

Visual Literacy in Medical Education:
Benefits, Uses, and Application

by

Kate McSweeney

A Thesis submitted to the
Visual Material Culture Studies Program
Mount Allison University
in partial fulfillment of the requirements for the
Bachelor of Arts Degree
with Honours in Visual and Material Culture Studies

April 13, 2023

Table of Contents

Table of Contents	ii
Illustrations.....	iii
Acknowledgements	iv
Abstract.....	v
Introduction.....	1
Chapter 1: Visual Literacy in Education.....	9
2.1 Analysis of Fransecky and Debes’s Visual Literacy: <i>A Way to Learn – A Way to Teach</i>	9
2.2 The Incorporation.....	14
2.3 What Does it Mean to be Visually Literate?.....	15
2.4 The DIG Method.....	21
2.5 The Gaze	26
Chapter 2: Visual Literacy in Medical Education	29
3.1 What Does It Mean to be a Good Doctor?.....	29
3.2 The Benefits of Visual Literacy Training for Medical Students.....	31
3.2.1 Empathy	32
3.2.2 Communication.....	40
3.2.3 Tolerance for Ambiguity.....	42
3.2.4 Observation Skills and Pattern Blindness	46
Chapter 3: Current Visual Literacy Training in Medical Schools.....	51
Conclusion:	54
Bibliography:.....	56

Illustrations

Figure 1. The Components of the Visual Literacy (VL) Theory

Source: Maria D. Averginou and Rune Pettersson, "Toward a Cohesive Theory of Visual Literacy," *Journal of Visual Literacy* 30, no. 2 (2011): 5; <https://doi.org/10.1080/23796529.2011.11674687>.

Page 4

Table 1. Table outlining visual writing skills grouped thematically.

Source: Joanna Kędra, "What Does it Mean to be Visually Literate? Examination of Visual Literacy Definitions in a Context of Higher Education," *Journal of Visual Literacy* 37, no. 2 (2018): 78; <https://doi.org/10.1080/1051144X.2018.1492234>.

Page 18

Figure 2. Visual Literacy Array based on ACRL's Visual Literacy Standards

Source Denise Hattwig et al., "ACRL Visual Literacy Competency Standards for Higher Education," Association of College and Research Libraries, last accessed March 31, 2023.

Page 21

Figure 3. Landscape image taken in Antwerp, Belgium on May 22, 2022

Photo credit: Kate McSweeney

Page 25

Figure 4. Image taken at a climate protest in Toronto, Canada on September 27, 2019

Photo credit: Kate McSweeney

Page 25

Table 2. The steps and process of the DIG method

Source: Dana S. Thompson, "Teaching Students to Critically Read Digital Images: A Visual Literacy Approach Using the DIG Method," *The Journal of Visual Literacy* 38, nos. 1-2 (2019): 114; <https://doi.org/10.1080/1051144X.2018.1564604>.

Page 26

Table 3. Lesson outline using the DIG method.

Source: Dana S. Thompson, "Teaching Students to Critically Read Digital Images: A Visual Literacy Approach Using the DIG Method," *The Journal of Visual Literacy* 38, nos. 1-2 (2019): 115; <https://doi.org/10.1080/1051144X.2018.1564604>.

Page 27

Figure 5. Attributes of a good doctor

Adapted from: Jane Macnaughton, "The Humanities in Medical Education: Context, Outcomes and Structures," *Medical Humanities* 26, no. 1 (2000): 24; <https://doi.org/10.1136/mh.26.1.23>.

Page 32

Figure 6. Flow chart indicating reasons for empathy decline amongst medical school students.

Source: Melanie Neumann et al., "Empathy Decline and Its Reasons: A Systematic Review of Studies with Medical Students and Residents," *Academic Medicine* 86, no. 8 (2011): 1000; <https://doi.org/10.1097/ACM.0b013e318221e615>.

Page 39

Acknowledgements

This thesis is the product of many months of hard work and dedication. When I entered Mount Allison University, I had no intention of pursuing an Honours degree and definitely no intention to write a thesis. However, the Visual and Material Culture Studies Program drew me in from my previous major in biology. My first dedication needs to be to the VMCS program and department at Mount Allison as a whole. Championing a program such as this is no easy feat as it presents something unique within Canada. The department allowed me to easily switch up my degree and provided me with all the help I needed to catch up on any missed courses.

I would like to specifically thank Dr. Christina Ionescu for her unwavering support and encouragement. It was because of her that I was enticed into this program when she explained that I was already halfway to completing a minor in VMCS in my second year and everything moved along from there. She helped me to develop the idea for my thesis after I expressed my interest in one day pursuing a degree in medicine and showed me that it was possible to connect VMCS to the world of medicine. This only proved to me even more how applicable VMCS is to our everyday lives. Dr. Ionescu also made every effort to help me whenever I needed and helped me to run an independent study over the summer of my third year, which allowed me the opportunity to research for my thesis and to think about how I wanted to address such a new and broad topic.

I also must thank Dr. Battiloro, Dr. Beck, and Dr. Fanning for showing me how amazing the arts can be. As someone who came from a science-based high school background, I had no interest in pursuing the arts until I took a chance and took courses with these professors. The classes were accessible, interesting, and lots of fun. They have also continued to support me in other ways, such as helping me to navigate university courses and reading over my thesis for me.

Lastly, I would like to thank my family for supporting me in whatever path I chose for myself while I was at university. I made a lot of changes during my time at Mount Allison, but they were always there to help me make it through with ease.

This thesis would not have been possible without the contributions of those mentioned above. I am proud to present this thesis to the university and to be able to represent Mount Allison's VMCS department as its first Honours student.

Abstract

Text-based learning has been the dominant and most traditional form of learning throughout history. As a result, the workforce is comprised of individuals who have been taught primarily through textual means. Text-based learning perpetuates a cycle of information transfer (i.e., students read what their teachers have read). This system has become outdated as we move toward a society that is increasingly reliant on visual media and technology. Instead of sitting down with a textbook, students need to be allowed the option of learning in a way that provides them with information while simultaneously enhancing and teaching skills that lie outside the realm of memorization.

Unlike text-based literacy, visual literacy allows students to learn effectively through visual media by teaching them how to take meaning away from this media at a deeper cognitive level. One way to update the standard curriculum that is followed in high schools, universities, and post-graduate institutions is to implement a course or series of courses that teach students about visual literacy. This would be especially beneficial for medical school where students acquire the knowledge necessary to treat patients in a holistic manner. While student learning in medical schools is rooted in textual sources, the real-world application of what students learn must extend beyond their memorization of terms and treatments. In addition to the analyzing and assessing of patient symptoms, the doctor-patient relationship is essential to medical care and is known to impact a patient's recovery. Therefore, doctor-patient interaction is rooted in empathy and communication, not something that can be taught through a text but, as I will demonstrate, something that can be imparted through visual means. Thus, this thesis addresses the need for visual literacy training across multiple levels of schooling with a strong focus on postgraduate medical studies.

A compulsory course on visual literacy is essential in both undergraduate studies and medical schools because it would develop necessary and crucial skills desired in various fields, particularly the medical field. These abilities include leadership, empathy, communication, and critical analysis. Many of the ways in which these skills apply to future physicians are applicable across a variety of fields. Proper training and teaching ensure that it is possible for everyone to develop these traits that are crucial to the workforce. The compulsory course mentioned above must cover several topics in the field of visual literacy and a proposed framework for this course

will be provided. This proposed framework includes several modules beginning with teaching the principles of visual analysis and exemplifying this by providing images, paintings, and video clips, asking students to create images of their own, analysis of images in closer relation to students' field of study, and multiple discussion periods. A course like this can be modified to fit into any school or program's curriculum; however, in this thesis, the course proposition is intended specifically for medical students. Prior to delving into the topic described above, it is crucial to first lay down the foundations of what visual literacy is and how it is related to various fields of study, particularly the medical profession.

Introduction

Before discussing the benefits of visual literacy to medical school students, the history and significance of visual literacy must be explored. The concept of visual literacy has been around since the late 1930s when scholars began to be interested in the subject.¹ Visual literacy is connected to and developed parallel to the study of iconology and visual culture. As an acquired skill, it makes a point to draw a connection between seeing and reading.² This has become a confusing notion for some since by definition reading is seeing but seeing is not necessarily reading. Visual literacy has come to redefine the very definition of reading. While reading is generally connected to making meaning of words and texts, in the context of visual literacy it became used to refer to the process of close looking at an object or image. Through the very basis of linking handwriting or print and meaning, reading strikes us as more of an acquired skill as opposed to seeing which, on the most basic of levels, refers to a competence of the visual-spatial world.³

Putting the concept of visual literacy into words began when John Debes coined the term “visual literacy” in 1969 and defined it as:

a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication.⁴

As explained by Alan Michelson, in 1968, Debes and his associates formed the International Visual Literacy Association, which is still active today and has created the foundation for over 60 years of visual literacy scholarship. In an article that proposes a short summary of visual literacy

¹ Ernesto José Peña Alonso, “Visualizing Visual Literacy,” (PhD diss., University of British Columbia, 2018), iii, <https://doi.org/10.14288/1.0368982>.

² James Elkins, *Visual Literacy* (New York: Taylor & Francis Group, 2009), 11.

³ Elkins, *Visual Literacy*, 11-13.

⁴ John Debes, “The Loom of Visual Literacy,” *Audiovisual Instruction* 14, no. 8 (1969): 27.

training and conceptualization, Michelson provides his thoughts surrounding visual literacy and explains that what drove him to reflect on it was the increase in popularity of television which, during his time, gained increasing favour with the public.⁵

Following his introduction of visual literacy to the world, Debes published another influential study with Roger Fransecky in 1972, in which they stated that the members of the National Conference on Visual Literacy agreed upon the former's proposed definition of this key concept.⁶ Recently, Joanna Kędra writes that since Debes proposed his definition, visual literacy has spread across multiple disciplines and contexts and thus has gained various definitions.⁷ As expected, Debes's definition was revised through time; it has been used by the International Visual Literacy Association since 1989. Because of the plethora of definitions that are proposed by theorists coming from various backgrounds, the field of visual literacy has been lacking a coherent theory and definition of its core concept itself. This lack of coherence in respect to what visual literacy is and entails should be perceived as a problematic, still-to-be-resolved aspect of the field of visual literacy, which spans across multiple disciplines.⁸ Averginou and Pettersson state that certain components of visual literacy are selected by scholars to be compatible with their particular field of study, which leads to a wide range of definitions created to fit a certain agenda. This is expertly explained as such:

Consequently, perhaps the nature of the theoretical “pieces” each group offers is homogeneous. However, when these pieces are brought together to create the jigsaw of a VL theory, then the result is so heterogeneous that it hinders the formation of a proper theory. In other words, these theoretical pieces may provide us with a substantial amount of knowledge about the concept, but they are unable to organize and structure it, to direct any applications of it, to account for related

⁵ Alan Michelson, “A Short History of Visual Literacy: The Last Five Decades,” *Art Libraries Journal* 42, no. 2 (2017): 96, <https://doi.org/10.1017/alj.2017.10>.

⁶ Roger Fransecky and John Debes, *Visual Literacy: A Way to Learn – A Way to Teach* (Washington, D.C.: Association for Educational Communications and Technology, 1972), 9.

⁷ Joanna Kędra, “What Does it Mean to be Visually Literate? Examination of Visual Literacy Definitions in a Context of Higher Education,” *Journal of Visual Literacy* 37, no. 2 (2018): 68-71, <https://doi.org/10.1080/1051144X.2018.1492234>.

⁸ Kędra, “What Does it Mean to be Visually Literate,” 71.

phenomena, and to provide any predictions as to how the concept will behave under any given circumstances.⁹

This is what is believed to be the reason why there has been no formation of an unanimously agreed upon definition of visual literacy. In turn, this has made it difficult to generate research that focuses specifically on visual literacy. While this has caused some issues within the field, it does not need to be seen as a disadvantage on all facets. Through the mix of unique viewpoints aiming to define it, visual literacy has preserved a dynamic profile of open-ended discourse.¹⁰

It is understandable that a field covering such a wide range of topics, from critical analysis to the history of images, would be difficult to define. This has not stopped generations of scholars from attempting to create a concrete definition for the field and its focus. However, one of the most important characteristics of visual literacy is that it is constantly changing. Visual literacy cannot exist at any one point in time without drawing from the period in which it resides; this includes aspects of modern culture, trends, and communication methods. These

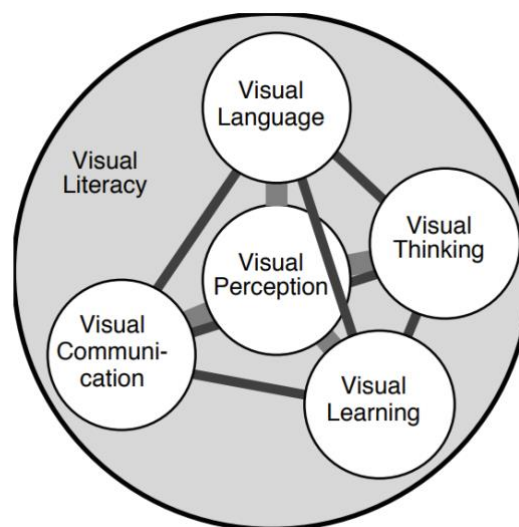


Figure 1. The Components of the Visual Literacy (VL) Theory.
Source: Maria Averginou and Rune Pettersson, "Toward a Cohesive theory of Visual Literacy," *The Journal of Visual Literacy* (2011), 5.

examples are always changing, and thus visual literacy and what it entails will always be changing. Furthermore, it must also be acknowledged that visual literacy practices will vary from culture to culture, geographic region to geographic region, nation to nation, given that visual practices are rooted in local, ethnic, or national culture. This paper will discuss visual literacy within Canada and the United States. None of this should not deter others from creating new definitions of visual literacy and my observation just serves as a reminder that the concept will continue to change in relation to advances in visual media and technology as well as our relations to them. If definitions for visual literacy are created periodically along with the changes seen within society, they will serve as a marker of history across the years.

⁹ Maria D. Averginou and Rune Pettersson, "Toward a Cohesive Theory of Visual Literacy," *Journal of Visual Literacy* 30, no. 2 (2011): 2, <https://doi.org/10.1080/23796529.2011.11674687>.

¹⁰ Averginou and Pettersson, "Toward a Cohesive Theory of Visual Literacy," 2.

Along with the definitions of visual literacy to which I referred above, others have been proposed and some of the most prominent will be analyzed in the following sections. Kędra, for example, states that visual literacy has often been seen as a parallel to alphabetic literacy, which makes sense of the frequently used analogy of visual reading and writing.¹¹ Justifiably, this perspective has since been criticized as being insufficient to describe visual literacy. While this description of a complex concept may seem.¹² It is important to note that three elements have remained consistent over the last sixty years since Debes first introduced the notion of visual literacy.¹³ Second, new information technologies always change people and the way in which they learn. Third, the educational relationship between the active teacher and the passive student needs to be reconfigured to reflect the current information technologies circulating in the modern world. In the decade that followed the initial definition of visual literacy, several authors such as John Debes, Clarence Williams, and Roger Fransecky contributed more general reflections.¹⁴

Another crucial definition of visual literacy appears in Robert Heinich's 1982 co-authored monograph, entitled *Instructional Media and The New Technologies of Instruction*. In this study, we read that "visual literacy is the learned ability to interpret visual messages accurately and to create such messages. Thus, interpretation and creation in visual literacy can be said to parallel reading and writing in print literacy."¹⁵ This assertion is thus recognizing that there are different aspects to visual literacy outside of just looking, namely involving similar abilities as reading and writing, which are often thought of less within visual literacy as they tend to form their own category.¹⁶ It is nonetheless essential to point out that the aforementioned monograph was published in 1982, only thirteen years after Debes's initial definition, so the author was able to build upon the original conceptualization while still staying close enough to it that his thinking would fit in with then-current literature and studies.

Visual literacy was faced with challenges as publications came out that did not support this concept. Such publications included "Visual Literacy: A Failed Metaphor" by Michael Cassidy and James Knowlton, published in 1983. This seminal article begins by stating that visual literacy

¹¹ Kędra, "What Does it Mean to be Visually Literate," 70.

¹² Kędra, "What Does it Mean to be Visually Literate," 71.

¹³ Michelson, "A Short History of Visual Literacy," 96.

