Journal of University Teaching & Learning Practice

Volume 20 | Issue 4 Article 03

2023

Redefining visual literacy in an era of visual overload: The use of reflective visual journals to expand students' visual thinking

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Recommended Citation

Guglietti, M. (2023). Redefining visual literacy in an era of visual overload: The use of reflective visual journals to expand students' visual thinking. *Journal of University Teaching & Learning Practice, 20*(4). https://doi.org/10.53761/1.20.4.03

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Abstract

In an era in which "all media are mixed media" (Mitchell, 2002), visual information is central in interpersonal and mass communication. Despite this daily consumption of visual information, "digital natives" (Prensky, 2001) are not prepared to critically engage with images (Brumberger, 2016). Scholars in the field of visual literacy identified a curricular bias towards written texts (Elkins, 2007), and the need for more training of visual literacy in higher education (Metros & Woolsey, 2006). However, the discussion of visual literacy in higher education is dominated by studies that measure teaching strategies (Bowen, 2017; Johnston et al. 2017) but rarely discuss the meaning of visual literacy from a student perspective. Visual reflection is a learning experience that involves reading, writing, thinking, and feeling with and through images. This study investigates undergraduate students' experience with visual reflection in a visual studies class through a phenomenographic approach to 29 visual journals and a thematic analysis of 9 semi-structured interviews with students. The objective is discussing the potential contribution of visual reflection to students' multimodal literacies. This study contends that the promotion of visual reflection needs to be systematically implemented in all fields engaged in knowledge production as visual reflection enhances academic learning, fosters multimodal literacies, and promotes the visualization of knowledge.

Practitioner Notes

1. The reading, analysis, evaluation and production of images is fundamental to multimodal literacies.
2. Visual reflection is a practice that enhances students' understanding of abstract concepts.
3. Reflective visual journals encourage the practice of visual reflection.
4. Visual reflection fosters visual thinking, which is necessary for knowledge production.

Keywords

reflective visual journals, visual thinking, visual literacy

Introduction

In an era in which "all media are mixed media" (Mitchell, 2022), visual information is central in interpersonal and mass communication. Despite this daily consumption of visual information, "digital natives" (Prensky, 2001) are not prepared to critically engage with images (Brumberger, 2016). For the last decade, scholars in the field of visual literacy have identified a curricular bias towards written texts (Elkins, 2007; Kedra & Žakevičiūtė, 2019), and the need for more training of visual literacy in higher education (Felten, 2008; Metros & Woolsey, 2006). Even in areas of study such as visual culture, which interrogates visual phenomena, the instructional bias is towards the verbal analysis and evaluation of images rather than their production (Elkins, 2007). This gap between the demands of multimodal environments and students' academic training is worthy of attention. Contemporary literacy is multidimensional and multimodal and includes many literacies, such as digital, media, and technological literacies, which are dependent on, or at least informed by, images (Matusiak et al., 2019; Riddle, 2009). Sanders and Albers (2010) accurately describe the demands of these multimodal environments, which include familiarity with the decoding, evaluation, and production of visual and multimodal texts:

> Literacy, no longer confined to communication through reading and writing of traditional printed text, has expanded and figuratively exploded, particularly within the past decade. Messages are now created, inscribed, sent, and received in multimodal ways steeped in the use of new technologies. In today's world, a literate person must be able to read and create a range of paper-based and online texts (newspapers, pamphlets, websites, books, Kindle, and so on), participate in and create virtual settings (classrooms, Second Life, Facebook, Elluminate, blogs, wikis) that use interactive and dynamic Web 2.0 tools, and critically analyze multimodal texts that integrate visual, musical, dramatic, digital, and new literacies. (pp. 1-2)

A move towards a multidimensional concept of visual literacy reflects an increasing sophistication in scholarly debates since the 1960s, when Debes first defined visual literacy as "a group of vision competencies" (as cited in Chauvin, 2003, p.122). However, this theoretical discussion has not yet resulted in widespread curricular practices that promote the training of visual literacy beyond traditionally "visual" disciplines such as visual arts or media communication (Little et al. 2009; Min, 2019). Moreover, a review of the literature suggests that the training of visual competencies (e.g., reading, analyzing and producing images) at the undergraduate level is still lacking a systematic approach across disciplines and, in many cases, consists in pilot projects and training workshops (Blummer, 2015), reinforcing the perception that visual training is secondary to verbal literacies. In this context, some visual literacy scholars have called for a "systematic institutional approach" (Avgerinou, 2009; Metros & Woolsey, 2006) that avoids the use of images as an "exotic addition to the typical teaching mode" and promotes "visually-led teaching" instead (Kedra & Žakevičiūtė, 2019, p. 2). This means that the use of images in the classroom should not be a marginal exercise but a core component of students' experience in higher education.

This paper contributes to the discussion of "visually-led" teaching and learning by studying the potential of visual reflection beyond the training of visual competencies. Visual reflection is a learning experience that involves reading, writing, thinking, and feeling with and through images. The contention of the study is that as visual literacy is central to multimodal literacy, visual reflection offers students a comprehensive multimodal experience that better prepares them to navigate multimodal media and information environments and enhances their learning. In fact, the analysis

of reflective visual journals and students' views of reflective visual journaling suggests that visual reflection may enhance learning by promoting multiple cognitive practices (e.g. analysis, synthesis, application, evaluation), and facilitating the personalization of abstract concepts through visualization and performance. In addition, the analysis reveals that visual reflection does not require any specialized visual training and could be adopted in any class.

