

**VISUALIZING VISUAL LITERACY**

by

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the degree of Doctor of Philosophy

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## **Abstract**

*Visual literacy* is a concept that has been reshaped and nuanced according to various factors through time, such as the increasing prevalence of contemporary visual technologies and evolving notions of literacy. This dissertation explores the mobilization of this concept through the last century and addresses the implications of its interdisciplinary and polysemic nature. By tracing the evolution of this term, as well as some of its correlates in English, I map the concept of “the visual as a literacy,” in the process addressing the following questions:

- How do notions and theories of visual literacy differ through time and across disciplinary fields?
- How have different historical approaches shaped the understanding of visual literacy?
- What practical outcomes could a comprehensive overview of visual literacy bring to teaching the concept?

To answer these questions, I first completed a comprehensive search of available databases for all uses of “visual literacy” in English, in the process compiling a working bibliography of 2400 documents. Subsequently, I created a full-text database of 330 representative documents I deemed most central to the mobilization of visual literacy. I employed text visualization approaches combined with close reading to understand trends and patterns in my datasets. Beyond using available tools for text visualization, I also worked with a team to design and program a tool specifically for analysis of my full-text corpus: The Glass Cast (Peña, Juárez, Dobson, & INKE Research Group, 2016). This tool is a plug-in for the open-source reference management software Zotero. It allows researchers to visualize relationships

between documents in a bibliography over time. In itself, this tool is a unique contribution to scholarship and a key outcome of this study. It and other supplementary materials are available here: <https://errrnesto.github.io>.

Findings of this research included the revelation of a rich history of visual literacy dating to 1939, the identification of three virtually independent historical avenues, or waves, of mobilization of visual literacy, and the coexistence of at least two confounding understandings of the concept. Ultimately, I address these two different understandings in an attempt to inform the work of educators invested in the topic.

## **Lay Summary**

This study explores how the concept of *visual literacy* evolved over time and across disciplines. I identified uses of “visual literacy” in literature available through library and other databases. I employed text visualization approaches combined with close reading to understand trends and patterns in a set of documents defined through these searches. Additionally, I compiled a full-text corpus of key texts about “visual literacy” and worked with a team to design and program a tool, “The Glass Cast,” specifically for analysis of this corpus (Peña, Juárez, Dobson, & INKE Research Group, 2016). Findings of this research included the revelation of a rich history of visual literacy dating to 1939, the identification of three virtually independent historical avenues, or waves, of mobilization of visual literacy, and the coexistence of at least two confounding understandings of the concept. Ultimately, I address these two different understandings in an attempt to inform the work of educators invested in the topic.

## Preface

This dissertation is original work by the author, Ernesto Peña. I designed, conducted, analyzed, and represented the program of research with guidance from my committee. An early version of Chapter 2 has been published in Spanish. Peña, E., & Dobson, T. M. (2017). Humanidades digitales y la movilización del conocimiento: el caso de la alfabetización visual. *VIRTUalis*, 7(14), 206–221. I wrote the entirety of the manuscript, but deem the guidance of my supervisor Dr. Dobson meritorious of co-authorship in articles related to my dissertation.

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# Chapter 1: Introduction

## 1.1 Visual literacy

By mapping *visual literacy* and its correlates in English, this dissertation explores the mobilization of this concept through the last century and addresses the implications of its interdisciplinary and polysemic nature. The use of linguistic analogies (e.g., visual language, visual rhetoric, visual grammar) in regards to images is ubiquitous enough to make it virtually impossible to identify and track the first occurrence of such analogies. Moreover, correlates appear in many languages.<sup>1</sup> For the purpose of this thesis, I focus my examination primarily on use of the English term *visual literacy*.

In recent times, the declaration of the prominence of the visual over other channels of communication has been persistent across several disciplines, including film studies, design, sociology, and literacy education (e.g., Bolter, 1991; Fransecky & Debes, 1972; Kress, 2005; Messaris, 2012; Sartori, 1998). It is within this loom of visuality that the concept *visual literacy* has been woven together throughout the 20<sup>th</sup> century and beyond. In the introduction of his edited collection of essays, *Visual Literacy* (Elkins, 2008), Elkins alludes to his own research about the mobilization of the concept:

A search of newspaper and magazine databases revealed that *visual literacy* has been in uncommon but intermittent use for over a hundred and fifty years; it has

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<sup>1</sup> In Spanish alone, visual literacy has been translated as *sintaxis de la imagen* (Image syntax) and *alfabetización visual*, among others. In the case of the latter, the term *alfabetización* implies not a condition (literacy) but a process (“litera-zation”). This apparently minor detail has an impact on the way Spanish speakers deal with literacy as a whole. According to the Spanish Academy (Real Academia Española), there is no correct term to say ‘literate’, but there is a correct term for ‘illiterate’ (i.e., *analfabeto*). If one wants to refer to a literate individual in Spanish, the right term would be *alfabetizado*, which implies going through the process of *alfabetización*. One could assume that in Spanish, from a linguistic point of view, it is more difficult to internalize the possibility of being literate without a proper process. This alone could have huge implications for the adoption of a semiotic turn in literacy in Spanish-speaking countries and it is potentially relevant to the discussion of whether visual literacy is teachable or not.

been used to denote low-level, secondary school appreciation, of the sort that enables a student to identify Michelangelo's *David*. (p. 1)

Elkins evidences elitism in his dismissive reference to grade-school contexts; also, he does not provide any information about the databases or methods used to conduct the search to which he alludes here.

Following up on his claim here, I conducted my own scouring of databases for *visual literacy*. My first searches suggested the occurrence of *visual literacy* is more recent. Its coinage has been traditionally credited to John Debes in 1969 (e.g., Avgerinou & Ericson, 1997; Baca, 1990; Moore & Dwyer, 1994; Williams & Debes, 1970), and since then it has been adopted by several disciplines. Over the years, the concept of visual literacy has been reshaped and nuanced according to various factors, such as the prevalence of contemporary visual technologies and evolving notions of literacy. For instance, in design education, visual literacy is a well-known concept but is also problematic due to its various interpretations. In Graphic and Information Design, visual literacy is, on the one hand, the richness and variety of visual references that a designer has to solve communication problems. In this interpretation of the concept, visual literacy would be a matter of degree: the more visual references, the more literate one appears. This understanding of visual literacy can still be found in specialized design media (e.g., Trevatt, 2015). On the other hand, visual literacy has been defined as the technical knowledge required to communicate through visual means. The acquisition of the first type of visual literacy would require meaningful observation: keeping up with design trends, attending exhibitions, buying design reference books, watching films, advertisements and visual communication artifacts in general. The second type of visual literacy would come from understanding representation techniques and formulas refined

through practicing the creation of visual discourses (Heller, 2005, p. 236-237). This kind of knowledge has been summarized in design textbooks such as *Language of Vision* by Gyorgy Kepes (1944) or *A Primer of Visual Literacy* by Donis Dondis (1973). One could argue these two understandings correspond to reading (a skill oriented towards knowledge acquisition) and writing (a skill oriented towards production), respectively.

The multiplicity of meanings of visual literacy extends to many disciplines. However, it is possible to affirm that understandings of this concept typically fall within a range between two broad notions. On the one hand, visual literacy is regarded as a set of skills or competencies for visual communication that can (and should) be taught formally in the classroom (e.g., ACRL Board of Directors, 2011; Ausburn & Ausburn, 1978; Dondis, 1973; Edutopia, 2012a, 2012b; Fransecky & Debes, 1972; Herring, Mishra, & Koehler, 2014). This notion of visual literacy is associated with the term “graphicacy” (Aldrich & Sheppard, 2000; Balchin & Coleman, 1966; Roth, Pozzer-Ardenghi, & Young Han, 2007; Wainer, 1980) and is prevalent across several disciplines. According to this perspective, it is possible for an individual to be “visually illiterate” (Williams, 2000, p. 229) if that person has not learned certain conventions for visual communication or learned a particular, preferred visual “grammar.” Alternatively, visual literacy is framed as innately acquired: because it is informed by individual perception, personal experience and socialization, it does not require explicit instruction (Messaris, 2012). According to the latter perspective, any person who has the capacity to perceive visual information develops a visual literacy by assimilating such information through observation and experience. According to this model, “visual illiteracy” could only be a consequence of some degree of visual impediment, since every acquired token of visual data provides knowledge that could contribute to literacy.

Probably the most representative example of a lack of a uniform understanding of visual literacy, even within a single institution, is the case of the International Visual Literacy Association (IVLA), the organization that Debes founded after he claimed the coinage of “visual literacy.” Since 1969, representatives of IVLA have sought to define and distinguish a cohesive understanding of visual literacy. To establish consensus on the concept’s scope and definition, members of IVLA have conducted at least two reported Delphi studies (Baca, 1990; Brill, Dohun, & Branch, 2007).<sup>2</sup> Several articles were published that either revised the results of these studies or attempted to provide new insight into a theory of visual literacy (e.g., Avgerinou & Ericson, 1997; Avgerinou & Pettersson, 2011). Some members of IVLA argue that the absence of both a definition and a theory of visual literacy has not only hindered scholarly research, but also put at risk the concept’s continued relevance, as the following quotations reveal:

There are two major impediments to research on VL. The first is a lack of a widely accepted definition of the term Visual Literacy itself. The second, perhaps a consequence of the first, is a lack of a cohesive theory. (Braden, 1996, p. 9)

[I]f a concept does not have a broadly accepted definition, if the theory behind it is confusing, and if its viability on practical terms is a matter of continuing controversy, then the only reasonable way to cope with it is to abandon it.

(Avgerinou & Ericson, 1997, p. 280)

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<sup>2</sup> According to Hsu and Sandford (2018), “The Delphi technique is a group communication process as well as a method of achieving a consensus of opinion associated with a specific topic. Predicated on the rationale that more heads are better than one and that inputs generated by experts based on their logical reasoning are superior to simply guessing, the technique engages a group of identified experts in detailed examinations and discussions on a particular issue for the purpose of policy investigation, goal setting, and forecasting future situations and outcomes” (p. 344).

Despite these concerns, the disappearance of the term “visual literacy” is an unlikely event, especially because its existence has depended only in part on its use within scholarly communities. Nevertheless, I would argue the current multiplicity of understandings exemplifies Braden’s (1996) claims about the lack of a cohesive theory. In the years since Braden offered his remarks, there has been at least one prominent attempt to acknowledge the contributions of various thinkers to scholarly understandings of visual literacy. This attempt was undertaken by Williams (e.g., Williams & Newton, 2010; Williams, 1999, 2000a, 2000b), who proposed an educational model known as “omniphasism” that aims to recognize the influence of “intuitive” and “rational” intelligences (2000b, p. 224) on the interpretation of imagery. Williams (1999, 2000a, 2000b) situates his approach to visual communication in scholarship that is reviewed in Chapter 3 of this dissertation, including Dondis (1973), Elkins (2008), Kress & van Leeuwen (1996), and Messaris (1994, 1998). However, he does not offer much engagement with the differences between various theories of visual literacy, including those represented in Dondis’s and Messaris’s models. Williams also overlooks the contributions of John Debes, arguably the first scholar to attempt a theory of visual literacy, and those of the IVLA, which allegedly comprise some of the most influential sources on the topic of visual literacy.

## 1.1 Research questions

Despite the fact that available literature on the topic suggests there is neither a cohesive theory, nor an understanding of visual literacy even after at least 45 years of conscious attempts to assemble one, visual literacy is mostly treated as if there was either an explicit or implicit consensus on its definition, probably because the term is intuitive enough to convey the broader notion of a form of visual learning. However, it is important to

consider the nuances of the term through years of interdisciplinary evolution with a view to developing a understanding of its complexities, both theoretically and in terms of pedagogical applications.

This research project attempts to tackle this issue by providing a comprehensive map of the mobilization and definition of visual literacy through the last century. This research project addresses the following questions:

- How do notions and theories of visual literacy differ through time and across disciplinary fields?
- How have different historical approaches shaped the understanding of visual literacy?
- What practical outcomes could a comprehensive overview of visual literacy bring to teaching the concept?

I would argue that any attempt to understand the evolution of cross-disciplinary terms or concepts requires the adoption of both a mindset prone to purposefully ignore disciplinary and hierarchical boundaries, and a set of methods to engage in interdisciplinary research.

These methods, and their role in informing and shaping this research project, are described next.

## **1.2 This dissertation**

This dissertation does not follow common conventions of the genre in the social sciences. As it progressed, the research project grew in structural complexity, making it difficult to separate methodology from analysis and almost impossible to subscribe the work to a more canonical format. The work was iterative, although I endeavour to present it roughly chronologically.

Given that the questions are chiefly concerned with identifying the mobilization of a particular lexical item across disciplines as evidenced in written records, I aimed to be exceedingly careful in establishing protocols for my literature review so as not to overlook any relevant materials. In Chapter 2, I describe a protocol constituted of various methodological approaches designed to locate and gather the documents that constituted the data for this research. In this phase of the research, I first conducted an exhaustive search for the term through library databases. I also began locating and digitizing relevant sources with a view to building a personal library of relevant work. At the point I had collected over one hundred sources, I felt the need to employ text visualization approaches to understand trends and patterns, a method that seemed ideally suited to a research project on visual literacy. My first pass at visualizing my data, described in Chapter 2, entailed using the following tools to identify, access and verify documents and their metadata, as well as to see trends in usage:

1. Google Ngrams, a visual interface of the Google Books Search corpus used to visualize the occurrences of visual literacy and its correlates.
2. Google Books Search, allegedly the largest corpus of digitized books and magazines available, used as the main source of data.
3. Google Scholar, a database of scholarly sources that allows for searches of terms by date and relevance.
4. WorldCat.org, by its own description: “the world's largest network of library content and services” used mainly to verify the metadata from the Google Books Search.

In Chapter 3, I offer a detailed discussion of the mobilization of the term visual literacy based on an initial analysis of the data collected and visualized through the methods

described in Chapter 2. The discussion offered in Chapter 3 is limited, however, because it fails to account for myriad connections between sources. That is to say, while initial analysis of my data (a corpus of published texts on visual literacy) shows a trajectory of the use of the term through time, it does not show how the term may have been mobilized between different disciplines (for example, between the fields of Design and Literacy Education).

A second approach to data analysis is described and then discussed in Chapters 4 and 5 respectively. The second approach to data analysis consisted of Social Network Analysis, coding, and 3D text visualization. Social Networks have been broadly defined as “socially relevant nodes connected by one or more relations” (Scott & Carrington, 2011, p. 11) and coding involves the analysis and interpretation of texts to discover “meaningful patterns descriptive of a particular phenomenon” (Auerbach & Silverstein, 2003, p. 3). After building a full-text corpus by obtaining documents and digitizing them where necessary, I encoded relations between them as analytical units, a practice fundamental to Social Network Analysis (e.g., Marin & Wellman, 2014). By doing this, I determined how particular theories have influenced others and for how long those theories have prevailed, and also considered the potential reasons behind this. These relations are determined from explicit and implicit references across documents and the direction of these references. Two strategies were integral to this work:

- a. The identification of main scholars who emerged as prominent based on the impact of their ideas, and evidenced by the mobilization of their work.
- b. The identification of numbers of connections and the connections across academic fields.

Coding for features such as these provided some sense of the prevalence of particular understandings of the concept of visual literacy, making it possible to get a general sense of the mobilization of visual literacy by field of study. Encoded texts are also susceptible to be visualized in various different ways beyond what is possible without encoding. Social Network Analysis and coding thus led me to return to the method of data visualization to give “graphical legibility to analytical results” (Burdick, Drucker, Lunenfeld, Presner, & Schnapp, 2012, p. 18). As available visualization tools did not provide the specific functionalities that I required, I decided to develop a tool myself. A description of the process of development of this tool is in Chapter 4. A discussion of what social network analysis and visualization through the use of this tool revealed occurs in Chapter 5. Chapter 6 offers concluding thoughts and a proposal for future work based on the findings of the analysis performed in previous chapters.

## **Chapter 2: A Photomosaic**

### **2.1 Selecting search terms**

Coming to a general understanding of different renditions of the same idea (in this case, *visual literacy*) requires acknowledgement of the contexts in which the idea emerged and the particularities of those contexts. It is sensible to assume a broad understanding of the mobilization of an idea may be attained through an exhaustive review of literature in which the term and its equivalents have emerged. I began such an exhaustive search for the occurrence of Visual Literacy and its correlates in English through standard academic search protocols, which included general searches across the repository of 735 databases at the University of British Columbia Library. Understandably, historical databases were of particular relevance. Among those I examined, primarily through the portal pointstothepast.ca, were the following:

- 17th & 18th Century Burney Collection Newspapers
- 19th Century British Newspapers
- 19th Century U.S. Newspapers
- Gale NewsVault
- Illustrated London News Historical Archive, 1842-2003
- Picture Post Historical Archive
- Independent digital archive
- Sunday Times digital archive
- Daily Mail historical archive
- Readers' Guide Retrospective, 1890-1982

One of the first references to a form of visual rhetoric revealed through these initial explorations is in *Chirologia* (Bulwer, 1644). The title of this fascinating volume includes the phrases “the natural language of the hand” and “the art of manual rhetoric.” This treatise explores the way in which people communicate in a non-verbal manner through manual gestures; it is, in a sense, an illustrated dictionary of hand gestures (see Figure 2.1). More recently, W.J.T. Mitchell qualifies visual literacy as a “seemingly unavoidable metaphor” (Mitchell, 2008, p. 11) and suggests other terms that have been used to refer to such a metaphor, such as “visual language,” and the “language of vision” (p. 13). However, I would argue that visual language and visual literacy are not equivalent terms, just as language and literacy are not synonyms. Visual language is an approach to communication; visual literacy refers to competence in this approach to communication. Moreover, correlates appear in many languages. While acknowledging early precursors to visual literacy, I needed to limit the scope of my search for this single-volume work; thus, I elected to track, in English language only, *visual literacy* and five close correlates: *graphicacy*, *graphical literacy*, *visual grammar*, *visual semiotics* and *visual rhetoric*. I selected these five correlates because of their semantic proximity to the idea of a specific *literacy* (in the sense of competence or knowledge, as mentioned above) related to visual forms of representation. The terms I selected either refer to the overall idea of becoming literate in visuals (graphicacy, graphical literacy) or to very specific aspects of such literacy: visual grammar refers to the layout and arrangement of visual elements, visual semiotics to the study of models of meaning, and visual rhetoric to the use of visual discourse oriented to persuade. Other terms (such as visual language, offered by Mitchell) proved to be too broad on closer examination – even, for example, including animal communication. Taking visual literacy and these correlates as the

entry point in this thesis is ultimately a pragmatic decision, made with a view to limiting the data and responding to the relevance that the broad concept to which these descriptors allude has had in the primary disciplines within which I have been working through the past ten years: Graphic Design and Literacy Education.

**Figure 2.1** An Illustrated page from *Chirologia* (Bulwer, 1644, p. 153) displaying relationships between specific emotions and their expression through hand gestures. Used under Public Domain.



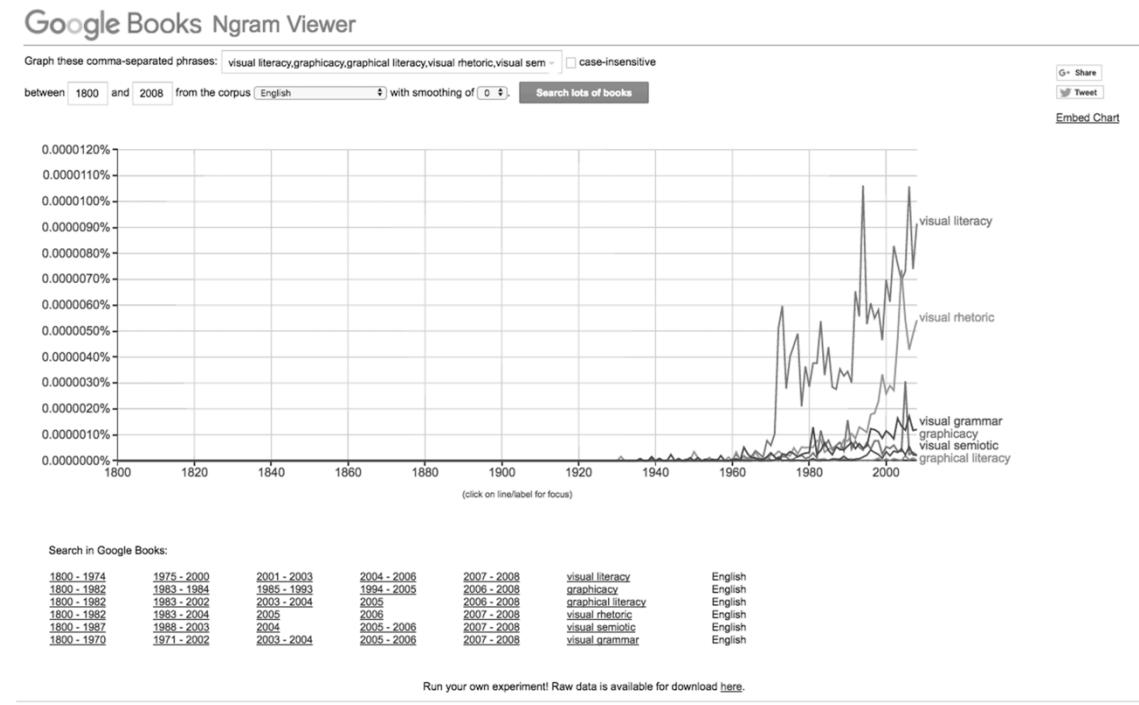
## **2.2 Temporal delimitation and determining trends in usage with Google NGram Viewer**

The study of the mobilization of visual literacy required delimitation beyond the selection of these search terms. I did not wish to set boundaries based on disciplines or fields of study because the non-observance of traditional disciplinary boundaries during the initial search was one of the study's conditions: the emergence of disciplinary patterns was expected, but only as a consequence of the research process. Instead, due to the implicit historical character of this project, the delimitation initially selected was time; however, the use of time as a guiding principle posed particular challenges, starting with the need to establish temporal boundaries for the literature review – and, indeed, the entire research project – without yet having determined the origin of the term. I found the solution to these challenges in full-text searching of the massive Google Books corpus enabled through Google Ngram Viewer.