¹⁴ Michelson, "A Short History of Visual Literacy," 96.

¹⁵ Robert Heinich, Michael Molenda, and James D. Rusell, *Instructional Media and the New Technologies of Instruction* (New York: John Wiley and Sons, 1982), 62.

¹⁶ Rune Pettersson, *Visual Literacy* (Oxford: Pergamon Press; The International Encyclopedia of Education, 1994), 2.

is a paradox in the sense that it is inherently contradictory and through this, that the visual literacy movement mystifies more than it clarifies the subject. It makes a point to state that the word *literacy* implies a visual nature as literacy refers to knowledge and skills that are required for the encoding and decoding of messages, which are, by their very nature, based in the visual (writing or text-based).¹⁷ This is an understandable point of view and it is persuasively argued; however, the addition of the adjective *visual* to the noun *literacy* is meant to hone in and enhance the field that the term is aiming to describe. Visual literacy is referring to literacy surrounding images and even material objects, and it is meant to exclude things such as textual sources. It is true that literacy refers to a set of skills surrounding coding and decoding messages but when referring to visual literacy, the word takes on a new meaning. Literacy in this sense is the ability to *read* images and this is why the word *visual* is added, because it implicates visual media, such as images, into the world of traditional literacy. The points that are raised in this article have a sound base, but it must be considered that this article was only written fourteen years after the introduction of visual literacy in scholarship and the field of education. Although some aspects and concerns have remained the same, today it is clear that the meanings and definitions of visual literacy are rapidly changing. At its inception, visual literacy strove to encompass such a large range of topics with no base in the field that it was difficult for many to comprehend. Over time, researchers and practitioners have come to study the field at a closer range in addition to taking the time to truly understand what visual literacy means.

Following Cassidy and Knowlton's article, David Sless's "Visual Literacy: A Failed Opportunity" was published in 1984, just a year later as a reaction to the former scholars' work. This article begins by drawing attention to the points raised in Cassidy and Knowlton's work, primarily the contradictory expectations that come from attempting to qualify visual skills through literacy. However, Sless states that rather than clarifying the matter, his predecessors' article creates its own confusions by missing the value in the metaphor as well as the opportunity to conduct further research and studies. As a result of this, Sless aims to argue that visual literacy is not a failed metaphor so much as a failed opportunity. He writes that "unfortunately, both the advocates of VL and their recent critics have an extraordinarily narrow conception of the arguments and evidence that might be deployed in the debate. They both demonstrate what might

¹⁷ Michael Cassidy and James Knowlton, "Visual Literacy: A Failed Metaphor," *Educational Communication and Technology Journal* 32, no. 2. (1983): 67-68, <https://doi.org/10.1007/BF02766724>.

be described as a narrowness of vision, even perhaps a certain blindness.”¹⁸ By writing this, Sless is thus stating that those who aim to criticize visual literacy, and specifically Cassidy and Knowlton, are encumbered by narrow vision. The field of visual literacy is of impressive size and diversity, and its capacities far outweigh its definition, which can only attempt to encompass such a broad and multidisciplinary field. Those who look at visual literacy from only one perspective are bound to miss the opportunities that are presented and unlocked by the notion when adopting multiple viewpoints. Further along in the article, Sless makes a point that the sources used for many studies critiquing or even just writing about visual literacy draw primarily on sources from experimental psychology and that even though the psychologists presenting them are in the process of investigating a certain area, they do not necessarily understand it completely as they are conditioned by their approach. He suggests that those who are looking into visual literacy pay more attention to the wealth of past human achievement and traditions of practices that take part within the field.¹⁹ These points brought up by Sless made note of the areas in which visual literacy study was lacking. It is obvious that today the study of visual literacy does not exclude past and current practices as embraced by a variety of image users (artists, scientists, engineers, etc.), but initially the field paid little attention to this and focused on a research tradition with unanswered questions. While visual literacy has had its fair share of criticism, time has only allowed for the discipline to develop and gain a larger following.

The most recent and comprehensive definition of visual literacy comes from the Association of College and Research Libraries in their article “ACRL Visual Literacy Competency Standards for Higher Education” (2011) in which they write that:

Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media. Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture.²⁰

¹⁸ David Sless, “Visual Literacy: A Failed Opportunity,” *Educational Communication and Technology Journal* 32, no. 2 (1984): 224, <https://doi.org/10.1007/BF02768894>.

¹⁹ Sless, “Visual Literacy: A Failed Opportunity,” 245.

²⁰ Denise Hattwig et al. “ACRL Visual Literacy Competency Standards for Higher Education,” *Libraries and the Academy* 13, no. 1 (2013): 62, <https://doi.org/10.1353/pla.2013.0008>.

This definition was proposed by the Visual Literacy Task Force under the aim of creating a set of competency standards for visual literacy in education.²¹ There has been little in the way of new definitions since 2011, which points to the fact that the ACRL has created a definition that properly encompasses the multifaceted, interdisciplinary nature of visual literacy. In addition to this, dozens of new and important articles have been published since, advancing a field that has been over fifty years in the making. After tracing the development of the key concept of visual literacy since its initial introduction by Debes, it is now possible to examine why it has been growing in popularity in recent years.

Since the beginning of the 21st century, forms of digital technology and media have become integral parts of almost everyone's lives. While such technologies have integrated themselves seamlessly into this digital age, the recognition of the roles that technologies play in visual literacy and learning began decades ago. Fransecky and Debes wrote that "in general, today's child is more visual, better informed, and intellectually more skilled. The principal reason for these sets of differences appears to be that he has been watching television."²² This clearly indicates that while some may see the impactful role of technology on society as something novel to the 21st century, such influence has been around since the invention of the television and likely traces even further back to the use of photography and painting. Seeing as the connection between visual literacy and technology has been made since the inception of the former as a term, there is a link between the two and this is something that has not been sufficiently examined by scholars.

Our contemporary society is highly visual, which can be attributed to the pervasiveness of technology and online communication platforms in all spheres of our lives. Digital media platforms have made it so that almost anyone has the ability to create, consume, and share images and other forms of visual media. Today's students were born into an environment saturated with images and other forms of visuals while their communication modes are mediated visually, through means including video creation, emoji use, and video chatting.²³ Platforms such as Snapchat rely almost solely on the visual for communication, as users send pictures of themselves or their surroundings to friends with little context or writing. This example indicates how easy it

²¹ For details, see Hattwig et al., "ACRL Visual Literacy Competency Standards for Higher Education," cited above.

²² Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 8.

²³ Joanna Kędra and Rasa Žakevičiūtė, "Visual Literacy Practices in Higher Education: What, Why and How?," *Journal of Visual Literacy* 38, no. 1-2. (2019): 2, <https://doi.org/10.1080/1051144X.2019.1580438>.

is to replace or supplement other forms of communication with images and visuals. It can be easy to convey a message or a feeling through a picture and sharing it usually requires little effort. The success of social media alongside a growing visual ecosystem is supported by the fact that the human brain can absorb 36,000 visual images every hour because between 70% and 90% of information that is received and processed by the brain is visual.²⁴ Other platforms, such as Facebook and Instagram, rely on the circulation of images, which can come from a variety of sources. This type of unfiltered image sharing can be dangerous as there is a high risk for the user of encountering fake news and misinformation. Indeed, this is where visual literacy skills and abilities become useful. The ability to critically analyze and interpret what one sees is essential in being able to decode and process messages coming from an overwhelmingly visual sphere.

After performing extensive research on visual literacy and its history, I am able to propose a definition that better reflects current thinking on the importance and impact of the image and visual culture on our ways of thinking, being, and living. In my view, visual literacy is a learnt capacity that one develops through the acquisition of knowledge and practical training, which allows them to read, analyze, and critique visual media. Visual media include all types of images (e.g., photographs, paintings, sculptures, films, advertisements, etc.). In addition, visual literacy provides an individual with the ability to design meaningful and effective visuals through the lens of both a creator and a viewer, which imbues their expression and communication with a greater form of self-awareness and creates visually engaging media for the audience. In our context, visually literate individuals are members of society who are best equipped to survive and thrive in the ever-changing digital landscape whereby communication is often mediated by communication technologies that rely heavily on the distribution and creation of a wide range of images.

Through understanding the history of visual literacy and why it has been a topic of great discussion for over fifty years, knowledge of its in-context significance and possible applications can be employed in our contemporary world to the benefit of students. Considering that visual forms of media are more abundant than ever, visual literacy has earned its rightful place in the attention of scholars and educators in the 21st century.

²⁴ David Hyerle, *Visual Tools for Transforming Information into Knowledge* (Thousand Oaks, CA: Corwin Press, 2009), 28.

Chapter 1: Visual Literacy in Education

This chapter is going to explore the history of visual literacy in the context of education as well as its current uses in higher education contexts. At the outset, a proposition to incorporate visual literacy into children's schooling by Fransecky and Debes, the first of its kind, will be analyzed. By exploring this initial proposition, a framework is provided for further analysis of modern-day visual literacy practices.

2.1 Analysis of Fransecky and Debes's Visual Literacy: *A Way to Learn – A Way to Teach*

Given the proliferation of images everywhere today, it is no wonder that the incorporation of visual literacy practices and training has come to the attention of many researchers, especially those working in the education sector. The notion of including such practices into education began with Fransecky and Debes's booklet: *Visual Literacy: A Way to Learn – A Way to Teach* (1972). This followed Debes's initial definition of visual literacy in 1969, as previously discussed above.

The aim of this booklet was to provide teachers and those who work in other fields of education with information about how to educate visually literate children as well as involve them in the learning process. It was designed specifically to incorporate ideas relating to then-emerging new field of visual literacy into the classroom. An important note is made about how the validity of visual literacy concepts comes through personal experience with those who are engaging in visual literacy practices.²⁵ This is a critical aim of this proposed training, and it is something that has persisted all the way to today. Because the concept of visual literacy is so hard to define, as it can encompass abstract ideas and stretch across disciplinary boundaries, the best way to understand it and to believe in its value is to personally experience its effects. Today there are more options to do so as the field has been much more rigorously studied. Anyone could educate themselves through watching videos or participating in activities in which learning is encouraged through visual means and for visual literacy acquisition. In fact, Fransecky and Debes's idea of personal experience refers to experience with children who engage in activities aimed at building visual literacy. They write that reading about visual literacy can certainly give you the base knowledge about the subject, but only personal experiences can show you its true validity and value.²⁶

²⁵ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 6.

²⁶ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 6.

As stated by Fransecky and Debes, there is an important distinction made between the children of 1972 and their corresponding adult generation. They call the children of their time the “television generation,”²⁷ as they were raised in a more technological world than their predecessors due to the invention and wide distribution of the television set. This technological integration into society’s daily life led to children who were used to information being presented to them through images and videos rather than through print. It is noted that the adults living at the time found the visual language facility of children to be strange yet remarkable. There was a great debate about the defining characteristics of this new generation. Some adults were frightened by them because the children seemed to talk more freely, especially about subjects which were previously seen as taboo. Moreover, these children seemed to refuse to reproduce or embrace the same lifestyle that their parents lived.²⁸ It seems apparent that while this may have been one of the first instances of a large gap between the ideals of one generation as related to those of another, this notion is not strange at all. With each coming generation children will be exposed to more information and practices than they ever were before. This could be a result of constant advancements in technology, but there are also many other contributing factors, such as a change in the general ideology of a society, which would cause children to be raised on completely different beliefs and ideals than their parents.

It is also stated that the children of the 1970s were highly critical of the education system and its educators: “schools, they tell us, are institutions that absorb funds to support tedium and enslavement, institutions with undue emphasis on credentials, certifications, and superficial achievement affirmed with a diploma.”²⁹ After reading this, many readers may be surprised to hear this opinion expressed by children from fifty years ago. Thoughts and arguments such as this one have become integral parts of 21st-century learning that favours critical thinking. People have begun arguing that the current day education system teaches students to behave and exist only in the ‘correct’ way—this way being that the student must sit still and listen, contain their movement and emotions until a designated twenty-minute recess period, and keep criticisms to themselves and accept everything they hear as the one valid truth. Moreover, they must always recognize the difference between right and wrong answers. These notions are not only harmful, but they have

²⁷ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 8.

²⁸ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 8.

²⁹ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 8.

led to higher education systems that judge performance based on standardized tests while teaching generations of students who are gradually deprived of their individuality and creativity. The education system has not been designed to produce original thinkers but to produce students ready to participate in a capitalistic society that rewards those who can uphold the wishes of the elite class. It all comes full circle once one recognizes that it is that very elite class that has designed the education system. Thus, we have found ourselves in a feedback loop with seemingly no end and the only hope being the few who dare to challenge the system into which they have been bred.

Some of those people who actively challenged the system were Fransecky and Debes themselves. They were pressing for a change to the education system, which would include more innovation and opportunities for individualized learning.³⁰ It is unfortunate to see that ideas such as these were proposed fifty years ago and yet it is hard to see any change since then. There has certainly been an increase in the range of courses available to students in upper levels of education, specifically at the undergraduate level, but students in primary to high school levels have seen their curriculum become the subject of intense policing and many crucial topics and books which students should be reading and analyzing have been banned. Frequently, it appears as though society is progressing forwards in terms of what students are allowed to learn in schools as well as the ways in which they learn, but then that progress is backtracked depending on the governing powers.

Fransecky and Debes describe, moreover, how students have the ability to effect change within their schools or universities, referring to how the size of student groups fascinated with the world of television and movies grew so large that many universities began incorporating film courses and film festivals into the curriculum.³¹ A new generation of students emerged who were thrust into a world of visuals, which only continued to develop into the world in which we live today. This new way of being and living presented students with a whole different mode of communication, which opened new doors and opportunities for them to learn in new ways. Nonetheless, whereas the younger generation was raised in the world impacted by television, the adults were not and ultimately, they were and still are the ones in power.

It is after this point that Fransecky and Debes began writing about the incorporation of visual literacy practices into education. Their reflection starts with reintroducing the concept of

³⁰ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 9.

³¹ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 9.

visual literacy and its official definition as agreed upon by the National Conference on Visual Literacy. They recognize that the notion that one can ‘read’ images can be hard for some to understand and thus they dedicate a section to helping people understand this concept. At the outset, they state that “today we proliferate visual language – symbols, message carriers, body language – on television, in film, and in advertising ... [and] students in visual literacy projects suddenly sense a new power, a new language facility, that they haven’t felt with words.”³² The previous main mode for communicating messages was through writing or orally. If people wanted to learn about something, they most often had to read about it in books or they could talk to someone about it. Textual and oral sources can also be connected to visual literacy. For someone to be able to read an image, they must also be able to read and critically analyze texts. To this effect, Fransecky and Debes use as an example the phrase “John sees Harry” and they point out the role of each ‘person’ in this sentence: John is the performer and the grammatical subject element, and Harry is the receiver and the object within the structure. If the position of the two ‘people’ were reversed in the phrase, then it would take on an entirely different meaning. Similarly, they state that a visual representation of this phrase would also indicate a similar relationship between the performer and the receiver. These preliminary observations lead to the idea that there is such thing as a ‘visual language’. Both visual and verbal languages involve a series of thought processes which precede the actual visual and verbal elements (writing or speaking).³³ Identifying the connection between visual and verbal forms of language and communication was the precursor to the development of the concept of reading images.

Since education and schools have existed, the primary mode of teaching has concentrated on developing verbal skills, which include reading, writing, and speaking.³⁴ Any skills pertaining to matters of visual literacy, which would not have been called by this name, were taught minimally, in the same way that they are today. Education in this field may occur more frequently in a child’s first years of schooling, where they learn about images and what different objects are and how they are depicted, but not much occurs after these years. Teaching in this field was deemed an ‘extra’ in terms of what children should be taught and was often reserved for children with specific ‘talents’ within the arts.³⁵ This is something that we are still seeing today, though the

³² Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 9.

³³ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 9.

³⁴ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 12.

³⁵ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 12.

incorporation of visuals into everyday teaching practices has been growing; nevertheless, if students are to learn through visual means or to express themselves visually, they must actively choose to study in that field such as the visual arts or art history. A clear separation between words and images does nothing more than convince students that the visual world does not belong in the world of academia unless linked to the acquisition of reading skills in early childhood education, which can be a harmful notion. Addressing this discrepancy is an important first step in paving the way for the integration of visual literacy practices in education.

