitions)*. AIArtists.org. Retrieved September 1, 2025, from <https://aiartists.org/refik-anadol>
- AIArtists.org. (2025). *Sougwen Chung – Artist profile (Photos, Videos, Exhibitions)*. AIArtists.org. Retrieved September 1, 2025, from <https://aiartists.org/sougwen-chung>
- Anam, F. F. C. (2023). *Leveraging generative AI solutions in art and design education: Bridging sustainable creativity and fostering academic integrity for innovative society*. E3S Web of Conferences, 426. <https://doi.org/10.1051/e3sconf/202342601102>
- Andrews-Hanna, J. R., Woo, C.-W., Wilcox, R., Eisenbarth, H., Kim, B., Han, J., Reynolds Losin, E. A., & Wager, T. D. (2022). The conceptual building blocks of everyday thought: Tracking the emergence and dynamics of ruminative and nonruminative thinking. *J Exp Psychol Gen*, 151(3), 628-642. <https://doi.org/10.1037/xge0001096>
- Barney, D. T. (2019). A/r/tography as a pedagogical strategy: Entering somewhere in the middle of becoming artist. *International Journal of Art & Design Education*, 38(3), 618-626.
- Better Words Online. (2025.). *Concept — Definition, meaning, synonyms & etymology*. Retrieved August 13, 2025, from <https://www.betterwordsonline.com/dictionary/concept>
- Benjamin, G. (2021). What we do with data: a performative critique of data “collection.” *Internet Policy Review*, 10(4). <https://policyreview.info/articles/analysis/what-we-do-data-performative-critique-data-collection>
- Beyond Technology LLC. (2024, June 24). *How artificial intelligence is transforming predictive analytics*. <https://beyondtechnology.net/how-artificial-intelligence-is-transforming-predictive-analytics/>
- Blanco, F. (2017). Cognitive bias. In J. Vonk & T. K. Shackelford (Eds.), *Encyclopedia of animal cognition and behavior* (pp. 1-7). Springer. https://doi.org/10.1007/978-3-319-47829-6_1244-1
- Boden, M. A. (2003). *The creative mind: Myths and mechanisms* (2nd ed.). Routledge. <https://archive.org/details/margareta.bodenthecreativemindmythsandmechanismsroutledge2003>
- Boden, M. A. (2007). *Creativity in a nutshell*. *Think*, 5(15), 83–96. <https://doi.org/10.1017/S147717560000230X>
- Bourriaud, N. (2002). *Relational aesthetics*. Les Presses du réel.

- Brisco, R., Hay, L., & Dhimi, S. (2023). Exploring the role of text-to-image AI in concept generation. *Proceedings of the Design Society*, 3, 1835-1844.
- Britannica Dictionary. (2025). *Intelligent*. In *Britannica dictionary*. Retrieved August 14, 2025, from <https://www.britannica.com/dictionary/intelligent>
- Britannica Dictionary. (2025). *Understanding*. In *Britannica dictionary*. Retrieved August 14, 2025, from <https://www.britannica.com/dictionary/understanding>
- Cambridge University Press. (2025). *Assumption*. In *Cambridge dictionary*. Retrieved August 15, 2025, from <https://dictionary.cambridge.org/dictionary/english/assumption>
- Carceller, A. T. (2024). The ARTificial Revolution: Challenges for redefining art education. *Digital Education Review*, 45, 84–90. <https://doi.org/10.1344/der.2024.45.84-90>
- Castells, M. (2001). *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford University Press.
- Chandler, D. (2006, November 4). *Semiotics for Beginners: Signs*. Princeton University. Retrieved August 14, 2025, from <https://www.cs.princeton.edu/~chazelle/courses/BIB/semio2.htm>
- Chen, H. C., & Chen, Z. (2023). Using ChatGPT and Midjourney to generate Chinese landscape painting of Tang poem 'The Difficult Road to Shu'. *International Journal of Social Sciences and Artistic Innovations*, 3(2), 1-10
- Compton, M., & Barrett, S. (2016). A brush with research: Teaching grounded theory in the art and design classroom. *Universal Journal of Educational Research*, 4(2), 335–348. <https://doi.org/10.13189/ujer.2016.040204>
- Crawford, K. (2022). *Atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press.