Literature Review

Towards multimodal definition of visual literacy

For nearly fifty years, scholars dedicated to the study of visual literacy have focused on the definition of visual literacy in terms of competencies, abilities, and skills. A recent emphasis on multimodal literacy instruction has led to a reconceptualization of visual literacy as multimodal and multidimensional (Kedra, 2018, Pettersson, 2013). Serafini (2015) defines multimodal texts as "print-based and digital texts that utilize more than one mode or semiotic resource to represent meaning potentials" (p.3) and multimodal literacy as "generating meaning in transaction with multimodal texts" (p.4). The notion of "multimodal literacies" responds to an increasingly globalized and digital environment in which individuals are faced with texts that combine multiple cultural references, formats, genres, and media. The successful navigation of a multimodal environment requires competence in decoding, manipulation, and transformation of multiple semiotic systems, which includes verbal, visual, audio, gestural and spatial signs (The New London Group, 1996). In sum, a literate person is prepared to thrive in multimodal environments.

In a review of the *Visual Literacy Standards for Higher Education* from 2011, the ACRL (2022) expanded the definition of visual literacy to include the assessment, and responsible production and sharing of digital images, the evaluation of the ideological impact of images, and the pursuit of social justice through visual practice, among other competencies and dispositions (p.2). This shift towards an understanding of visual literacy as multimodal has two clear effects on the discussion of visual literacy: firstly, it challenges the view of visual practice as just centered on the reading and production of images, and secondly, it presents visual competencies as central to media, digital and information literacies. The latter has, in turn, a direct impact on the way we should understand the training of visual literacy in higher education as visual competencies are now seen as essential to decode, interpret and participate in our media and information environments.

The central role of images in everyday communication is also observed in academic environments where more students and teachers rely on visual and multimedia resources to produce and communicate their work (Hatttwig et al., 2013, Matusiak et al., 2019). However, the training of visual literacies is not yet "part of the core curriculum across degree programs" at the university level (Ervine, 2016, p. 109) despite evidence that shows that students are unprepared to face the demands of and image-rich world (Brumberger, 2011).

The study of undergraduate visual literacy skills

While there is vast academic work on teaching visual literacy at the pre-collegiate level since the 1970s, the emphasis on visual literacy instruction in higher education only became evident in the late 2000s (Felten, 2008). The study of teaching and learning of visual competencies in higher education has focused on the impact of visual literacy on meaning-making (Bowen, 2017; Gadelshina, Cornwell & Spoors, 2019; Thomas, Place & Hillyard, 2008), the development of students' identity (Sakr, 2019), science learning, particularly among Biology students (Arneson & Offerdahl, 2017; Wiles, 2016), and the development of professional skills (Bentwich & Gilbey, 2017; Johnston, Parker &

Fox, 2017; White, Breslow & Hastings, 2015; Yeh & Cheng, 2009). A common observation in many of these studies is that undergraduate students lack basic visual literacy skills despite being "digital natives" (Prensky, 2001). In fact, they seem to struggle with both visual reading and writing skills (Brumberger, 2011; Metros, 2008). This means that students cannot interpret and express themselves visually at the level required by our information and media environment (Ervine, 2016, p. 109). The "lack of a unified approach to visual literacy education" in higher education certainly aggravates this situation (Blummer, 2015, p.22).

While many of the studies of visual literacy at the undergraduate level revolve around the impact of specific pedagogical strategies and artifacts to improve undergraduates' visual literacy skills, only few prioritize students' perspectives and experiences (Matusiak et al., 2019). This paper contributes to a shift in perspective by analyzing students' experiences with visual reflection. My contention is that we need more information about what students feel and do with images to develop pedagogical strategies that will really address their needs.

Visual Reflection as "thinking through making"

Visual reflection is a learning experience that involves reading, writing, thinking, and feeling with and through images. Bertling (2019) defines visual reflection as the use of visual imagery "where subject matter, materials, techniques, and compositional elements can communicate meaning metaphorically" (p. 28). Scholarly approaches often view visual reflection as a pedagogical strategy in art teacher education (Bertling, 2017; Hofsess, 2015; McDermott, 2002). In this context, visual reflection facilitates students' growth as reflective practitioners (Schön, 1991). While significant, these studies contribute to a conceptualization of visual reflection as a pedagogical rather than a visual literacy practice or experience. A noticeable exception is the work of Loerts and Belcher (2019) that explores the development of more complex views of literacy through visual journaling in an undergraduate education program. The study includes semi-structured interviews with teacher candidates who report having experienced a broader sense of literacy through visual journaling.