One of the first examples presented in the practical pamphlet dealing with incorporating visual literacy into education practices is photography. Fransecky and Debes pertinently point out that: “as students move through visual literacy activities, as they learn to report, to translate, to generalize, to organize, and to theorize about experience, as they move from simple photographs through the subtlety of a painting or a feature film, youngsters symbolize actual events, they fictionalize, they ‘language’ on many levels as they extend their own abilities to communication, both visually and verbally.”³⁶ By incorporating different forms of learning, such as allowing students the opportunity to partake in photography either in a class designed specifically to teach it or as a component of a different course, students are given an outlet to express themselves and their unique point of view. Mediums such as these allow students to participate in formative activities that differ from the traditional ways of learning to which they have previously been exposed in a word-focused education system. Children can also be exposed to visuals in other physical areas of the classroom: for example, images mounted on a bulletin board along with statements that challenge students to interpret what they are seeing in those pictures, observe smaller details, and perform visual interpretative activities.³⁷ By displaying images and challenges such as these, children are being exposed to different modes of communication and various types of meaning-making.

Fransecky and Debes advise educators to acquaint themselves with the world of visual literacy by getting a camera. They write that “the camera is a visual pen we use to write about the world we see and to record some portion of reality that will transmit our thoughts by visual representation to another person at a later time.”³⁸ Learning to create meaning through the use of

³⁶ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 13.

³⁷ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 14.

³⁸ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 18.

photographs is an effective way of integrating visual literacy practices into the student's life. Oftentimes, in order for something to be deemed worthy of having its picture taken, it needs to be something 'special' that is not seen every day.³⁹ By using a camera to take pictures of a subject—from objects you see in your day-to-day life, to things that bring you joy, or special items or scenes—you are learning how to take personal visual experiences and transmit them into a form that can be shared with others. The simple action of taking a photograph is much more powerful than people may be led to believe. By training your brain to think in terms of and through images, you are in turn, teaching it how to tell a story through one simple visual composition such as a photograph. This is an easy and effective way to teach those who have no idea what visual literacy is the power that images can hold. Once someone has a grasp of the concept and how it can transfer into their everyday life, they will begin to learn how to read images. After advocating for learning a skill such as this, Fransecky and Debes state that it is important to get a camera into the hands of students for them⁴⁰. The beauty in this is that at first, there is very little teaching required; you can give students a camera, show them how to use it, then send them out into the world to take pictures of whatever they like, or there could be an assignment asking for images of specific objects or that relate to a specific feeling or emotion. After this, students can look at each other's images and discuss what they see, and they can be tasked with explaining why they took pictures, setting aside the common notion that photographs need to 'look good' or be aesthetically pleasing.

This method proposed by Fransecky and Debes is what paved the way for the incorporation of visual literacy practices into education. In the aftermath of this article's publication, there was an increase in teaching visual literacy to children, which has only continued to grow and become more widely distributed over the years.

2.2 The Incorporation

As the visual literacy movement emerged, schools began incorporating visual literacy into their curriculum sometimes as temporary courses, but some were permanent additions ranging from K-12 years.⁴¹ Fransecky and Debes provide a list of schools that created programs in visual literacy, which takes up a few pages of their pamphlet. The first example provided was at Green

³⁹ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 18.

⁴⁰ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 19.

⁴¹ Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 23.

Chimneys School in Brewster, New York. This school was one of the first to become involved in visual literacy activities. It was there that students began working with early versions of Photo-Story Discovery Sets, which are sets of pictures on cards provided to students with the opportunity to create their own stories by arranging the cards in whatever sequence they choose. The material presented on the cards would be recognizable to most children while still ranging in complexity. One of the sets of cards presents students with the challenge of sorting cards into categories rather than telling a story with them. The school extended the work from the Photo-Story Discovery Sets to the development of other skills, such as writing and speaking. In addition, after the success of those activities, the school gave students the chance to start taking photos and use those as the base for a similar activity to the Photo-Story Discovery Sets. These activities were so successful that the school extended the programs to all eight grades and new activities were added.⁴² There were many more examples listed in the article that spanned across multiple other states, all with similar stories about the success of visual literacy activities within their schools. The importance of visual literacy practices was observed almost immediately as they were implemented. If educators could observe these effects fifty years ago, then it stands to reason that activities such as these should still exist to some capacity. These activities most definitely still exist today in different forms such as creating infographics, photography classes, reading graphic novels, etc. It seems, however, that these activities have become standard practice and we may have forgotten the initial reason for their incorporation into curriculum; thus, it is possible that we have also disconnected these activities from their initial objectives. This disconnect may create new problems as these activities are integrated into courses of all types, but there is never any specific focus on the benefits of teaching visual literacy and for the most part this type of understanding has been lost.

2.3 What Does it Mean to be Visually Literate?

Now that the concept of visual literacy has been defined and the use of its incorporation into education has been explored, it is crucial to examine what it means for someone to be visually literate. It makes sense to assume that for a person to be visually literate, they must be able to be proficient in all facets of visual literacy, but considering how abstract the concept of visual literacy is, it can be hard to measure or assess it regarding a learner's actions and abilities. To state it once more, "visual literacy involves both reading and writing visual communication: interpreting visual

⁴² Fransecky and Debes, *Visual Literacy: A Way to Learn – A Way to Teach*, 23 and 35.

material, recognizing its social or ideological implications, using it in appropriate and effective ways, and creating material that communicates effectively.”⁴³ This definition does a good job at encompassing the broad nature of visual literacy and indicates that there are practical applications for it, while highlighting its social and ideological implications. Interestingly, Deandra Little, Peter Felten, and Chad Berry point out that learning to look is much harder than anyone may think. The way in which we look at and observe something is such a familiar feeling that it may become misleading in its familiarity. Because of this, looking carefully and analyzing is a complex process that must be taught and learned, in the researchers’ view.⁴⁴

Kędra observes that researchers and educators describe visual literacy from their own (inter)disciplinary perspectives, but there are three terms that are normally used across the board in reference to it, which are visual literacy skills, abilities, and competencies. The use of ‘ability’ is often in the context of visual reading and writing as well as thinking. A ‘skill’ can be described, however, as a learned ability. Therefore, visual literacy skills are learnable through repeated teaching and practice, which aims at building a strong set of developed and improved skills in this area. In contrast, a competency in visual literacy allows a person to communicate visually and thus

Table 1. Table outlining visual writing skills grouped thematically.

Source: Joanna Kędra, “What Does it Mean to be Visually Literate? Examination of Visual Literacy Definitions in a Context of Higher Education,” *The Journal of Visual Literacy* (2018), 78.

Visual writing skills		
Visual communication	Visual creation and image production	Image use
<ul style="list-style-type: none"> • Communicate (creatively) with others • Combine visuals and verbal for intentional communication • Using visuals for intentional communication with others • Express oneself in terms of images • Ability to communicate more effectively • Proper use of visual communication elements 	<ul style="list-style-type: none"> • Create visuals/visual media • Create images in a variety of media • Create messages using visual symbols • Creating visual images: design and production of visual materials in a variety of media • Make simple images • Visualize basic data • Produce culturally significant images, objects, and visible actions 	<ul style="list-style-type: none"> • Use images (write) • Use images effectively • Use images ethically • Proper use of ready-made visual instructional materials • Use culturally significant images, objects, and visible actions • Employ the distinct syntax and semantics of different visual forms

ability is something with which a person can be born, whereas a skill is something that must be

⁴³ Eva Brumberger, “Ways of Looking: An Eye-Tracking Study of Visual Literacy Expertise,” *Journal of Visual Literacy* 41, no. 3 (2022): 66, <https://doi.org/10.1080/1051144X.2022.2053818>.

⁴⁴ Deandra Little, Peter Felten, and Chad Berry, “Looking and Learning: Visual Literacy across the Disciplines,” *New Directions for Teaching & Learning* 141 (2015): 1-2, <https://doi.org/10.1002/tl.20117>.

⁴⁵ Kędra, “What Does it Mean to be Visually Literate,” 72.

learned and nurtured. That is why using the term *skill* in conjunction with visual literacy makes the most sense because people may assume that the process of looking is an innate ability, but it is in fact a set of skills that must be developed over time with careful consideration.

The nature of visual literacy is such that it can be employed in almost every aspect of a person's life, as competency in this area impacts a variety of spheres, including social interactions and communication with other people. Kędra states that "the visual literacy concept combines skills in visual reading (interpreting, meaning making), visual writing skills (using or creating images) as well as visual thinking and learning abilities and other visual literacy skills."⁴⁶ Visual reading skills, according to Kędra, include interpreting, analyzing, understanding, exercising visual perception, evaluating, and using knowledge of grammar and syntax. Specific attention in teaching needs to be placed on the ability to recognize content that has been manipulated in some form and decoding images through the understanding of specific image elements that lead to a message being conveyed. The next category presented is visual writing skills which includes visual communication, creation and image production, and image use. This category applies mainly to a person's ability to make effective use of visual literacy skills as a means of communication and to express oneself. A thematic grouping of visual writing skills is outlined in Figure 2 which presents them as categorized under visual communication, visual creation and image production, and image use. This chart is useful when attempting to grasp the concept of visual writing as it can be considered the broadest category of visual literacy and encompasses a great range of skills.⁴⁷

Visual thinking and skills are of a nature that allows them to be applied within every category of visual literacy competency. A main aspect to building visual literacy is the ability to critically think whether one is thinking about the meaning of an image or thinking about how to create meaning through the creation of a visual. In conclusion, if someone aims to be visually literate, there is a wide range of skills that need to be mastered, which range from reading to writing to communication and interpretation, and building these many skills may certainly take a considerable amount of time. It has been noted that visual literacy receives less attention than information literacy in the educational sphere: for the most part, acquiring, interpreting, and using

⁴⁶ Kędra, "What Does it Mean to be Visually Literate," 73.

⁴⁷ Kędra, "What Does it Mean to be Visually Literate," 77-78.

information has become a core objective of the educational curriculum, while developing visual literacy remains on the sidelines.⁴⁸

It has become apparent that in order for a person to become visually literate, they must both be actively taught how to do so as well as learn through personal experience, the latter of which can be easily achieved due to the saturation of images in today's society. Skills such as those outlined above will stick with someone throughout their entire life, even if they do not realize it. These skills will complement the acquisition of other forms of literacy and help with learning in various subjects spanning all types of subjects. Kędra and Žakevičiūtė remark that millennial and post-millennial generations are highly skilled in the use of technology, but they are often visually illiterate, which is nothing but surprising. This poses a great deal of challenges to educators as oftentimes they take students' competency in image production and evaluation for granted.⁴⁹ Just because students are exposed to a wealth of images which comes as a result of an increase in everyday technologies does not mean that they have learned how to critically think about and analyze what they are seeing on a day-to-day basis. Brumberger explains that when examining someone's competency in reading visual expression, their ability to accurately discern meaning from images and other visual material is observed. In addition, to analyze a competency in efficiently using visual communication, the results are evaluated based on a specific set of criteria. In both examples, the end products are what is being examined rather than the underlying process. While this type of study is crucial to the understanding of what it means to be visually literate, it does not provide enough information about how to distinguish those with basic visual literacy skills from experts.⁵⁰ In other words, it is important to look at the process by which people execute their visual literacy skills as well as how they learned them. Another way to quantify visual literacy skills comes from the Association of College and Research Libraries (ACRL), as we will see below.

⁴⁸ Dana S. Thompson et al., "A Proliferation of Images: Trends, Obstacles, and Opportunities for Visual Literacy," *Journal of Visual Literacy* 41, no. 2 (2022): 122, <https://doi.org/10.1080/1051144X.2022.2053819>.

⁴⁹ Kędra and Žakevičiūtė, "Visual Literacy Practices in Higher Education," 1.

⁵⁰ Brumberger, "Ways of Looking," 65-66.

The Association of College and Research Libraries is a division of the American Library Association, which represents more than 10,200 academic and research librarians. Their aim is to advance learning and to develop programs, products, and services to help research librarians within the academic community.⁵¹ As

stated in the ACRL's *Visual Literacy Competency Standards*, this document was created by the Visual Literacy Standards Task Force (VLTF).

In 2010, the ACRL Information Literacy Standards Committee supported the ACRL Image Resources Interest Group (IRIG) in developing the visual literacy standards. As a result of this investment, the first draft of those standards was distributed in 2011.⁵² The

first standard states the following learning outcome: "The visually literate student determines the nature and extent of the visual materials needed."⁵³ According to Hattwig et al., there are two categories within this standard, the first being that the student defines the need for an image and the second being that the student identifies a variety of image sources. The first category has learning outcomes such as defining the purpose of an image, outlining the scope, articulating criteria that need to be met, identifying key concepts, and noting the need to recognize discipline-specific conventions. There are seven standards in each category and subcategories within them, which are then linked to specific learning outcomes. They may be adapted according

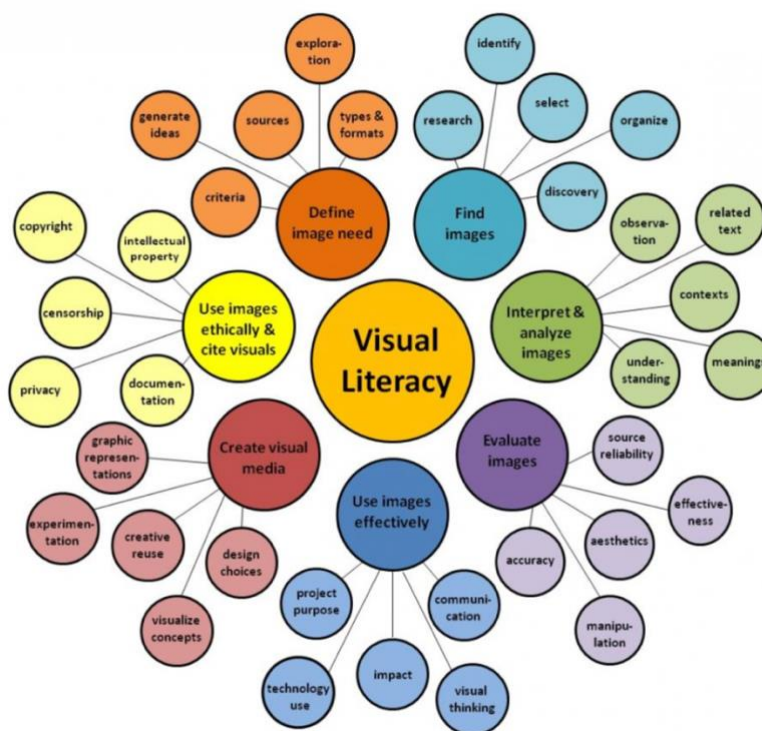


Figure 2. Visual Literacy Array based on ACRL's Visual Literacy Standards. *Source:* Denise Hattwig et al. "Visual Literacy Standards in Higher Education: New Opportunities for Libraries and Student Learning," *Portal: Libraries and the Academy* (2013), 75.

"The visually literate student

determines the nature and extent of the visual materials needed."⁵³ According to Hattwig et al., there are two categories within this standard, the first being that the student defines the need for an image and the second being that the student identifies a variety of image sources. The first category has learning outcomes such as defining the purpose of an image, outlining the scope, articulating criteria that need to be met, identifying key concepts, and noting the need to recognize discipline-specific conventions. There are seven standards in each category and subcategories within them, which are then linked to specific learning outcomes. They may be adapted according

⁵¹ Association of College and Research Libraries, "ACRL History," American Library Association, accessed March 30, 2023, <https://www.ala.org/acrl/aboutacrl/history/history>.

⁵² Hattwig et al., "ACRL Visual Literacy Competency Standards for Higher Education," 62.

⁵³ Hattwig et al., "ACRL Visual Literacy Competency Standards for Higher Education," 75.

to the needs of an educational institution, which could translate to creating courses for the purpose of teaching visual literacy or the implementation of visual literacy modules within the context of a separate course. While the standards are listed in a linear structure, the article makes it clear that everyone learns differently and that students may perform multiple aspects of visual literacy simultaneously, such as searching for and evaluating images. Lastly, it is noted that producing and teaching visual literacy information is a collaborative effort between various contingencies, such as librarians, archivists, and curators. To properly integrate visual literacy into a curriculum, there needs to be partnerships and shared information across all departments within an institution.⁵⁴ Figure 3 provides, through visual means, what visual literacy entails based on the ACRL standards. The seven bubbles around the centre represent the seven standards and, from those, branch out the additional subcategories and learning outcomes. Having a visual representation to illustrate what visual literacy is and what it means for someone to be visually literate is important because the foundation of visual literacy lies in images and a visual representation offers up an engaging way for people to understand the ramifications of this key concept. If someone is wondering whether a particular skill relates to visual literacy in some way, they can refer to this image, which offers an almost all-encompassing view of the many facets of visual literacy. In addition, the standards offer a way to qualify and quantify visual literacy skills, which was previously quite difficult to do given the abstract, fluid nature of this concept. Educators generally require concrete guidelines such as these to effectively implicate visual literacy practices into a classroom setting.