Google Ngram Viewer (GNV) is a visual interface that enables users to search the millions of books and magazines within the digitized Google Books collection for phrases from one to five words. The perspective afforded by the Ngram Viewer is “rich-prospect” (Ruecker, Radzikowska, & Sinclair, 2011) insofar as the interface offers meaningful visual representation of items in the collection and a means of manipulating the display to determine trends and patterns. At the time of this study, the GNV allowed for searches between 1800 and 2008. Occurrences of phrases or search terms are displayed in a line graph showing, on the *x* axis, the percentage of items that contain the term in the entire corpus of Google Books and, on the *y* axis, the year in which such items were published. Inputting my terms to GNV returned a graph that showed clear trends in usage within the Google Books

corpus (Figure 2.2); however, as I discuss below, this broad perspective required detailed verification, particularly given concerns about the reliability of the Google Books data set.

**Figure 2.2 Google Ngram Viewer landing page displaying the results of a simple search for the terms *visual literacy*, *visual rhetoric*, *visual grammar*, *graphicacy*, *visual semiotics* and *graphical literacy*. *Visual literacy* and *visual rhetoric* emerge as the most-used terms.**



## 2.3 Limitations and affordances of the Google Book project for scholarly research

Conceptualized in 2002, the controversial Google Books project (“Google Books History,” n.d.) is a venture in digitizing all books ever published. Its implications have been extensively discussed within and beyond the academy. By 2010, sources reported that the number of books scanned by the company reached 12 million out of approximately 130 million existing books in more than 45 languages, representing almost 10% of total books (Jackson, 2010). Some sources claim that by 2015 the number of scanned books had increased to 25 million (Heyman, 2015), while others report that by 2013 there were already around 30 million volumes scanned (Darnton, 2013).

At the time of submission of this thesis (Spring 2018), there were two ways to search this collection: 1) through GNV (discussed above), whereby trends are shown on a line graph; 2) through key-word-in-context (KWIC) searching, whereby results are displayed as a list, with each occurrence of the term shown in the context of “snippets” of text. The latter is commonly referred to as Google Books Search (GBS). The Google Books Search project (hereafter GBS) has received much criticism, mainly based on legal implications in regards to copyright (e.g., Kubis, 2010). There has also been criticism about the operability of the search system, insufficient reliability of Optical Character Recognition (hereafter OCR), and the handling of metadata (Pope and Holley, 2011) – to the extent it has been described as “A Disaster for Scholars” (Nunberg, 2009). However, the promoters and apologists of the GBS are consistent in declaring it is better to have such a full-text resource that allows KWIC searching and display (something other scholarly databases regularly do not allow) despite its failings than not to have it at all. Their main argument is one of access: it is profoundly beneficial to have these documents searchable in the public domain, readily available for myriads of users who otherwise would rarely have opportunity to consult such primary sources of information, either within or beyond universities and other academic venues (e.g., Dougan, 2010; Leonardo, 2012). Despite its potential flaws, the possibility of KWIC searching and the availability of a text visualization tool made this corpus ideal for the first stage of this project. Moreover, the interplay between GNV and GBS enabled the determination of the chronological boundaries of the literature review as well as access to the immediate verbal context of the search terms.

## 2.4 Verifying the GNV overview: A photomosaic

As intimated above, generating a broad overview of the usage of my search terms through GNV was only the first step of a detailed process that would, to use the metaphor of photography, require zooming in and out, or a changing of camera angles, as well as the use of different cameras altogether. It seemed suitable for the purpose of this visualization approach to adapt the “visual information seeking mantra” introduced by Shneiderman (1996): “Overview first, zoom and filter, then details on demand” (p. 337). Keeping this in mind, I used the notion of composite images known as “photo mosaics” as an analogy. Photo mosaic is a technique that entails sectioning an image, usually using a tight grid, and substituting each section for an image that matches its visual features in terms of luminosity and color (see Figure 2.3). The result is a large image that can only be seen from a considerable distance, composed of smaller images that can only be appreciated from a short distance. In this metaphor, access to information through the search tools of a resource like GBS would be analogous to looking for images with particular features through a narrow-angle lens. The GNV interface offers the opportunity to widen the angle in a relatively controlled fashion to the largest possible sample of available literature. As well, it is possible to access the information in different levels of detail. These affordances are what led me to consider these tools as the most convenient approach to perform a historical analysis of visual literacy.

**Figure 2.3 . Example of a photo mosaic using a puzzle-shaped grid. Puzzle photographic mosaic of London Royal Albert Hall created with Mosaic Creator software by A. Olejnik [https://commons.wikimedia.org/wiki/File:Andrej\\_olejnik-albert-hall\\_mosaic\\_2000.jpg](https://commons.wikimedia.org/wiki/File:Andrej_olejnik-albert-hall_mosaic_2000.jpg). Used under Creative Commons Attribution 3.0 Unported: <https://creativecommons.org/licenses/by/3.0/>.**



Initial searches for my terms using GNV produced thousands of documents that had to be organized on several different levels for the purpose of analysis. Initially, these terms were organized into two different layers on the basis of their conceptual proximity to the notion of the visual as a literacy. The first of these layers was in close conceptual proximity to *visual literacy*: it consisted of the two terms *graphical literacy* and *graphicacy*. Both were paired with *visual literacy* as direct correlates due to their similar broadness and denotative meanings, and because each include a direct reference to literacy (explicitly in the case of *graphical literacy* and implicitly in the case of *graphicacy*). The rest of the terms, as noted above, referred to more specific features of visual communication: *visual grammar* has been

used within film and graphic design, for example, to refer to a definition of the basic rules that elements of visual communications arguably do or at least should follow; *visual semiotics* has been associated with the study of visual signs and their meanings, and *visual rhetoric* has been used to reference examination of the persuasive properties of visuals in general. The inclusion of these terms in a second, more distal, layer was motivated by the fact that each term has been used in at least one of the fields that have championed visual literacy or its correlates (see Table 2.1).

**Table 2.1 Distribution of related terms based on conceptual proximity to *visual literacy*.**

Main term	Visual literacy		
<b>First layer</b>	Graphical literacy		Graphicacy
<b>Second layer</b>	Visual semiotics	Visual rhetoric	Visual grammar

Most of the second-layer terms are ingrained in the foundation knowledge of their host disciplines and are integral to the understanding of many of the central concepts therein. However, to detail the search and visualization process described in this chapter for each one of these terms with the same degree of rigour would be redundant. So, although each of these terms are located in the historical context laid out in Chapter 3, and the first layer of correlates are mapped out in that same chapter, only the verification process pertaining the term “visual literacy” is described in detail.

After identifying documents that contained visual literacy in the GBS repository, I obtained full-text copies of all and digitized the full documents or pertinent sections.<sup>3</sup> Some were not available via standard channels locally and so were ordered from other libraries in North America. I used citation chaining (following cited sources in landmark documents) to

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<sup>3</sup> This process is described in detail in Chapter 4.

find additional documents relevant to this project. Not every document gathered during this process was a scholarly source. The sample obtained for this research includes documents of many kinds, including legal documents, advertisements and any other type of record that would facilitate the elaboration of a comprehensive map of the mobilization of visual literacy and its correlates. Fortunately, neither GNV nor GBS discard documents based on their academic rigour as judged by standard review processes. Google Scholar was consulted in regards to scholarly texts specifically. As Google Scholar has no built-in visualization tool that displays publication in a timeline format as GBS does (through GNV), it was necessary to look for occurrences year by year.

Following the conceptual analogy of the photo mosaic, the analysis of the occurrences of visual literacy found within the documents in Google Books was organized in three different levels of depth:

1. *Wide Angle* of the frequency of use of the term visual literacy over time, provided solely from the results of the search of the term within the Google Ngram Viewer interface. The results of this first stage allowed for speculation on the correlation between particular historical events and the trends evidenced in the chart.
2. *Medium Angle* of the interpretation of results from the first level of depth and the identification of “landmark” documents containing references to events, ideas or individuals that could have facilitated the mobilization of the concept between fields.
3. *Close Up* obtained through close reading of the landmark documents identified in the previous stage. It is important to point out that this was an iterative process: the three phases mentioned above were constantly revisited.

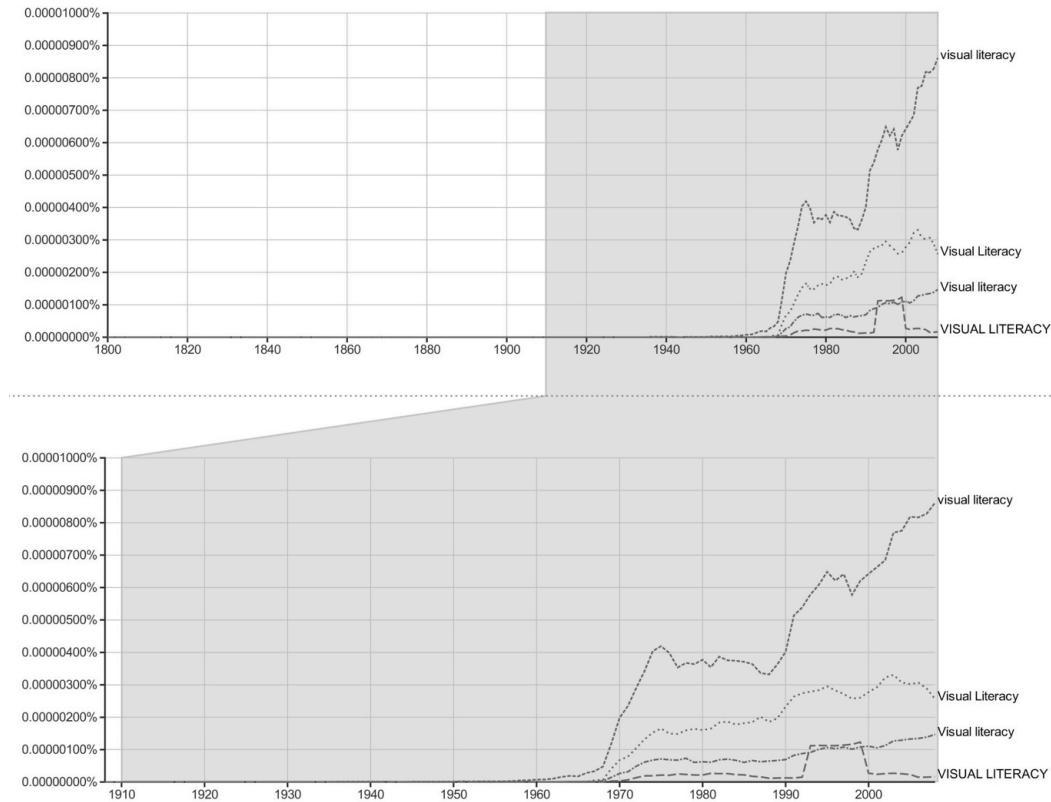
This three-stage method led to the identification of key events like the first incidence of the term *visual literacy* in the Google Books corpus, which was, notably, almost 30 years before what is alleged by many sources to be the first use of the term in 1969 (e.g., Avgerinou & Ericson 1997; Baca 1990; Hortin, 1980; IVLA, n.d.; Levie, 1978; Moore & Dwyer 1994; Rockenbach & Fabian, 2008; Sutton, 1993; Williams & Debes, 1970). It also enabled the identification of historical moments in which the concept of *visual literacy* was strongly promoted. The stages of the protocol outlined above are expanded upon below.

#### **2.4.1 A wide-angle view: Finding placeholders**

This first search for *visual literacy* through GNV—limited to documents published in English between 1800 and 2008—provided a sense of the temporal reach of the research. The result was a line chart that seemed to concentrate the activity to the last 50 years of the graph. Given the lack of results before the 20<sup>th</sup> century, the search was narrowed to a period of one hundred years, starting at 1908 (see Figure 2.4). I should note here that although the database of Google Ngram Viewer has been updated since 2008 (e.g., Orwant, 2012), its graphical interface does not go beyond 2008 (Google Ngrams Viewer Team, 2013). This was the case even at the time of final edits to this thesis (Spring 2018). Rosenberg (2017) observes that work on the Google Books project in general has been waning through the last six years. Books are still being added, but “at a significantly slower pace than at the project’s peak around 2010–11” (n.p.). This does not mean that documents added after 2008 are unavailable in Google Books (those can be accessed through the standard KWIC Google Books Search); it means it is not possible to visualize those results through Google Ngram Viewer. I should also note that although the search for visual literacy described above focused on the period between 1908 and 2008, there are documents in my bibliography that are outside those

temporal limits. Documents that precede the first identified occurrence of visual literacy (e.g., Playfair, 1786; Russel, 1801) were typically referenced by others that do appear within this period. Documents published after 2008 were obtained through year-by-year searches in Google Books and Google Scholar, as mentioned before.

**Figure 2.4 Results of the search for *visual literacy* in English within the Google Books repository, 1800-2008 and 1908-2008, with a default “smoothing” (value = 3) in GNV.<sup>4</sup>**



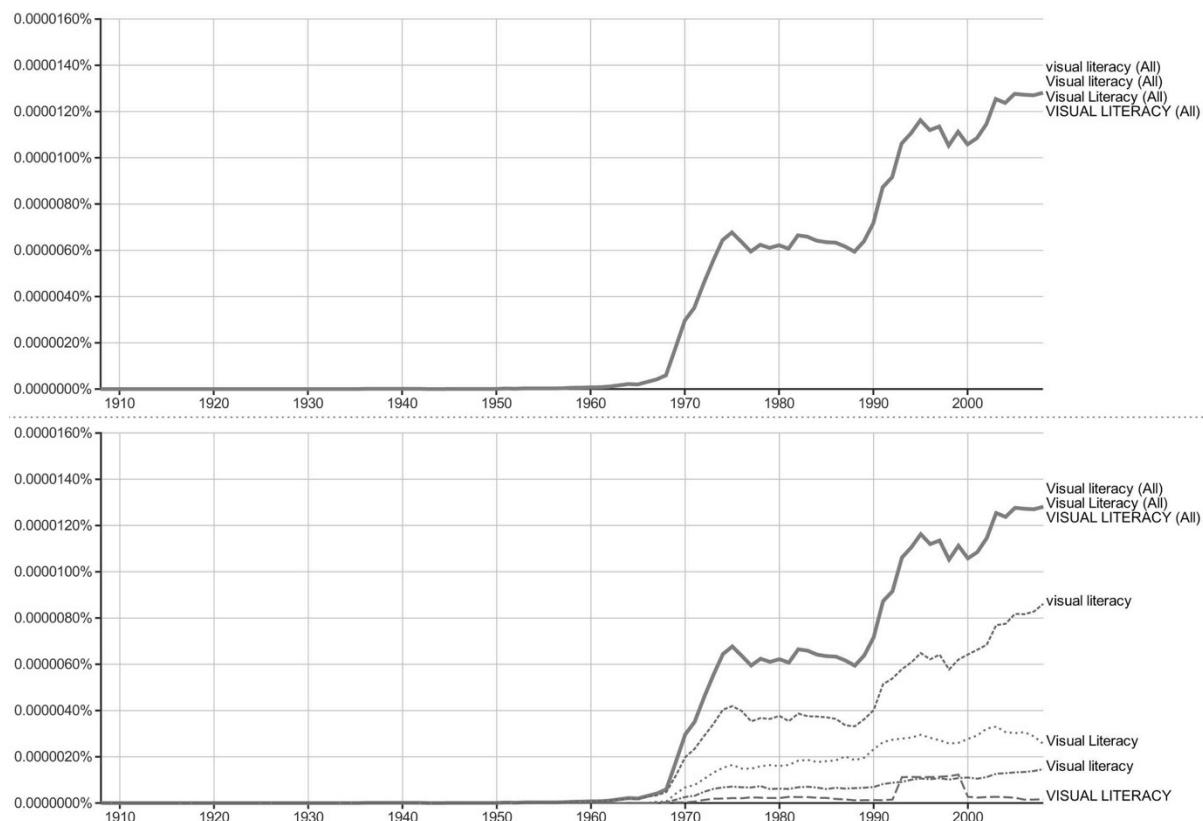

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<sup>4</sup> Statistical smoothing refers to the practice of averaging the value of individual data points in a set to reveal trends without compromising its validity (Simonoff, 1996). When averaged, the data points in a line chart are displayed as curves as opposed to hard lines, hence the name. In the case of GNV smoothing, the value of smoothing provided by the interface refers to the number of years included in the averaging algorithm. For instance, if the smoothing has a value of 5, the data point of each year is averaged with the 2 years before and after (Google Ngrams Viewer Team, 2013).

Initially, the results yielded from the search encompassing the period between 1908 and 2008 seemed broadly consistent with the widely accepted premise that *visual literacy* was coined in the late 1960s: the line chart in Figure 2.4 shows a visible increment in usage around that date. However, there are simple and yet important considerations that had to be taken into account. For instance, letter case can dramatically affect the results of the search. The GNV interface allows users to activate or deactivate the sensitiveness of the search to letter case. To test the impact of this feature, a search for the term *visual literacy* was conducted disregarding letter case. The result was four different lines in a single chart, one for each particular case variation of the term: *VISUAL LITERACY*, *Visual Literacy*, *Visual literacy*, and *visual literacy* (see Figure 2.4). As the main purpose of this exercise was to visualize the occurrences of the phrase regardless of format, a search for all versions of the phrase—irrespective of letter case—was conducted. The result was a chart displaying one single line, expandable to five, representing all occurrences of the term and its variations (see Figure 2.5). This method of considering all possible letter case combinations within a phrase can help overcome fairly common and well documented problems with GBS's OCR engines involving letter case sensitivity and typographic features (e.g., Strange, McNamara, Wodak, & Wood, 2014). For instance, it is not uncommon to find misidentifications of the OCR software in distinguishing between *rn* and *m* in the Google Books corpus, producing potentially misleading results (Pope & Holley, 2011). In GBS, such misidentifications might occur in relation to words like *bum* and *burn* (see, for example, National Center for Health Statistics, 1995, p. 247). OCR commonly introduces errors in distinguishing between *l* and *L*, or *b* and *h* as well. These are due to features of the design of particular fonts as well as poor optical letter recognition by the software. Even a poor choice of spacing among letters in the

text during the production of the document could lead to misreading, by people and machines alike. Recognizing the limitations of OCR, I considered the possibility of misidentification of the letters *li* in ‘literacy’ as *h* or *H* and performed searches employing the phrase “visual hteracy” in GNV and GBS. These searches yielded several results (e.g., Paley & Malbert, 1994) that had to be considered and reviewed in order to determine their significance.

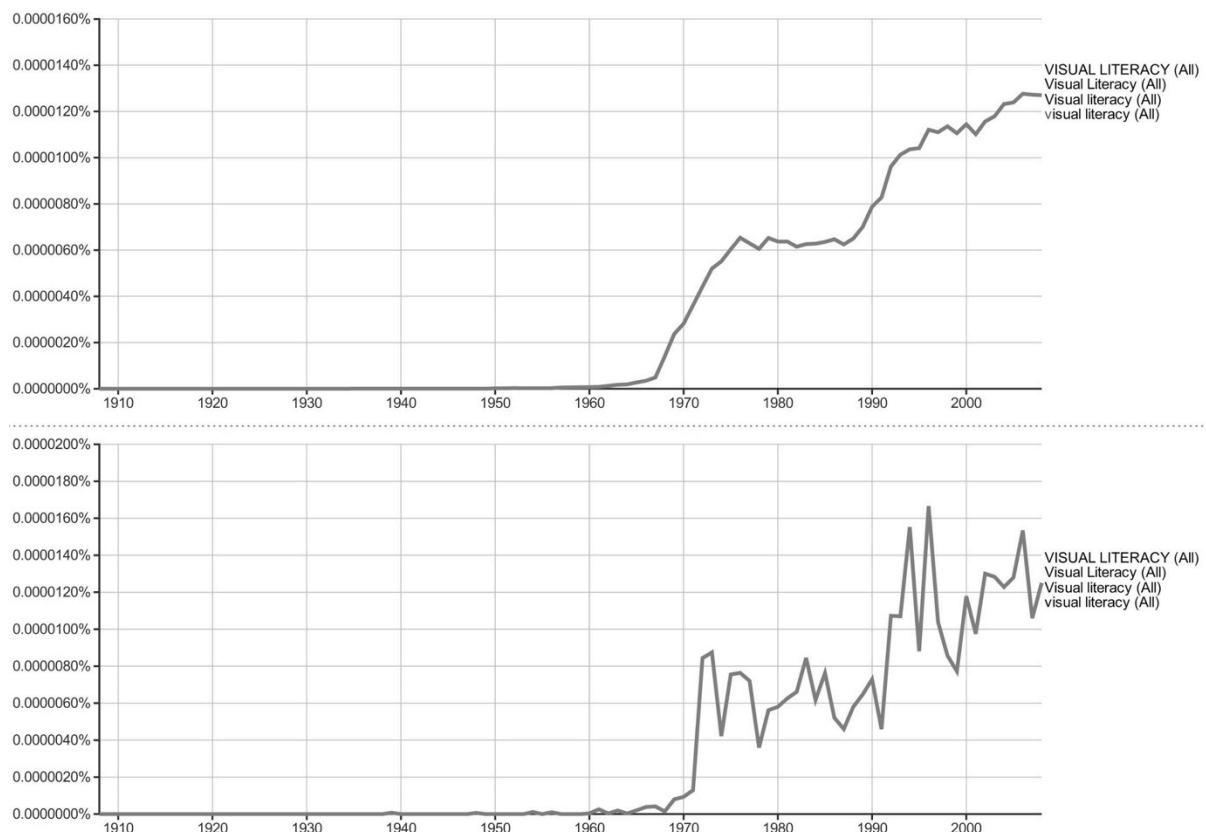
**Figure 2.5 Results of the search for *visual literacy* in all case variations (*VISUAL LITERACY*, *Visual Literacy*, *Visual literacy*, and *visual literacy*) in English within the time span 1908–2008, with a default ‘smoothing’ (value=3) in GNV, collapsed (top chart) and expanded (bottom chart).**



A second operational factor affecting the heuristic perspective afforded by the “wide-angle” view of the research protocol is the granularity of the line chart. The “smoothing” of the GNV line chart is set at 3 by default, which means the value shown for a particular year has the data of 3 years added onto each end and is then divided by 7 (Google Ngram Viewer

Team, 2013). This feature is particularly helpful when it comes to revealing trends; however, as the focus of this phase of the research was locating documents actually containing these terms, and not determining trends, this default smoothing was not particularly helpful. Thus, I conducted two searches, which generated two graphs: the first, titled “trend chart,” was generated with the smoothing value set to 4; the second, titled “raw chart,” was generated with the smoothing set to 0 (see Figure 2.6). The purpose of establishing these settings for the search behaviour and chart granularity was the identification of trends, one the one hand, and occurrences in which *visual literacy* would have been given at the year scale on the other hand. The latter responded to the assumption that each occurrence of the term in the GNV chart corresponds to at least one document containing the term. It is from this assumption that it was determined there was a lack of occurrences of the term visual literacy in literature digitized for GBS before the set time span 1908–2008.