The ACRL *Visual literacy standards for higher education* (2011) briefly refers to reflection as a desirable learning outcome in the training of visual production (n.p.). More recently, discussions of multimodal visual literacy began to assign a more central role to reflection in visual practice. For instance, the ACRL Visual Literacy Task Force (2021) regards the "practice of visual discernment and criticality" (para. 7) as a constitutive pillar of visual literacy in a digital and multimodal environment. However, this criticality is discussed as happening *in connection with* rather than *by means of* visual production. In other words, reflection is typically seen as a verbal evaluation of past visual production experiences. A noticeable exception is the work of Candy (2019) who explores "embodied cognition" in connection with reflective creative practice (p. 51). "Embodied cognition" is thinking that "deeply rooted in the body's interaction with the world" (Wilson, 2002, p. 625). For Candy (2019) "the process of making something can facilitate a form of 'thinking through making'" (p. 51). This thinking through production facilitates learning that is rationally and affectively experienced.

While Candy (2019) discusses "thinking through making" in the context of creative reflection, I propose undergraduate visual reflection as another instance of "thinking though making" (p.51) as it constitutes a performance through which students visualize, connect and embody their learning. The goal of this study is therefore to describe how this "thinking through making" associated with reflective visual journals happens, and how it might enhance undergraduate learning beyond the specific context of art making.

Reflective visual journals

Reflective visual journals combine reflection and visual expression in a variety of media (Loerts & Belcher, 2019). They also promote critical and analytical skills while encouraging the articulation and development of students' voices (Hyland-Russell, 2013). Visual journals provide access to students' lived experiences and perspectives on their own learning (Grenfell, 2013; Sinner, 2011). Researchers also report that students who complete visual journals engage deeper and more holistically with course material even when they are not used to producing images (Deaver & McAuliffe, 2009; Hyland-Russell, 2013).

Visual journaling is a central technique of visual reflection (Bertling, 2019). However, as noted earlier, the discussion of visual journaling experiences rarely focuses on how visual reflection assignments might contribute to the development of visual literacy or multimodal literacies, even if reflection is assumed to be at the core of visual competencies such as interpretation, evaluation and decoding. Similarly, discussions on reflection practices in education, including student journals, tend to focus on written reflection and seldom explore the potential effects of visual reading, writing, and thinking on student reflection (Andresen, Boud & Cohen, 1995; Langer, 2002; Mezirow, 1998; Schön, 1991). In contrast, this paper contends that visual journaling presents students with the chance to experience and reflect through multimodal practices, as visual journals require students' knowledge production through images, design features and written text.

The fact reflective visual journals offer undergraduate students the opportunity to reflect by engaging in multimodal production is significant given the current "reconfiguration of representational and communicational resources of image, action, sound, and so on in new multimodal ensembles" (Jewitt, 2008, p.241). Digital media and information environments demand changes in what and how we teach as multimodality requires engagement with content communicated through various formats and media. In sum, the participation of students in contemporary culture depends on their familiarity with the decoding, interpretation, evaluation and production of various media texts. This study therefore explores one strategy, reflective visual journals, that educators can adopt to promote multimodal literacy in higher education.

Method

A research team, constituted by a principal investigator and two undergraduate research assistants, conducted the present study between Spring 2020 and Winter 2021. The context is a second-year visual culture class for communication studies majors at a research-intensive university in Western Canada. The course is one of the few dedicated to the discussion of visual methods and visual culture theory in a communication and media program. Most students registered in the class are women in their early twenties, some are international students and almost everyone lacks substantial experience in professional communication. The class emphasizes visual reading skills (e.g., image analysis and interpretation) despite the recent introduction of reflective visual journals.

A complete reflective visual journal requires eight entries; each responds to a scholarly argument discussed in class (e.g. the nature of visual literacy, the representation of suffering, the disciplinary gaze, the spectacularization of society, the weaponization of bodies, the limits of objective vision, the visualization of national identity, and the possibility of articulating a resistant gaze). Each of the eight entries consists of an image produced by the student and a brief written text (200-300 words). Students must submit four entries on week six of the term and the remaining four at the end of the term. The assignment receives a grade. Students must produce a visual argument in response to the topic, analyze the images produced for each entry and evaluate the impact of visual reflection on

their learning. The resulting entry is multimodal as it includes an image and a text that interact to produce meaning.

A graduate research assistant introduced and described the project via Zoom before the class at the beginning of the Spring 2020 and Winter 2021 terms. The classes were online due to pandemic restrictions. Students received a written consent form where they were asked access to their reflective visual journal assignments by the research team and their participation in qualitative interviews with a research assistant. They were also given the option to withdraw from the study anytime until the release of the anonymized data to the research team, which happened approximate three months after the end of the final grade submission period for each course. The total aggregated and anonymized data comprised 232 multimodal entries from a total of 29 reflective visual journals, and nine semi-structured Zoom interviews with students. The interviews focused on students' experiences producing reflective visual journals and their views of visual reflection and visual literacy. A graduate research assistant conducted the interviews with the participants within the three months following the end of the course. The interviewer followed an open-ended questionnaire designed by the research team. Zoom interviews lasted between 30' to 45' minutes.

The reflective visual journal entries were analyzed using phenomenography, a method that consists in the identification and description of practices that constitute a collective experience, in this case reflective visual journaling (Marton, 1981). Phenomenography is an interpretivist and qualitative approach that "investigates the qualitatively different ways in which people experience or think about various phenomena" (Marton, 1986, p.31). For Marton (1986) the main difference between phenomenology and phenomenography is that the former focuses on capturing the essence of experience while phenomenography attempts to exhaustively map variations within experience (p. 41).