Further examples of clarifying visual literacy skills come from Kędra and Žakevičiūtė, who discuss the importance of visual literacy education in the 21st century and how that translates into visual literacy skills for students. They argue that “images have the potential to become lingua franca of our daily communication, especially amongst the younger generations. Thus, tertiary education should take advantage of visual modes of knowledge and knowing by introducing at least some elements of visual literacy education across all disciplines.”⁵⁵ A lingua franca is a language that people use to communicate when they speak more than two different languages, also referred to as a bridge language. This concept is an interesting one because it touches on the connective nature of visual literacy and the way in which it can bring people together. By introducing visual literacy across all disciplines, educators are exposing students to a new form of

⁵⁴Hattwig et al., “ACRL Visual Literacy Competency Standards for Higher Education,” 62.

⁵⁵Kędra and Žakevičiūtė, “Visual Literacy Practices in Higher Education,” 1-2.

communication that exists outside traditional verbal communication. Kędra and Źakevičiūte describe the points made by Jeeyoung Min, who implied that visual literacy should have practical implication. In addition, it is suggested that students learn to construct meaning and to master it while using verbal and visual elements through “the four-fold process of noticing, conceptualizing, constructing, and conveying.”⁵⁶ This means that for someone to master the skills of visual literacy, they must find practical uses for it and practice by involving themselves in the process of communicating visually.

In conclusion, the multifaceted nature of visual literacy makes it hard to qualify and quantify the exact attributes and skills that one must obtain to be considered visually literate. There have been steps taken to provide a framework that can be used by educators who wish to incorporate visual literacy into a classroom setting. This has become a new notion and, while it may take time to adapt curriculums that have been stagnant for decades, there is no doubt a long list of benefits to allowing visual literacy to enter classes across all disciplines.

2.4 The DIG Method

Dana Statton Thompson has written an article about a method for teaching visual literacy called the digital image guide (DIG) method. Her article begins by stating that within the first two decades of the 21st century, a period during which communication has become more visual in nature than ever, the creation and emergence of a variety of digital technologies has increased concern amongst educators. This is due to the prevalence of visuals promoting ‘fake news’ that are found throughout various social media platforms. Due to this, it is more important now than ever to teach students how to critically evaluate images so that they can export those skills outside of the classroom as well. Skills such as visual literacy are necessary for students to become discerning citizens who can begin to understand the pivotal role that images play within our society.⁵⁷ The statistics are nothing but staggering: “According to a 2018 Pew Research Center report, the majority of Americans (77%) go online every day. However, 39% of 18- to 29-year-olds (roughly the same age as college students) go online almost constantly (more than several times a day) compared to only 36% of 30- to 49-year-olds, 17% of 50- to 64-year-olds and 8% of

⁵⁶ Kędra and Źakevičiūte, “Visual Literacy Practices in Higher Education,” 3.

⁵⁷ Dana S. Thompson, “Teaching Students to Critically Read Digital Images: A Visual Literacy Approach Using the DIG Method,” *The Journal of Visual Literacy* 38, nos. 1-2 (2019): 111, <https://doi.org/10.1080/1051144X.2018.1564604>.

65- year-olds and older.”⁵⁸ When people are going online, it is usually to use social media platforms such as Facebook, Instagram, and Twitter. Platforms like these make it easy to consume and share images. In fact, most social media platforms are based on the creation and sharing of images: for example, on Instagram, users can post photos to their profile for their followers to see and they are also able to browse through posts from other people that they follow or do not follow, posts that are primarily visual in nature. In addition, most platforms have expanded to include video sharing and livestreams, which provide even more ways to share information through visuals. Students rely heavily on the usage of these platforms to communicate with their peers either through verbal means or through the sharing of images.

There is a tendency of people to believe everything that they encounter on the internet, even though many of them are fully aware of the harm that it can cause to unconditionally trust the validity of texts and images. While encountering a plethora of images is not inherently an issue, Statton states that a problem arises when students treat *shallow* and *deep* images in a similar manner because they are often encountered on the same platforms without information or context to suggest in which category they fall exactly. She writes that “social media feeds have flattened out contextual clues that existed in different media such as magazines, newspapers, radio and television.”⁵⁹ This means that previously, print or non-social-media sources offered more information indicating the true provenance and production context of images, such as whether they were meant to push a particular agenda, but through social media this no longer occurs. Shallow images are described by Thompson as ‘typical’ internet images, such as pretty landscapes or funny memes.⁶⁰ An example of this category of images is Figure 3, which is a landscape photo taken by me in Antwerp, Belgium in the context of exploring the city as a traveller. This image features architectural aspects that caught my eye, as well as beautiful vegetation that complements the structures, but other than this simple visual appeal and personal relevance, there is nothing else going on in it, content-wise. As explained by Thompson, shallow images such as my photograph

⁵⁸ Thompson, “Teaching Students to Critically Read Digital Images,” 111.

⁵⁹ Thompson, “Teaching Students to Critically Read Digital Images,” 111.

⁶⁰ Thompson, “Teaching Students to Critically Read Digital Images,” 111.

mainly exist for the purpose of entertainment, and they do not require any critical thought to grasp the concept of the image and therefore no additional thought is required on the part of the viewer. In contrast to shallow images, the category of deep images includes, amongst others, advertisements, political cartoons, and news images. Images like these require greater interrogation and thought because they are created to serve a certain purpose such as selling, persuading, or informing people of one thing or another. The viewer must take it upon themselves to do more than just look at the surface level of the images; they must dig deeper into the image to analyze and understand what the message is that the image is



Figure 4. Image taken at a climate protest in Toronto, Canada on September 27, 2019.

Photo credit: Kate McSweeney

exposed.⁶²



Figure 3. Landscape image taken in Antwerp, Belgium May 22, 2022.

Photo credit: Kate McSweeney

attempting to convey and how

to perceive it.⁶¹ Figure 4 is an example of a deep image.

This image was taken in Toronto, Canada in front of Ontario's provincial parliament building. Within this image, there are many signs that can be read and that are being held up by protestors, and from those sub-visuals there is a lot of information that can be gleaned. This image was taken to make a certain point: it was created to be a powerful image that inspires people to look deeper into the climate crisis and reflect on why so many people are protesting about it. Learning to unpack and understand deep images is crucial for students because, without these skills, their attention and views will be manipulated more easily through the media to which they are so frequently

⁶¹ Thompson, "Teaching Students to Critically Read Digital Images," 112-113.

⁶² Thompson, "Teaching Students to Critically Read Digital Images," 113.

It is the distinction between shallow and deep images that prompted Dana Thompson to create the DIG method to be used within schools. She writes that the learning objectives of the DIG method are: “(1) after instruction, students will be able to identify the different types of images (shallow and deep) encountered on the internet and social media platforms and (2) after instruction, students will be able to utilize the DIG Method to critically read deep images.”⁶³ To create this method (see Table 2), Thompson conducted substantial literature research and adapted questions found in an online guide about evaluating digital images. The method has four distinct categories: analyzing, interpreting, evaluating, and comprehending. The instructions provided for each are meant to serve as a set of guidelines for those wishing to implement visual literacy training into their classroom. It was construed in such a way that it could be taught as a

Table 2. The steps and process of the DIG method.

Source: Dana Statton Thompson, “Teaching Students to Critically Read Digital Images: A Visual Literacy Approach Using the DIG Method,” *The Journal of Visual Literacy* (2019), 114.

The DIG Method

Analyzing

1. Review and describe the image.
Who, what, when and where do you see represented in the image?
2. Review the text.
What textual information is provided (caption, date and/or headline)?
3. React to the image.
How does the image make you feel?

Interpreting

1. Determine the source (creator, publisher and/or website) of the image.
Who created the image? Who owns and/or published the image?
2. Determine the message of the image.
What is the message? Who is the intended audience?
3. Search for other online sources that further contextualize the image.
How does context (social, cultural, historical and/or political) inform the image?

Evaluating

1. Think back to your first reaction to the image.
How might your reaction impact how you view the image?
2. Refer back to the other websites that have published the image.
Has the image been misrepresented or manipulated?
3. Assess the reliability and accuracy of the image.
Is the image reliable and accurate? Why or why not?

Comprehending

1. What judgments can you make about the image based on your evaluations above and the available information?
 2. Do any of your biases or point of views impact how you view the image?
If so, how?
 3. What is the purpose of this image (to inform, to instruct, to sell, to entertain, to enjoy and/or to persuade)? Why do you think so?
-

stand-alone lesson or could be spread out as a series of modules in a course or program of study,

⁶³ Thompson, “Teaching Students to Critically Read Digital Images,” 113.

but more frequently it is used as a one-time lesson. In specific terms, the DIG method was developed to be used with students at the post-secondary level or in upper-level courses in high school; it works best with groups of students ranging from 10 to 40. For students to be able to properly participate in the activities outlined, they need a copy of the DIG method (as seen in Table 2), an internet-connected device, and writing utensils. After completing the activity, the teacher or instructor can analyze student responses.⁶⁴ Table 3 provides a useful lesson plan that could be used to guide instructors by giving a time frame for each activity and what should be done or discussed during that time.

What Thompson developed provides a great starting point for designing a visual literacy curriculum. It is easy for people to dismiss teaching visual literacy and instead opt to increase the number of visuals used during a lesson or something that does not actively teach image analysis skills. Thompson has demonstrated that it is possible to create lessons that teach specific

Table 3. Lesson outline using the DIG method.

Source: Dana Statton Thompson, “Teaching students to critically read digital images: a visual literacy approach using the DIG method,” *The Journal of Visual Literacy* (2019), 115.

Time	Activity
5 minutes	<p>Introduction</p> <p>Introduce the lesson and define visual literacy</p> <p>Feel free to explore one or more of the <i>ACRL Visual Literacy Standards</i>; Standard Three (the visually literate student interprets and analyzes the meanings of images and visual media) and Standard Four (the visually literate student evaluates images and their sources) are particularly relevant to this activity.</p>
15 minutes	<p>Mini-lecture on the concept of <i>shallow</i> and <i>deep images</i></p> <p>Explain the differences between <i>shallow</i> and <i>deep images</i></p> <p>Ask the students to provide some examples</p> <p>Project examples overhead for the students to evaluate.</p> <p>Show your own examples of <i>shallow</i> and <i>deep images</i></p> <p>Walk the students through the differences between these images, asking for the students’ input about which classification they would assign to each of the images.</p>
25 minutes	<p>Using the DIG Method</p> <p>Project the <i>deep image</i> you have selected or allow the students to use their own example</p> <p>Allow students to complete the worksheet, checking students’ progress periodically.</p> <p>After they have worked independently, have the students confer with a partner for five minutes or so, discussing the similarities and differences in their answers.</p>
15 minutes	<p>Reporting back, closing discussion and recap</p> <p>Bring the group back together and ask a few pairs of students to share so the class can see other examples/applications</p> <p>Allow time for discussion here, if possible</p> <p>Recap the lesson, reiterating the differences between <i>shallow</i> and <i>deep images</i> and the importance of critically reading <i>deep images</i></p>

components of visual literacy, such as the difference between shallow and deep images, which provides a useful entry point for a whole series of lessons on how to decode and contextualize

⁶⁴ Thompson, “Teaching Students to Critically Read Digital Images,” 113-114.

images, lessons that could be eye-opening for the visually illiterate. Thompson's lesson plan is free for anyone to access and can be found across various platforms, including *Visual Literacy Today*, which is an open-access platform where anyone can submit their thoughts or work on visual literacy, and thus engage in thinking about this key skillset and its importance in today's world.⁶⁵ Meaningful contributions to the field of visual literacy such as Thompson's are what allows for advancements in teaching visual literacy to 21st-century students.

2.5 The Gaze

The concept of the gaze has been around since the 1970s, when it originated in film theory as a form of criticism questioning who is looking. In its most basic sense, the gaze refers to how people look at visual representations and how they engage with visual media.⁶⁶ The word "gaze," as opposed to other terms relating to looking such as glimpse, stare, or scrutinizing, has been used almost solely in relation to discussions about art.⁶⁷ Once the concept of the gaze was established, there were branches created that speak to different elements of visual media and how different people observe them. Loreck writes that one such example of a branch is the "male gaze," which was initially created in film criticism. The male gaze suggests a sexualized way of looking at women with the female participant as the "object" of the gaze—the object of heterosexual male desire. This concept was introduced and developed by filmmaker Laura Mulvey.⁶⁸ In her groundbreaking essay "Visual Pleasure and Narrative Cinema," Mulvey writes that the fascination with film derives from and is reinforced by pre-existing patterns of fascination that were created as a result of social formations. She describes a phenomenon called "scopophilia" (initially described by Sigmund Freud), which presupposes that looking is a source of pleasure as much as being looked at is also. In a passionate way, Mulvey argues that the majority of film was created and exists to satisfy male scopophilia. Women were/are often on display to be looked at.⁶⁹ A double standard occurs when women are not invited to gaze at men in the same way; rather, they are

⁶⁵ See Visual Literacy Today, "Welcome"; <https://visualliteracytoday.org/>, last accessed March 30, 2023.

⁶⁶ Janice Loreck, "Explainer: What Does the 'Male Gaze' Mean, and What About a Female Gaze?," *The Conversation*, January 5, 2016, <https://theconversation.com/explainer-what-does-the-male-gaze-mean-and-what-about-a-female-gaze-52486>.

⁶⁷ The Chicago School of Media Theory, "The Gaze," The University of Chicago, <https://lucian.uchicago.edu/blogs/mediatheory/keywords/gaze/>, last accessed January 15, 2023.

⁶⁸ Loreck, "What Does the 'Male Gaze' Mean."

⁶⁹ Laura Mulvey, "Visual Pleasure and Narrative Cinema," *Screen* 16, no.3 (1975): 6-18. <https://doi.org/10.1093/screen/16.3.6>.

expected to align and position themselves with the female characters who are desired by men.⁷⁰ Other examples of the gaze are the white gaze or the orientalist gaze. All these gazes position themselves within a specific power dynamic that already exists in society. Becoming aware of the gaze means that people must also become aware of the way they think and the way in which society has conditioned everyone to filter and receive information of all sorts. Understanding subconscious thoughts or inherited behaviours and how they translate into the media around us is a crucial point in visual literacy and how it impacts us.

To take the concept of the gaze and to place it in the context of visual literacy requires additional thought as well as understanding what it means to “frame” something. While the concept of the gaze as well as that of the frame have long been used primarily in film analysis, they are also crucial to consider with any type of visual media including paintings, advertisements, and photographs. Framing is “the literal presentation and/or representation of an image or object in physical space, and the accompanying interpretative markers a viewer both perceives and generates. To *frame* something then, on the literal level, is to give it a physical presence of some kind.”⁷¹ The frame is the manifestation of conscious thought regarding what the author/creator wants to say through their works. It is similar in concept to composition in the sense that everything exists in a curated form to perform specific functions. Composition is a means to creating an effective frame as the frame itself is the sum of information provided in an image. Other elements that contribute to the frame are lighting, colours, form, etc. It is the interpretation of what is within the frame that constitutes visual literacy and thus framing is an essential component to creating meaning within an image. This is also where the gaze ties in as the gaze forms as a result of personal experience shaped by surrounding societal norms and pressures. This leads to viewers producing different meanings and interpretations from one image. Exchange is critical in the analysis of gaze: “*Gaze* as a mode of visual analysis implies a two-way relationship – that is someone to gaze and someone to gaze back. The viewer draws information and conclusions about the image based on how her/his *gaze* into the visual image or object is returned.”⁷² This relationship is about the powers at play between the viewer and the image at which they are looking. An image can return a gaze in countless ways, the most obvious of which is through the

⁷⁰ Loreck, “What Does the ‘Male Gaze’ Mean.”