**Figure 2.6 Results of the search for *visual literacy* and its case variations (*VISUAL LITERACY*, *Visual Literacy*, *Visual literacy*, and *visual literacy*) in English within the time span 1908–2008. The top chart, named “trend chart,” displays the results with a granularity of 4; the bottom chart, named “raw chart,” displays the results with a granularity of 0.**

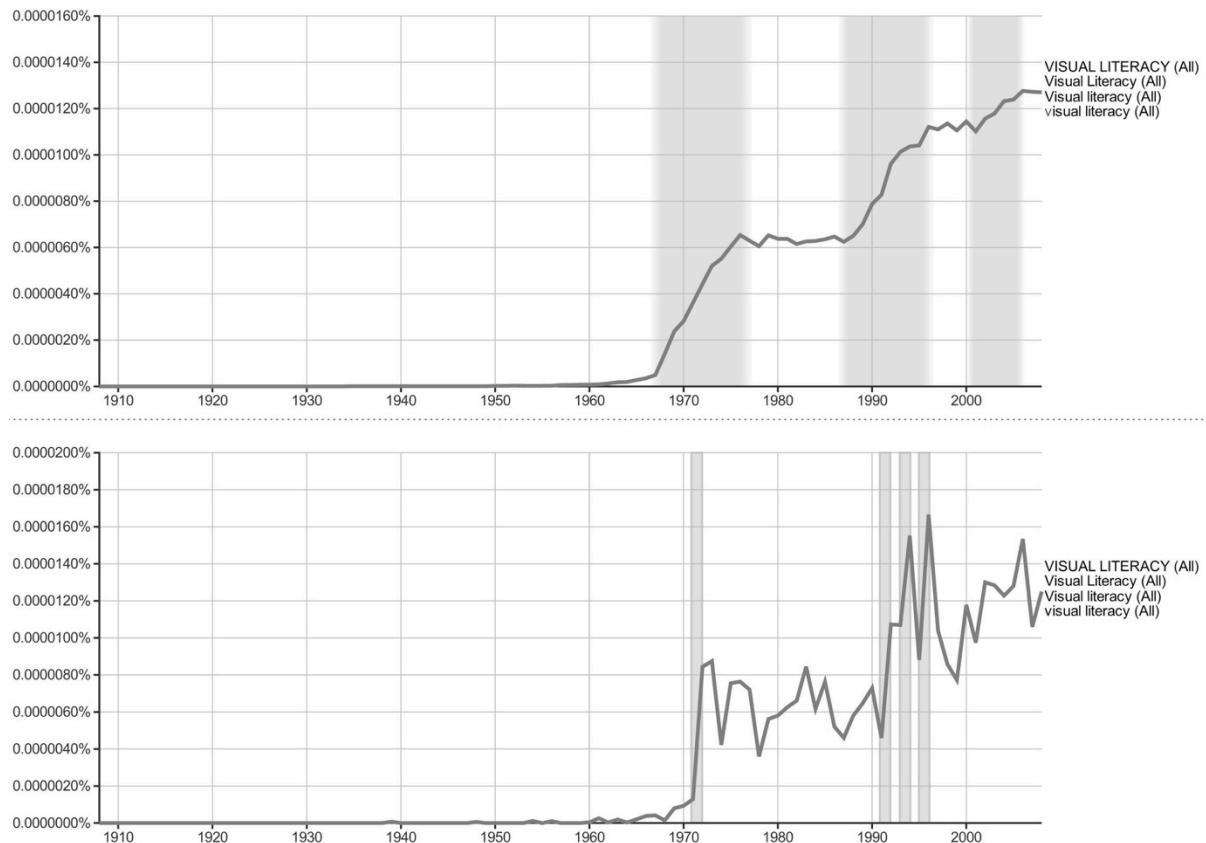


The “wide-angle” view afforded by these line graphs allowed me to find points of interest for further analysis: for example, sudden peaks in the chart indicated isolated occurrences of the term,<sup>5</sup> while the origin points of noticeable climbs indicated an increment in use of the term. As I examined the literature from a distance (Moretti, 2000) through the lens of the graphs, such features flagged identifiable events of unknown nature: they were

<sup>5</sup> These spikes in occurrence could correspond to specific behaviours and publishing practices, and can be explained in different ways. For instance, a document containing several occurrences of the term will produce a spike in the line chart for the year in which it was published unless the number of occurrences normalizes for the entire next year, in which case it will show an increment.

“placeholders,” if you will. For instance, the trend line graph in Figure 2.6 shows an explosive increment in occurrences of all variations of the term *visual literacy* in the late 1960s that continues until the mid-1970s, at which point numbers of occurrences stabilize. The next apparent explosive increment occurs in the late 1980s and continues until the next period of relative stability, between the mid-1990s and the early 21<sup>st</sup> century. In the early 21<sup>st</sup> century, another increment in occurrences is evident, apparently continuing at a slower rate than prior explosions of interest, and lasting until approximately 2008 (see Figure 2.7). Prominent peaks in the line graph suggest relevant events in the late sixties, late eighties, and the early 21<sup>st</sup> century that provoked an increment in use of *visual literacy* in the large sample of literature available through GBS. As opposed to the trend graph, the raw graph gives a much sharper set of signals (see Figure 2.7). Besides the isolated occurrences of the term, it is possible to observe spikes in usage between the years 1971–1972 and 1991–1996 (see Figure 2.7). The intermediate years, during which less abrupt increments in the frequency of usage took place, are also valuable landmarks suggesting possible agents that might have caused such increments (see Figure 2.7). In general, the usage of GNV during this initial phase of the research protocol was to develop a rough overview of the usage of the term within the GBS repository of documents. This chronological overview informed directly the second phase of the protocol, the “medium angle” view.

**Figure 2.7. “Placeholders” (grey bands), defined as explosive increments, in the occurrences of *visual literacy* in both the “trend chart” (top) and “raw chart” (bottom).**



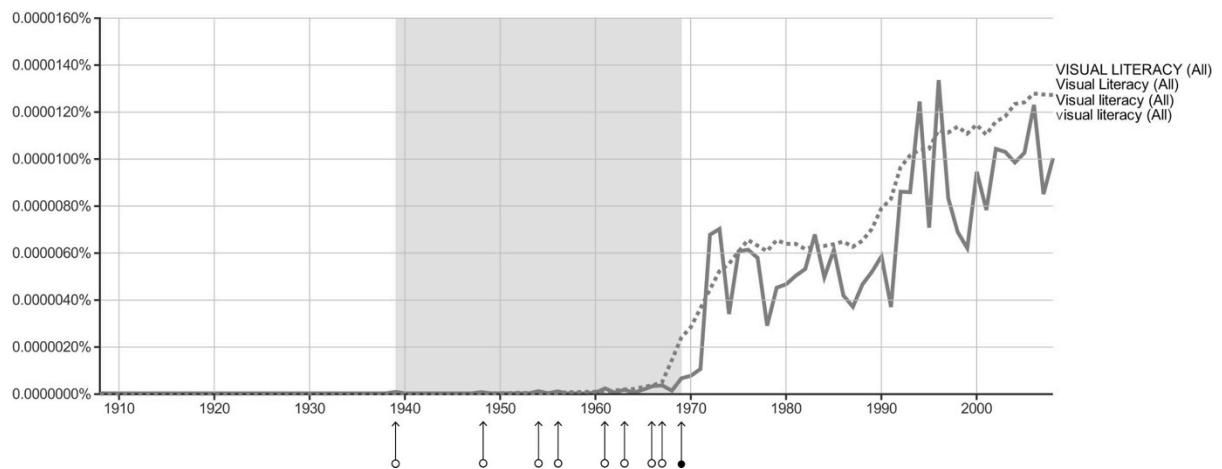
#### 2.4.2 A medium-angle view: Interpreting the signals

The next step entailed elucidating the nature of the points of interest or “placeholders.” Some of the placeholders coincided with the year of publication of key documents in Design, Film and Media Studies and Literacy Education, documents that were already familiar to me given my background in Design (i.e., Dondis, 1973; Messaris, 1994; New London Group, 1996). This led me to consider the possibility that the rest of the placeholders, both isolated occurrences and sudden increments, might also relate to documents worth evaluating as source material. This assumption proved to be mostly

accurate. Moreover, as the general goal was to create a complete landscape of the mobilization of *visual literacy*, my aim was to “fill the blanks” by investigating occurrences or “placeholders” that did not fit presumptions or previous knowledge or were not reported in commonly referenced literature.

Eventually, I devised a method of finding at least one relevant document for each “placeholder.” This consisted of using the GNV built-in search tools to isolate and explore each year individually. Both the trend and raw charts mentioned earlier, on first examination and viewed without magnification, indicated the first occurrence of *visual literacy* was not in year of its alleged coinage (1969), as I expected, but two to three years before. This result was not a mere artifact of the smoothing process in the trend chart, since the same phenomenon was found in the raw chart. Noticeable on closer examination was the apparition of sporadic and barely visible peaks in the raw chart spread out for approximately thirty years before the same date. Based on the assumption that every occurrence of a term should be backed up by at least one document available in the GBS repository, the time span for the search was narrowed again to start from the earliest occurrence registered on the line graph, corresponding to the year 1939 (see Figure 2.8).

**Figure 2.8** Various isolated occurrences of *visual literacy* (represented by a white circle [○]) in the 30 years before its alleged coinage in 1969 (represented by a black circle [●]).



Despite the apparent absence of any occurrences of the term prior to approximately 1940 in GNV, a search for *visual literacy* was performed using the KWIC search tool provided by the interface of Google Books (GBS) as a verification measure, with a narrowed temporal range of 1920 and 1940 (such verification also serves to guard against errors or glitches in the visual representation of data through the GNV chart). This new search in GBS returned 14 results, each instance of the term embedded in approximately 160 characters of contextual writing (Spangler, 2013), with an opportunity to obtain more detailed context for each record. (The number of characters of this contextual material has recently increased to up to 230 [Southern, 2017].) All of the contextual fragments provided by Google Books were closely scrutinized. Of the 14 documents, 10 were false leads. Three revealed a discrepancy between the actual year of publication and the records held by the digital repository. (One of these documents in fact corresponded to a familiar reference: Dondis [1973]. A much later year of actual publication was identified in the colophons of the other two scanned documents.) The remaining document was consistent with the date of the record and

displayed an excerpt of text that contained the term *visual literacy* used in a way consistent with the definition of the term employed in this study. This finding was key, and is discussed in greater detail in Chapter 3.

I then narrowed the temporal search parameters to the year 1939, the year of the earliest occurrence of the term according to GNV. This search produced 4 results. As before, however, there were inconsistencies between publication dates in the GBS metadata and actual publication dates—presumably human input errors. Only the document alluded to earlier proved to be a true match for the search. As before, there were operative considerations that had to be taken into account to prevent misleading results. GBS allows for phrase searching using quotation marks to delimit search text (Rahul, 2013). A phrase search for “visual literacy” yields a different number of occurrences in GBS; however, it does not guarantee more reliable results. For example, it does not flag phrases such as “visual as a literacy” or “visual illiteracy.” As well, the collocation of “visual” and “literacy” in such order may occur within a phrase when these two terms are not part of a semantic unit (e.g., ...because linguistic signs are *visual, literacy* is a skill that...). Moreover, even if the results displayed in the raw chart were completely reliable in terms of identifying the occurrences, the temporal metadata of Google Books, as we have seen, is not reliable. To overcome all these potential sources of error, it was necessary to verify each document both individually through Google Books Search and other databases such as WorldCat and UBC library.

#### **2.4.3 A close-up view**

The results of the above search protocols revealed the earliest record of *visual literacy* in the Google Books corpus occurs in 1939, within a document titled *The Art Museum and the Secondary School* by Robert Tyler Davis. It was impossible to access to the document

locally. WorldCat database identified a physical copy of the document in New York's Albright Art Gallery, which I obtained through the interlibrary loan service of the University of British Columbia. In this document, the phrase *Visual literacy* refers to a literacy of the visual in the realms of the United States art education movement of the 1930s and the late 1940s. Using WorldCat, along with other UBC databases and electronic collections, I was able to obtain copies of subsequent documents, and to explore the potential connections between them. This phase entailed close reading, with the information provided from earlier stages of the search protocol guiding the reading. At times close reading supported my expectations; other times the term emerged abruptly in an unexpected context.

In all, I undertook close reading of around 2400 documents. This provided the historical circumstances and disciplinary contexts of occurrences of *visual literacy*. It also allowed me to generate a curated final list of 330 key documents necessary to understand the mobilization of the term without argumentative redundancy. Close reading of such documents enabled me to, for example, infer the role of events like the popularization of the television, or the passage into law of the National Defense Education Act (United States Office of Education, 1958), in the mobilization of visual literacy and adoption of the concept between disciplinary fields. A detailed account of these events is represented in Chapter 3.

## **Chapter 3: A Map of Visual Literacy**

In this chapter, I tell of the mobilization of *visual literacy* from 1939 to 2008. To situate my discussion of the mobilization of the term, I first provide: 1) an overview of visual literacy definitions since 1969; 2) a summary of key terms related to knowledge mobilization; 3) and a comment on the challenge of defining disciplines. The remainder of the chapter follows the thread of visual literacy through the last century, as revealed by the detailed research described in Chapter 2. I should stipulate that this chapter is only my first attempt at telling this complex story. Chapter 5, based on a different approach to data analysis, offers a second perspective.

### **3.1 Defining visual literacy**

In *A Primer of Visual Literacy*, Dondis (1973) states: “The major pitfall in developing an approach to visual literacy is trying to overdefine it” (p. 9). Notwithstanding, since 1973 many definitions have emerged, most commonly found in texts devoted, at least partially, to recording attempts to define the term (e.g., Avgerinou & Ericson, 1997; Hortin, 1980; Serafini, 2017). Such texts affirm that consensus about the definition of the term is not and never has been present. As Serafini (2017) summarizes, “Like the concept of *literacy* in general, there is little consensus concerning a single definition of *visual literacy*.” (p. n.p.). Earlier, Avgerinou and Ericson, (1997) tried to offer an explanation for the lack of a single definition – that of the interdisciplinary mobilization of the term:

Understandably, the coexistence of so many disciplines underlying the concept of VL is a major problem in attempting a definition. The determination of the relations of VL with the theory and practical applications of all those areas has proved to be extremely difficult. Even though their research findings might be

supportive, they eventually lead to confusion, since in many cases they have been contradictory. (Avgerinou & Ericson, 1997, p. 283)

In spite of the challenges described above, there have been conscious attempts to create consensus around the definition of the term. Hortin (1980) reports on a questionnaire given to delegates attending to the Lake Okoboji Educational Media Leadership Conference, titled “Visual Literacy—The Last Word” (Cureton & Cochran, 1976), in which the attendees responded to the following question: “what does the term visual literacy means to you” (p. 102). Ironically, the outcome of this exercise was sixty-two different definitions (Hortin, 1980, p. 291). Ten years later, Baca (1990) conducted an extensive study to gather views on visual literacy and also to work toward a unified view among the participants, all of whom were part of the Visual Literacy Association. This exercise resulted in an extensive list of constructs, but no definitive definition. Table 3.1 gives a sense of some ways in which visual literacy has been defined historically.

**Table 3.1 Definitions of visual literacy from 1969 to 2012**

Definition	Author and discipline
Visual literacy refers to 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, and 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 master-works of visual communication.	Debes, 1969, p. 27 Discipline: Technology, Audio-Visual Materials, and New Educational Media
Visual literacy allows the visual literate . . . when viewing a man going around a corner in a film, not to feel at all compelled to peek behind	Hammet & Illick, 1971, p. 262 Discipline: Education

<b>Definition</b>	<b>Author and discipline</b>
the screen to see where the man on the film has gone.	
An animal is a visual literate, I suppose, to the extent that its actions seem logically to follow from the available visual stimuli. [...] Visual literacy primarily involves the study of perception related to meaning and action.	Fillion, 1973, p. 308-9 Discipline: Education
Literacy means that a group shares the assigned meaning of a common body of information. Visual literacy must operate somewhat within the same boundaries.	Dondis, 1973, p. x Discipline: Design
Visual literacy can be defined as a group of skills which enable an individual to understand and use visuals for intentionally communicating with others.	Ausburn & Ausburn, 1978, p. 291 Discipline: Technology, Audio-Visual Materials, and New Educational Media
Visual literacy itself is defined as the active reconstruction of past experiences with incoming visual information to obtain meaning.	Sinatra, 1986, p. 5 Discipline: Literacy Education
Visual literacy is the ability to understand the communication of a visual statement in any medium and the ability to express oneself with at least one visual discipline. It entails the ability to: understand the subject matter and meaning within the context of the culture that produced the work, analyse the syntax—compositional and stylistic principles of the work, evaluate the disciplinary and aesthetic merits of the work, and grasp intuitively the Gestalt, the interactive and synergistic quality of the work.	Curtiss, 1987, p. 3 Discipline: Art Education
Visual literacy may be defined very simply as knowing what to do in front of an object that is made or displayed "just to be looked at," the most common function of works of art in this culture.	Rice, 1989, p. 95 Discipline: Art and Museum Education
Fluency in visual media is now routinely referred to as "visual literacy"	Messaris, 2012, p. 104 Discipline: Film Studies
Visual literacy has thus been established as a strategy that can be used to decode, interpret, and understand the visual world, much like a written or oral text.	Beier, 2013, p. 37 Discipline: Art Education

In one of the most comprehensive attempts to articulate the definition of *visual literacy*, the Association of College and Research Libraries (ACRL) offer both a definition—“a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media” (ACRL Board of Directors, 2011)—and a set of standards, performance indicators, and learning outcomes for Higher Education. The seven standards and performance indicators from the ACRL are listed below (see Table 3.2).

**Table 3.2 Visual literacy standards and performance indicators for Higher Education, Association of College and Research Libraries (ACRL Board of Directors, 2011)**

Standard Number	Description	Performance Indicators
One	The visually literate student determines the nature and extent of the visual materials needed.	<ol style="list-style-type: none"> <li>1. The visually literate student defines and articulates the need for an image.</li> <li>2. The visually literate student identifies a variety of image sources, materials, and types.</li> </ol>
Two	The visually literate student finds and accesses needed images and visual media effectively and efficiently.	<ol style="list-style-type: none"> <li>1. The visually literate student selects the most appropriate sources and retrieval systems for finding and accessing needed images and visual media.</li> <li>2. The visually literate student conducts effective image searches.</li> <li>3. The visually literate student acquires and organizes images and source information.</li> </ol>
Three	The visually literate student interprets and analyzes the meanings of images and visual media.	<ol style="list-style-type: none"> <li>1. The visually literate student identifies information relevant to an image’s meaning.</li> <li>2. The visually literate student situates an image in its cultural, social, and historical contexts.</li> <li>3. The visually literate student identifies the physical, technical, and design components of an image.</li> <li>4. The visually literate student validates interpretation and analysis of images through discourse with others.</li> </ol>
Four	The visually literate student evaluates images and their sources.	<ol style="list-style-type: none"> <li>1. The visually literate student evaluates the effectiveness and reliability of images as visual communications.</li> <li>2. The visually literate student evaluates the aesthetic and technical characteristics of images.</li> <li>3. The visually literate student evaluates textual information accompanying images.</li> </ol>

<b>Standard Number</b>	<b>Description</b>	<b>Performance Indicators</b>
		4. The visually literate student makes judgments about the reliability and accuracy of image sources.
Five	The visually literate student uses images and visual media effectively.	1. The visually literate student uses images effectively for different purposes. 2. The visually literate student uses technology effectively to work with images. 3. The visually literate student uses problem solving, creativity, and experimentation to incorporate images into scholarly projects. 4. The visually literate student communicates effectively with and about images.
Six	The visually literate student designs and creates meaningful images and visual media.	1. The visually literate student produces visual materials for a range of projects and scholarly uses. 2. The visually literate student uses design strategies and creativity in image and visual media production. 3. The visually literate student uses a variety of tools and technologies to produce images and visual media. 4. The visually literate student evaluates personally created visual products.
Seven	The visually literate student understands many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically.	1. The visually literate student understands many of the ethical, legal, social, and economic issues surrounding images and visual media. 2. The visually literate student follows ethical and legal best practices when accessing, using, and creating images. 3. The visually literate student cites images and visual media in papers, presentations, and projects.

### 3.2 Knowledge mobilization: Principles and key terms

The framework of Knowledge Mobilization (Cooper, 2012; Levin, 2008) will inform the discussion in the remainder of this chapter about the ways and contexts in which visual literacy has been articulated through the past roughly 80 years. Knowledge Mobilization

deals with the transmission of knowledge in a fairly abstract and open-ended way, but provides at least a figure to define the participation of particular agents in the mobilization of ideas or concepts. These agents are “mediators,” individuals or organizations that mediate between parties involved in the implementation of processes and strategies of knowledge mobilization. Such organisations or individuals are known by different names depending on the field of study. In the particular case of education, besides “mediator,” these names include “knowledge broker” or “education broker.”

The focus of this research is on events and individuals that could have taken part in the mobilization of visual literacy and its correlates across different fields, and thus the figure of “mediator” is crucial for describing the evolution of these concepts. In addition to mediators, I considered more specific and delimited units of study that would help me navigate the historical evolution of understandings around the concept over time and between disciplines. These units are explained below.