Phenomenography is a method developed in the 1970s by a group of education scholars from the University of Gothenburg, who sought an alternative to positivist and objectivist research in education. Influenced by phenomenology, Marton (1986) championed an approach that would be less concerned with determining "true" learning and focused instead on observing students' experiences and understandings of phenomena (p.37). In sum, phenomenography provides a clear method to map variations in student experiences.

The phenomenographic analysis of students' reflective visual journals required the aggregation of the data, and the exhaustive identification and classification of visual and reflective practices as manifested in writing. For instance, statements such as "I cropped this image" or "this image represents suffering" are indications of visual and cognitive practices. The analysis also focused on categorizing visual, cognitive and affective practices manifested or suggested in images. For instance, many students introduced images that illustrated a particular aspect of a theoretical discussion (e.g., a student copied and pasted an online image of war to "show" how suffering looks like) or produced an image to experience a particular emotion connected with the reading (e.g., a student takes a selfie to "feel" the gaze of the camera).

The goal of the phenomenographic analysis of reflective visual journals was to systematically describe and categorize what students did when asked to complete the assignment. For this reason, the research team generated categories that captured different practices and behaviours suggested by the visual journal entries. The resulting categories were cognitive practices (e.g., understanding, analysis, synthesis, application and evaluation), emotions, visual competencies (e.g., analysis, evaluation, and production) and practices of visual reflection (e.g., representation and re-enactment of concepts). This coding did not precede the analysis but was generated by the research team in response to the data.

During a second stage of coding, the team explored potential connections between the different groups of codes (cognitive behaviour, emotions, visual competencies and visual reflection practices) to explore correlations between visual competencies and cognitive and visual reflection practices.

A second part in the analysis consisted in the generation of themes from verbatim interview transcripts. The data produced served to contextualize the discussion of students' visual reflective practices. The decision to conduct semi-structured rather than unstructured interviews was in response to a practical need: to protect the anonymity of participants no member of the research team could conduct the interviews and a graduate research assistant was hired for this purpose. In this context, the use of an interview guide ensured that data collection focused on the same areas of experience, in this case the production of reflective visual journals and students' experiences and views of visual literacy. The interviewer, though, received instructions to modify the wording and the order of the questions as needed to facilitate "the collaboration between interviewer and informant" typical of this method (Given, 2008, p. 811).

Findings and Discussion

The phenomenographic analysis of the reflective visual journal entries and the thematic analysis of interviews both pointed to the role of visual reflection, and visual thinking in general, in promoting students' multimodal literacy and enhanced learning. Students attribute reflective visual journals the potential to facilitate their understanding of abstract verbal texts, encourage mindfulness and creativity, foster the personalization of theoretical ideas, and even assist in the retention of information. The analysis of students' visual reflective practices provided an insight into how visual reflection fostered many of the low and high-level cognitive practices identified by Bloom (e.g., understanding, applying, analyzing, evaluating and creating) (Anderson et al., 2001). This finding confirmed some of students' perceptions of the activity, such as the encouragement of creativity and the personalization of abstract ideas (application). In addition, the practice of visual reflection also engages with practices that are multimodal, such as the illustration of a verbal argument, the transfer of knowledge that exists in multiple formats and modes (e.g., the repurpose of an existent image to illustrate a theory discussed in a written article), the production of a visual argument that responds to a written document, and the evaluation of a visual argument in written form.

In this section I will discuss three main findings that reveal visual reflection's potential to enrich students' academic learning and foster their multimodal literacy through visual thinking.

Visual reflection supports and enhances academic learning

Our thematic analysis of the qualitative interviews with student participants confirmed some of the anecdotal evidence that points to a systematic marginalization of visual literacy, and visual reflection in particular, in academic education. The most frequent theme that the research team identified was novelty: students regard reflective visual journals as new because they involve image production. They even claim that the activity fostered their creativity as they were asked to "engage with the material in a different way." This novelty is also the reason behind students' initial apprehension and anxiety:

> It was certainly a new experience, I think it really allowed me at least to engage with a very creative medium (…) So I think going with a creative visual journal or reflective visual journal really enabled me personally to engage with the content (…) So yeah, I think it created a little stronger understanding, I guess. (Interview 1, para.1)

In this quote, the student defines creativity in line with Bloom's definition, "produce new or original work" (as cited by Armstrong, 2010, para. 1), as the development of a visual argument in the context of a reflective visual journal was a new experience for most students interviewed in this study.

Reflective visual journaling also facilitates students' understanding by prompting them to visualize abstract concepts and make connections to personal experiences and knowledge:

> When I usually do readings (…) I'm writing things down like what's the main argument and like, you know, things like that. But this time around (…) I also had to look for different things (…) because we have to like make something physical out of it, you know, something that we can see like in the world, you really have to connect it more. (Interview 3, para. 7)

This quote also shows the link between understanding and application, in this case the production of an image that encapsulated the student's view of the written argument.