⁷¹ Visual Literacy Toolbox, “Frame and Gaze,” University of Maryland College Park, http://vislit.arhu.umd.edu/modules_frameGaze.php, last accessed March 15, 2023.

⁷² Visual Literacy Toolbox, “Frame and Gaze.”

eyes of a subject within the image and the exact locus of their looking. Choosing where the gaze is directed would have been an important decision on the part of the image creator and depended on what message they wanted to portray.

As a result, understanding the gaze as well as the frame is important in visual literacy acquisition, and it helps the reader-viewer process how images take on their own agency in conjunction with the latter's personal experiences.

Chapter 2: Visual Literacy in Medical Education

The section that follows applies the concept of visual literacy to the field of medical education, arguing that visual literacy should be deemed essential to medical training for a variety of reasons.

3.1 What Does It Mean to be a Good Doctor?

The question of what it means to be a good doctor is central to discussions about physicians and how to properly train them during medical school. Answers to this question have certainly changed over the years as we have progressed from a society focused primarily on healing patients in a manner that is not only effective but also expeditious, given the prevalence of old diseases such as smallpox or the Spanish flu that ran rampant throughout the world in a time before widespread vaccines could control their spread, to a society focused more on the patients' needs and the doctor-patient relationship. Today, one of the most important aspects of being a doctor is how to interact with patients to create a safe environment built on trust and understanding. This has not been perfected, but the shifted focus means that we are improving medical education and incorporating new elements that were not previously taught in medical schools.

While valued qualities in a doctor have changed, it is still difficult to put into words what the ideal physician should be like and what qualities they should possess. To this effect, Julia Sotelo makes the following useful observation:

It is fairly easy to define in a few words what makes a good lawyer, a good architect, or a good writer, by saying that it is one who wins difficult trials, who builds the best constructions, or who writes moving novels—no more qualities would be absolutely necessary. In contrast, to define what makes a good doctor is a rather difficult task.⁷³

This statement makes an important distinction between medicine, where defining what it means to be a good doctor is most difficult, and other professions, which seem to find it easier to describe their ideal practitioners. Practicing medicine requires an interesting mix of familiarity with science and facts, on the one hand, and on the other, putting into practice humanistic qualities. The latter aspect has garnered less attention from medical educators: after all, it is much harder to teach human behaviour and test it through conventional means.

⁷³ Julio Sotelo, "Good Doctors Abound," *BMJ* 325 (September 2002): 712; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1124230/>.

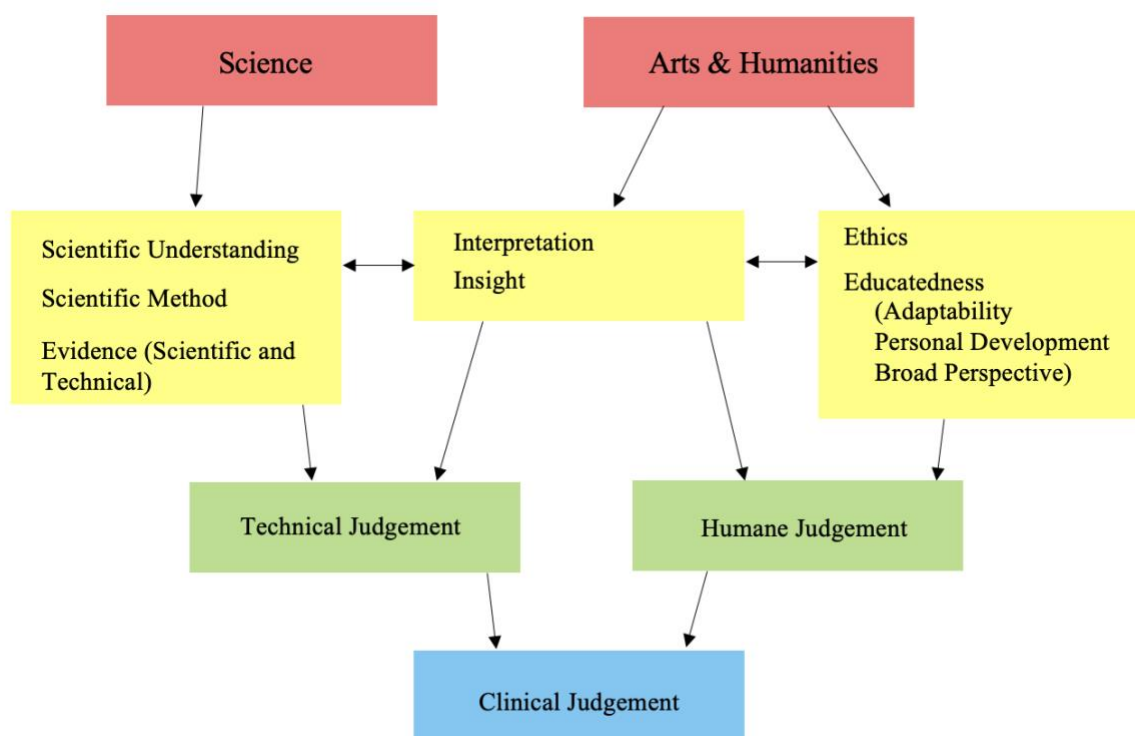
This is also Jane Macnaughton's preoccupation, and she elaborates on the subject by stating the following:

It is clear that doctors need to understand their patients through a scientific knowledge of how the body works and to appreciate how scientific research can help them to make decisions about the best treatment for their patients. But this scientific approach needs to be modified in the clinical situation when dealing with the individual patient. A "humane" doctor is required, with the understanding, assisted by interpretative ability and insight, and governed by ethical sensitivity, to apply this scientific evidence and skills to the individual patient.⁷⁴

A good doctor must be able to analyze any given situation and discern from that what the best course of action is. This can mean in terms of treatment but also how to govern themselves

Figure 5. Attributes of a good doctor.

Adapted from: Jane Macnaughton, "The humanities in medical education: context, outcomes and structures," *Medical Humanities* (2002), 24.



⁷⁴ Jane Macnaughton, "The Humanities in Medical Education: Context, Outcomes and Structures," *Medical Humanities* 26, no.1 (2000): 23 <https://doi.org/10.1136/mh.26.1.23>.

depending on who they are interacting with and what type of additional skills may be required for the interaction. Every patient is different and that is what makes it so difficult; a doctor must be able to take in a plethora of non-verbal communication and decide how to act accordingly. This is why it is crucial for a doctor to already have “humane” qualities such as sensitivity, empathy, and communication skills. By already possessing these attributes the doctor is ready to handle any situation that may be thrown their way. Figure 5 illustrates the diversity in attributes that a good doctor should possess and how they connect to one another. It demonstrates how science and training influence some of these attributes, such as using a scientific method, which can lead into technological skills and understanding of medical issues. In contrast, the arts and humanities (which would include a field like visual literacy) influence other skills, such as ethical judgement, which leads to humane behaviour. Science and the arts and humanities are shown crossing over at interpretation and insight because both these fields teach students how to interpret different types of inputs, whether those are physical wounds or the more subtle inputs of a patient’s feelings and emotions. All these skills lead to clinical judgement, which is the overall action of judging a given medical situation comprised of both technical and humane aspects. People seem to think that the skills learned from science and those acquired by studying arts and humanities are completely separate, but there is evidence that the two complement and supplement each other in more ways than previously thought.

In conclusion, defining what it means to be a good doctor is just as difficult as is defining visual literacy. There are so many factors at play that they can be listed but not placed together to form a short, coherent definition. It is evident, however, that a good doctor needs to possess an impressive array of skills which range from medical and scientific knowledge to humanistic qualities such as empathy and understanding, the latter of which have only been more recently incorporated into the understanding of a good doctor’s qualities and into the medical education system.

3.2 The Benefits of Visual Literacy Training for Medical Students

The connection between, on one side, non-scientific curricula and modes of learning and, on the other, the medical field has not always been clear. For the most part it makes sense that in order for a student to learn medicine they must cover topics such as human physiology, pathology, cell biology, etc. Having the proper knowledge in these fields is crucial to being a doctor, as

without it one could not properly diagnose and treat any given ailment. In the past, teaching these subjects was a one and done deal where students would go through medical school, learn the required subjects and curricula, and then be shipped off to a residency. Additionally, useful skills may certainly be learned during a residency, as it offers students the chance to have face-to-face contact with patients and real-world medical experience, but these additional lessons and skills forged throughout a residency should also be incorporated earlier in the medical education system. When a student is left to teach themselves in a real-life scenario how to properly interact with a patient, how to communicate effectively, or how to be empathetic, they are going to learn an individual lesson, and some lessons will be more effective than others. And while teaching arts and humanities in medical school should not be a cookie-cutter experience where every institution teaches the exact same thing, it should still be incorporated in new and unique ways in every medical school. The beauty of the arts and humanities lies in how versatile they are—a certain subject may be taught, and students may each get a different experience out of it. However, this also proves to be a challenge. In a rigorous environment such as medical school, people find it hard to quantify the outcomes and lessons learnt from the arts and humanities, and since they cannot be necessarily measured through “traditional” means such as tests and exams, subjects in these fields are often overlooked as they pose too much of a challenge.

The aim of this section of the paper is to indicate the benefits that visual literacy training would have on students studying medicine. There are other areas within the arts and humanities that would be helpful to medical students as well, but visual literacy skills span across such a wide array of areas, as indicated in previous sections of this paper, that there would be tremendous effects seen within the student population if there was a customized course teaching visual literacy to students. There are ways to teach visual literacy in medical school both as a separate entity and in a way that incorporates medical elements into it, so as to show students how what they are learning can be applied in the field.

3.2.1 Empathy

Empathy is a core component of human nature. It is often described as “putting ourselves in the place of others, the proverbial ‘walk in another’s shoes’ that requires us to try to understand what another person is thinking or feeling.”⁷⁵ This is one of the simplest ways to think about empathy and it makes it easy to teach and explain it to others. Empathy requires resonating with how someone else is feeling and it comes from a place of understanding based on similar personal experiences. Even if someone has not had any experiences similar to another person’s, they should still be able to envision what it would be like to be the other person and to understand at least the most basic of emotions that they are experiencing. To empathize with someone requires at least two basic elements: the first is a cognitive effort to think about how someone else is feeling and the second is an emotional reaction.⁷⁶ By expressing to someone that you understand how they are feeling and that you feel for them is a powerful sentiment. It helps for people to feel heard and that they may not be as alone in their suffering or emotions as they may have previously thought.

The ability to empathize with one another developed as a means to survival and now has become more developed to support human growth and prosperity.⁷⁷ Having strong empathy skills helps to effectively navigate a wide variety of social situations from one-on-one conversation to working within a large group. The connection that is formed between two individuals who can empathize with one another is extremely strong. To be heard is to have one’s feelings validated and while it may be argued that feelings do not need to be validated by an external source in order to be valid, human nature makes it so that when someone feels validated in their emotions, they are better able to put things into perspective.

Empathy is often confused with sympathy. The difference lies in the means of connection and understanding. Sympathy can be loosely understood as pity and sorrow for someone else and their condition. It is a much more surface-level approach to connecting with someone and does not have the same effects that empathy does. Sympathy often presents itself in phrases like “I’m sorry you feel like this” or “oh that’s too bad.” These statements sound devoid of any real feelings or emotions to whoever is on the receiving end. People revert to sympathy if they do not know how to respond in an empathetic way. Some people are not as familiar or comfortable with empathizing or they may feel that since they have no experiences that relate to the ones of the people with

⁷⁵ Elizabeth A. Segal, *Social Empathy: The Art of Understanding Others* (New York: Columbia University Press, 2018), 3.

⁷⁶ Segal, *Social Empathy*, 3.

⁷⁷ Segal, *Social Empathy*, 29-30.

whom they are speaking, it is better to just sympathize with them. However, people can recognize when someone is making an effort to connect and empathize with them, and this goes a long way. It is for these reasons that being able to empathize with people is an essential skill to being a doctor, as it allows for a deeper level of connection between a doctor and their patient.

Empathy in the medical field is similar to empathy that can be employed on a day-to-day basis, but there are greater implications to empathy in a clinical setting. In connecting empathy to the clinical experience, Stewart Mercer and William Reynolds explain:

Empathy is a complex, multi-dimensional concept that has moral, cognitive, emotive and behavioural components. Clinical empathy involves an ability to: (a) understand the patient's situation, perspective, and feelings (and their attached meanings); (b) to communicate that understanding and check its accuracy; and (c) to act on that understanding with the patient in a helpful (therapeutic) way. Research on the effect of empathy on health outcomes in primary care is lacking, but studies in mental health and in nursing suggest it plays a key role.⁷⁸

This demonstrates that empathy is multifaceted in a way similar to visual literacy. It is hard to assign a concrete definition to empathy, as it is a complex aspect of human nature. Most elements of empathy are demonstrated through words and feelings, as there are no physical components to this sentiment outside expressions of comfort such as giving someone a hug. The following pertinent observation also needs to be considered: "Empathy is expressed both through verbal and nonverbal behavior, and nonverbal behavior (NVB) is estimated to account for 60%–90% of communication."⁷⁹ This indicates that since empathy has the capacity to be transmitted through nonverbal means such as facial expressions or body language, it can reach a wider audience as humans rely heavily on nonverbal behaviour. Mercer and Reynolds add that patients greatly value empathy from those who are treating them within the medical context. Empathy has been shown to enhance the doctor-patient relationship and to improve the satisfaction of care from both the doctor and the patient. A study was conducted on nurses' empathy relating to the anxiety, depression, and hostility exhibited by patients with cancer and it showed lower levels of those

⁷⁸ Stewart W. Mercer and William J. Reynolds, "Empathy and Quality of Care," *British Journal of General Practice* 52 (2002): 9, <https://doi.org/10.1007/0-387-33608-7>.

⁷⁹ Áine Lorié et al., "Culture and Nonverbal Expressions of Empathy in Clinical Settings: A Systematic Review," *Patient Education and Counselling* 11 (2017): 412, <https://doi.org/10.1016/j.pec.2016.09.018>.

feelings in people when they were cared for by people with empathy for them.⁸⁰ Having empathy for patients can lead to feelings of mutual trust and respect, which in turn is beneficial for all parties involved. If a patient feels seen and heard, then they are more likely to feel comfortable talking with a doctor and disclosing details that may otherwise be uncomfortable for them to share. A study published by Melanie Neumann and her team concluded that “empathy also plays an important role in achieving patient-centeredness, which is one of the six main goals of a 21st-century health system and comprises the ‘qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient.’”⁸¹ There is no doubt that the evidence of the benefits of empathy in a clinical setting are there. It is now just a matter of helping and teaching students how to develop their empathy through the course of their medical education. Empathy is thought of as something that people either have or they do not have, that it is innate, however just as visual literacy needs to be taught on its own, so does empathy.

While it has been recognized that empathy is a core component of effective medical care there has been a lack of regard for encouraging the development of this quality in medical students. What happens most frequently is that students enter medical school wide-eyed and ready to contribute meaningfully to creating a better world, but after many years of rigorous studying, heavy workloads, and little time to pursue personal interests, they come out of their medical training devoid of the same type of empathy they may have had at the outset. Unsurprisingly, there has been considerable reflection on this topic recently from researchers knowledgeable on this topic, who purport that “the perceived erosion of empathy in medical practice has been linked to an overcommitment to bioscientific and technological dimensions of health care.”⁸² This statement implies that medical school curriculum focuses heavily on teaching the sciences and tends to neglect any other fields. Forcing students to only learn from a purely scientific perspective can be harmful, as such narrow focuses limit their learning capacities. Disciplines adopt their own approaches to imparting knowledge, and when it comes to the sciences, the most common practice

⁸⁰ Mercer and Reynolds, “Empathy and Quality of Care, 9.

⁸¹ Melanie Neumann et al., “Empathy Decline and Its Reasons: A Systematic Review of Studies with Medical Students and Residents,” *Academic Medicine* 86, no. 8 (2011): 996-7, <https://doi.org/10.1097/ACM.0b013e318221e615>.

⁸² Justine T. H. Lam, Mark D Hansen, and Maria A. Martimianakis, “Exploring the Socialization Experiences of Medical Students from Social Science and Humanities Backgrounds,” *Academic Medicine* 95, no. 3 (2020): 401, <https://doi.org/10.1097/ACM.0000000000002901>.

for teaching is through lecturing, laboratory work, and examinations (e.g., tests and exams). Expanding outside these traditional modes of learning is beneficial to all parties involved.