For the purposes of this research, a “Knowledge Token” is a unit of analysis that refers to specific concepts, ideas or constructs that could be investigated and traced individually. In the work presented here, “visual literacy” and its correlates (e.g., “graphical literacy” and “graphicacy”) would be Knowledge Tokens. A “Mobilization Stream” could be defined as the projection of a field of study through time. Even if it were possible to talk about particular historical moments in the development of a stream, these are not necessarily static and can change and evolve depending on particular circumstances. Mobilization Streams describe the displacement of a Knowledge Token over time between fields of study due to the action of a particular agent or mediator, or the influence of a particular historical event. A “Mobilization Trigger” is an event or an influential action that prompts the

mobilization of a Knowledge Token between or within fields of study: for example, an historical event or the publication of a relevant document. In this context, an historical event is an occurrence that sets in motion the adoption of a Knowledge Token in the realms of a different discipline. For example, television mobilized “visual literacy” from museum education to media studies. In this study, there were occasional overlaps between mediators and triggers (e.g., in the case of a particular individual organizing an event); in such instances, the figure of the mediator was privileged because events were observed to refer to the actions of the mediators (see Figure 3.9 for map of all mobilization streams).

### **3.3 Defining disciplines**

The description of the evolution and mobilization of visual literacy and its correlates articulated below uses “academic discipline” as an organizing element. That is to say, section headings reflect the discipline in which each usage was championed, starting with the field that hosted the first documented occurrence of “visual literacy” within the full-text databases I searched. I acknowledge that defining disciplinary boundaries is always challenging, for the concept of “academic discipline” is not straightforward (Becher, 1989). Cohen and Lloyd (2014) define discipline “as academic studies that focus on a self-imposed limited field of knowledge” (p. 189), but they also acknowledge that limits can be set in relation to investigation, research methods or epistemologies. Moreover, fields of knowledge are not static; they change constantly in response to various factors and some argue this trend has increased in recent times. As Turner (2006) points out:

Disciplinary boundaries in modern systems of knowledge and information are changing rapidly under the impact of new information technologies, the

postmodernization of culture, and above all the changing relationship between the university, the national culture and the nation-state. (p. 184).

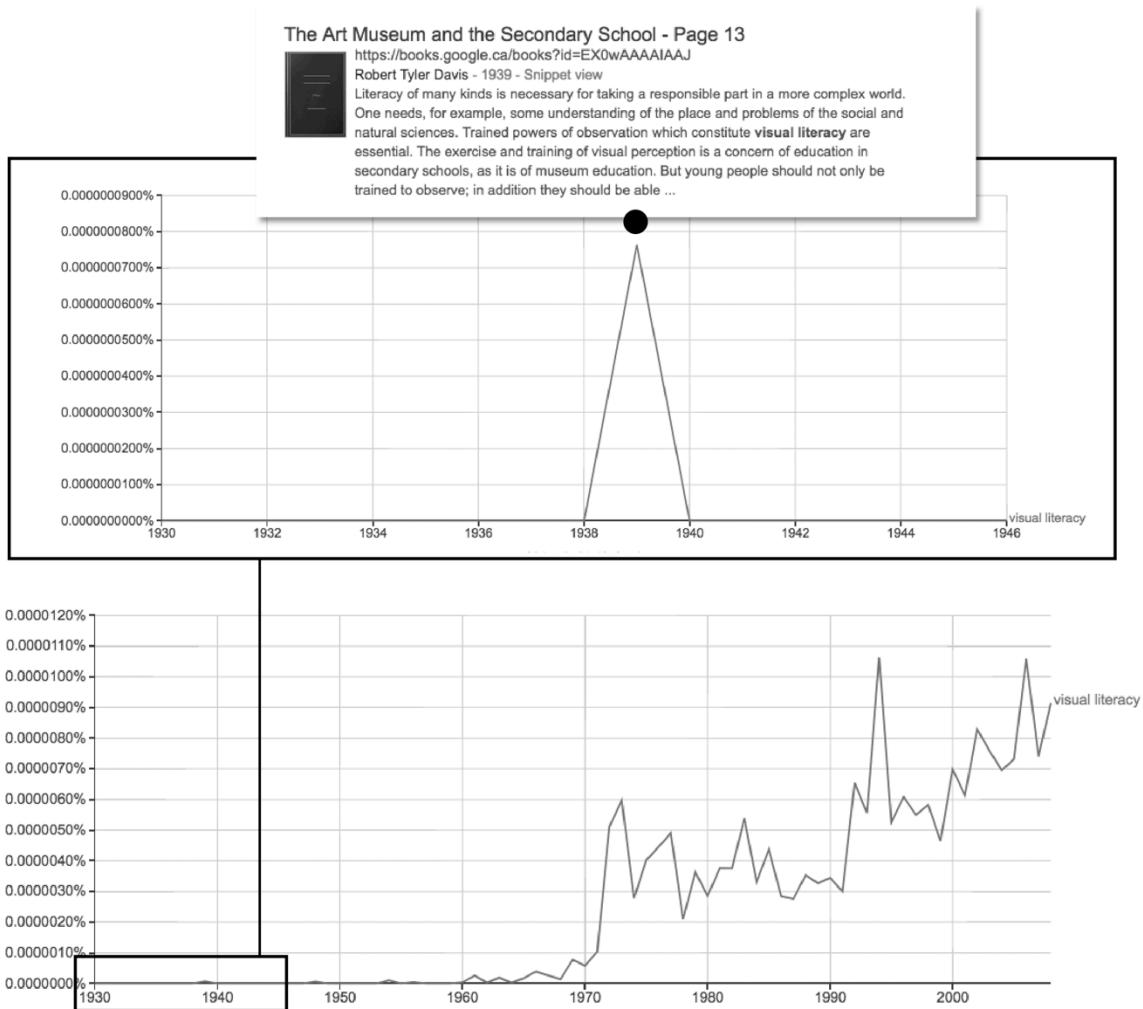
Moreover, many scholars have acknowledged a need to embrace interdisciplinary approaches in order to effectively tackle critical current issues, a call that has been enthusiastically taken up by newcomers to academia (Golde & Dore, 2001). The emergence of interdisciplinary scholarship should have pushed universities to try to make their disciplinary structures more flexible; however, universities appear to be slow in adapting to this kind of scholarship (Borrego & Newswander, 2011). The tension between emerging interdisciplinary scholars and rigid departmental structures within academic institutions has an impact on the way disciplines are understood. For instance, scholars like Gazzaniga (1998) have gone as far as to say that “The modern university is partitioned along academic lines that no longer truly reflect today's intellectual life. These academic groupings are now just categories that accountants and business managers use to build a budget” (p.237).

Despite of all this, I did attempt to track discipline in this research. Often, I had to infer the disciplinary boundaries within which scholars and documents existed from the available resources, including self-identification of the author, journal indexing and academic department. It is worth noting that some disciplinary boundaries were easier to define than others, particularly in the first 40 years of research I reviewed (e.g., up to the 1980s). The relative cohesiveness of the disciplines, however, began to erode through the latter portion of the 20<sup>th</sup> century, making it increasingly difficult to relegate documents and authors to single fields. Nevertheless, I feel these suggested disciplinary boundaries, difficult as they are to define, give an important frame to the development of visual literacy. It is important to note that the examination of the mobilization of visual literacy within the disciplines described

here does not reflect the overall impact that this concept has had in any particular discipline. That is, there are cases of disciplines such as Film Studies or Graphic Design in which the concept of visual literacy is pertinent to virtually every aspect of scholarship and teaching because visual communication is the object of study. Alternatively, in Art Education or Literacy Education, visual literacy is only one aspect of scholarship and teaching. Art, for example, cannot be reduced to visual-driven reading and interpretive practices; rather, art takes many forms: literary, musical, and so on.

### 3.4 Art and Museum Education

**Figure 3.1 First occurrence of *visual literacy* recorded in GNV and its corresponding document in GBS. The bottom section of the graph locates the term over the full span of the timeline between 1930 and 2008. The top part of the graph zooms into a 9-year range of the search results and displays the preview snippet of a key document in GBS.**



The exhaustive search described in Chapter 2 revealed the earliest explicit appearance of the term visual literacy occurs within the field of Museum Education in a publication titled *The Art Museum and the Secondary School* (Davis, 1939). This document is a report on the findings of research commissioned by the General Education Board, an institution funded by John D. Rockefeller that operated between its foundation in 1903 and closure in 1964 (Rockefeller Archive Center, n.d.). In *The Art Museum and the Secondary School*, Davis

(1939) described the general scenario of museums in United States in the late 1930s and detailed the functions that museums ought to have. He reflected on the duty that society imposes on secondary schools in mentoring young people to fit into society, and lamented the fact that the potential of museums as tools for assisting in this process was not being seized.

Among many other contentions in this document, Davis (1939) asserts the need to expand the boundaries of schooling beyond “mere” linguistic skills, and calls for different sorts of literacies, visual literacy among them:

Mere reading and writing are no longer sufficient. Literacy of many kinds is necessary for taking a responsible part in a more complex world ... Trained powers of observation which constitute visual literacy are essential. The exercise and training of visual perception is a concern of education in secondary schools, as it is of museum education. (Davis, 1939, p. 13)

Davis went further, declaring that visual literacy should enhance students critical abilities, and that training young people to observe is not enough: “they should be able to use those observations independently, to develop a personal scale of values and to use their powers of observation constructively” (p. 13).

*The Art Museum and the Secondary School* appears to be an obscure work. The content of the document was not further published, and apparently it garnered little attention, possibly because World War II deflected people’s interests. After WWII, discussions related to visual literacy re-emerged in the field of educational technology (e.g., Allen, 1956). Such discussions attended to the implications of television and its possible implementation in classrooms. This movement emerged as a precursor to Dondis’ later usage of visual literacy

in the context of Design. It is impossible to say why museum educators did not take up the work of Davis nearer 1939. Perhaps WWII prevented him from becoming a prominent mediator for visual literacy, and his pamphlet from becoming a recognized as a mobilization trigger of the term and concept. Possibly other factors played a role, such as the visibility of the publication within and beyond the field of Museum Education due to the genre (report), form (pamphlet). It seems likely that Davis (1939), in making his claims about the value of museums as learning spaces, drew on Dewey's well-known theoretical approaches to art and education, particularly from *Art as Experience* (Dewey, 1934). However, it is impossible to confirm this using documentary evidence alone, because Davis provides almost no references. Beyond the influence that Dewey's ideas might have had on Davis's document, and even though the art education movement had many advocates, it is fair to say Dewey stands out as a cohesive theoretical force during that period and a highly accomplished mediator. His influence is widespread in the available literature on the art education movement between the 1930s and 1960s, as detailed in many historical accounts of that period (e.g., Belshe, 1946; Hastie, 1965; Kaufman, 1966; Keel, 1963; NSSE, 1941).

Davis' document is contextualized as part of the emergence of a "vigorous art-education movement" (Keel, 1965, p. 35) during the 1930s and 40s in the United States that witnessed the development of several projects aimed at introducing art-based curriculum in formal education. Some of these projects addressed visual art (only a part of an array of modes involved in art education) and some promoted the use of museums as pedagogical tools. In regards to the latter, the Owatonna Art Project (Belshe, 1946; Gayne, 1943; Hastie, 1965; Kaufman, 1966; NSSE, 1941; Ziegfeld, 1944) was an initiative that Melvin Haggerty, its main promoter, sought to offer as a resource to enrich citizens' lives during the

Depression (Belshe, 1946; Gayne 1943; Hastie, 1965; Michalowski, 1978; Ziegfeld, 1944).

Although this project was not strictly a visual literacy initiative, it did aim to deepen participants' aesthetic awareness in relation to their immediate everyday environments. The curriculum offered to those participating in the project included several practices, among them the making of aesthetic objects and the staging of a "class museum" (Gayne, 1943, p. 21).

Shortly before Davis' article, and extending after it for twenty-five years, other events and initiatives emerged, such as the Eight-Year Study conducted between 1932 and 1940 by the Progressive Education Association (PEA) and funded by the Rockefeller Foundation, the General Education Board, and the Carnegie Corporation of New York (Bullough Jr., Kridel, & Goodlad, 2007; "Educational News and Events," 1942; Plummer, 1969; Watras, 2006; "What Did the Eight-Year Study Reveal?" 1942). The theoretical foundations of these and other endeavours date to the early 20<sup>th</sup> century, when systematic theories of art-education began to emerge (Belshe, 1946; Hastie, 1965; Keel, 1963).

World War II and the continuing popularization of television in the United States directed the interest of the education community towards technology, making it a *de facto* mobilization trigger. The arrival of television was received by some scholars in the realms of art education as a promising event, from the moment of the first massive telecast in April of 1939. For instance, in "Television: A New Means of Art Education," Grier (1941) observes: "The combination of aural and visual material in television has the advantage of provoking in the audience a concentration of attention closely parallel to that of an actual gallery visit" (p.10). Television was also described as the "new miracle in mass communication" (NSSE, 1941, p. 169). Unfortunately, the spark of new research this event might have initiated was

eclipsed shortly thereafter by the participation of the United States in World War II. This event impacted art education by reducing the funding of scholars and institutions, and caused a notable setback in research (Munro, 1946). After the war, in 1947, the National Art Education Association was founded (NAEA, 2013). This organization sought to keep the voice of the art education movement alive through the first publication of the journals *Art Education* in 1948 and *Studies in Art Education* in 1959, respectively.

Despite the apparent initial excitement about the potential of television as a teaching resource, the new technology found some resistance in the realms of Art Education. Arguably, this resistance was a shared problem between the producers of the so-called “new educational media” (Allen, 1959, p. 53) and some art educators. This view is reflected in the following two quotations:

In the early days of its introduction as an instructional medium, TV was hailed by its advocates as the greatest contributor to mass education since the invention of movable type. That it has not received wider acceptance and use in classrooms, in particular in Art Education, is due to various factors. The fault lies both with those who have been the producers of educational television and the receiving teachers who are resistant to change and hesitant about allowing any intrusion into the art room. (Schwartz, 1966, p. 22)

The newest and perhaps most exciting developments in media, however, do not seem to have made the impression on art education which they have already made on many other curriculum areas. Specifically, programmed instruction, television and computer-assisted learning are rarely, if at all, considered in our literature or adapted to our classrooms. (Lanier, 1966, p. 5)

It is easy to see why, in consequence of the reluctance of some members of the Art Education community to adopt new technology, discussions surrounding the participation of new media in the development of visual literacy became rare and sporadic. Such a relative detachment from the technological aspect of visual literacy might have provoked the first manifestations of the still-prevalent dichotomy in scholarly understandings of visual literacy. This dichotomy splits visual literacy into either: (1) a personal, contextual and fundamentally semiotic activity that manifests in several aspects of an individual's life; or (2), a teachable skill necessary for mastering a visual conventional language, a "vocabulary" of visuals—a *visua-bulary*, if you will.

An interesting statement about the first understanding of visual literacy can be found in *Vision in Art in People to People* (Johnson, Johnson, Stoops, Mattil, & Freundlich, 1963):

visual literacy [is] a capacity for discerning and responding to visual aspects of things we see about us ... Visual literacy is not a mechanical recording of elements; it is an understanding of what we observe in relationship to things previously observed (p.10)

In this document, the authors acknowledge the other half of the dichotomy—the "visual literacy as a skill" understanding of the concept—but rename it and refer to it as "practical vision": "[the] Mastery of skilled, rapid, *practical vision*," they write, "has little or nothing to do with visual literacy in art" (p. 15 emphasis added).

Besides the popularization of television, the passing into law of the National Defense Education Act (NDEA hereafter) in 1958 (Flemming, 1960; Norberg, 1958) also seems a decisive mobilization trigger for the concept of visual literacy between the fields of Art Education and New Educational Media. After the NDEA was passed, visual literacy started

again to be a matter of study in Art Education (e.g., Barkan, Ziegfeld, McFee, Kuhn, Jefferson, & Lanier, 1965; Lewis, 1965; Schwartz, 1966), with some theoretical crossovers from New Educational Media. It also seems, after the inception of the Visual Literacy Movement in New Educational Media in 1969 (discussed below), the understanding of visual literacy as a teachable skill prevailed over visual literacy as a personal semiotic activity. It is likely that, in the years that followed, some art educators who were invested in the topic aligned their understandings with the mainstream definition of “visual literacy” being established by researchers working in New Educational Media at the time. This is supported by the publication of several documents during the 1970s on the topic of visual literacy (e.g., Ladevich, 1974). A review of the literature supports the hypothesis that the first recorded definition of visual literacy (Davis, 1939) according to my literature review not only remained unknown to scholars interested in the visual aspects of Art Education—the field in which it had occurred—but that within both fields it was thought the term was coined and first theorized by scholars in New Educational Media (i.e., Rice, 1989). The changing frequency of occurrence of *visual literacy* in the GNV (see Chapter 2) during the 1980s reflects a trend of diminishing interest in visual literacy during this period, in comparison to the previous 10 years.

At the beginning of this period, there was already at least one publication declaring the “fall of visual literacy as a priority among the English teaching profession” (O’Rourke, 1981, p. 72). O’Rourke also denounced the lack of change in teaching practices in classrooms for this particular skill. In recent years, Elkins (2003) has revived interest in the concept of visual literacy in Art Education, although he uses the term “visual studies.” Elkins’ take on visual literacy is positioned within a larger discussion of Visual Culture as a

new field of study for scholars in Art Education. His project is to approach cultural studies from a visual-oriented perspective, not making any serious attempts to redefine “visual literacy” but instead reviewing the concept from many theoretical and historical points of view. The goal of Elkins (2008) is to critique the meaning of the word *literacy* in “visual literacy,” an effort that he followed up in a later work. For the purposes of this study, I do not consider Elkins to play the role of a mediator of visual literacy, nor his work to date to be a mobilization stream *per se*. Rather, Elkins provides a helpful overview of some mobilization streams discussed above that are particularly important to an understanding of the concept of visual literacy.

### **3.5 Technology, Audio-Visual Materials, and New Educational Media**

As noted earlier, the mobilization of “visual literacy” occurs concurrently in several disciplines through the mid part of the 20<sup>th</sup> Century and beyond, and I have therefore organized this initial review of literature along disciplinary lines. In this section, I discuss the emergence of a second mobilization stream, possibly spawned from Art Education, within the emerging field of New Educational Media. This stream gathers momentum after World War II (see Figure 3.9).

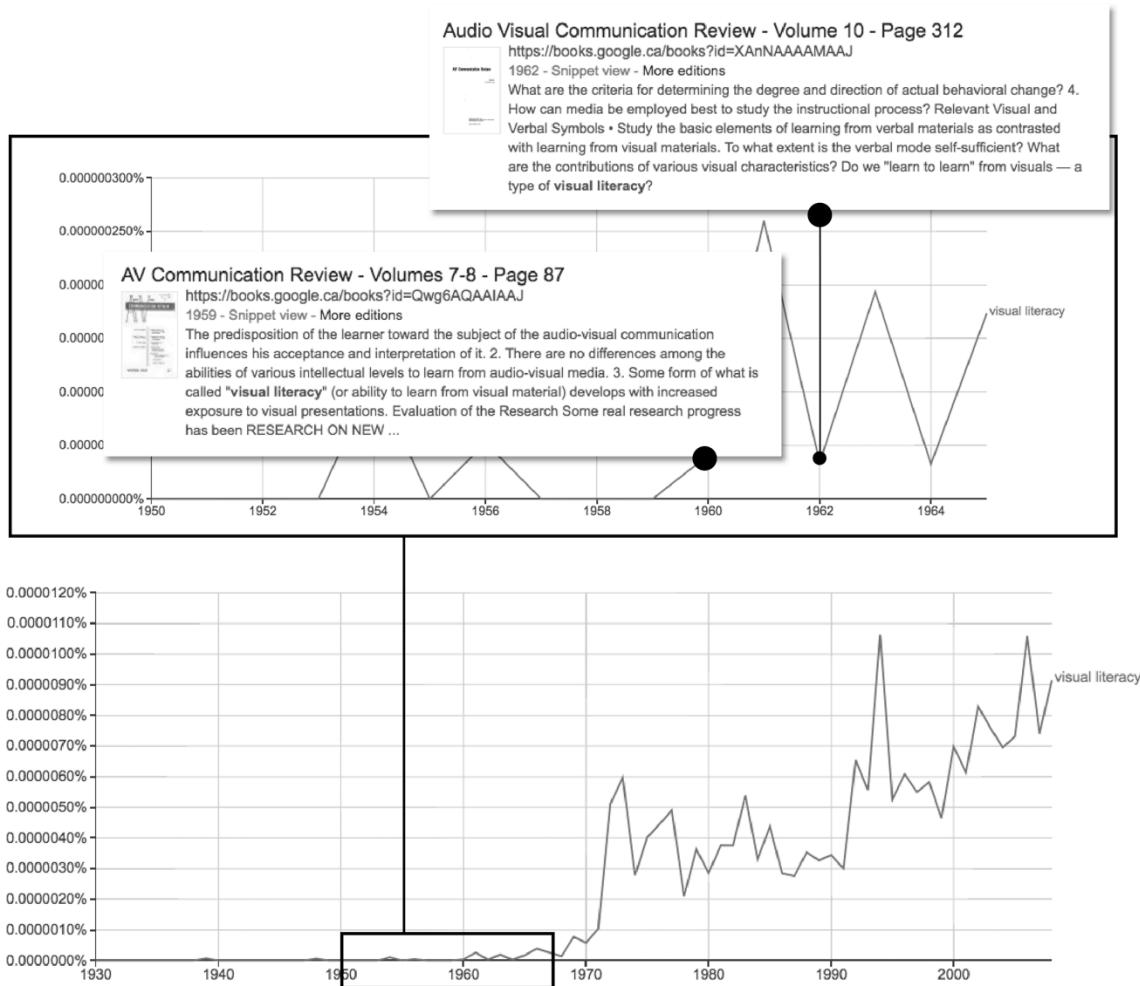
It seems reasonable to assert the development of audio-visual materials with educational purposes is rooted in the technological development of cinema itself. The first occurrences of “audio-visual” as a standalone term appear in the early 1930s, coinciding with the development of major advancements in recording practices and technologies, as well as the full adoption of sound-on-film systems by every major filming company (Bordwell, 1985). However, the spread of the term and the first efforts to develop audio-visual media with educational aims occurred with the popularization of television after the end of World

War II. These two major events were triggers for the mobilization of visual literacy from Art Education into what was interchangeably known as “Audio-Visual Materials” and “New Educational Media,” which included “motion picture films, television, filmstrips, slides, pictorial illustrations, radio, recordings, graphic materials, three dimensional objects, individual teaching machines, stereographs, and field trips into the community” (Allen, 1959, p. 83).