Some students regard the production of reflective visual journals as facilitating the retention of concepts. This retention is for many the result of engaging in practices, such as visualization and analysis of images, that are unfamiliar and require a more active engagement with the subject matter. In fact, for many of the students interviewed, visual reflection demanded practices that were multimodal such as reading, thinking, knowledge transfer, and the translation of arguments in visual terms:

> I think that this project did take a lot of time to do just because I was thinking about it in my daily life and reflecting on what I had to do (…) So it was a nice challenge to have to think about concepts that were like written on text, and then produce something visual out of it, which I think was kind of… yeah, it was a nice challenge to do, for sure. I felt like I was kind of taking one thing and then making another thing out of it.

> I think it was the moment where I had to pick my image because I, you know, have experience in learning theory, in trying to understand it, but then that transition moment where, ok I know the theory, how I am going to apply it in my own unique way? I think that transition period, where I am literally sitting on my desk, and just thinking like how? Where have I seen this? Right? Um, I think that was a key moment because when I did think of something, I couldn't stop typing. I couldn't stop thinking "Oh my God, all aspects of that theory are starting to become more clear." (Interview 2, paras. 10-11.)

Students' accounts of their experience with visual reflection describe complex multimodal processes that ultimately result in enhanced understanding of theoretical material. This evidence supports Arnheim's (1983) call to reconcile the perceptual and the intellectual realms, to consider thinking as "visual," as always involving visualization. Arnheim (1983) describes the dynamics of "visual thinking" as follows:

> There is no perceiving without thinking and forming, no thinking without perceiving and forming, and not forming without perceiving and thinking. Together there are the three aspects of the productive mind (.) (p. 10).

The data discussed earlier suggests that visual reflection not only invited students to think about images but also to engage in visualizations that assisted in the understanding of theoretical knowledge. It can be argued then that visual reflection fosters the practice of visual thinking, and thus, the training of "productive minds" (Arnheim, 1983, p.10). In the next section, I will discuss with more detail how visual reflection is a learning experience that invites students to engage in visual thinking in their learning.

Visual reflection promotes students' visual thinking

The phenomenographic analysis of the reflective visual journal entries confirmed students' views of visual reflection, as it led to the identification of multiple cognitive practices, such as analysis, evaluation and verbal reflection, feelings in connection with the subject matter discussed in the entry, emotions triggered by the production of the visual entry, and different degrees of visual argumentation. The analysis of visual production practices revealed that students can produce independent visual arguments by editing pre-existing images, producing collages, drawing, and taking photographs. This initial coding of practices did not show any conclusive link between the complexity of the visual argumentation and reflection, and the quality of the visual output. In fact, many deep and sophisticated visual arguments and reflections resulted in amateurish images. This finding challenges some scholarly assessments of visual literacy that determine students' visual literacy purely in terms of students' reading and writing competencies (Bowen, 2017).

The exploration of connections between cognitive practices (e.g., understanding, analysis, application and evaluation), visual competencies and visual reflection practices did not reveal any substantial correlation. This means that students engage in multiple cognitive practices and mobilize multiple visual competencies when they produce their reflective visual journals. Visual reflection does not seem to require the mastery of any visual competency but the ability to combine different skills and practices. In fact, the class does not provide training on visual production and most participants had no prior specialized education in visual production.

This finding is encouraging because it suggests that visual reflection does not require any prior specialized training and may be introduced in any class.

Most reflective visual journal entries present evidence that students can illustrate a verbal argument and connect knowledge from different sources. In the case of Figure 1 a student illustrated a discussion about war photography and the representation of suffering by introducing an image that represents suffering. This entry shows students' understanding of the written theoretical text, and the use of visual information to produce a new multimodal text (the reflective visual entry). The entry is not complex from a visual perspective; the student just repurposed an image found online, and except from some new design decisions (i.e., placement of the image, the creation of a frame and the production of a detail of the photograph to make the illustration more evident to the reader), there is no evidence of developed visual production skills. In the case of Figure 2, the student opted to produce a collage to respond to the ethics of representing others, in this case the student is recalling the scandal triggered by the discovery of photographs that showed the Canadian Prime Minister Justin Trudeau wearing blackface. From the perspective of the students' visual skills, the image is more sophisticated than Figure 1 as it required the production of a new image (a hand holding Trudeau's photo wearing blackface). However, the production of this visual argument was largely dependent on existent images and basic editing skills. The analysis of cognitive practices suggested by the image tells a different story, though, as the image demonstrates a sophisticated combination of understanding, application of new knowledge, synthesis of diverse information and creation of a new visual argument. As in the case of Figure 1, there is a clear dissociation between

the level of the students' visual production practices and the level and complexity of their cognitive practices.