The secondary outcomes, either positive or negative, that come of the medical school curriculum are known as the “hidden curriculum.” One of these effects being the decline in empathy seen in medical school students. There are numerous reasons why this could occur, some examples are:

Mistreatment by superiors or mentors: Medical students may experience situations of harassment, belittlement, degradation, humiliation, gender specific discrimination, or sexual harassment. Vulnerability of medical students and residents: *Values of idealism, enthusiasm, and humanity are present in students at the beginning of medical school, but these may diminish as trainees are confronted with clinical reality (characterized by illness, human suffering, and death) and their focus shifts to technology and objectivity rather than the humanistic aspects of medicine.* High workload: Students and residents face long working hours, with an associated lack of sleep and inadequate relaxation time.⁸³

⁸³ Neumann et al., “Empathy Decline and Its Reasons,” 998; emphasis mine.

These examples pinpoint several issues that exist within the medical school system. Student wellbeing is not placed at the forefront of the education system but rather the goals are to produce hundreds of the exact same type of person to perform the exact same tasks. By not recognizing that every student is different and that every student is a human being, medical schools or any post-secondary school systems are harming students more than helping them. In addition, through various studies there has been a reported increase in cynicism in medical school students as they go through their schooling and their commitment for caring for underserved patients decreased through the years as well.⁸⁴ Figure 6 is a flow chart that was created as a result of reviewing various pieces of literature and studies conducted on the topic of student empathy. The root of the cause is hypothesized to be the hidden curriculum as well as the formal/informal curriculum, which refers

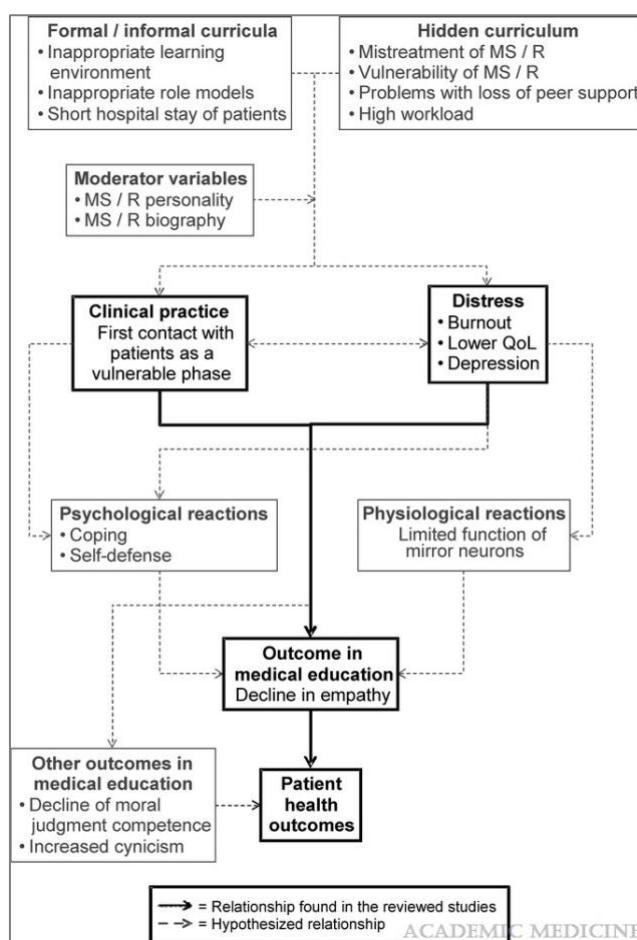


Figure 6. Flow chart indicating reasons for empathy decline amongst medical school students.

Source: Melanie Neumann et al., "Empathy Decline and Its Reasons: A Systematic Review of Studies with Medical Students and Residents," *Academic Medicine* (2011), 1000.

⁸⁴ Neumann et al., "Empathy Decline and Its Reasons," 999.

to issues such as unsuitable learning environments or a short length of stay of a patient that the student may be assisting or observing.⁸⁵

Students often feel alone as they go through schooling and if they are suffering due to intense workloads or if their own mental health is being impacted, it can be hard to know where to go. If the school does not have measures in place to help students or does not take the time to adjust curriculums to help students succeed, then it is no wonder that students' empathy declines as they go through the years of medical school. One such way to help foster student empathy throughout their time in medical school is by incorporating visual literacy education into the curriculum.

There is a plethora of ways that visual literacy can be taught to students. One of the simplest and most fundamental ways is to provide students with a series of images or pieces of artwork and to ask them to describe what they are seeing. Instructors could first teach students the basics of close looking, complete activities such as the DIG method, or ask them to jump right in and to examine the images or visual media on their own. The easiest way to do this initially is to choose images that have people in them because this has the clearest connection to the theme of empathy because this feeling is most applicable to the human condition. Making a conscious effort to examine and extrapolate information from an image requires more effort than some may think. Viewers take in information and interpret it without thinking about why they are thinking about it in that way. By starting with basic images and other visuals, students can build up the skills necessary to look closely at an image and this skill can transfer into close looking in relation to patient care. Students can be tasked with observing the face of the person in the image and interpreting what they may be feeling. At this stage it is also important to open discussion with a wider group so that students can discuss their thoughts with others. This will show how easy it is for people to interpret things differently. However, it is the effort put into understanding how someone is feeling that makes a huge impact on patient care.

Video clips can also be beneficial for teaching visual literacy and fostering an increased sense of empathy in students. This offers a more straightforward approach where medical school students can see how what they are learning will be applicable to their profession. Students could be asked to evaluate body language and how that conveys implicit meaning in a video (or image). This builds students' awareness of a form of nonverbal communication that is so important for developing empathy. Even though the people within the videos or images are not in real-life

⁸⁵ Neumann et al., "Empathy Decline and Its Reasons," 998.

situations, the skills that can be developed as a result of analyzing and interpreting these forms of visual media have a lasting effect on the students in the real world.

In addition to helping students develop their empathy through conscious efforts to interpret how someone may be feeling based on nonverbal information, a course on visual literacy presents them with a chance to take a break from their normal medical schoolwork. As previously stated, placing such emphasis on the sciences, and teaching primarily through tests and exams leads to students' burnout and stress. A course that deviates from the norm gives students a chance to challenge their brains and in asking them to complete work in a different discipline, it allows them to return to their scientific studies with a fresh perspective. In the same way that it has been proven that taking a break while working long hours improves focus and productivity, taking a break from one type of study to work on a completely different one also improves student function.

A main goal of art is to provoke a reaction in the viewers. Sometimes this reaction is immediate, but sometimes it takes time and thought. Either way, understanding the reaction is a crucial step to taking in any piece of media. If a reaction occurs quickly, that does not mean that there are not layers and meanings hidden within the image. Sometimes understanding why a reaction is immediate is important because these reactions are often based in one's personal experiences and emotions or a preconceived perception that arises as a result of a curated societal experience. In the same way that art and other images evoke certain feelings, working with patients can also elicit various responses in a doctor based on actions or appearances. These reactions should not just be taken at face value. One's initial judgement of someone is usually incorrect or based on personal biases. Taking a step back allows for a moment of reflection that can only aid in a deeper connection. Doctors must be able to recognize their feelings and allow them to happen as it can be harmful to consistently push away personal emotions even if it feels like the right thing to do in a professional setting. Taking the time to think about this can help in connecting with a patient and understanding how they are feeling, and it can moreover open a line of communication between patient and doctor. It is for this reason that teaching students how to critically think about and analyze images can help them in their medical careers. This is one of the most effective ways to teach empathy and to encourage students to think about their feelings and thus think about how others are feeling as well.

3.2.2 Communication

Communication is a key aspect of human relationships. As described above, it can occur in many different forms, the main two being verbal and nonverbal communication. Humans would not have been able to evolve in the way that we have without effective communication strategies. Verbal expression has become the primary form of communication as it is incredibly effective, as long as everyone can speak the same language. Language barriers occur frequently almost any time someone travels outside of their home country, where their native language is not spoken. When this occurs, people tend to rely on nonverbal means of communication. This includes hand gestures and body language. Communication is rooted in the concept of semiotics, as semiotician Marcel Danesi explains:

semiotics is the science that attempts to answer the following question: What does X mean? The X can be anything from a single word or gesture, to an entire musical composition or film. The ‘magnitude’ of X may vary, but the basic nature of the inquiry does not. If we represent the meaning (or meanings) that X encodes with the letter Y, then the central task of semiotic analysis can be reduced, essentially, to determining the nature of the relation $X = Y$.⁸⁶

Semiotics is how language evolved. At some point every object, colour, place, etc. had to be ascribed meaning. There is a root definition for everything, but *everything* also has multiple different meanings and interpretations based on the individual interpreting it. Languages came into existence as people assigned different words and meanings to the same thing in their particular geographic or cultural context, and thus the world has thousands of languages. Applying semiotics can also lead to uncovering deeper meanings and understandings such as those incorporated into visual literacy practices. There is no one correct meaning to anything and this versatility is what makes visual literacy possible and a teachable subject.

Being taught visual literacy in medical school helps students develop better communication skills to aid them throughout their professional medical journey. In the context of medical training, effective communication is particularly important:

Communicating with patients is an essential medical activity. Patient–physician communication not only helps capture the anamnesis and transmit information but also has

⁸⁶ Marcel Danesi, *Messages, Signs, and Meanings: A Basic Textbook in Semiotics and Communication* (Toronto: Canadian Scholar’s Press, 2004), 3.

a therapeutic effect and supports the patient's healing process. Patient–physician communication has been shown to have a positive effect on psychosocial outcomes (e.g., quality of life, anxiety, depression) and on objectively measurable outcome parameters (e.g., symptom reduction, lowering of blood pressure and blood glucose levels).⁸⁷

Communication is similar to empathy in these ways. When patients feel heard and understood, it leads to a relationship of better quality and thus trust can be built, and the patients can receive the best care possible. Empathy is, in and of itself, a way to communicate. It is an effective way to communicate feelings such as care, thoughtfulness, and understanding all in one. It is for these reasons that communication and empathy often go hand in hand as each one can influence the other. In addition to the communication between doctor and patient, the communication between members of a team is also critical to a healthy and productive work environment. Alan Bleakly and Robert Marshall, in a review of various critical contributions to scholarship on the subject, found that up to 80% of errors made within the clinical setting come as a result of poor communication and understanding within a team. This poor communication can occur due to a perceived hierarchy amongst medical staff on the same team and students accepting the proposed chain of command is seen as a part of the aforementioned 'hidden curriculum' occurring in medical school. The loss of empathy amongst medical students also leads to more negative feelings about coworkers and colleagues, ultimately hindering proper communication.⁸⁸

It is evident that due to the close connection between empathy and communication, teaching the former sentiment to students will, in turn, teach them how to be effective communicators as well. Thus, when teaching visual literacy to medical school students in such a way as what is described above, communication amongst students should improve as well. One of the main tasks asked of students being taught visual literacy is to observe and then to articulate what they are seeing and what their own personal interpretation is in a given context. This may seem straightforward, but when asked to explain a thought or feeling that just occurs naturally when looking at something, people are often met with a lack of words to describe what they are thinking. While it might be frustrating to some, this is an important lesson, as it teaches students

⁸⁷ Neumann et al., "Empathy Decline and Its Reasons," 996.

⁸⁸ Alan Bleakly and Robert Marshall, "Can the Science of Communication Inform the Art of the Medical Humanities?," *Medical Education* 47, no. 2 (2013): 128, <https://doi.org/10.1111/medu.12056>.

how to verbally express what they are seeing and thinking in a way they may not have thought to try before.

Another way in which visual literacy can be taught to foster the growth of communication skills is by asking students to communicate their thoughts and feelings through images. This could mean providing students with a set of images or asking them to go out into the world and take their own pictures that convey a particular meaning. Images convey thoughts very quickly as visual information is processed almost instantaneously in the brain and learning to communicate by visual means, in visual media that often has multiple interpretations, can teach someone to communicate better verbally as well.

3.2.3 Tolerance for Ambiguity

The world around us is rife with ambiguity. It is impossible to know exactly what anything is, who someone is, or what a particular message means. Being comfortable with ambiguity is an important part of human nature. Those who can handle the notion that the world is complicated and there is no one correct answer to anything will find greater joy and comfort in existing. Uncertainty and ambiguity are similar concepts, but Gail Geller makes an important point stating that:

Although [the] concepts are related and have been used interchangeably, ambiguity and uncertainty are not equivalent. ... Both are types of “risk,” but they vary in probability: In a case of uncertainty, the probability of a particular outcome is known; with ambiguity, the probability is unknown. ... [U]ncertainty relat[es] to an event in the future and ambiguity concerning circumstances in the present. In this light, “ambiguous” situations have either more shades of gray or greater urgency and may, thus, require more tolerance.⁸⁹

This distinction brings to light why a tolerance for ambiguity may be more difficult for some than the concept of uncertainty. While uncertainty often pertains to what may happen in the future, ambiguity is a tangible feeling within the present. Ambiguity is the lack of one correct answer and the possibility that there may be dozens of answers to one question. This often makes people feel uncomfortable because we have been led to think that there is always a correct way to do things.

⁸⁹ Gail Geller, “Tolerance for Ambiguity: An Ethics-Based Criterion for Medical Student Selection,” *Academic Medicine* 88, no. 5 (2013): 581, <https://doi.org/10.1097/ACM.0b013e31828a4b8e>.

School often teaches children the difference between right or wrong and how to answer questions properly on a test. As opposed to being tolerant of ambiguity, people can also be intolerant of ambiguity or have an aversion to it, which means that when someone is faced with a situation that is insoluble or complicated, they perceive it as a threat.⁹⁰

Within the medical field, a tolerance for ambiguity can mean life or death. Gail Geller, Ruth Faden, and David Levine make the following important observation:

the practice of medicine has always been characterized by uncertainty, arising from limitations of professional knowledge, problems of diagnosis, ambiguities of treatment and outcome, and the unpredictability of patient response. Variations in physicians' attitudes and values add to the ambiguities of medical practice. Preferences and perceived risks are subjective, and no two physicians are likely to view them in the same way.⁹¹

Every doctor must be prepared to face a great deal of uncertainty and ambiguity throughout their professional career, and those who have the ability to accept and understand that ambiguity will make the best doctors. Miriam Bentwich and Peter Gilby remark that “tolerating ambiguities and knowing how to manage them is said to be one of the conditions for being a medical expert. Ambiguities are often inherent in the information provided to the physician. Professional competence necessitates managing situations characterized by incomplete information, where there is no single clear answer or a correct course of action.”⁹² Frequently, patients present a wide array of symptoms, some of which are vague and non-specific.⁹³ This is one of the many ways in which doctors are faced with ambiguity on a daily basis. Some may become uncomfortable in this situation, not knowing exactly what to do right away. Within the medical field, a doctor with a low tolerance for ambiguity is linked to defensive practice, discomfort in the face of death and grief, increased test-ordering practices, and many other actions or feelings.⁹⁴

⁹⁰ Geller, “Tolerance for Ambiguity,” 582.

⁹¹ Gail Geller, Ruth R. Faden, and David M. Levine, “Tolerance for Ambiguity Among Medical Students: Implications for Their Selection, Training and Practice,” *Social Science and Medicine* 31, no. 5 (1990): 619, [https://doi.org/10.1016/0277-9536\(90\)90098-d](https://doi.org/10.1016/0277-9536(90)90098-d).

⁹² Miriam E. Bentwich and Peter Gilbey, “More Than Visual Literacy: Art and the Enhancement of Tolerance for Ambiguity and Empathy,” *BMC Medical Education* 17, no. 200 (2017): 2 <https://doi.org/10.1186/s12909-017-1028-7>.

⁹³ Silvio Ndoja et al., “The Erosion of Ambiguity Tolerance and Sustainment of Perfectionism in Undergraduate Medical Training: Results from Multiple Samplings of a Single Cohort,” *BMC Medical Education* 20, no. 1 (2020): 2, <https://doi.org/https://doi.org/10.1186/s12909-020-02345-5>.

⁹⁴ Geller, “Tolerance for Ambiguity,” 582.

The medical school curriculum places such a heavy emphasis on right and wrong, in part by adopting as the primary method of teaching lecturing, expecting students to memorize what is said or what they read, then to reproduce the knowledge on a test. Testing has long enforced the idea that there is always one right answer, and as students go through the years of medical school only demonstrating their knowledge through memorization and replication, they are bound to leave the system believing that they must always know exactly what to do in any given situation and there will always be a right answer and a wrong one.