Another historical event that provided a mobilization trigger occurred in 1957 when, within the political and military tensions of the Cold War, the former Soviet Union launched the *Sputnik I* satellite, provoking an immediate reaction from the U.S. government and initiating the “space race” between these two countries. The success of the *Sputnik* launch was viewed in the United States as a political and technological threat, and also as an educational crisis—particularly for sectors like the sciences, mathematics, and other technology-related disciplines. This was the spark that caused the National Defense Education Act (NDEA), legislation designed to support all fields of education that fit the national needs of the moment, to be passed into law in 1958 (Flemming, 1960). Many educational projects and institutions had to reframe their approaches to qualify for NDEA benefits, and thus the passing of this legislation was a crucial trigger for the mobilization of visual literacy within and beyond Art Education, as this concept was seen to support science, mathematics and technology-related topics. Title VII of the NDEA deals specifically with research and experimentation into audio-visual media for educational purposes, a category of the NDEA into which Art Education did not seem to fit (Rice, 1958). Title VII did, however, give an immediate boost to the field of instructional media. From that moment on, “visual literacy” started to be a term of common use in the realms of New Educational Technology,

and was directly associated with audio-visual media in a relatively banal way until the Visual Literacy Movement (described below) provided theoretical grounds for the concept. Definitions of visual literacy in the available literature surrounding New Educational Technology were rare and sparse. For example, in one such document, the concept was defined as “[the] ability to learn from visual material” (Allen, 1959, p. 87), and in another as a way to “... ‘learn to learn’ from visuals” (Meierhenry, 1962, p. 312) (Figure 3.2).

**Figure 3.2 Occurrences of visual literacy in literature after the National Defense Education Act of 1958. The bottom part of the graph provides chronological context offered through GNV; the top part displays the years in which relevant documents were published, according to GBS.**



In this review so far, I have shown examples of the utilization of “visual literacy” in two different disciplines from 1939 onward. However, in much of the literature from the early 1970s, the coinage of the term “visual literacy” is credited to John Debes (Williams & Debes, 1970), who served for a time as coordinator of education projects for the Eastman Kodak Company (e.g., Avgerinou & Ericson, 1997; Baca, 1990; IVLA, 2012; Moore & Dwyer, 1994; Williams & Debes, 1970). Indeed, Debes claimed the term himself (Eastman Kodak Company, 1967; Johnson, 1977), thereby becoming the self-anointed creator of a Knowledge Token that was already in use for at least 30 years. The accreditation to Debes is given even in the case of Art Education literature, the disciplinary context in which the term was first utilized by Davis. It is true that, unlike previous attempts to introduce “visual literacy,” Debes worked to put together an actual theory of the concept. His take on visual literacy drew upon the work of a range of scholars, including the following: C.M. Turbayne (1962), probably the first scholar to theorize on the communicative potential of visual metaphors; J.J. Gibson (1929, 1951, 1954, 1961), one of the most prominent researchers on visual perception; and Rudolph Arnheim (1943, 1969, 1974), the art and film theorist who championed the notion of “visual thinking” in the western world. Arnheim and Gibson are two of the most extensively cited researchers among most of the mobilization streams of visual literacy. Debes also drew on notions of a universal grammar from Noam Chomsky (1957), as well as the work of Charles Carpenter Fries (1952) on “verbal structure.”

However, Debes’ later writings on visual literacy show that these last two points of theory were gradually abandoned. Eventually, Debes’ endeavour started to be recognized as the “Visual Literacy Movement” (Moore & Dwyer, 1994, p. 14). This movement was responsible for many important theoretical contentions, first among these the declaration that

visual language should be placed on par with verbal language (Fransecky & Debes, 1972).

This statement resonates with the contention that there exist multiple *modes* of meaning-making or *languages* by Halliday (1985), and more recently with the multimodal approach to meaning proposed by the New London Group (NLG, 1996), to which I will return later in discussing visual literacy within the field of Literacy Education.

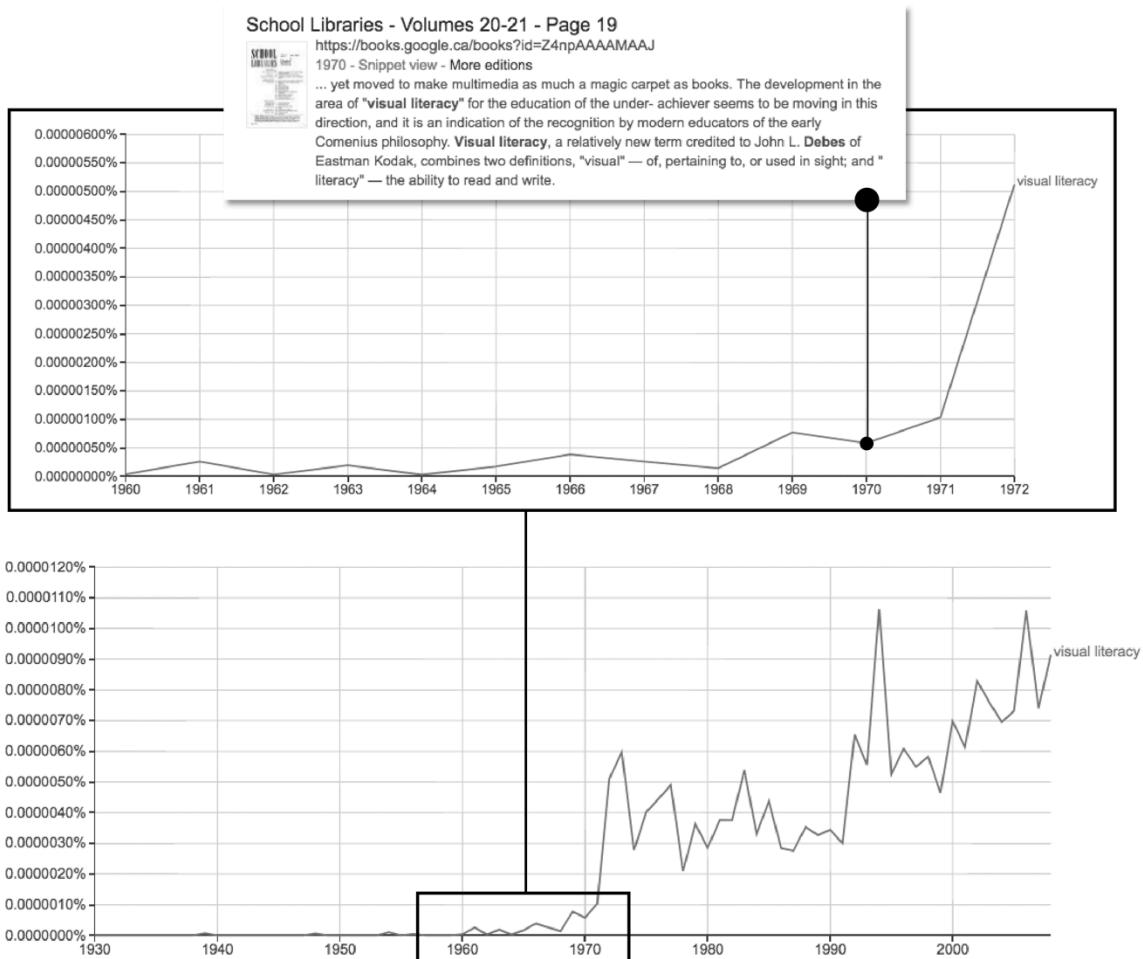
### **3.5.1 Visual Literacy Movement**

The breadth of resources Debes drew on in developing his theory is matched by the extent of its influence on later mobilizations of the concept. Moreover, new media technologies—the photographic camera in particular—played a central role. It is clear that Debes garnered recognition as the founder of the Visual Literacy Movement and was able to promote the concept so successfully in large part because he, unlike scholars who came before him, had the backing of Eastman Kodak and the benefit of Eastman Kodak marketing strategies. Debes' work defined “visual literacy” as a set of visual skills or competencies which allow a visually literate person to “discriminate and interpret the visible actions, objects and symbols” (Fransecky & Debes, 1972, p. 7; see Figure 3.3). He and some of his colleagues proposed and applied a teaching model to develop visual literacy exercises in classrooms with the photographic camera, a tool championed over other visual communication tools (Fransecky & Debes, 1972). Evidently such projects, and the strong promotion of the camera, were part of Eastman Kodak marketing strategies: the writings of Debes and his contemporaries revealed that visual literacy as a concept was cast in the shadow of the Eastman Kodak corporate specter. During the early years of visual literacy-based educational programs, it was thought the spread of photography by itself enabled visual communication on a large scale (e.g., “A Selected Bibliography of Visual Literacy,”

1971; Fransecky & Debes, 1972; Ladevich, 1974; Lanier, 1966). The rationale for the almost *exclusive* use of the photographic camera in education programs—an apparent corporate ploy—was that visual literacy only became possible by having visual technology available on a *mass* scale. As Fransecky and Debes argued in 1972, “the base of mass communication is photographic” (p. 15).

Despite the undeniable potential of the photographic camera as a resource for visual communication, Debes’ decision to promote photographic equipment was clearly influenced by his own insider access to the technology. The later exposure in mainstream education that his theoretical contentions received, and even the credit he was accorded for coining the term itself were directly enabled by his position as a high-rank employee of Eastman Kodak (Debes, 2013). Kodak as a company has played a crucial role in the popularity of the concept of “visual literacy” since perhaps the mid-1960s. By 1966, Kodak was already indirectly championing the concept and term in the United States and Canada by co-funding, along with the Ford Foundation, an initiative called the Visual Communication Education Project, or VICOED (University of Wisconsin, 1966), a program based out of Western Washington University that had the following stated goal: “to train teachers to teach students to express themselves visually” (Deschin, 1966, “To Teach Language of Vision”).

**Figure 3.3 Early mentions of visual literacy in association with Debes and Kodak.**



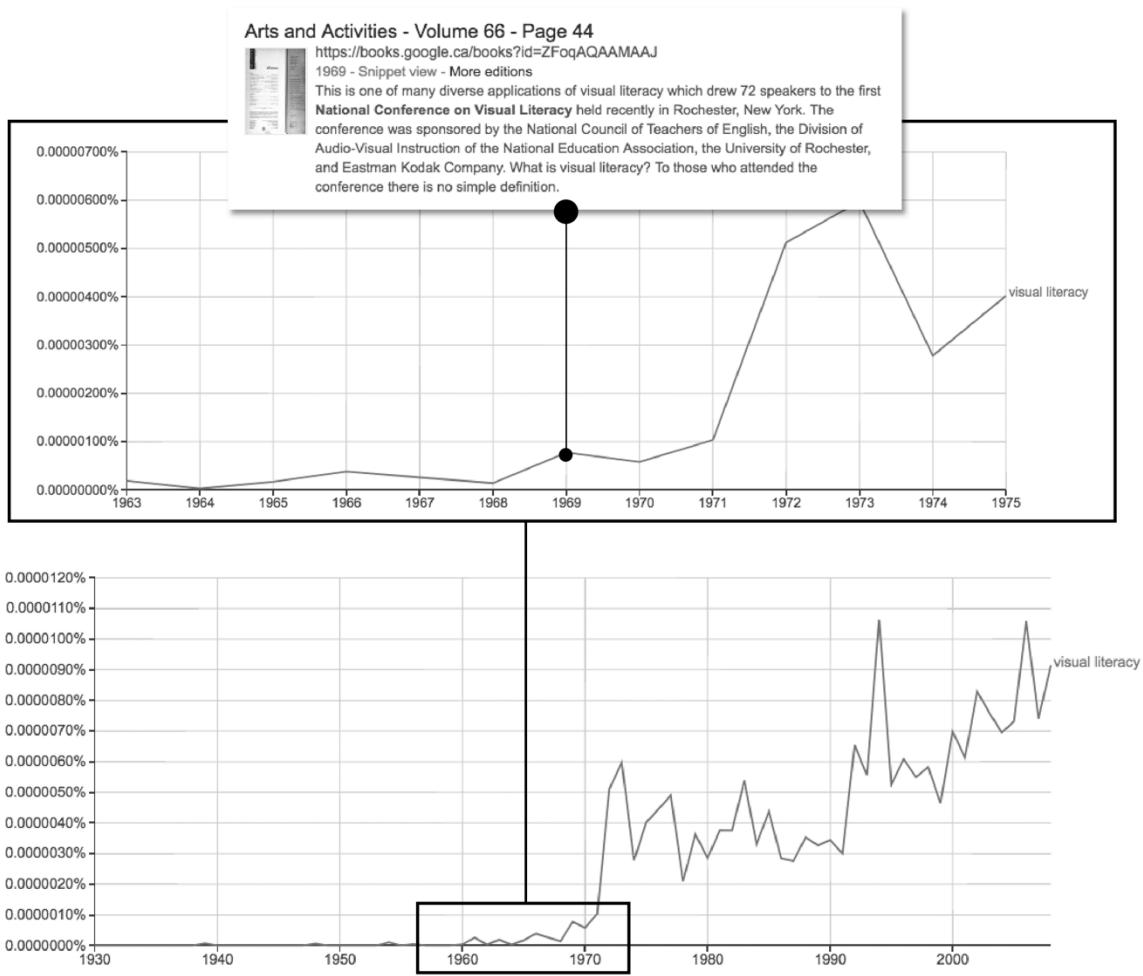
The influence of VICOED in the mobilization of visual literacy and the extent of Kodak's involvement in such an enterprise are not completely clear. Literature suggests that the VICOED initiative was developed and led by graphic artist and professor of the Western Washington University, Ray Schwalm, before any involvement of Kodak. Schwalm was a fairly well known name in graphic arts education and could have taken the role of mediator between Art Education and Graphic Arts or Graphic Design if his participation in VICOED had gained more prominence (e.g., Schwalm & International Graphic Arts Education Association, 1962). A member of the Graphic Communications Education Association

(hereinafter GCEA), Schwalm participated in conferences related to Graphic Arts regularly. In 1965, it appears Schwalm may have published a paper about the funding that Ford Foundation granted to a program on graphic arts education in the first number of the *Visual Communications Journal*, one of the official publications of the GCEA (Schwalm, 1960, 1965). Unfortunately, the journal is out of print and no longer in circulation; moreover, I could not retrieve a copy of the article via inter-library loan and thus could not include it as part of my full-text collection. However, if such an article exists and refers to the VICOED program, it would give further evidence of Schwalm's influence over Kodak's rendition of visual literacy.

Jacob Deschin, The Camera Editor of the *New York Times* in 1966, published a column about the program and its reach in which he makes clear the participation of Kodak in VICOED (Deschin, 1966; "Jacob Deschin, Camera Editor," 1983). The column features Donald Hyndman and Earl Sundeen, both employees of Kodak ("Earl I. Sundeen Award," n.d.; Smith & Sundeen, 1956), but there is no mention of Ray Schwalm, despite his obvious involvement during that very year (University of Wisconsin, 1966), and the fact that he was directly involved in the program over the following years (Western Washington University, n.d.). The available literature also suggests VICOED was successfully implemented at first, offering courses and workshops on design and visual communication for teachers (Western Washington Univ., Bellingham, 1966); however, the program lost momentum before the development of a full curriculum, which was the next intended step (Scurr, 1981). The program was maintained within Western Washington University until it merged with the Department of Art of that institution in 1993 (Western Washington University, n.d.). Although it is impossible to prove, in 1966 VICOED could have been the connecting point

between visual literacy and Kodak, and by extension a Mobilization Trigger of the Visual Literacy Movement. Whether this is accurate or not, Kodak continued to promote visual literacy as part of its advertising discourse in the following years (Eastman Kodak, 1969, 1970).

**Figure 3.4 Mentions of the First National Visual Literacy Conference.**



In 1967, John Debes published a newsletter for Kodak called *Visuals are a Language*. Supposedly, it was in the context of this publication that his coinage of “visual literacy” and the initial dialog over the definition of the concept actually occurred. This dialog and the newsletter led indirectly to the first *National Conference on Visual Literacy* (held in

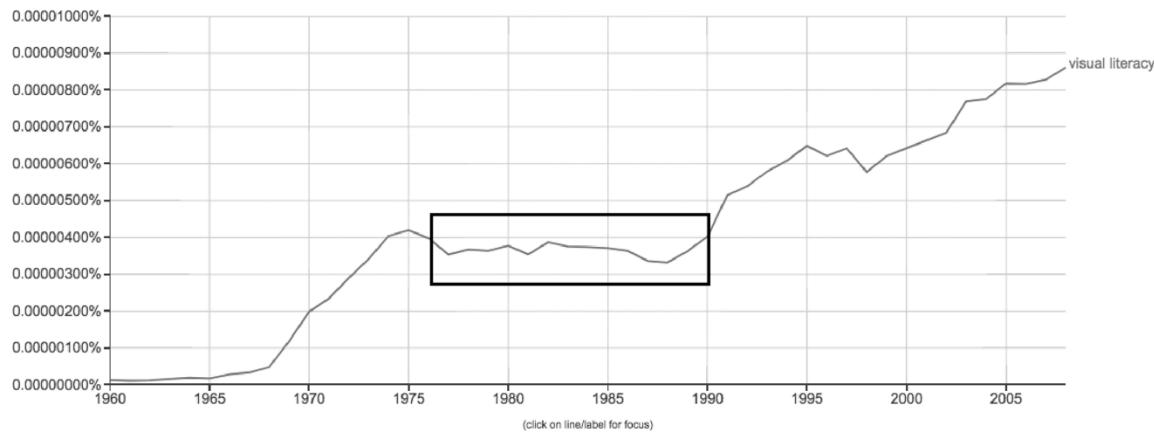
Rochester NY, home of Kodak's corporate headquarters) and the later foundation of the International Visual Literacy Association (IVLA), as well as the *Journal of Visual Literacy* (Stuart, 2005) (Figure 3.1-3.4). It is fair to state that, beyond providing an operational definition of the term visual literacy, Debes led one of the main Mobilization Streams in the trans-disciplinary understanding of visual literacy. His leadership supported the successful replication of those ideas in other fields in following years.

Given the instructional technology-oriented thrust of Debes' Visual Literacy Movement, it was quickly associated with the then-broader field of New Educational Technologies, which has since become the field of Educational Technology. Almost immediately after its foundation, the IVLA affiliated itself with the Association for Educational Communications and Technology, an institution that claims to be the oldest professional home of the field (AECT, 2013; Fransecky & Debes, 1972), and that occupies a central position in Educational Technologies. The IVLA maintains its affiliation with AECT even today (IVLA, n.d.; Orey, Jones, and Branch, 2013). It is reasonable to assume the association of these two institutions gave much greater exposure to the concept of visual literacy than would have occurred otherwise, since the AECT embraced the term and started promoting it as part of their usual professional activities (e.g., Fransecky & Debes, 1972). However, it is impossible to assert with confidence that use of this concept in this particular field was strictly a consequence of the AECT's affiliation with Debes and the IVLA, for *visual literacy* had appeared before in Educational Technology contexts (e.g., Allen, 1959; Meierhenry, 1962). In the following years, the IVLA promoted many initiatives for the application of visual literacy curricula in a successful way (e.g., "Visual Literacy Weaves into Curriculum," 1978), and it is still today one of the leading advocates for visual literacy

in the educational technology field. The IVLA promotes what is possibly the most influential theoretical stream of “visual literacy” as a concept outside the broad field of Education.

### 3.5.2 Decline and diversification: Visual literacy in the 1980

**Figure 3.5 Visual literacy between 1960 and 2008 with a smoothing of 3 to accentuate trends. During the 1980s occurrences seemed to have normalized or stabilized.**



Over the last two decades of the 20<sup>th</sup> century, Debes’ Mobilization Stream was split by various thinkers into a multitude of different ideas. During the early 1980s, the momentum of the Visual Literacy Movement began to slow down, and this set the stage for the first criticisms of the concept. Scholars like O’Rourke (1981) declared the “fall of visual literacy,” openly questioning the legitimacy of the interest of the academic community in the concept (Figure 3.5). Around the same time, Cassidy and Knowlton (1983) questioned the suitability of “visual literacy” as a metaphor, and suggested its employment could open the door to other less suitable “literacies” like olfactory, auditory, or tactile literacy, proposing instead that visual literacy is merely a natural condition for humans (this idea resonates with one of Messaris’ [1994] main contentions, a point to which I return in the subsequent section on Film Studies). Sless (1984), though, proposed expanding the understanding of visual literacy to include other traditions, among which were strong representatives of specific

design topics like the ideas of German designer Gui Bonsiepe or the Isotype project.<sup>6</sup> I discuss both of these topics at greater length in the Design section of this chapter. At the same time, many researchers embraced the concept of visual literacy and advanced it, some influenced by Debes and the IVLA (Sinatra, 1986), some others providing their own definitions and theoretical frameworks (e.g., Curtiss, 1987). In consequence, by the end of the 1980s, the definitions and understandings of visual literacy were diverse and dispersed.