Figure 1

Illustration of a verbal argument

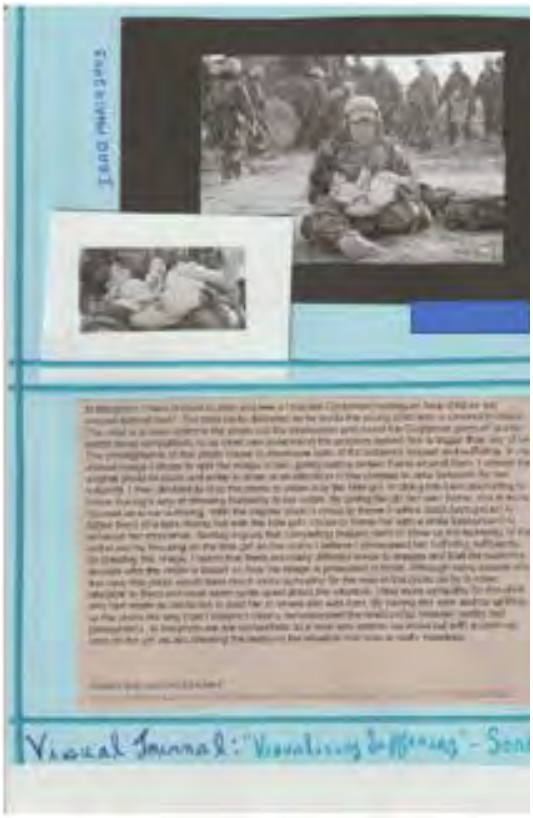


Figure 2

Knowledge transfer

Figure 3

Visual reflection

In Figure 3, a student discusses the difference between a picture (an original) and an image (visual information). At first sight, the visual output is rudimentary; the drawing is far from skillful, as the image seems to be just a simplified visual summary of the differences between pictures and images. However, the analysis of the written portion of the entry reveals that the student performed the transition from original to visual information by creating an original, the drawing, and then taking a photograph of this *original* to complete the journal entry. The student reflects on the new status of the original picture once included in the journal:

> I believe that my visual representation below would be considered more of an image because it is binding me (the artist) with those who view or mark my work, creating shared context and meaning. However, it also has picture qualities. For example, after the semester is done, I'm probably going to destroy my drawing because it has no further use to me. (journal statement)

The lack of evidence of any direct link between the depth and complexity of the visual argumentation, the depth and complexity of the visual reflection and the quality of the image production suggests that reflective visual journals may not directly improve visual production in the short term. However, the phenomenographic identification of the cognitive practices present in the entries show that reflective visual journals are assignments in which students engage in visualizations that involve cognitive practices such as observation, recalling of knowledge and information, knowledge transfer, synthesis, and evaluation. We can therefore maintain that reflective visual journals facilitated students' visual thinking as students seem to have no difficulties in visualizing knowledge to produce multimodal texts in which images and verbal signs both complement and support each other.

Visual reflection exposes students to multimodal meaning-making

The phenomenographic analysis of visual reflection also resulted in the identification of a practice of visual reflection, which the research team labelled *concept re-enactment,* and that is present in just 15 entries out of 232. Concept re-enactment is an instance of visual reflection in which students engage in visual, tactile, audio and verbal practices to experience a concept and/or emotion. These performances may be *planned* or just occur *spontaneously,* only becoming evident to students during their written reflection. I argue that multimodal thinking is most evident in concept-reenactment as the practice requires the involvement in embodied experiences that are communicated visually and in written.

As we see in Figure 4, the images that result from concept reenactment vary in quality. In this case, the student is responding to Susan Sontag's (2015) Regarding the torture of others, an article first published in 2004 in *The New York Times Magazine*, that denounces the Bush administration's efforts to silence the scandal triggered by the publication of images of torture of prisoners in the hands of American military in Abu Ghraib. The image shows the student's attempt at digitally recreating a particularly well-known image from the series, which shows a hooded prisoner balancing on a stool, his arms outstretched.

At first sight, the image does not seem particularly well executed but the reading of the accompanying text reveals that it is just a trace of a more complex process of visual reflection that happened before and during image production and that involved the student's reflection through the embodiment of digital and visual production skills. Concept re-enactment is, thus, a practice in which students embody concepts to understand abstract ideas and, in this process, engage in practices that are not just visual but gestural, digital, aural, and even spatial. In this case, the student reconstructs the image of torture to experience the act of producing an image of this nature and, thus, responds to the journal's prompt for that entry: "what are the ethics of seeing?" The written text also indicates that the reflection was planned as a concept reenactment:

> My experience of creating this image was calming, as I found myself beginning to become more comfortable with my relationship towards the original photograph throughout my experience of appropriating it. This offers a controversial thought that the perpetrator may have begun to separate themselves from the real act through the appropriation of the act through being photographed. (journal statement)