In addition to the harm that could come to a patient as a result of a doctor's low tolerance for ambiguity, the wellbeing of the medical students and doctors suffers as well.⁹⁵ A study conducted by Silvio Ndoja and his team showed that students pursuing dermatology and physical medicine had the lowest tolerance for ambiguity in contrast with those studying psychiatry, emergency medicine, and radiation oncology, who had the highest tolerance for ambiguity, although there was no further investigation into the reasoning behind these findings. Furthermore, the study aimed to look at the correlation between perfectionism and a tolerance for ambiguity. The study outlined the different types of perfectionism, isolating three main ones: rigid perfectionism, self-critical perfectionism, and narcissistic perfectionism. This was an area of interest because in general medical school students are known to have higher perfectionism rates than students in other disciplines such as the arts.⁹⁶ In addition, a relationship exists between medical school students with a low tolerance for ambiguity and a strong fear of making mistakes as well as a negative attitude towards the underserved.⁹⁷ Behaviours and attitudes such as these create an unhealthy work environment as well as an uncomfortable environment for patients. The results of the Ndoja-led experiment showed a negative correlation between tolerance for ambiguity and perfectionism meaning that with an increase in tolerance for ambiguity, a decrease in perfectionism also occurred. The researchers also observed that at the end of a year-long clinical exposure, students' tolerance for ambiguity decreased. This could be attributed to the anxiety that occurs during clinical placements and the way in which students actively try to avoid this feeling. As they try to avoid these feelings of anxiety and discomfort, they are not giving themselves long enough exposure to the uncomfortable situations to properly become accustomed to them as well

⁹⁵ Ndoja et al., "The Erosion of Ambiguity Tolerance," 2.

⁹⁶ Ndoja et al., "The Erosion of Ambiguity Tolerance," 2.

⁹⁷ Geller, "Tolerance for Ambiguity," 582.

as develop proper coping mechanisms, ultimately leading to worse anxiety and a cycle that never ends. In addition, the students are only given short periods of time (around two weeks) on each rotation, which is likely not enough to get used to a new environment and develop proper knowledge and skills associated with a variance in patients.⁹⁸

Teaching visual literacy to medical students is an effective way to increase their tolerance for ambiguity. A tolerance for ambiguity and empathy are closely related. Where a doctor needs to show empathy towards a patient and their concerns, they must also be able to empathize in the face of ambiguities and uncertainties that they experience themselves.⁹⁹ This is where visual literacy comes into play. When students are tasked with looking at an image or any form of visual media, they must come up with a personal interpretation. There will never be one correct answer about how to interpret a particular form of media. That is why people have been so enamoured with art for thousands of years. Art can make people feel things and every person experiences these feelings differently. It is this phenomenon that allows every human being to forge a personal connection with the media with no two individuals' reactions ever being the same. It is for this reason that increasing students' visual literacy through specific teachings will aid in their tolerance for ambiguity.

A study was conducted by Bentwich and Gilbey focusing on a large group of students who attended a course in the medical humanities with special focus towards the end on visual literacy and how to look at images. After the students attended this class for two years of pre-clinical study, they were shown a series of images and asked to discuss what was going on in them as well as how they made them feel through various components. The students were then prompted to discuss their thoughts with one another in an open discussion. Their results showed that 67% of students who completed the course thought that their discussion of artworks contributed to their understanding and acceptance of many possible meanings to a given situation. In addition, 52% of students thought that the discussion helped with their visual observation skills.¹⁰⁰ This study indicated the potential that visual literacy has to increase students' tolerance for ambiguity as well as their observation skills. The study was conducted recently so there is still room for more

⁹⁸ Ndoja et al., "The Erosion of Ambiguity Tolerance," 4.

⁹⁹ Bentwich and Gilbey, "More Than Visual Literacy," 2.

¹⁰⁰ Bentwich and Gilbey, "More Than Visual Literacy," 4.

research to be conducted within this field in order to fully understand the benefits and effects that visual literacy can have in respect to a tolerance for ambiguity.

In a world that places such strong emphasis on the *correct* way to do things, those who have the most *right* answers are more admired than the ones who do not. This comes as no surprise seeing as the education places immense value on testing as a means to evaluate intelligence. Through this system, students' tolerance for ambiguity lowers as they become uncomfortable and become fearful of failure at the prospect that there may not be one right answer. This is becoming increasingly dangerous especially within the medical field, where a practicing physician with a low tolerance for ambiguity may do more harm than good when faced with uncertainty while treating a patient. Teaching visual literacy to medical school students is undoubtedly an effective way to increase the tolerance for ambiguity amongst students and thus amongst the doctors of the future. Visual literacy teaches that there are infinite possible ways to glean meaning from any type of visual media. Everything we perceive is visual in nature and thus taking in any type of visual cues from a patient during the process of diagnosing falls into this category. It is crucial that a doctor remains comfortable during situations in which not everything is as clear cut as it may have been made out to be during their years in medical school. A mandatory course on visual literacy each year during medical school will help students to develop critical skills such as a tolerance for ambiguity that may be responsible for saving lives in the future.

3.2.4 Observation Skills and Pattern Blindness

Keen skills of observation are essential in everyday life and are a core component of visual literacy. All visual information that gets taken in by an individual is a result of their personal observation. Those of us who have the ability are all able to observe, but not everyone has developed their observational skills to their full potential. Asko Lehmuskallio discusses how the look and in turn observation is a medium. What people look at and with what kind of thoughts has long been a question puzzling us as humans. The act of looking or observing is understood as the process whereby one's eyes are pointed, and their attention is focused on a particular medium. Because of the nature of looking humans created media made specifically to be looked at and observed. This intentional creation of something to be aesthetically pleasing to the eye comes as a

result of understanding the nature of human observation.¹⁰¹ This indicates where the need for understanding observation skills came from. As soon as humans began to intentionally create media to satisfy the observer, there became a self-consciousness and awareness associated with looking.

Lehmuskallio describes an experiment conducted where participants were tasked with looking at a particular painting featuring many people. They were prompted to first just observe the painting as they normally would as well as to look at it after being asked specific questions. The results indicated that the fixation points of the eye as well as the movement between the points varied depending on the question being asked. This suggested that for the separate tasks, the participants saw different images each time even though they were all looking at the same painting throughout. Such a phenomenon has been dubbed “inattentional blindness,” which describes how when someone is looking at something with a specific intention, they may miss a stimulus that exists right in front of them.¹⁰² Simons and Chabris created a video showing two groups of people, one wearing white and one wearing black (three of each), playing basketball, but while they are playing, either a woman with an umbrella or a person dressed as a gorilla walks through the middle of the game from one side of the screen to the other. Participants were asked to count either the number of passes made by one team, or the number of aerial passes and the number of bounce passes made by its players. Following this, the participants were asked four questions, such as whether or not they noticed anything in the video other than the six players. The results of the experiment indicated that 54% noticed the umbrella woman or the gorilla while 46% did not.¹⁰³ This experiment indicated that when people are tasked with observing something while simultaneously expecting it to happen, they are likely to miss other things that could be going on as well.

A condition such as inattentional blindness presents a threat to medical practice. Johanna Shapiro, Lloyd Rucker, and Jill Beck write that “clinical observation, including identification of key pieces of data, recognition of patterns in the data gathered, and interpretation and reinterpretation of both data and patterns, is a key component of medical decision making, the

¹⁰¹ Asko Lehmuskallio, “The Look as a Medium: A Conceptual Framework and an Exercise for Teaching Visual Studies,” *Journal of Visual Literacy* 38, nos. 1-2 (2019): 9-11, <https://doi.org/10.1080/1051144X.2018.1564607>.

¹⁰² Lehmuskallio, “The Look as a Medium,” 13.

¹⁰³ Daniel J. Simmons and Christopher F. Chabris, “Gorillas in our Midst: Sustained Inattentional Blindness for Dynamic Events,” *Perception* 28, no. 9 (1999): 1066-8, <https://doi.org/10.1068/p281059>.

complex process by which clinicians gather data, arrive at conclusions, and decide upon management.”¹⁰⁴ It is impossible to separate clinical care from the ability to observe. Many forms of diagnoses come from looking at something—be that a skin condition, X-ray scans, or a blood sample viewed under a microscope. Drawing conclusions from these visual cues is a main teaching point during medical school. Students are taught to pick out certain visual stimuli and come to a conclusion based upon what they can see. There is no way to guarantee that a conclusion or diagnosis is correct, regardless of what is taught during medical school, however every element should be considered before making a final judgement.

When, during medical school or clinical practice, a student observes a causal relationship between two items (a stimulus and a diagnosis or conclusion), they unintentionally create a personal system of pattern recognition. The human mind is a powerful tool, and when a connection is made between two items and one of the items occurs again, it is likely that the individual will make a reference back to the initial link. Irwin Braverman states:

The end result of a “bedside” teaching or “clinical diagnostic reasoning” session, unfortunately, is the construction of a pattern that is memorized. When the student next encounters this pattern and recognizes and remembers it, he has a diagnosis or set of diagnoses from which he can proceed in the care and treatment of the patient. As teachers, we have assumed that all students, medical or otherwise, who do not observe details and patterns as well as we believe they should are “poor students,” rather than realizing that we have not taught them how to observe. Although each of us has innate talents of observation and logic, in some they have not been fully developed or their existence even recognized.¹⁰⁵

This banking of information is helpful at times but can be harmful at others. In any given situation it is pertinent to take a step back and to reconsider everything that is seen. Drawing on previous connections and knowledge can help to influence a decision, but by no means should any doctor assume that just because they have seen something before (a particular pattern, colour, condition, etc.) the diagnosis or result will be the same as it was the first time. Building a continuous base of

¹⁰⁴ Johanna Shapiro, Lloyd Rucker, and Jill Beck, “Training the Clinical Eye and Mind: Using the Arts to Develop Medical Students’ Observational and Pattern Recognition Skills,” *Medical Education* 40, no. 3 (2006): 263, <https://doi.org/10.1111/j.1365-2929.2006.02389.x>.

¹⁰⁵ Irwin M. Braverman, “To See or Not to See: How Visual Training Can Improve Observational Skills,” *Clinics in Dermatology* 29, no. 3 (2011): 344, <https://doi.org/10.1016/j.clindermatol.2010.08.001>.

knowledge is what allows for doctors to become better at their practice as the years go on, but accumulating knowledge does not equate to clinical expertise in every possible form.

Teaching visual literacy to medical school students is an effective way to train their observational skills as well as their ability to recognize patterns and be consciously aware of that recognition. This was put into effect with the aforementioned study conducted by Shapiro, Rucker, and Beck whereby medical school students had three two-hour sessions training with clinical photography or training using arts and dance. For the students working with art, both representational and non-representational art was used. This contrasted with any previous medical humanities courses that utilize art observation as a teaching method. Usually only representational art is used in these studies, and this means that the art showed to students had easily identifiable signs such as humans, animals, vegetation, and other recognisable features. This is helpful when teaching non-arts students because it simplifies the identification of symbols and their perceived meanings. The use of non-representational art (abstract) within this study allowed for increased observations and pattern recognition with students coming to conclusions based upon their ability to interpret patterns (symmetry, shapes, themes, etc.) and their representation within space. In the clinical photography group, students were taught about how to critically observe an image and pick out details that could form a pattern relating to a specific diagnosis. The instructor made a specific point to students about the importance of not jumping to a conclusion too quickly. This led to students justifying the in-context relevance of each detail and discussing the importance of some justifications over others. At the end of the sessions, the students stated that they felt like they did learn about observational skills, pattern recognition, and better ways to approach the diagnosing of a patient. The arts group learned similar lessons but also focused more on the doctor-patient relationship versus coming to a particular diagnosis. This included skills such as deep seeing, which helps with discerning meaning from a patient's facial expressions or body language, awareness of emotional responses of the self, and questioning assumptions. Ultimately the short course proved an effective method to increase students' observational skills, both inside and outside clinical practice, and their ability to recognize patterns and be aware of the associations those patterns create.¹⁰⁶

Every art form is rooted in patterns and often when someone is observing a work of art, they are conscious of some patterns and unconscious of others. Recognizing a pattern is both a

¹⁰⁶ Shapiro, Rucker, and Beck, "Training the Clinical Eye and Mind," 263-267.

natural and learned human behaviour. Being aware of patterns is helpful in both recognizing the connections that get made as well as gaining deeper insight into what patterns can represent. Visual literacy is one way to teach students how to observe as well as how to recognize patterns. Any form of visual media requires keen observation skills in order to understand its true meaning or to draw personal conclusions from it. As explained earlier, these skills are also essential within the medical field. Observational and pattern recognition skills provide medical professionals with the ability to glean information just by looking at something and coupling that with effective communication skills, the process of diagnosing a patient becomes easier and more accurate.

Chapter 3: Current Visual Literacy Training in Medical Schools

It is now important to turn our attention to the learning outcomes of including visual literacy training in medical schools, and to do this, we will focus on a personal interview I conducted with a pioneer in this field, Lisa Friedlaender. As the importance of visual literacy and close looking has become more widely known, the integration of visual literacy into curriculums has grown as well. Such is the example of the course *Enhancing Observational Skills* now taught at Yale University.¹⁰⁷ Linda Friedlaender is the Curator of Education at the Yale Center for British Art and alongside her husband, Gary Friedlaender who is the Chair of the Department of Orthopaedics and Rehabilitation at Yale School of Medicine, she developed this highly influential program.¹⁰⁸ The aim of this program was to task students from the Yale Medical School with looking at and analyzing paintings from the museum within the university.¹⁰⁹

I had the pleasure of speaking with Linda Friedlaender about the program, how it came to be, and how it is executed. To begin, she discussed that visual literacy is learning how to see and she explained how initially in museum culture the focal point was on the object (the artwork) but more recently the focus has shifted to place more importance on the viewer rather than the object itself.¹¹⁰ The notion that the viewer is as important if not more so than what is being looked at was a novel concept that led to the recognition of visual literacy and how important it is. Every work of art is created with intention and the desire to evoke certain thoughts or feelings in the viewer, and the real-life response that occurs after the work has been created can be analyzed and compared to the initial intention of the creator. This allows for an examination of how the meaning of artwork can change depending on who is viewing it. The ambiguity of art has always been central to its appeal, and it has existed for centuries. Now as art takes so many new forms, with new types arising every year, this knowledge and understanding is more important than ever.

¹⁰⁷ Yale University, “Enhancing Observational Skills,” Yale Center for British Art, accessed March 30, 2023, <https://britishart.yale.edu/enhancing-observational-skills>.

¹⁰⁸ Gary E. Friedlaender and Linda K. Friedlaender, “Art in Science: Enhancing Observational Skills,” *Clinical Orthopaedics and Related Research* 471, no. 7 (2013): 2065, <https://doi.org/10.1007/s11999-013-3000-0>.

¹⁰⁹ Jacqueline C. Dolev, Linda K. Friedlaender, and Irwin M. Braverman, “Use of Fine Art to Enhance Visual Diagnostic Skills,” *The Journal of the American Medical Association* 286, no. 9 (2001): 1020, <https://doi.org/10.1001/jama.286.9.1020>.

¹¹⁰ Linda Friedlaender, Curator of Education at the Yale Center for British Art, virtual interview by Kate Mcsweeney, “A Discussion about Yale Enhancing Observational Skills Course,” August 26, 2022.

Following this conversation, I asked Linda Friedlaender about the program itself and what inspired her to create it. She described how over a decade ago she went to visit a friend of hers in the hospital and noticed that she was visibly in distress. A doctor came by to check on her, and after asking how she was doing and her response being that she was fine, they promptly left. This left Friedlaender upset, as she was seeing her friend not doing well and how she was so easily dismissed by someone who is supposed to be caring for her.¹¹¹ An experience like this is not unique to just Friedlaender or her friend; many people have found themselves in the position of either or both of them. Sometimes it can be difficult to articulate how you are feeling when put on the spot by someone who is in a position of power over you. Many people revert to the basic “fine” or “I’m okay” when asked how they are doing. This has become standard practice both within a medical setting and outside. One of the most common greetings between two individuals is “Hi! How are you?” to which everyone almost always instinctively responds with “I’m good. How are you?” regardless of how they are actually feeling. The initial question feigns interest in the real feelings of whoever is being addressed, but for the most part, it is just used as a pleasantry. Visual literacy is a great way to increase empathy and emotional sensitivity that can help in a situation such as the one described by the interviewee.