In 1990, Baca presented a thesis entitled *Identification by Consensus of the Critical Constructs of Visual Literacy: A Delphi Study*. Baca (1990) reported extensively on the different understandings and definitions of visual literacy that had emerged in different sub-fields of Education, Communication Studies, and Educational Technology during the more than 20 years since Debes claimed to have coined the term. Baca's thesis recounts existing approaches to visual literacy, the theoretical organization of the concept, applied visual literacy programs, and results of research into the definition of the term. In Baca's summary, it is possible to find mentions of what is defined in this thesis as second-layer correlates of visual literacy, like the constitution of a visual language, or ideas on visual vocabulary, grammar, and syntax, or visual perception. These are concepts brought up by the participants of the Delphi study in an attempt to define visual literacy. Baca produced a list of questions used to guide a panel of experts to come up with shared statements or, as Baca defined them, "accepted constructs" (p. 65) about visual literacy. The panel of 43 people consisted of a "non-random selection of visual literacy experts who were primarily persons who have published relevant literature and who were recognized as experts by members of the 1989 Executive Board of the International Visual Literacy Association" (p. 15). Notably, the IVLA

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<sup>6</sup> The Isotype method (International System of Typographic Picture Education) is a standardized system of data representation through pictorial items. The Isotype method has been credited with setting the foundation of modern visualization (Twyman, 1975).

is the institution that John Debes founded. Many of these accepted constructs are still echoed in the general understanding of what visual literacy is today, showing the extended mobilization of Debes' stream over the latter half of the 21<sup>st</sup> century to the extent that Debes and scholars affiliated to the IVLA were featured recently in a white paper produced for the highly popular graphic design software company Adobe Inc. (Bamford, 2011). In turn, this document is included in the standards compilations of accredited institutions (i.e., ACRL Board of Directors, 2011). It is fair to state the stream of mobilization triggered by Debes and his Visual Literacy Movement appears to have been most successful, if we define "success" as having the broadest influence within a range of disciplines, even if efforts to come up with a solid theory are still ongoing (Avgerinou & Pettersson, 2011). As the inclusion of some of Debes' ideas in Adobe Inc. software documentation might suggest, his stream was adopted by the field of Graphic Design. Graphic Design literature forms another rich resource for the exploration of the evolution of visual literacy.

In the next section, I wish to wind back the clock to follow a different mobilization stream within the field of Graphic Design. It is also important to note that the further one progresses through the 20<sup>th</sup> Century after the emergence of the Visual Literacy Movement described above, the more disciplinary boundaries become blurred and at times completely permeable. Following chronologies within disciplines, although necessary for this first examination of the topic, is ultimately a limited approach to understanding mobilization, a point that I take up in Chapters 4 and 5.

### **3.6 Graphic Design**

The arrival of Laszlo Moholy-Nagy in the United States in 1937 was an event that urged what would become a vibrant panorama of design and art education in that country

(Bennett, 2006; Heller, 2005). Moholy-Nagy, a former renowned professor of the Bauhaus School of Design in Germany, founded the Institute of Design in Chicago (now within the Illinois Institute of Technology and known as the “New Bauhaus”). He was not only part of the professional design leadership at the time, but also an influential advocate for the integration of industry and education, art and technology.<sup>7</sup> Moholy-Nagy’s materials-based approach to art education during the late 1940s and early 1950s, primarily through the exploration of design elements in the construction of two- and three-dimensional structures (Hastie & National Society for the Study of Education, 1965), is a method still used today in design education. Moholy-Nagy provides insight into his sense of the importance of visual literacy and its relation to technology with the following statement: “The illiterate of the future will be the person ignorant of the use of the camera as well as of the pen” (Moholy-Nagy, 1938, p. 52). Later, he expanded this notion: “The illiterate of the future would not only be the man ignorant of handling a camera, it also would be the man without a colour and space concept” (Moholy-Nagy, 1950, p. 149).

Being a predominantly practice-oriented discipline, Graphic Design accommodated itself to the influences it received from a developing design industry in the United States, as well as influences from established European media. This caused the theoretical grounds of modern design to start developing outside of the discipline, until a formal design curriculum was eventually developed (Heller, 2005). For example, it is likely that the Peircean semiotic model that has prevailed in design education since the early 1970s (Ehses, 1976) arrived in the field through Max Bense, an influential German scholar of aesthetics (1967, 1971). Bense could also be credited with the initiation of the field of visual semiotics (Nadin, n.d.), a

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<sup>7</sup> The idea of integrating industry and education was a position also held by Dewey (Belshe, 1946; Hickman, 1990)

Knowledge Token also explored in this thesis. Another theoretical influence came via the work of Charles Morris, an American scholar based in Chicago. Moreno (1983) argues Morris developed key ideas after the semiotics of Peirce, noting that Morris engaged in discussions with Dewey (a prominent American Pragmatist like Peirce) about their different understandings of Peircean semiotic theory. Moreover, during the late 1930s and through the late 1940s, Morris was in close contact with Otto Neurath, the director of the International Foundation for Visual Education and the creator of the Isotype method (Burke, 2009). Morris also became an active part of the Unity of Science Movement, eventually emerging as its most vocal member in the United States.

Morris might have been the crucial player in the introduction of the Isotype (International System of Typographic Picture Education) method to the United States; however, it is generally acknowledged most of the success of Isotype was the product of the workshops that Neurath and his colleagues ran in several countries to implement their method (Cat, 2011). Interestingly, it was in relation to Isotype that the first mentions of the Knowledge Token *visual grammar* occurred in the United States (“Use Pictorial Charts, Librarians Advised,” 1937). It is also worth mentioning that Isotype is defined as a “visual dictionary” in this same document (p. 224). Generally speaking, the understanding of “visual grammar” as a set of rules and structures that people tend to follow in representing visual information prevails now in the realms of Design Education (e.g., Leborg, 2006), just as it does in Art Education (e.g., Addison & Burgess, 2012), New Educational Technologies (e.g., Pettersson, 2002), and Literacy Education (Kress & van Leeuwen, 1996).

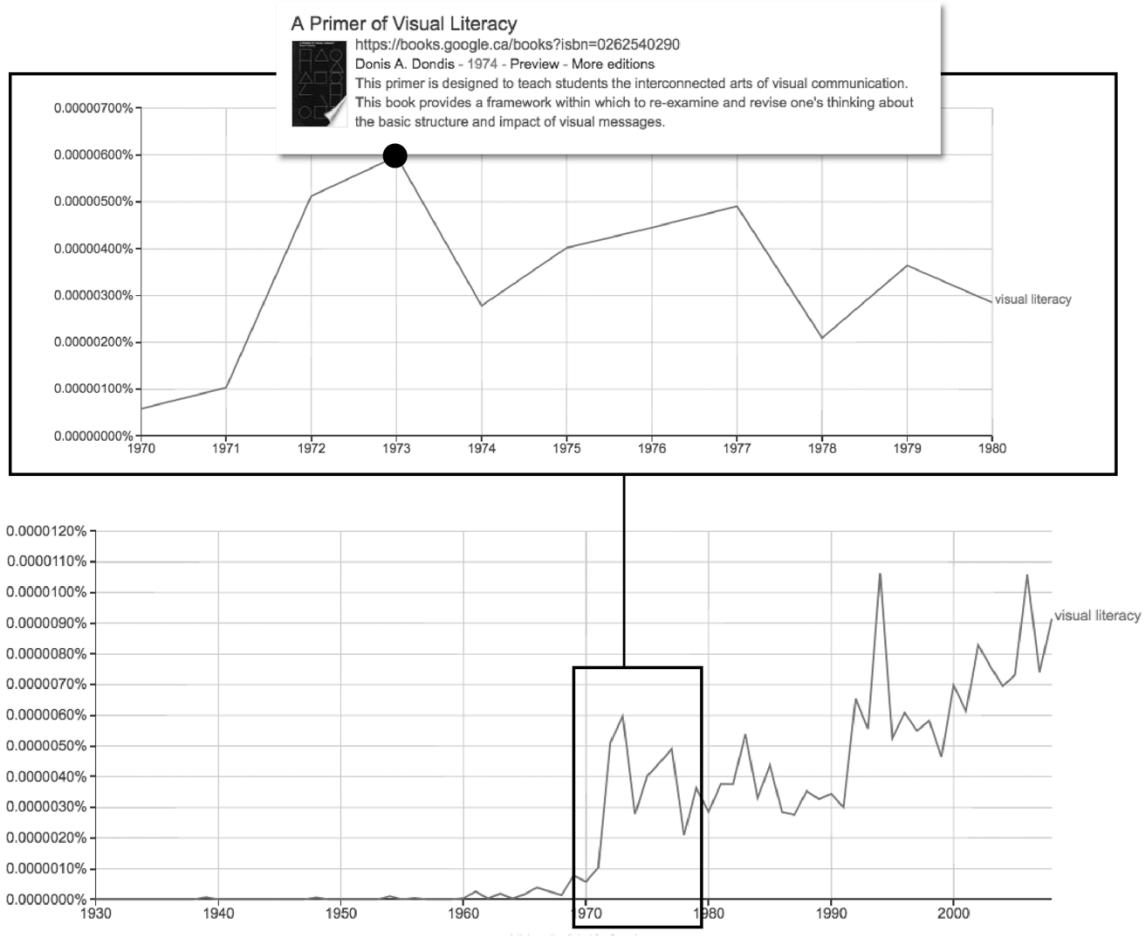
Another second-layer Knowledge Token, *visual rhetoric*, is also prevalent in the field of Design Education. The most successful attempt to translate the principles of classical

rhetoric into an approach to the production and analysis of visual artifacts can be credited to Gui Bonsiepe's *Visual / Verbal Rhetoric* (1965). Bonsiepe is a German designer and former professor of the Ulm School of Design. A year before Bonsiepe published this monograph, the influential literary critic Roland Barthes (1964) published his pivotal work *Writing Degree Zero* in which the essay "Rhetoric of the image" is presented, an interesting attempt to analyze advertising techniques following a rhetorical framework. However, from my own expertise practising and teaching design I would argue that, despite traction gained on the subject by Barthes among many designers and experts (e.g., Sonesson, 2008), Bonsiepe's (1965) work is remarkably clearer as a resource for applying the theory of visual rhetoric to design because it offers a comprehensive method (e.g., Lupton & Ehses, 1996). In any case, since the success of Barthes' work, visual rhetoric has been a theoretical commodity for designers and design-related disciplines oriented towards persuasion, as in the case of advertising (e.g., De Almeida, 2009; Mzoughi & Abdelhak, 2011; Rossolatos, 2012; Sonesson, 2008).

It was not until 1973 that the term "visual literacy" started to be relevant in design education in North America. This shift was largely due to the work of Donis Dondis, best known for her work *A Primer of Visual Literacy* (Dondis, 1973), a still highly regarded and extensively referenced book in the realms of Design. Dondis participated in the first conference organized by Debes, adopting some of his perspectives on visual literacy. She became one of the better-known spokespersons for Debes' stream of visual literacy outside of the context of the IVLA. Dondis may well be directly responsible for the widespread adoption of "visual literacy" in the design community and, in a theoretical sense, can be considered the mediator of that adoption. The impact that Dondis' work had in design

education should be considered a mobilization trigger in itself, and constitutes a significant stream of mobilization for the concept of visual literacy.

**Figure 3.6 Year of publication of "A primer of Visual Literacy" by Donis Dondis. Although the text was published in 1973, the metadata in GBS gives 1974 as the date of publication.**



### 3.7 Film Studies

Before Barthes (1964) and Bonsiepe (1965), the Knowledge Token *visual rhetoric* was used by C. A. Lejeune (1931) to praise the aesthetic properties of the titles employed in the silent film *Turksib* (Turin, 1929). *Visual rhetoric* continued to be used recurrently in cinema and scholarship surrounding cinema for different purposes until the mid-1960s. In film studies, the term “visual literacy” implied a reference to the medium of photographic film, or to any other medium that deals strictly with visual information. It was not rare to find

cinema and television together referred to as the vehicles of literacy, both in the middle of the 20<sup>th</sup> century and today (e.g., Apkon, 2013; Foster, 1979). Moreover, motion picture films were certainly part of what was considered new educational media (Allen, 1959). Thus, besides the broad definition of visual literacy as “reading visuals” and the understanding of the development of critical skills (a notion still present today), Film Studies offers more specific definitions. Within film studies, “visual literacy” has been understood as a proficiency in the communicative and functional resources of film such as its grammar, meta-language, and even particular cinematic techniques (see *George Lucas on Teaching Visual Literacy and Communications* [Edutopia, 2012a] or *Martin Scorsese on the Importance of Visual Literacy* [Edutopia, 2012b]). Evidence of cinema’s interest in these topics can be found as early as the 1930s (Messaris, 1998), whether in support of or against such grammatical or meta-language standards.

An interesting exception to this common cinema studies approach to “visual literacy” has been recently proposed by Messaris (2012), who offers his own definition of the concept: “fluency in visual media” (p. 102). Like many other scholars mentioned in this chapter, Messaris can be positioned in several different disciplinary contexts because his work has been influential beyond film studies (for instance, in disciplines such as Media Studies and Communications). I have situated him in Film Studies because his understanding of visual literacy seems to have evolved directly from the above-mentioned understanding of the term within this discipline. The first explicit reference to “visual literacy” in Messaris’s work appears in *The Role of Visual "Literacy" in Film Communication*, in which Messaris states:

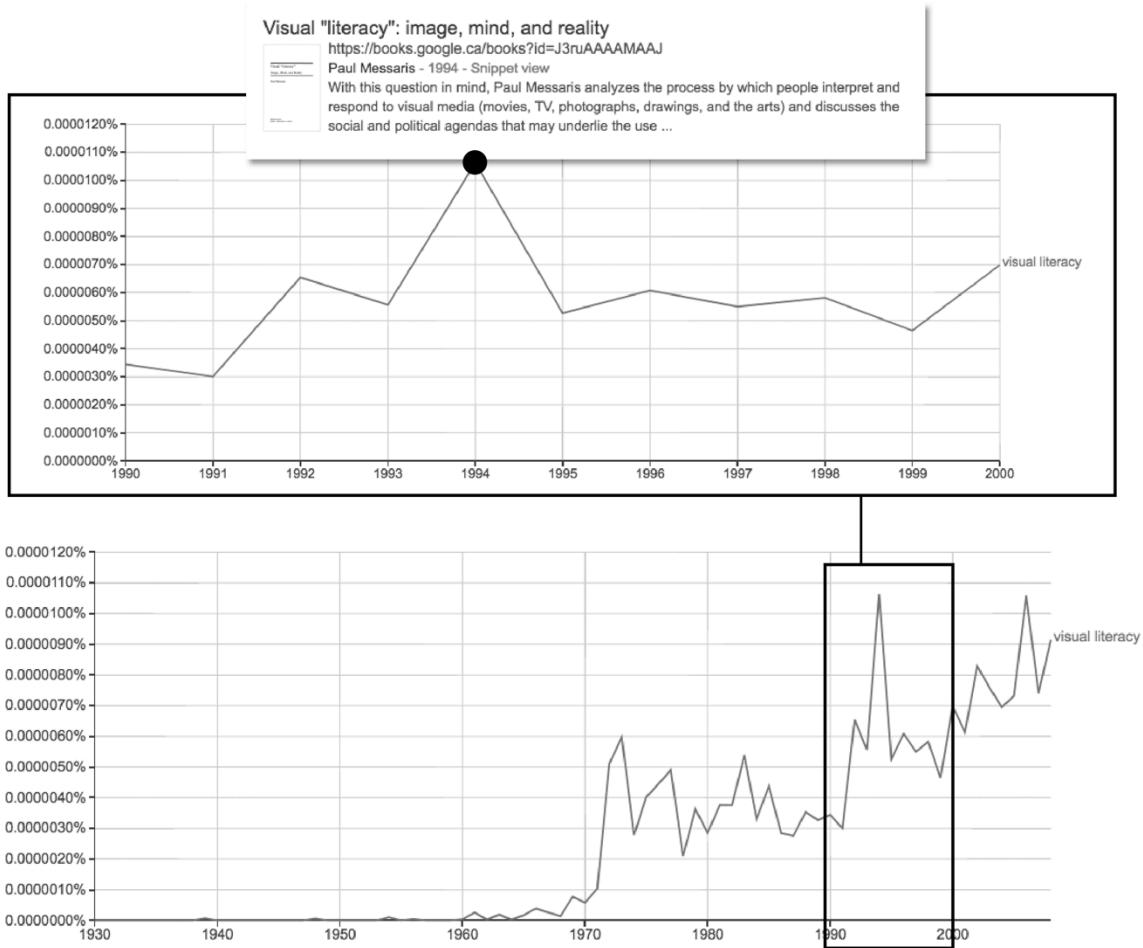
I am using the term "visual literacy" to refer to the notion that the interpretation of film or television—more precisely, of the formal structure of a movie or TV

program—depends on prior familiarity with a set of formal conventions (i.e., the conventional uses and meanings of such things as close-ups, point-of-view shots, slow motion, flashbacks, etc.). (p. 3)

In this article, Messaris refers back to a chapter piece titled “To What Extent Does One Have to Learn to Interpret Movies?” (Messaris, 1982) where he questions, possibly for the first time in his own work, the need to teach film conventions to make sense of moving images. Unlike most other contexts in which “visual literacy” has appeared, Messaris does not attempt to relate his work directly to the notion of instruction or teaching. *Teaching* visual literacy is not central in his theory. Messaris’ key book on visual literacy, *Visual Literacy: Image, Mind, and Reality* (1994), was later reviewed by Arnheim (1996), considered by some to be the champion of visual thinking. He is one of the most influential scholars in the understanding of visual communication and the few theoretical commonalities across disciplines like Art Education, New Educational Media, Design and Film Studies (it is worth noting Elkins [2003] attributed to Arnheim an association with visual literacy, probably on account of Arnheim’s 1969 work *Visual Thinking*.) In his review of Messaris (1994), Arnheim’s understanding of visual literacy is revealed:

The term “Visual Literacy” does not convey most of the valuable contribution of this work [referring to Messaris’ book], because literacy refers to verbal language, that is, to the learning of conventional signs. To apply it to visual media suggests they can be understood only as a set of conventional signs.  
(Arnheim, 1996, p. 77)

**Figure 3.7 Visualization of the frequency of occurrences of “visual literacy” in the year of publication of Paul Messaris’ key work, *Visual “literacy”: image, mind and reality* (1994).**



Recently, Messaris (2012) summarized his influential 1994 book in two basic propositions: first, unlike verbal language, the conventions of visuals and their meanings are highly informed by perception; second, because images are based on perceptual models, the manipulation of images is harder to detect than verbal manipulation. Messaris went further by expanding on the impact new technology has on our relation with visual information. Messaris’ insights on visual literacy are influential enough to be considered for the purpose of this study a Mobilization Stream of visual literacy on their own, although he

acknowledges previous work from some of the same theoretical influences present in Debes' stream of visual literacy. These include Arnheim (1969) and Gibson (e.g., 1929, 1951, 1954, 1961), as well as researchers who also influenced the Visual Literacy Movement's Mobilization Stream, such as Dondis (1973).

### 3.8 Media Studies

McLuhan (1955) offered one of the most insightful reflections on the implications of media and technology in relation to the acquisition of visual literacy in *A Historical Approach to the Media*. McLuhan is an exemplar of the permeability of disciplinary boundaries to which I referred earlier. Lamberti (2009) rightly observes that the ideas of McLuhan on media have their origin in literary studies; however, while McLuhan's work was produced in departments of English, primarily at the University of Toronto, it was quickly commented on in Art Education (e.g., Joyner, 1956). In fact, McLuhan is positioned by some as the father of a scholarly discipline that emerged in the 1950s: Media and Communication Studies (Poster, 2010). In regards to the emergence of this field, Grossberg, Wartella, Whitney, and Wise (2006) observe, "it is only since the 1920s that a unified body of knowledge has begun to take shape, and only since the 1950s that a formal discipline has existed" (p. xvii). As Marris and Thornham (1996) point out, however, the boundaries of the field are ever changing:

While there is a history to be traced, the interrelation between texts and their relative influence is commonly reassessed with the benefit of hindsight. Media Studies continuously disturbs, revisits, re-evaluates and sometimes rejects what have been previously been held as key texts. (p. 5)

However we define his primary field, McLuhan (1955) can certainly be understood as an early catalyst of the later adoption of the term “visual literacy” in the field of educational technology. Among many other assertions, McLuhan stated the dependency of North America on print media had caused a slow adaptation to recent technological developments, particularly television. McLuhan understood television to be “the successor of writing” and so, in his analysis, North America lost some of its “book literacy” without acquiring a needed visual literacy (McLuhan, 1955, p. 104). McLuhan is evidently a key influential public figure on the impact of media in culture; his work became a theoretical steppingstone for other thinkers such as media theorists Neil Postman (1971) and Jay David Bolter (1991, 1998). For his part, Bolter (1998) used visual literacy to frame a discussion on the hypertextual character of visuals within electronic media, questioning the implicit value that readers were giving to graphic material accompanying text. About the same time, Bolter wrote of the Internet as a trigger for the “Breakout of the Visual” in reading environments (Bolter, 2001). Bolter not only acknowledged the visual character of our culture, as expressed before by Gombrich (1950, 1960) and many others, but recognized the dual nature of visual literacy that Messaris (1994) had identified a few years before (conventional and natural). Bolter also acknowledged that facilitating access to the Internet and electronic media in formal education settings would result in engagement from the students in the production of visuals, as opposed to its consumption only, suggesting the great responsibility that educational systems had and still have.

The establishment of a Media Studies category in this map is somewhat arbitrary, because the approach of these scholars is not necessarily towards “visual literacy” as a concept but towards an increasing influence of *visuality* and its relationship with technology.

Besides McLuhan's (1955) and Bolter's (1998) explicit uses of "visual literacy," there are mentions of *literacy* in the work of Postman (1971) in particular that make reference to non-linguistic skills, such as in the following statement: "today literacy is the skills with which man manipulates the many media of mass communication" (p. 26).

Ultimately, within the landscape of the literature of Media Studies, an emergent field that is highly interdisciplinary, the uptake of "visual literacy" as an independent concept seems almost concurrent with the birth of the field itself. If one person is the mobilization trigger or mediator for the term within this field, it is McLuhan (1955).

### **3.9 Literacy Education**

During the 1990s, concurrent with the rise of visually intensive reading environments on the Internet, "visual literacy" began to be viewed as highly relevant in the field of literacy education and has continued to be increasingly relevant since then. A mobilization trigger within Literacy Education is the publication of *A Pedagogy of Multiliteracies* (New London Group, 1996), identified by some as the "central manifesto of the new literacies movement" (Leander & Boldt, 2013, p. 22). The influence of this document is evident across programs, academic venues, and publications related to Literacy Education. In it, the New London Group (hereinafter NLG) state the visual mode is one of several equally important modes of meaning-making, including the historically-privileged linguistic mode. The NLG is a collective of 10 scholars from English speaking countries (the United Kingdom, Australia and the United States) with different primary disciplinary affiliations who are also linked to the field of Literacy Education. They gathered in New London, Connecticut, in 1994 to formulate "a theoretical overview of the connections between the changing social environment facing students and teachers and a new approach to literacy pedagogy" (NLG,

1996, p. 60). They called this new approach “multiliteracies,” arguing, “the multiplicity of communications channels and increasing cultural and linguistic diversity in the world today call for a much broader view of literacy than portrayed by traditional language-based approaches” (NLG, 1996, p. 60). Gunther Kress, a social semiotician, was the champion of visual literacy within the NLG. The same year of the publication of the manifesto, Kress co-published *Reading Images: The Grammar of Visual Design* (Kress & van Leeuwen, 1996). This book along with the NLG manifesto placed the visual at the forefront of priorities in Literacy Education.