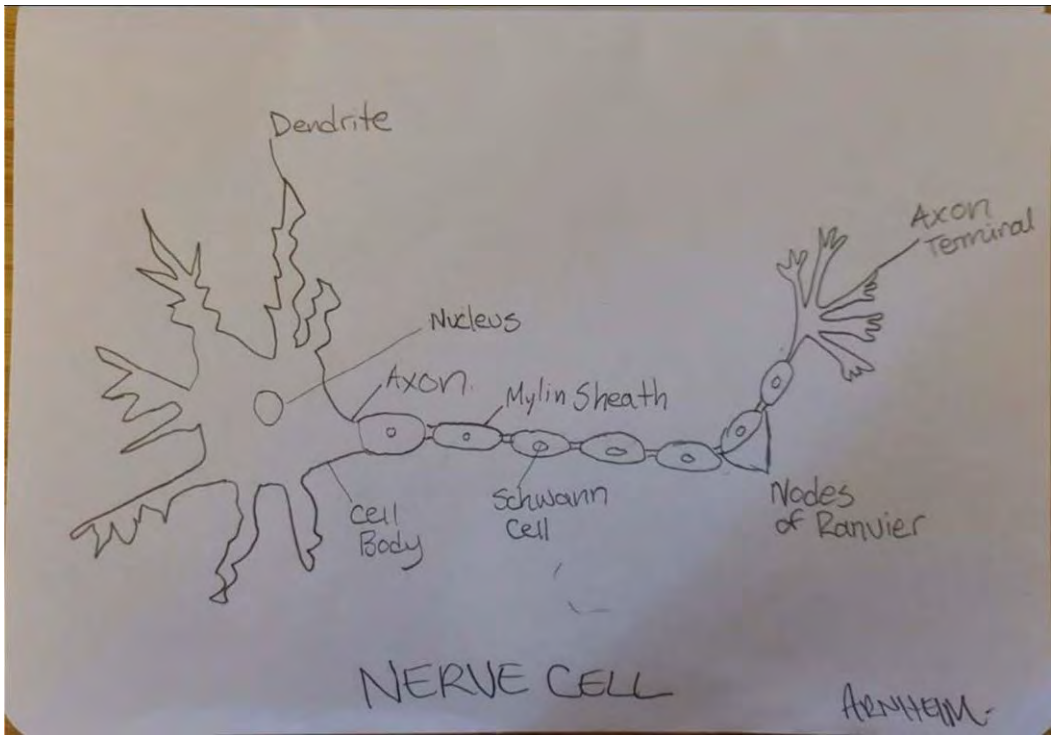
Figure 5 shows an unplanned performance of Arnheim's (1983) principles of visual education, observing, thinking, and forming. Unlike the previous example, there is no explicit discussion of a planned re-enactment even if the student felt the need of going "through the motions" to respond to Arnheim's argument.

Figure 4

Example of concept reenactment (planned)

Figure 5

Example of concept re-enactment (spontaneous or unplanned)



The act of drawing a nerve cell allowed the student to perform Arnheim's principles. There is nothing in the image, though, that suggests that this is a performance. The image is rather conventional and shows amateurish skill. However, the student acknowledges having a better understanding of Arnheim's discussion by drawing this image:

> I mentioned above that the act of drawing this image, helps to reinforce the "abstract" learning I have done about the nervous system. It gives context to that knowledge. It also helped me to see what Arnheim was talking about. I felt his ideas on perceiving, thinking, and forming were also a bit abstract, but through going through the motions on making this drawing and reflecting back on, I was able to see what he meant. (journal statement)

This spontaneous re-enactment is evidence that visual reflection is a process that does not just involve visual production. The student draws the image responding to Arnheim's (1983) discussion of the importance of visual thinking in science education. Arnheim (1983) highlights the importance of teaching students to observe and illustrate scientific phenomena to foster their understanding and thinking of scientific knowledge and processes, so it is not surprising that the student reproduces a scientific diagram possibly learned in high school. However, this initial connection becomes experiential once the student reflects on the act of drawing the nerve cell:

> When I see, and specially when I draw a nerve cell the different pieces and their purposes become apparent. I can see the nodes of Ranvier, where electrical impulses jump, and understand how the nervous system can work so quickly. (journal statement)

The act of drawing the nerve cell facilitated student's awareness of the importance of visualizing knowledge to learn. It could be argued that it was only through the act of visualization that the student became aware of the potential of visualization. The contention is, then, that visual reflection assists students in thinking about their learning by engaging in practices that require embodiment, feeling and rationalization. While the student drew this illustration of the nerve cell before in a science class, it is in the context of the reflective visual journal that this drawing triggers a reflection about the role of visualization on learning. I propose that an assignment that promotes students' knowledge of their own learning would benefit *any* student in *any* class and not just those in communication studies or fine arts.

Both examples of concept re-enactment make clear that visual reflection is multidimensional as it involves visual reading, writing, and thinking skills. In addition, the fact that visual reflection encourages concept-reenactment in some students points to the potential of visual reflection in facilitating experiential learning in higher education. In fact, an interesting aspect of concept re-enactment is the presence of what Adrienne Rich has called "thinking through the body" (as cited by Gallop, 1988, p.1). This means that when students engage in concept re-enactment, they perform practices that allow them to experience and think about concepts. This thinking through the body is different than just pondering or contemplating a concept, as the student feels the urge to *do* to understand, and this realization may even happen while they are embodying the concept, as in the case of the digital reproduction of the Abu Ghraib image. This embodiment of reflection suggests that visual reflection might encourage some students to move beyond Western and patriarchal modes of knowing that privilege objective observation and abstract reasoning and engage with feelings and sensations anchored in the body (Michelson, 1996). For instance, a student responded to a reading that discusses the mediation of technologies of vision by taking a selfie and reflecting on the distance between the experience of taking a photo and the feel of being objectified by it. The student notes:

> I am not used to being both a viewer and a subject of a photo as it's being taken, it is a strange form of labour trying to wrangle your own body and surroundings into an acceptable position to take a photo. I spent a lot of time fiddling with the angles of the mirror to get them in the right position to reflect me on both sides. It felt a bit surreal honestly, I usually avoid photos because they make me feel self-conscious and can make my anxiety flare up a bit, that feeling wasn't as pronounced when I was creating this image since I avoided including my face. (journal statement)

The written entry describes the physical struggle of framing the body before the camera. This experience of physically *labouring* to achieve the desired result enhanced the student's understanding of how technologies of vision shape our bodies and minds. In this context, the visual reflection becomes an opportunity for the student to relive and bring awareness of knowledge that is already "rooted in the body" but may have been untapped until then (Michelson, 1996). In this context, the image does not document but serves as a *trigger* and *trace* of a performance.