Enhancing Observational Skills is now a required course for all medical students at Yale University. In the program description we read:

Observational skills are the basic tools of a physician, and they can be improved through practice. The Enhancing Observational Skills program uses representational narrative paintings at the Yale Center for British Art to tell a story using rich visual detail. Indeed, these works are presumed to be unfamiliar to the students and, thereby, full of details for which they have formed no previous bias or specific understanding. This provides the opportunity to focus more clearly on the process of looking, methodically and objectively, and on using that process to deepen observers’ abilities to understand what they see.¹¹²

This was the basis by which the program began. During the interview, Linda explained how the program operates. Students are given a set amount of time to look at a particular painting before being brought back into the larger group. They are then asked to describe the painting that they

¹¹¹ Interview with Linda Friedlaender, cited above.

¹¹² Friedlaender and Friedlaender, “Art in Science: Enhancing Observational Skills,” 2065.

studied. This section proved challenging for many students as they were asked to only describe what they saw and not to draw any types of conclusions from it. Many students would begin a statement by saying “I think,” but they would be stopped and asked to rephrase what they had originally intended to say. Following this, the students are allowed to discuss what they think is happening in the painting and what the story is. Then the students who were listening can contribute if they think that something was missed or if they have alternate thoughts as to what is going on in the painting. The next part of the exercise was to leave the museum and head to another room where students were presented with a series of coloured medical images, primarily images of skin to which they were asked to repeat the same activity that they did with the paintings. Lastly, students were asked to reflect on their experience and think if they learned anything new about themselves or about the process of observing. The students learned about their inherent bias when they began to make judgements in relation to what was happening in any of the images.¹¹³ This experience provides students with the opportunity to reflect on the ways in which they have been observing up until this point and to think about why they look at things this way and from where their own biases come exactly.

The *Yale Medicine Magazine* reports that the program was very successful at Yale and has since been adopted at dozens of universities across the United States as well as universities in Europe. Police officers have even taken the course at Yale and in place of looking at medical images, they would look at a street scene or a crime scene.¹¹⁴ The success of the program has demonstrated the need for the arts in medical school and thus the importance of visual literacy within the field.

¹¹³ Interview with Linda Friedlaender, cited above.

¹¹⁴ Cathy Shufro, “Yale Innovation in Art of Observation has Worldwide Reach,” *Yale Medical Magazine*, Autumn 2006, 64, https://medicine.yale.edu/news/yale-medicine-magazine/autumn2006_348375_43933_v1.pdf.

Conclusion:

What Should Visual Literacy Training in Medical School Look Like?

The information presented above highlights the background and justification for the benefits of visual literacy training within medical school. Taking such a broad and interdisciplinary study as visual literacy and translating it into a university course is not easy. Thankfully there have been many studies done that provide examples of how visual literacy can be taught and presented in a classroom setting. I propose that more elements should be added to a base program such as the one created by Linda Friedlander. Her program has shown how successful courses in observation can be and it seems that this is one of the most basic forms in which visual literacy can and should be taught to students.

For a course in visual literacy to be successful students will need to be taught some of the background information above such as what visual literacy is, how it presents itself in the modern world, and how semiotics function to convey meaning. Only the most basic information needs to be presented because part of the benefits to a visual literacy course is allowing students to learn things for themselves and to come to their own conclusions with some guidance. Lessons should be interactive, such as taking students to a museum or simply printing out images for students to examine. After directing students to interpret images such as paintings in a way similar to Yale's program, they should be asked to create media of their own. There are many different forms that this could take. Students could be asked to present a certain theme, idea, or message through visual forms. Depending on how strict the curriculum needs to be, this could be achieved through filmmaking, photography, drawing, painting, or acting—whatever media the student chooses. There would also be merit in spending a week or so on these different forms of media and asking students to create something using each medium. This is only affected by time constraints but can be modified for any timeline. Getting students to create their own media puts them in the headspace of a maker and they can begin to understand a completely different point of view. It will allow them to analyze the difference between intended meaning and interpreted meanings. The students would create these forms of media and share them with the rest of the class. Other students would first offer up their own interpretations based on visual cues and evidence before being told what the meaning was that the creator had likely intended to imprint onto the image. This is a valuable

lesson as students can understand that there will never be one correct answer when it comes to visual media.

For medical school students, the latter half of the course should begin to tie in medical aspects such as looking at medical images. Students could also be asked to watch specific videos pertaining to clinical encounters. Perhaps a before-and-after comparison would be beneficial as well. Asking students to observe these forms of media at the beginning of the course and at the end would offer an important perspective into how the students' attitudes have changed over their time in the course.

The beauty of visual literacy as an outcome is that it can be easily adapted in pedagogical contexts. When designing a course to teach visual literacy, many aspects need to be considered, such as class size, age group, and student interests. A base framework can be created, but a course on visual literacy should be adjusted to meet the specific needs of the class. This is difficult as presenting the idea of a course without strict guidelines to follow may not be well received. However, if a few pilot programs can be created and executed, then it is more than likely that people will begin to understand its benefits. This is where programs such as the one at Yale play an important part because it showcases just how useful visual literacy can be within the medical field and for medical school students.

I firmly believe that a specific course designed to teach medical school students about visual literacy, as opposed to integrating aspects of visual literacy into a different arts and humanities course, is not only beneficial but fundamental to the creation of good doctors. A course such as this will lead to students with increased empathy, communication skills, tolerance for ambiguity, and observational skills that aid in the recognition of patterns and awareness of pattern blindness. The benefits of teaching visual literacy to students are clear, and it is now a matter of implementing this into postsecondary education. Starting small and building up a program is a great way to do this. My hope is that as this understanding spreads, more institutions across Canada can adopt programs teaching visual literacy to students.

Bibliography

- Association of College and Research Libraries., “ACRL History,” American Library Association. Accessed on September 25, 2022.
<https://www.ala.org/acrl/aboutacrl/history/history>.
- Averginou, Maria D. and Rune Pettersson. “Toward a Cohesive Theory of Visual Literacy.” *Journal of Visual Literacy* 30, no. 2 (January 2011): 1-19.
<https://doi.org/10.1080/23796529.2011.11674687>.
- Bentwich, Miriam E. and Peter Gilbey, “More Than Visual Literacy: Art and the Enhancement of Tolerance for Ambiguity and Empathy.” *BMC Medical Education* 17, no. 200 (November 2017): 1-9. <https://doi.org/10.1186/s12909-017-1028-7>.
- Bleakly, Alan and Robert Marshall. “Can the Science of Communication Inform the Art of the Medical Humanities?” *Medical Education* 47, no. 2 (2013): 126-133.
<https://doi.org/10.1111/medu.12056>.
- Braverman, Irwin M. “To See or Not to See: How Visual Training Can Improve Observational Skills.” *Clinics in Dermatology* 29, no. 3 (May 2011): 343-6.
<https://doi.org/10.1016/j.clindermatol.2010.08.001>.
- Brumberger, Eva. “Ways of Looking: An Eye-Tracking Study of Visual Literacy Expertise.” *Journal of Visual Literacy* 41, no. 3 (January 2022): 66-89.
<https://doi.org/10.1080/1051144X.2022.2053818>.
- Cassidy, Michael and James Knowlton. “Visual Literacy: A Failed Metaphor.” *Educational Communication and Technology Journal* 32, no. 2. (June 1983): 67-90.
<https://doi.org/10.1007/BF02766724>.
- Chicago School of Media Theory. “Gaze.” The University of Chicago. Accessed on September 30, 2022. <https://lucian.uchicago.edu/blogs/mediatheory/keywords/gaze/>.
- Danesi, Marcel. *Messages, Signs, and Meanings: A Basic Textbook in Semiotics and Communication*. Toronto: Canadian Scholar’s Press Inc., 2004.
- Debes, John. “The Loom of Visual Literacy.” *Audiovisual Instruction*, 14, no. 8 (1969): 25–27.
- Dolev, Jacqueline C., Linda K. Friedlaender, and Irwin M. Braverman. “Use of Fine Art to Enhance Visual Diagnostic Skills,” *The Journal of the American Medical Association* 286, no. 9 (September 2001): 1020-1. <https://doi.org/10.1001/jama.286.9.1020>.
- Elkins, James. *Visual Literacy*. New York: Taylor & Francis Group, 2009.
- Fransecky, Roger and John Debes. *Visual Literacy: A Way to Learn – A Way to Teach*. Washington, D.C.: Association for Educational Communications and Technology, 1972.

- Friedlaender, Gary E. and Linda K. Friedlaender. "Art in Science: Enhancing Observational Skills." *Clinical Orthopaedics and Related Research* 471, no. 7 (2013): 2065-7. <https://doi.org/10.1007/s11999-013-3000-0>.
- Geller, Gail. "Tolerance for Ambiguity: An Ethics-Based Criterion for Medical Student Selection." *Academic Medicine* 88, no. 5 (May 2013): 581-4. <https://doi.org/10.1097/ACM.0b013e31828a4b8e>.
- Geller, Gail, Ruth R. Faden, and David M. Levine. "Tolerance for Ambiguity Among Medical Students: Implications for Their Selection, Training and Practice." *Social Science and Medicine* 31, no.5 (1990): 619-24. [https://doi.org/10.1016/0277-9536\(90\)90098-d](https://doi.org/10.1016/0277-9536(90)90098-d).
- Hattwig, Denise, Joanna Burgess, Kaila Bussert, and Ann Medaille. "ACRL Visual Literacy Competency Standards for Higher Education." *Libraries and the Academy* 13, no. 1 (2013): 61-89. <https://doi.org/10.1353/pla.2013.0008>.
- Heinich, Robert, Michael Molenda, and James D. Rusell, *Instructional Media and the New Technologies of Instruction*. New York: John Wiley and Sons, 1982.
- Hyerle, David. *Visual Tools for Transforming Information into Knowledge*. Thousand Oaks, CA: Corwin Press, 2009.
- Kędra, Joanna. "What Does it Mean to be Visually Literate? Examination of Visual Literacy Definitions in a Context of Higher Education." *Journal of Visual Literacy* 37, no. 2 (August 2018): 67-84. <https://doi.org/10.1080/1051144X.2018.1492234>.
- Kędra, Joanna and Rasa Žakevičiūtė. "Visual Literacy Practices in Higher Education: What, Why and How?" *Journal of Visual Literacy* 38, nos. 1-2 (March 2019): 1-7. <https://doi.org/10.1080/1051144X.2019.1580438>.
- Lam, Justine T. H. Mark D Hansen, and Maria A. Martimianakis. "Exploring the Socialization Experiences of Medical Students from Social Science and Humanities Backgrounds." *Academic Medicine* 95, no. 3 (2020): 401-410. <https://doi.org/10.1097/ACM.0000000000002901>.
- Lehmuskallio, Asko. "The look as a Medium: A Conceptual Framework and an Exercise for Teaching Visual Studies." *Journal of Visual Literacy* 38, nos. 1-2 (April 2019): 8-21. <https://doi.org/10.1080/1051144X.2018.1564607>.
- Little, Deandra, Peter Felten, and Chad Berry. "Looking and Learning: Visual Literacy Across the Disciplines." *New Directions for Teaching & Learning* 141 (2015): 1-7. <https://doi.org/10.1002/tl.20117>.

- Loreck, Janice. "Explainer: What Does the 'Male Gaze' Mean, and What About a Female Gaze?" *The Conversation*. January 5, 2016. <https://theconversation.com/explainer-what-does-the-male-gaze-mean-and-what-about-a-female-gaze-52486>.
- Lorié, Áine, Diego A. Reinero, Margot Phillips, Linda Zhang, and Helen Reiss. "Culture and Nonverbal Expressions of Empathy in Clinical Settings: A Systematic Review." *Patient Education and Counselling* 11 (2017): 411-24. <https://doi.org/10.1016/j.pec.2016.09.018>.
- Macnaughton, Jane. "The Humanities in Medical Education: Context, Outcomes and Structures." *Medical Humanities* 26, no. 1 (2000): 23-30. <https://doi.org/10.1136/mh.26.1.23>.
- Mercer, Stewart W., and William J. Reynolds. "Empathy and Quality of Care." Supplement, *British Journal of General Practice* 52S (2002): S9-12. <https://pubmed.ncbi.nlm.nih.gov/12389763>.
- Michaelson, Alan. "A Short History of Visual Literacy: The Last Five Decades." In "Information Literacy in UK and US Art Libraries," ed. Leo Appleton and Gustavo Grandal Montero. Special issue, *Art Libraries Journal* 42, no. 2 (2017): 95-8. <https://doi.org/10.1017/alj.2017.10>.
- Mulvey, Laura. "Visual Pleasure in Narrative Cinema." *Screen* 16, no. 3 (1975): 6-18. <https://doi.org/10.1093/screen/16.3.6>.
- Ndoja, Silvio, Saad Chahine, Donald H. Saklofske, and Brent Lanting. "The Erosion of Ambiguity Tolerance and Sustainment of Perfectionism in Undergraduate Medical Training: Results from Multiple Samplings of a Single Cohort." *BMC Medical Education* 20, no. 1 (November 2020): 1-7. <https://doi.org/10.1186/s12909-020-02345-5>.
- Neumann, Melanie, Friedrich Edelhäuser, Diethard Tauschel, Martin R. Fischer, and Markus Wirtz. "Empathy Decline and Its Reasons: A Systematic Review of Studies with Medical Students and Residents." *Academic Medicine* 86, no. 8 (2011): 996-1009. <https://doi.org/10.1097/ACM.0b013e318221e615>.
- Peña Alonso, Ernesto José. "Visualizing Visual Literacy." PhD diss., University of British Columbia, 2018. <https://doi.org/10.14288/1.0368982>.
- Pettersson, Rune. *Visual Literacy*. Oxford: Pergamon Press; The International Encyclopedia of Education, 1994.
- Segal, Elizabeth A. *Social Empathy: The Art of Understanding Others*. New York: Columbia University Press, 2018.

- Shapiro, Johanna, Lloyd Rucker, and Jill Beck. "Training the Clinical Eye and Mind: Using the Arts to Develop Medical Students' Observational and Pattern Recognition Skills." *Medical Education* 40, no. 3 (March 2006): 263-8. <https://doi.org/10.1111/j.1365-2929.2006.02389.x>.
- Shufro, Cathy. "Yale Innovation in Art of Observation has Worldwide Reach." *Yale Medical Magazine*, Autumn 2006. https://medicine.yale.edu/news/yale-medicine-magazine/autumn2006_348375_43933_v1.pdf.
- Simmons, Daniel J. and Christopher F. Chabris. "Gorillas in our Midst: Sustained Inattentive Blindness for Dynamic Events." *Perception* 28, no. 9 (1999): 1059-74. <https://doi.org/10.1068/p281059>.
- Sless, David. "Visual Literacy: A Failed Opportunity." *Educational Communication and Technology Journal* 32, no. 2 (1984): 224-8. <https://doi.org/10.1007/BF02768894>.
- Sotelo, Julio. "Good Doctors Abound." *BMJ* 325 (September 2002): 712. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1124230/>.
- Thompson, Dana S. "Teaching Students to Critically Read Digital Images: A Visual Literacy approach using the DIG method." *The Journal of Visual Literacy* 38, nos. 1-2 (2019): 110-9. <https://doi.org/10.1080/1051144X.2018.1564604>.
- Thompson, Dana S., Stephanie Beene, Katie Greer, Mary Wegmann, Millicent Fullmer, Maggie Murphy, Sara Schumacher, and Tiffany Sautler. "A Proliferation of Images: Trends, Obstacles, and Opportunities for Visual Literacy." *Journal of Visual Literacy* 41, no. 2 (April 2022): 113-13. <https://doi.org/10.1080/1051144X.2022.2053819>.
- Visual Literacy Today. "Welcome." Visual Literacy Today. Accessed on September 30, 2022. <https://visualliteracytoday.org/>.
- Visual Literacy Toolbox. "Frame and Gaze." University of Maryland College Park. Accessed on September 30, 2022. http://vislit.arhu.umd.edu/modules_frameGaze.php.
- Yale University. "Enhancing Observational Skills." Yale Center for British Art. Accessed on December 12, 2022. <https://britishart.yale.edu/enhancing-observational-skills>.