Literacy Education, as the name suggests (*literacy* having in the first sense to do with understanding of *letters*), had heretofore focused strongly on the linguistic mode in education (Ong, 1982; Street, 1984). Notwithstanding, certain areas of Literacy Education, such as those concerned with Children’s Literature, have been keenly interested in how images are understood for some time (e.g., the Reggio Emilia approach [Schiller, 1995]). It is interesting to note that Dondis (1973) is cited in *Reading Images* (Kress & van Leeuwen, 1996). Given Kress and van Leeuwen are also members of the NLG collective, it seems fair to assert that “visual literacy” in the field of Literacy Education was mobilized from the Design stream. It would seem the publication of “A Pedagogy of Multiliteracies” (NLG, 1996) was not only a trigger, but has encouraged a great amount of research that embraces new modes of retrieving and representing knowledge in literacy education. The GNV shows a spike in the use of Visual Literacy through the 1990s and 2000s, which is likely in part due to increased publications on the topic in this field triggered by a constellation of factors, such as the rise of the Internet and the publication of the NLG manifesto. I will return to this possibility in Chapter 5.

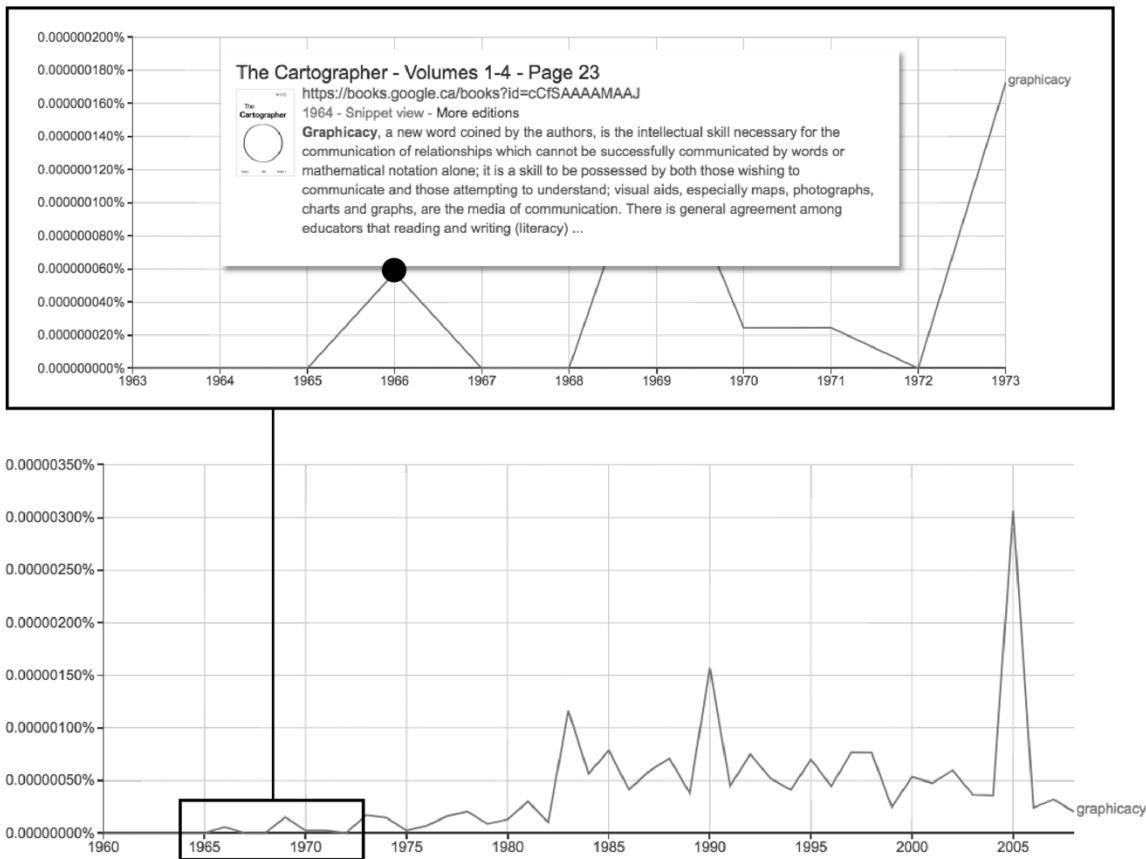
### **3.9.1 Graphical Literacy**

Besides visual literacy, Literacy Education hosts visual literacy's second-layer related term, *Graphical Literacy*. This term in particular emerged from and developed mostly within the field of Literacy Education in North America. In his 1981 work *Graphical Literacy*, Fry employed this Knowledge Token in the context of his development of a taxonomy of graphs: an attempt to classify every possible visual resource of representation. His proposal seemed to have some impact in certain academic communities (e.g., Danos & Norman, 2009), but not enough to be considered highly influential. Edward Fry himself did not appear to follow up on this work. Fry was best known for both the development of a formula to calculate readability (Fry, 1968) and his work *The Reading Teacher's Book of Lists* (Fry, 1984). Prior to Fry, the term *graphical literacy* had been used solely (and possibly for the first time) by Dixon (1966) to refer to the skill that engineers should have in communicating their findings, aided by visual resources.

One of the correlates considered in this work is *graphicacy*. Just like *visual literacy*, this term has its own history, although not as complex as the former. Because of this, despite existing disciplines in common between *visual literacy* and *graphicacy* (i.e., Graphic Design) I decided to give *graphicacy* its own section in this chapter.

## 3.10 Graphicacy

**Figure 3.8 First reported occurrence of Graphicacy in literature. Note the discrepancy between the date in the GBS snippet and the actual publication of the article (1966).**



### 3.10.1 Cartography

Three years before the boom of the Visual Literacy Movement in North America, Balchin and Coleman (1966), propose the term *graphicacy* in the United Kingdom to refer to a skill to be included as equal in importance to literacy, numeracy, and “articulacy” (p. 24), and as part of the foundations of a “good education” (p. 25). *Graphicacy* had first been coined within the realms of cartography and geography. Even though Balchim and Coleman were clear in presenting graphicacy as a concept not necessarily limited to reading cartographic maps, they also indicated their particular interest was in the depiction of “spatial

relationships” as well as other quantifiable relationships, like “time scales, rates of change, derivatives, abstractions” (p. 26). Such relationships are necessary for comprehending graphical information devices like visual maps, charts, and graphs. Therefore, “graphicacy” was introduced to define a visual language or languages with a particular syntax that can be fruitfully subjected to objective testing and assessment (Wainer, 1980).

### **3.10.2 Graphic Design**

Graphicacy was eventually adopted as a concept in the field of Design, and effectively integrated into existing models for practical applications during the first half of the 1970s. The mediator of this adoption was Michael Twyman (Brazil, 1975). Although it is not clear exactly what triggered the mobilization of this term from cartography to graphic design, a connection between Twyman and Marie Neurath in the early 1970s might have had something to do with it. Twyman created and directed the Department of Typography and Graphic Communication at the University of Reading in England until his retirement in 1998. The department that he created established a close relationship in 1971 with Marie Neurath, co-creator of Isotype (Burke, 2009). Isotype is one of the most successful examples of a conventional visual language, and it has heavily influenced and informed the modern field of infographics (Mijsenaar, 1997).

### **3.10.3 Experimental Psychology**

A different Mobilization Stream of graphicacy was opened in the field of experimental psychology when Aldrich and Sheppard (2000) began using the term. They define graphicacy as “the ability to understand and present information in sketches, photographs, diagrams, maps, plans, charts, graphs and other non-textual, two-dimensional formats” (p.8). According to the authors, graphicacy is an ability that, “unlike literacy, ... is

rarely taught explicitly” (p. 8) since “no detailed curriculum has been specified for the teaching of visual graphicacy within schools” (Aldrich, Sheppard, & Hindle, 2002, p. 62).<sup>8</sup> Aldrich et al., (2002) expanded on the notion of graphicacy by modifying the term to *tactile graphicacy*, which refers to a model of understanding how vision-impaired people make sense of graphical information by tactile means. In a later paper, Aldrich, Sheppard, and Hindle (2003) acknowledged Balchin and Coleman (1966) introduced the concept of graphicacy before them.

#### **3.10.4 Science Education**

Aldrich, Sheppard and Hindle’s (2003) more recent treatment of the topic has already been adopted by other researchers in North America, superseding its earlier use in the United Kingdom. One example is Roth, Pozzer-Ardenghi, and Young Han (2007), who extend Aldrich, Sheppard and Hindle’s (2002, 2003) notion of graphicacy to their own concept of “critical graphicacy.” This new term represents a Mobilization Stream in and of itself. Critical graphicacy was coined in the realms of science education to refer to the faculty of questioning “the power relations, discourses, and identities that human agents produce and reproduce using various forms of graphical representation” (p. xii). Such a new Mobilization Stream shows the ongoing currency of the concept of visual literacy and its first and second-level correlates in various fields, and underscores the value of a comprehensive investigation into its origins.

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<sup>8</sup> It is not clear to me if the authors suggest that these skills are not taught under the name of *graphicacy*, or not taught at all. If the latter, I would certainly disagree with such statement. Moreover, the work of Roth, Pozzer-Ardenghi, and Young Han (2007) in Science Education described below implicitly contradicts this notion.

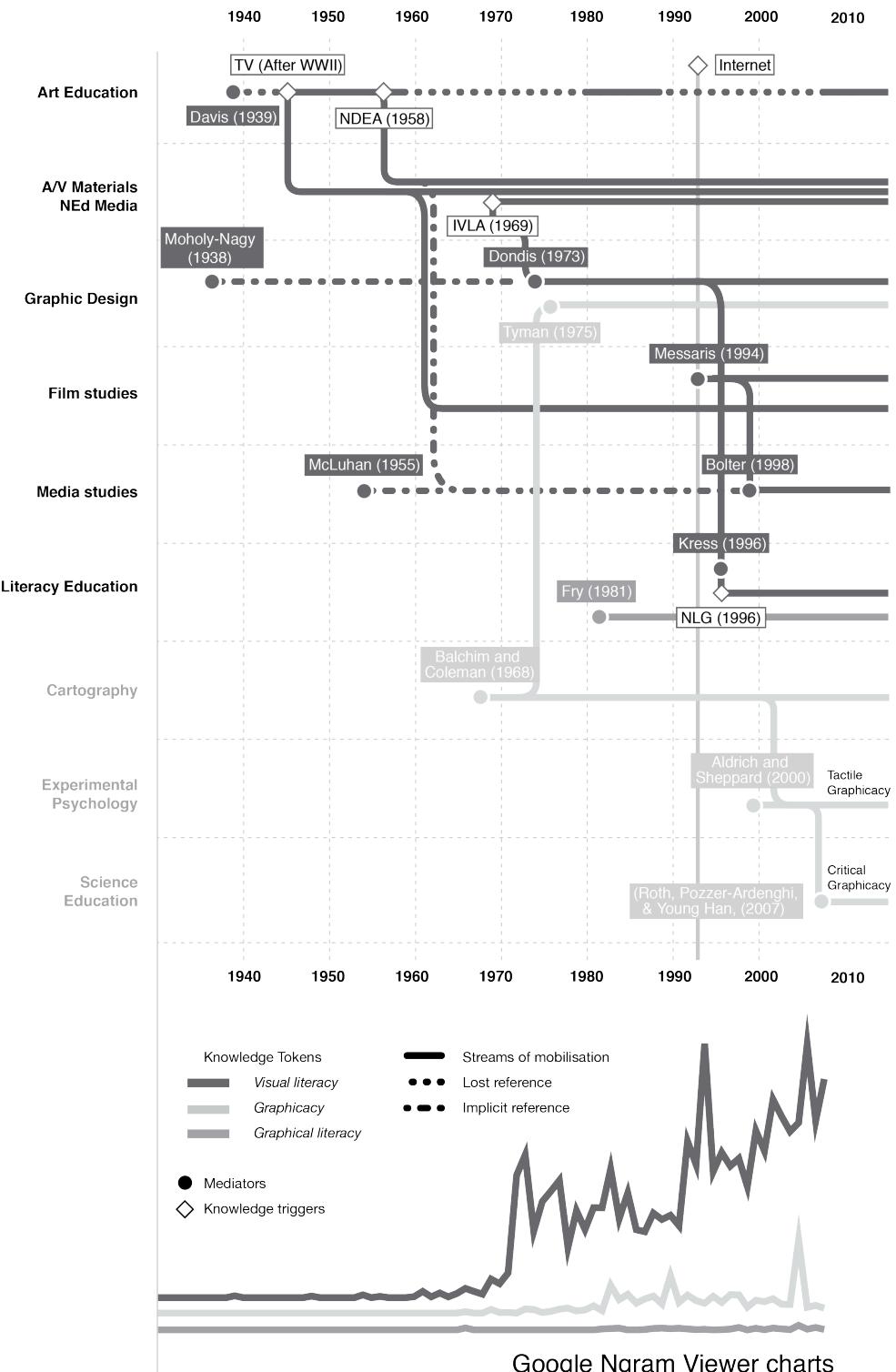
### **3.11 Summary**

The preceding account of several renditions of “visual literacy” over the 20<sup>th</sup> and early 21<sup>st</sup> century evinces the elusiveness of its definition, to say the least. In the 75 years since its first occurrence, “visual literacy” has been defined as the ability, fluency, skill, or competency to interpret and produce visual messages: sometimes construed as natural, sometimes as the product of a process of training or learning (Bolter, 1998; Messaris, 1994). It has also been defined more simply as the act of learning from visuals (e.g., Meierhenry, 1962). Some authors have interpreted visual literacy as rules and tools to be learned (e.g., Dondis, 1973), others as a social practice in which visual information is involved as a carrier of social meaning (e.g., NLG, 1996). Many of the most salient themes in these different historical understandings of visual literacy and its correlates have emerged as dichotomies. Visual literacy has been understood as the broad and implicit notion of “meaning-making” and also as explicit visual conventions, as both natural models of understanding visual information and artificial ones, as what one is socialized into and what one can be explicitly and formally taught. These dichotomies have been represented, for instance, in the distinction between “practical vision” and visual literacy respectively (Johnson, Johnson, Stoops, Mattil, & Freundlich, 1963, p. 15), or between the notion of visual literacy (as innate ability) and visual grammar (as a set of rules).

While working on this chapter, my attempt to present a non-linear, trans-disciplinary story was challenging to say the least. This chapter and its visual representation (see Figure 3.9) fulfilled their purpose as an initial literature review; however, they were not enough in terms of identifying connections between disciplines. Wishing to understand the mobilization

of visual literacy through complex disciplinary networks over time, I sought new methods of analysis, which are described in Chapter 4.

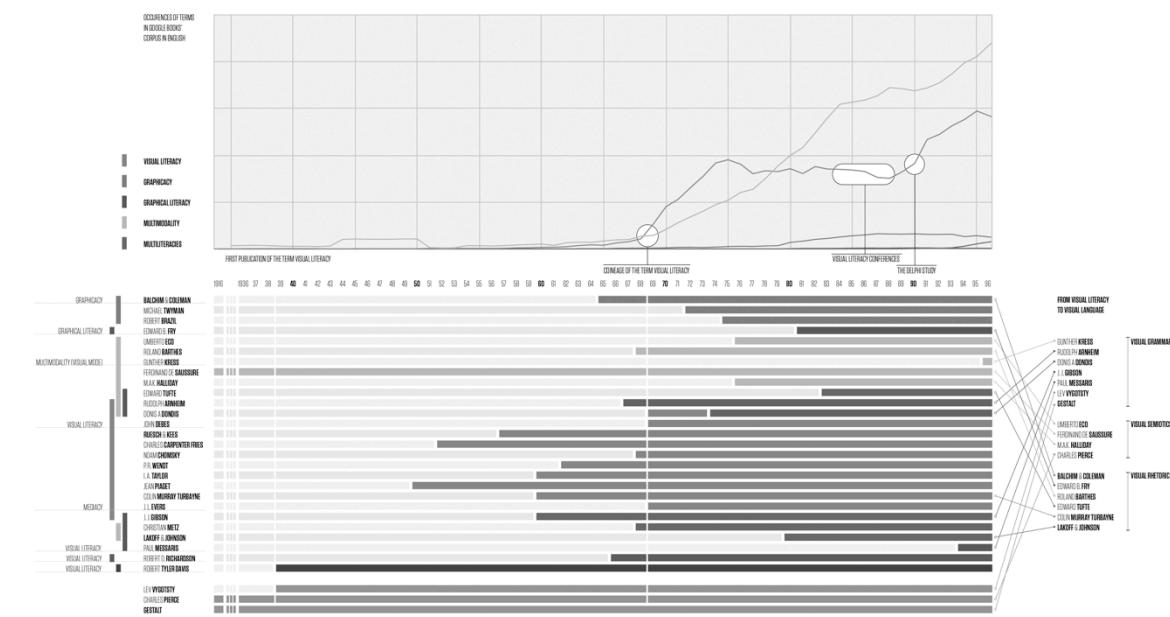
**Figure 3.9 Map of mobilization of *visual literacy* across disciplines over more than 70 years. The top part of the graph represents the mobilization of visual literacy, *graphicacy* and *graphical literacy*. The bottom part shows the line charts of the occurrence of the term in the Google Books repository.**



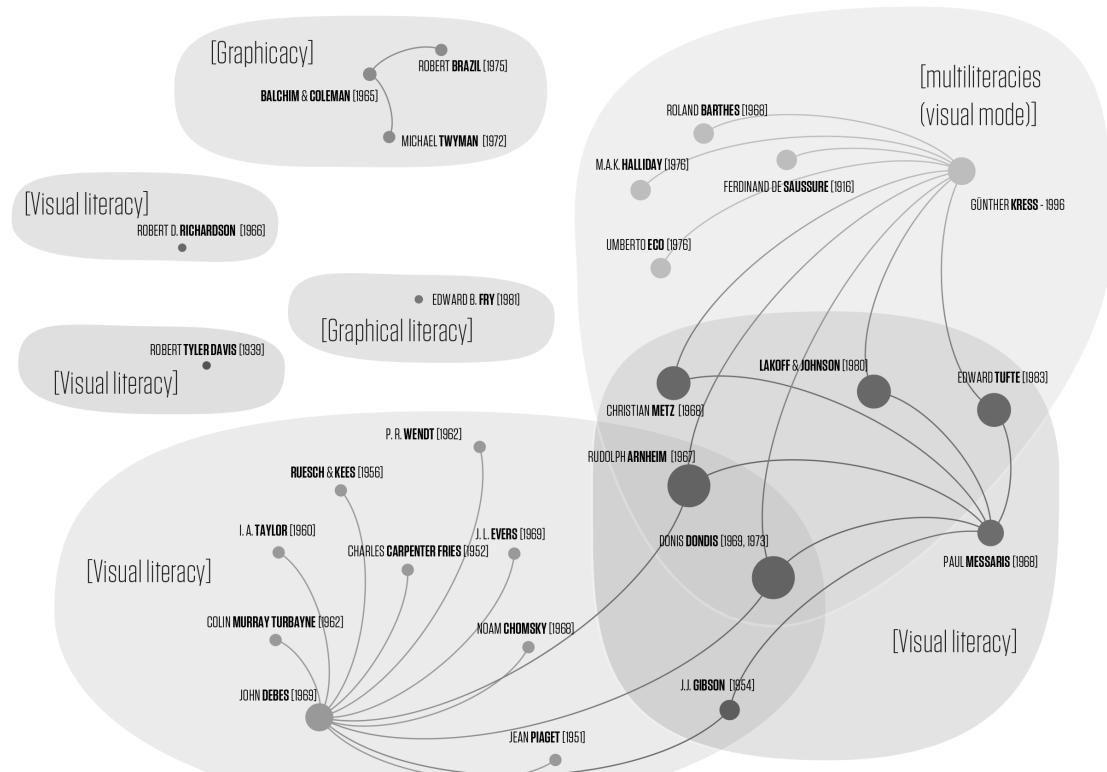
## **Chapter 4: A Three-Dimensional Map of Visual Literacy**

The description of the mobilization of visual literacy provided in Chapter 3 brings in itself interesting outcomes, such early occurrences of visual literacy in the literature, and the identification of critical historical moments that explain the emergence of visual literacy and other literacies. The account presented in Chapter 3 addresses directly the following research question: *How do notions and theories of visual literacy differ through time and across disciplinary fields?* However, this account is not sufficient to address second and third research questions: *How have different historical approaches shaped the understanding of visual literacy?* and *What practical outcomes could a comprehensive overview of visual literacy bring to teaching the concept?* The methods used in Chapter 2 account for the development of the concept over time, but provide little help in detecting explicit or implicit relationships between documents, such as shared references or indexing (I discuss these relationships in greater detail in the section on data coding). I made several attempts to organize my data in non-exclusively chronological models, and some of these static models provided insights on the conceptualization of the concept (see Figures 4.1 to 4.3). However, I realize that the level of granularity provided by these models is insufficient for an in-depth analysis of the concept: each model only displays the data from a very specific point of view.