- Demichelis, R. (2024). *The hermeneutic turn of AI: Is the machine capable of interpreting?* arXiv. <https://arxiv.org/abs/2411.12517>
- Dick, P. K. (1968). *Do androids dream of electric sheep?* Doubleday.
- Dunajeva, J. (2025). What is positivist and non-positivist (interpretivist) inquiry? In *Navigating social worlds*. SGH Warsaw School of Economics. Retrieved August 16, 2025, from <https://socialworlds.sgh.waw.pl/ontological-section/what-positivist-and-non-positivist-interpretivist-inquiry/what-positivist-and>
- Edelsbrunner, P. A., Malone, S., Hofer, S. I., Altmeyer, K., Brünken, R., Küchemann, S., Kuhn, J., Schmid, R., & Lichtenberger, A. (2023). *The relation of representational competence and conceptual knowledge in female and male undergraduates*. *International Journal of STEM Education*, 10(44), 1-19. <https://doi.org/10.1186/s40594-023-00435-6>

- Fathoni, A. F. C. A. (2023). Leveraging generative AI solutions in art and design education: Bridging sustainable creativity and fostering academic integrity for innovative society. *E3S Web of Conferences*, 426, 01102. EDP Sciences. <https://doi.org/10.1051/e3sconf/202342601102>
- Fei-Fei Li. (2025, August 8). *Wikipedia*. https://en.wikipedia.org/w/index.php?title=Fei-Fei_Li&oldid=1212352144
- Fernandez, E. (2024, January 2). *Midjourney review: The most advanced image generator in our times*. Medium. <https://medium.com/@erfm1122/midjourney-review-the-most-advanced-image-generator-in-our-times-bdd8ab425b3f>
- Florent Vinchon, Lubart, T., Bartolotta, S., Gironnay, V., Botella, M., Bourgeois-Bougrine, S., Burkhardt, J.-M., Bonnardel, N., Giovanni Emanuele Corazza, Vlad Petre Glaveanu, Michael Hanchett Hanson, Zorana Ivcevic, Karwowski, M., Kaufman, J. C., Okada, T., Reiter-Palmon, R., & Gaggioli, A. (2023). Artificial Intelligence & Creativity: A Manifesto for Collaboration. *Artificial Intelligence & Creativity: A Manifesto for Collaboration*, 57(4). <https://doi.org/10.1002/jobc.597>
- Franklin, U. M. (1992). *The real world of technology*. House of Anansi Press.
- Gadamer, H.-G. (2004). *Truth and method* (2nd rev. ed., J. Weinsheimer & D. G. Marshall, Trans.). Continuum. (Original work published 1960)
- GeeksforGeeks. (2025, August 6). *Computer vision datasets*. Retrieved August 14, 2025, from <https://www.geeksforgeeks.org/computer-vision/computer-vision-datasets-1/>
- Greenwald, A. G., & Krieger, L. H. (2006). *Implicit bias: Scientific foundations*. *California Law Review*, 94(4), 945–967. <https://doi.org/10.2307/20439056>
- Greer, G. H., & Blair, L. (2018). Arts-based research and the discourse of danger. *Studies in Art Education*, 59(3), 243–255. <https://doi.org/10.1080/00393541.2018.1479824>
- Han, B. (2022). *Non-things: Upheaval in the lifeworld*. Polity.