The analysis of concept re-enactment suggests that visual reflection extends beyond the students' ability to visually read and write, to become a multimodal practice that involves multiple literacies. In fact, when students visually perform a concept, they engage in experiences that require them to produce, analyze, evaluate, feel, and perform with and through images, in both print and digital

formats. This multimodal dimension of visual reflection highlights its importance as a teaching and learning tool not just in visual communication classes but across disciplines. As mentioned earlier, given the multimodal nature of our media and information environments, the training of multimodal meaning-making is fundamental to foster students' literacy. Students must be able to communicate their views, to learn and critically evaluate information and knowledge that is not just verbal but also visual and acoustic. Visual reflection offers students the chance to think and communicate beyond verbal knowledge and, in the process, it seems to enhance the relationship with their learning by making new knowledge more relatable.

Conclusion

The phenomenographic study of undergraduate students' reflective visual journals reveal the potential of visual reflection to enhance students' academic learning and experience of multimodal meaning-making. As it became evident through the analysis of students' views of the activity, the practice of visual reflection may enhance their understanding of abstract concepts, such as the notion of "gaze" or the idea of a "disciplinary regime of vision" discussed in many of the visual culture texts studied during the term. Students note that the visualization of concepts required by the reflective visual journals facilitates the personalization of the theoretical material; abstract concepts become more relatable, "closer." For instance, the notion of "gaze" becomes closer the moment a student identifies it in a picture or performs the gaze by taking a photograph. Students regard this visualization as promising because it is unfamiliar and requires them to be mindful about their learning. This is also the reason why some students associate visualization with an increased retention of the material studied in class, though there is no evidence that this retention is a direct and generalized effect of visual reflection as interviews happened just a few months after the end of classes.

The phenomenographic analysis of visual reflection partly confirmed students' perceptions of the activity as there is clear evidence that students engaged in multiple cognitive practices to complete the reflective visual entries. Just based on the phenomenographic reading of students' experiences, reflective visual journals proved to be a comprehensive activity that requires students to recall information, make connections with past information and experiences, transfer knowledge from different sources and/or formats and modes, visualize abstract concepts, synthesize information, apply knowledge, analyze images, and evaluate their own multimodal production and learning. While there is no evidence that reflective visual journals foster students' visual production skills, their potential to enhance student learning seems undeniable.

The analysis of students' visual reflection practices as present in reflective visual journals also reveals visual reflection as essentially multimodal and requiring the engagement of multiple literacies. In "A Pedagogy of Multiliteracies: Designing Social Futures," The New London Group (1996) envisions a multiliteracy pedagogy as "a complex integration" of "situated practice," "overt instruction," "critical framing" and "transformed practice" (n.p.). This means that to foster multiliteracy, students must take part in learning that is experiential (situated practice), based on guided activities that promote students' access to information (overt instruction) and facilitating the critical evaluation of learning (critical framing). However, the learning cycle is only complete when students return to a situated practice "where theory becomes reflective practice" (The New London Group, 1996). For the authors of "A Pedagogy of Multiliteracies," transformative practice happens when "students can demonstrate how they can design and carry out, in a reflective manner, new practices embedded in their own goals and values" (The New London Group, 1996, n.p). The findings discussed in this paper suggest that students engage in transformative practices when they reflect visually, as reflective visual journals require them to visualize theory through visual

production practices that are not only cognitively varied but demand the decoding, manipulation, and transformation of signs, both iconic and verbal, through different digital and tactile means, to show and experience abstract theoretical concepts. This means that visual reflection has the potential to better prepare students to not just navigate but become critically aware of our current modes of communication and knowledge production.

This paper supports Kedra and Žakevičiūtė's (2019) argument about the benefits of a "visually-led" learning experience, such as "better understanding of course content," the development of creativity and self-expression (p.2). The potential of "visually-led" assignments for the development of multimodal literacies is particularly evident in the practice of concept re-enactment, where visualization often transcends the boundaries of visual production to become an embodied experience of theory in which students perform, feel, and produce meaning-making though digital, tactile, aural, visual, and even spatial means. In sum, visual reflection requires students to experience and evaluate practices and forms of expression that are typical of our digital networked society. It is therefore urgent to consider a more systematic implementation of visual reflection in fields that are not obviously visual, as visual reflection enhances academic learning, fosters multimodal literacies, and promotes the visualization of knowledge. For instance, educators should consider the implementation of visual reflection in classes that introduce students to theory as participants found that visual reflection makes abstract notions more relatable and "closer." In an academic context that still prioritizes the written expression of objective knowledge, reflective visual journals offer students in any discipline the chance to *embody* and *feel* knowledge and, thus, experience a more diverse and rich learning.

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