- Han, B-C. (2022, July 3). *What are non-things*. Interni Magazine. Retrieved August 13, 2025, from <https://www.internimagazine.com/features/the-non-things-of-by-chul-han/>
- Harper, D. (2025). *Concept*. Online Etymology Dictionary. Retrieved August 13, 2025, from <https://www.etymonline.com/word/concept>
- Hasan, A. M. M. M. (2024). The power of words: Exploring language and communication in English literature. *Journal of Language, Literature, Social and Cultural Studies*, 2(2), 122–134. <https://doi.org/10.58881/jllscs.v2i2.80>
- Heitz, L., Bernstein, A., & Rossetto, L. (n.d.). *An Empirical Exploration of Perceived Similarity between News Article Texts and Images*. Retrieved September 4, 2025, from

- <https://ceur-ws.org/Vol-3658/paper8.pdf>
- Hermeneutics. (2025). In APA Dictionary of Psychology. American Psychological Association. Retrieved on August 17, 2025 from <https://dictionary.apa.org/hermeneutics>.
- Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*, 57(4), 542-570.
- Hutson, J., & Lang, M. (2023). Content creation or interpolation: AI generative digital art in the classroom. *Faculty Scholarship*, 472, 1-13. <https://digitalcommons.lindenwood.edu/faculty-research-papers/472>
- Hutton, L., & Henderson, T. (2017, January 27). *Beyond the EULA: Improving consent for data mining*(arXiv:1701.07999) [Preprint]. arXiv. <https://arxiv.org/abs/1701.07999>
- ImageNet*. (2025, July 28). In *Wikipedia*. Retrieved August 14, 2025, from <https://en.wikipedia.org/wiki/ImageNet>
- Intelligent. (2025). In *Merriam-Webster.com dictionary*. Retrieved August 14, 2025, from <https://www.merriam-webster.com/dictionary/intelligent>
- Irwin, R. L. (2013). Becoming a/r/tography. *Studies in Art Education*, 54(3), 198–215. <https://doi.org/10.1080/00393541.2013.11518894>
- Irwin, R. L., LeBlanc, N., Ryu, J. Y., & Belliveau, G. (2018). A/r/tography as living inquiry. In P. Leavy (Ed.), *Handbook of arts-based research* (pp. 37-53). Guildford Press
- Khair, S. M. A. S. A., Abidin, M. N. Z., Khamaruzaman, A. R., Anuar, I., & Yuserrie, F. A. H. (2023). Measuring undergraduate architecture students' acceptance using artificial intelligent image generator bot for conceptual study: A case study of Midjourney. *International Journal of Business and Technology Management*, 5(S3), 195-210.
- Kristjansson-Nelson, K. (2020). Methods in practice: Grounded theory in media arts education research. *The Interactive Journal of Global Leadership and Learning*, 1(1), 1-31.
- Lin, T.-Y., Maire, M., Belongie, S., Bourdev, L., Girshick, R., Hays, J., Perona, P., Ramanan, D., Zitnick, C. L., & Dollár, P. (2015). *Microsoft COCO: Common objects in context* (Version 3) [Preprint]. arXiv. <https://arxiv.org/abs/1405.0312>
- Malpas, J. (2022, August 22). Hans-Georg Gadamer. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Winter 2022 Edition). Retrieved August 17, 2025, from <https://plato.stanford.edu/entries/gadamer/>
- Mangus, C. W., & Mahajan, P. (2022). Decision making: Healthy heuristics and betraying biases. *Critical Care Clinics*, 38(1), 37–49. <https://doi.org/10.1016/j.ccc.2021.07.002>
- McLuhan, M. (1964). *Understanding media: The extensions of man*. New York: McGraw Hill.

- Merriam-Webster. (n.d.). Concept. In *Merriam-Webster.com dictionary*. Retrieved August 12, 2025, from <https://www.merriam-webster.com/dictionary/concept>
- Miller, K. (2024, March 18). *Privacy in an AI Era: How Do We Protect Our Personal Information?* Hai.stanford.edu; Stanford University. <https://hai.stanford.edu/news/privacy-ai-era-how-do-we-protect-our-personal-information>
- Moruzzi, C. (2025). Artificial intelligence and creativity. *Philosophy Compass*, 20(3), 1-8. <https://doi.org/10.1111/phc3.70030>
- Naik, Tanvi & Gostu, Hrishikumar & Sharma, Rahul. (2024). *Navigating Ethics of AI-Powered Creativity in Midjourney*. 1-6. 10.1109/INOCON60754.2024.10511571.
- Oecd. (2022). Measuring the value of data and data flows. In *OECD Digital Economy Papers*. <https://doi.org/10.1787/923230a6-en>
- Oppenlaender, J. (2022). The Creativity of Text-to-Image Generation. *Proceedings of the 25th International Academic Mindtrek Conference*, 192–202. <https://doi.org/10.1145/3569219.3569352>
- Reed, J., Alterio, B., Coblenz, H., O'Lear, T., & Metz, T. (2023). AI image-generation as a teaching strategy in nursing education. *Journal of Interactive Learning Research*, 34(2), 369-399.
- Ringvold, T. A., Strand, I., Haakonsen, P., & Strand, K. S. (2023). AI text-to-image generation in art and design teacher education: a creative tool or a hindrance to future creativity? *The 40th International Pupils' Attitudes Towards Technology Conference Proceedings 2023* (Vol. 1, No. October), 1-15
- Roose, K. (2022). An A.I.-generated picture won an art prize. artists aren't happy. *The New York Times*. Retrieved from: <https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html>
- Ryan, J. (2010). *A history of the Internet and the digital future*. Reaktion Books.
- Salvaggio, E. (2024, January 2). *LAION-5B, Stable Diffusion 1.5, and the Original Sin of Generative AI* | TechPolicy.Press. Tech Policy Press. <https://www.techpolicy.press/laion5b-stable-diffusion-and-the-original-sin-of-generative-ai/>
- Stewart, R. L. (2024, September 2). *Cultural Competencies in Education*. ResearchGate. https://www.researchgate.net/publication/383666249_Cultural_Competencies_in_Education
- Sun, J., Islam, N., & Yi, F. (2025). Synergizing Professional and Entrepreneurship Education in Chinese Private Colleges: A Grounded Theory Approach. *SAGE Open*, 15(3). <https://doi.org/10.1177/21582440251367513>

- Tie, Y. C., & Birks, M. K. Francis.(2019). Grounded Theory Research: A Design Framework for Novice Researchers. *SAGE open medicine*, 7, 2050312118822927.
- Tosh Marketing. (2025, May 2). *How does midjourney AI work? - Global Tech Council*. Global Tech Council. <https://www.globaltechcouncil.org/ai/mid-journey-artificial-intelligence/#:~:text=How%20Does Midjourney Work?,language models and diffusion models>.
- Trymata. (2025.). *What is reflexivity in qualitative research? Definition, process and examples*. Trymata. Retrieved August 16, 2025, from <https://trymata.com/blog/what-is-reflexivity-in-qualitative-research/>
- White, J. (2023, September 21). *Conceptual vs. practical: What's the difference?* Difference Wiki. Retrieved August 13, 2025, from https://www.difference.wiki/conceptual-vs-practical/#google_vignette
- Wikipedia contributors. (2025, July 17). *Data Protection Directive*. Wikipedia. https://en.wikipedia.org/wiki/Data_Protection_Directive
- Wyre, S. (2025, January 22). *AI and human consciousness: Examining cognitive processes*. American Public University. Retrieved August 14, 2025, from American Public University website: <https://www.apu.apus.edu/area-of-study/arts-and-humanities/resources/ai-and-human-consciousness/>
- Xiph. (2022, July 9). *Xiph Cyber - How social media is tracking you & collecting your data*. Xiphcyber.com. <https://xiphcyber.com/articles/social-media-tracking>