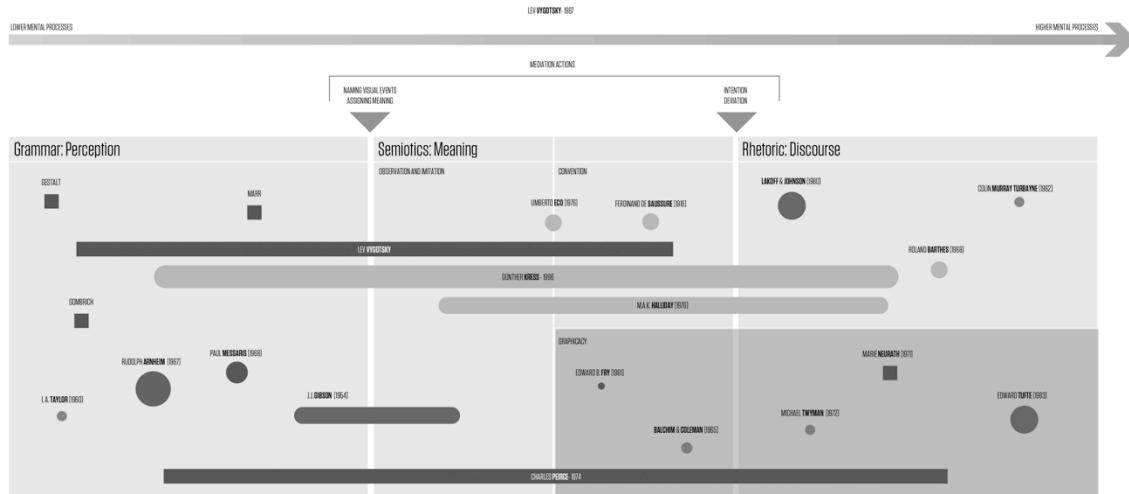
**Figure 4.1 A model of the mobilization of visual literacy based on mobilization tokens through timelines derived from data collection and analysis in Chapters 2 and 3.**



**Figure 4.2 A model of the mobilization of visual literacy based on mobilization tokens through network visualization.**



**Figure 4.3 A model of the mobilization of visual literacy based on conceptual commonalities.**



To tackle the remaining research questions, I had to dissect the history of the mobilization of visual literacy in a more detailed way. And for that, I had to find a tool that would allow me to document existing relationships between documents and to visualize such relationships in a clear, intuitive way. Because my main goal was to visualise relationships, I considered social network visualization tools for this task. Among my initial choices were Cytoscape, Gephi, and d3.js.<sup>9</sup> I found the operation of Cytoscape confusing as this software is designed for modelling bio-molecular interaction networks, and its functionalities require some familiarity with such models, a familiarity that I do not have. I saw potential in Gephi and d3.js., however. Because Gephi allows for the construction of a network from both a

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<sup>9</sup> Cytoscape and Gephi are both tools for visualizing networks. Cytoscape was originally created for biomolecular analysis. Gephi has more generic analysis functionalities. D3.js is a JavaScript library: a file that contains specific functions that are easily displayed in an Internet browser. In the specific case of D3.js, those functions deal specifically with data visualization.

visual editor<sup>10</sup> and a spreadsheet, I initially thought it would be possible (although not necessarily efficient) to build the entire network in that way. Once I had all the documents and the connections between them, I would use d3.js to make the visualisation accessible to all browsers. My first attempts to follow this method proved to be labour-intensive and susceptible to error. The problem, though, did not lie in the visualisation tools but in building the network itself, in creating the relationships in a simple, intuitive manner.

My search for suitable existing tools for organizing my data also led to the consideration of different citation managers, their functionalities and features. I am a strong advocate of open access, open knowledge and open-source tools and resources; thus, the primary open tool for bibliographic data management used by scholars, Zotero ([zotero.org](http://zotero.org)), quickly emerged as the preferred method of recording relationships among documents. These are the factors that led to the use of Zotero over other tools:

1. Open Access: The tool itself, and all its updates, are readily accessible to anyone free of charge and independent of affiliation to academic institutions.
2. Open Source: Because it is an open source tool, Zotero allows any user to create plugins and extensions that enhance the functionalities of the software. An example of this is Paper Machines (<http://papermachines.org/>), a plugin for Zotero than offers several options for visualization based on text retrieved from digitized documents.
3. Customization: Zotero, like any other citation management system, allows for the customization of tags; as well, it imports existing tags recorded in any scholarly database.

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<sup>10</sup> Using this method would require creating documents (nodes) and connections (edges) one by one.

4. Document Linking: Zotero offers the possibility of connecting or relating documents.

It creates these explicit relationships in its database and can display them later in selected outputs, including visual ones.

Of the factors listed above, the possibility of manually establishing relationships between documents, as opposed to relying exclusively on citation mining algorithms,<sup>11</sup> proved to be particularly relevant for this research project. Although these kinds of algorithms can identify formal references to documents within others and automatically make a link, they cannot qualify or recognize citation ontologies (Peroni & Shotton, 2012). Such qualification requires a close reading of the documents and the ability to add metadata manually. This distinction between the use of algorithms and adding connections manually is important. As noted above, links between published documents may be explicit or implicit: links are explicitly made through bibliographies, “Works Cited” pages, and so on, and these may be flagged through citation-mining algorithms. Implicit links, alternately, are not recorded through standard bibliographic methods. These can be crucial to understanding the mobilization of a particular concept, but may be missed without close reading. The way these implicit relationships were defined and coded is explained later in this chapter

## 4.1 Data sources

The first searches produced a working bibliography of 2400 discrete items. The process of obtaining these documents is described in Chapter 2. Initially, I organized these items in Excel with a view to creating an adjacency matrix.<sup>12</sup> Having selected Zotero to facilitate the

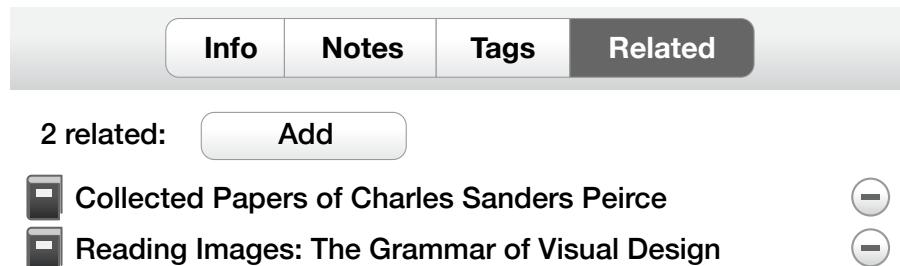
---

<sup>11</sup> Citation mining algorithms are operations programmed to identify references based either on citation syntax or other forms of identification (e.g., ORCID, ISBN, DOI, etc.)

<sup>12</sup> An adjacency matrix is a method of expressing relationships that entails identifying points of concordance between a single list of items distributed along two axes, one vertical and one horizontal, creating a matrix of coordinates.

process of creating and visualizing links between documents, I faced the task of transferring the 2400 items to Zotero. I added key bibliographic entries (e.g., knowledge tokens) first and, through a process of citation chaining and locating implicit links in each document, gradually added important related texts, manually linking the texts in Zotero as I progressed. In Zotero, researchers can create links between documents easily by adding them to a list and defining them as “Related” (see Figure 4.4). Books in the bibliography of Kress’ *Reading Images: The Grammar of Visual Design*, for example, could be “linked” to that text in Zotero through using the “related” feature of the application. In the Data Coding section below, I provide more detail about six sorts of relationships I identified between documents.

**Figure 4.4 Aspect of the module in Zotero that enables the creation of connections between documents. This tab is located in the right pane of the interface. It allows researchers to create connections between documents in the database manually.**



This was a slow process that entailed close re-reading of every text. At the point of saturation, when all disciplinary fields were represented by multiple entries, and when connections between fields were greatly overlapping, I stopped adding entries, resulting in 600 items. I found many of the 600 entries to be still redundant and further culled the data based on the following criteria:

1. Documents from the same author with relatively similar information about Knowledge Tokens (see Chapter 3) were discarded unless published in different fields of study. A notable example of this criterion is a paper published by Aldrich, Sheppard and Hindle (2002, 2003) titled “First steps Towards a Model of Tactile Graphicacy.” This work, published almost unaltered in two different journals, was kept in the database because of the different disciplinary interest of the journals, one concerned with visual impairment (Aldrich, Sheppard, & Hindle, 2002) and the other with Cartography (Aldrich, Sheppard, & Hindle, 2003) . This, however, is an exception: in most cases, I kept the earliest item and removed others from the database.
2. When two or more documents from different authors had similar information about visual literacy or its correlates, I kept the earliest, unless a potential mediator or trigger (see Chapter 3) was identified. This criterion in itself reduced the number of entries considerably, particularly after 1970, as a considerable number of documents in my database containing “visual literacy” had no relevant information besides the definition of the concept by John Debes.

After applying these two criteria and running the first attempts to visualize the data, I reduced the database to 330 entries.<sup>13</sup> This process was iterative, much of it being concurrent with the GNV work described in Chapter 2. The protocol described in that chapter provided the initial count of documents and was crucial for the definition of the final database. That is to say, the process described here was greatly informed by the photomosaic approach. The

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<sup>13</sup> The final dataset is available at [errrnesto.github.io](https://errrnesto.github.io).

goal of this approach was to define a full text database of visual literacy documents that could potentially be visualized in several different ways.

The 330 entries and their connections were reviewed to prevent lost or redundant connections. Part of this process included the digitization of any documents corresponding to the 330 entries that were not natively digital or had not been digitized.<sup>14</sup> In the case of large volumes, I did not necessarily digitize the entire document; instead, I focused on chapters or sections that pertained to or mentioned the knowledge tokens I identified earlier in this work. Zotero allows for searches within documents imported into the software library. To make the digitized documents fully searchable within Zotero, I passed them through an OCR engine and prepared all as plain text files.<sup>15</sup> The result of this exercise was an uncharted network of fully searchable documents and an even deeper knowledge of my data.

## 4.2 Data coding

### 4.2.1 Relationships between documents

I identified and coded several types of relationships between documents. Explicit relationships between documents included references in scholarly documents or in-text direct mentions in non-scholarly sources. Beyond these, I identified a number of implicit relationships (see Table 4.1).

**Table 4.1 Implicit relationships: definitions and examples.**

Relationship	Definition	Example
Affiliation	Authors belong to the same collective or movement.	American pragmatists: John Dewey, Charles Peirce
Mentorship	An author of one document was mentored	Benjamin Ives Gilman, the only explicit

<sup>14</sup> For this task, I used an application called TinyScanner. This application allowed me to collate the scanned pages in a single document.

<sup>15</sup> An OCR (Optical Character Recognition) engine is software used to read typed characters. In this case I used Adobe Acrobat Professional because it was easily available. Ideally, I would prefer to use an open source tool.

Relationship	Definition	Example
	or taught by another and this influence is evident in the work.	mention in Davis [1939] was a student of Charles Peirce and William James; Gunther Kress is a former student of Michael Halliday.
Influence	A document evidenced strong influence of the work of another. The influence was stated explicitly.	Charles Peirce heavily influenced Charles Morris' work, despite different semiotic approaches.
Context	The authors of two or more documents participated in interchanges (face to face or epistolary) that may have been relevant to the mobilization of visual literacy or its correlates.	Conversations between Otto Neurath and John Dewey on an entry in the International Encyclopedia of Unified Science. This led to an interchange between Morris and Dewey.
Omission	A reference that should have been explicit in the document was missing, apparently intentionally. <sup>16</sup>	The lack of reference of Debes in Dondis (1973).

Of these five categories, the relationship of omission was included last as it was only after visualizing the database that such relationships emerged. Further discussion of this relationship comes later in this chapter. Unfortunately, Zotero does not allow for the characterization of relationships, a matter to which I return shortly.

#### 4.2.2 Keywords, disciplines, waves and genre

Besides relationships, the documents that comprise the data for this research project were tagged within Zotero in five general categories: A) Term, B) Discipline, C) Discipline 2, D) Waves of Visual Literacy and E). Genres. These categories are shown in Table 4.2.

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<sup>16</sup> In this table I refer to the Debes/Dondis case as an example of omission. I discuss this case later in the thesis. There is one other case in which the relationship of omission is difficult to establish. One of two practically identical documents published by Aldrich, Sheppard and Hindle (2002, 2003) cite Balchin (1972) as someone relevant in the advancement “graphicacy,” but does not cite Balchin and Coleman (1966) as the first occurrence of “graphicacy” in literature. This could not be considered an omission because 1) the document citing Balchin (1972) was submitted and published after the one that has no mention to this scholar and 2) there is no evidence that Aldrich, Sheppard and Hindle knew about the existence of Balchin & Coleman (1966) before the publication of any of these documents.

**Table 4.2 Distribution of categories used to tag the documents for this research project.**

Category	Description	Terms
A. Term	Key search term appears in document.	visual literacy, visual rhetoric, visual semiotics, visual grammar, graphicacy, graphical literacy, and “literary visualcy”
B. Discipline	The main discipline of the document based on indexing in library databases.	Visual arts, Education, Geography, Popular Media, History, Advertising, Philosophy, Journalism, Visual studies, Psychology, Linguistics, Finance, Anthropology, Medical sciences, Politics and Performative arts
C. Discipline 2	The second or sub-discipline of the document based on indexing in library databases.	Educational technologies, Literacy education, Librarian education, Art education, Media studies, Film studies, Museum Education, Rhetoric, Design Education, Pedagogy, Semiotics, Academic Ethics, Special Education, Pictorial Journalism, Cartography, English, Education Psychology, Linguistics, Visual perception, Advertisement, Kinesics, Creative Education, Semantics and Poetry
D. Waves	Association with distinct temporal periods (waves) in the rise of <i>Visual Literacy</i> .	1 <sup>st</sup> wave of visual literacy, 2 <sup>nd</sup> wave of visual literacy, 3 <sup>rd</sup> wave of visual literacy, elements of 1 <sup>st</sup> and 2 <sup>nd</sup> waves of visual literacy, elements of 2 <sup>nd</sup> and 3 <sup>rd</sup> waves of visual literacy, antecedents of the 2 <sup>nd</sup> wave of visual literacy and criticism against the 2 <sup>nd</sup> wave of visual literacy
E. Genre	Document genre.	Curriculum, Report, Monograph, Journal Article, Book Chapter, Magazine Article, Advertisement, Video recording, Blog post, Dissertation, Conference paper

As shown in the table, **Term** (Category A) included key terms for this research mentioned in earlier chapters. Also included in this category is an additional term: “literary visualcy.” This term emerged during the coding process. It is used only once. It is important to note some of the 330 documents in the corpus contained none of the terms in this category. Such documents were necessary to provide context. For instance, as mentioned in Chapter 2, the most dated document is *The Commercial and Political Atlas: Representing, by Means of Stained Copper-Plate Charts, the Progress of the Commerce, Revenues, Expenditure and Debts of England during the Whole of the Eighteenth Century* by Playfair (1786). Although this document makes no explicit reference to any of the terms researched here, it is

referenced by documents pertaining to both *graphicacy* and *visual rhetoric* multiple times; therefore, I added it to the full-text corpus.

The main ***Discipline*** (Category B) in which the document was situated was identified based on keywords and indexing of journals, as well as of libraries and repositories (mainly Google Books, WorldCat and UBC library databases). In some cases, these tags were automatically retrieved; in others, the input had to be manual. This particular category was broad and inclusive. A second layer of information about disciplinary context was included in ***Discipline 2*** (Category C). These tags, again, were drawn from the metadata sources listed for *Discipline* (journal and library indexing). Among the genre codes in the fifth category, there were two, “Curriculum” and “Report,” which refer to documents used specifically for teaching and curriculum development, as well as accounts of the implementation of programs. That is to say, a curriculum document within Design might be tagged as follows: Discipline: Design; Subfield: Communication; and Genre: Curriculum.

During the coding process, a sense of intermittence in the emergence of visual literacy prevailed. The data suggested that occurrences of visual literacy could be broadly arranged in three temporal ranges, or waves (Category D). These patterns, hinted at in Chapter 2, are described in detail in Chapter 5. Genre (Category E) was also tagged.

Of these four categories, the 1<sup>st</sup> (term) and the 4<sup>th</sup> (wave of visual literacy), were most useful for the analysis. The categories pertaining to disciplinary background proved too inconsistent to be helpful, for the following reasons:

1. Inconsistency in number of disciplines mentioned per article across databases: The number of items in the list of disciplines (or subjects) varied depending on the database from which the document was retrieved (see Table 4.3). This made it

- difficult to set up a value for this field for the purpose of visualization. The inconsistency in the number of items seemed to be dependent on the year of publication. For example, older items tended to have more limited indexing in relation to discipline (see Table 4.4).
2. Inconsistencies in discipline headings between databases: In the case of WorldCat and the UBC library, indexing mostly followed a relatively consistent format: subject—publication place—topic. In the case of Google Books, the format seems more capricious, probably due to the variety of databases from which GBS draws the metadata for the documents (see Table 4.3 and 4.4)
  3. Inconsistencies in syntax across databases: Not all databases followed the same syntax, and there were syntax inconsistencies within databases. Even minor syntax variances, such as separating phrases with a solidus (/) as opposed to a double hyphen (--), had implications for the visualization process (see Table 4.3).

**Table 4.3 Distribution of disciplines (subjects) of Messaris (1994) as retrieved from WorldCat, Google Books and the UBC library databases.**

Messaris, P. (1994). <i>Visual Literacy: Image, Mind, and Reality</i> . Boulder, Colorado: Westview Press.		
WorldCat	Google Books	UBC library database
Visual communication -- United States -- Psychological aspects	Art / General	Visual literacy--United States--Psychological aspects
Visual literacy -- United States -- Psychological aspects	Business & Economics / Industries / Media & Communications	Visual communication--United States--Psychological aspects
Visual communication -- Psychological aspects	Business & Economics / Industries / Media & Communications Industries	
Visual literacy -- Psychological aspects	Education / Educational Psychology	
United States	Language Arts & Disciplines / Communication Studies	

Messaris, P. (1994). <i>Visual Literacy: Image, Mind, and Reality</i> . Boulder, Colorado: Westview Press.		
WorldCat	Google Books	UBC library database
	Language Arts & Disciplines / Literacy Psychology / General Social Science / General Visual communication Visual communication/ United States/ Psychological aspects Visual literacy Visual literacy/ United States/ Psychological aspects	

**Table 4.4 Indexing for McLuhan (1955) in the WorldCat, Google Books and the UBC library databases.**

McLuhan, M. (1955). A Historical Approach to the Media. <i>Teachers College Record</i> , 57(2), 104–110.		
WorldCat	Google Books	UBC library database
Mass media Communication	Communication	

One could argue that issues of inconsistency could have been solved by establishing a single database to retrieve all the documents, or by categorizing all the documents manually. A single database would not have worked because not all the documents were available in all databases. Manual categorization (which I ended up having to do in many cases to narrow down the options to two—the number that the visualization could handle) led me to inaccurate assumptions about the scholarship of some scholars, assumptions that muddied my analysis and were only dispelled through close reading and acquired knowledge on the disciplinary background of the authors of particular documents.

### **4.3 Data analysis: Visualization**

Once the documents were coded and the relationships established, I produced visualizations of trends and patterns. Early attempts to produce visualizations directly from the database were unproductive, as the available formats for data exportation in Zotero do not include the relationships between documents. Without those, there was no point in visualizing the data. Ultimately, I found the data used to generate the visualization could be obtained from an HTML file called “Zotero Report.” This file displays bibliographic information about the documents, but also user-generated relationships (see Figure 4.5). I started exploring visualization formats. It is important to remember that the steps described in this chapter were not sequential, but iterative. When the exploration for the visualization layout started, the final number of data entries was not yet defined.

**Figure 4.5 Aspect of the “Zotero report” displaying the first two records of the 330 that comprised the data for this research. Each record includes the title of the document, bibliographic data, a list of tags, attachments and the other documents in the database connected to the record.**

**Peircean visual semiotics: Potentials to be explored**

**Author** Winfried Nöth  
**Author** Isabel Jungk  
**Issue** 207  
**Pages** 657-673  
**Publication** Semiotica  
**ISSN** 00371998  
**Date** 2015-10  
**Extra** 00000  
**Journal Abbr** Semiotica  
**DOI** [10.1515/sem-2015-0058](https://doi.org/10.1515/sem-2015-0058)  
**Date Added** 2/6/2016, 5:18:03 PM  
**Modified** 2/6/2016, 5:33:41 PM

**Tags:**

- A. Visual semiotics / visual grammar
- B. Visual arts
- C. Visual studies
- D. -

**Attachments**

- [visualsemiotics2015.pdf](#), indexed: Yes

**Related**

- Reading Images: The Grammar of Visual Design
- Collected Papers of Charles Sanders Peirce

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**Handbook of Research on Teaching Literacy Through the Communicative and Visual Arts, Volume II: A Project of the International Reading Association**

**Author** James Flood  
**Author** Shirley Brice Heath  
**Author** Diane Lapp  
**Publisher** Routledge  
**Date** 2015-04  
**Extra** 00147  
**Abstract** The Handbook of Research on Teaching Literacy Through the Communicative and Visual Arts, Volume II brings together state-of-the-art research and practice on the evolving view of literacy as encompassing not only reading, writing, speaking, and listening, but also the multiple ways through which learners gain access to knowledge and skills. It forefronts as central to literacy education the visual, communicative, and performative arts, and the extent to which all of the technologies that have vastly expanded the meanings and uses of literacy originate and evolve through the skills and interests of the young. A project of the International Reading Association, published and distributed by Routledge/Taylor & Francis. Visit <http://www.reading.org> for more information about International Reading Association books, membership, and other services.  
**# of Pages** 628  
**Date Added** 2/3/2016, 4:37:28 PM  
**Modified** 2/3/2016, 4:37:32 PM

**Tags:**

- A. Visual literacy
- B. Education
- C. Educational technologies
- D. -

**Attachments**

- [books?id=cJx4CAAAQBAJ](#), indexed: No

**Related**

- Handbook of research on teaching literacy through the communicative and visual arts
- Visual Literacy: Viewing: The Neglected Communication Process or "When What You See Isn't What You Get"

The visualization of networks in general has well-established distribution patterns and algorithms (e.g., Force-directed layout, Fruchterman Reingold, etc.),<sup>17</sup> and there are accessible tools for the production of such networks either through manual population of data (e.g., Gephi) or through automatic citation chaining (e.g., Citespace, WhoCites).<sup>18</sup> My early attempts to visualize the relationship between documents built within Zotero followed some of these conventions and were produced by changing the format of the Zotero Report through a web scraping<sup>19</sup> process that converts from HTML to CSV,<sup>20</sup> a format that works particularly well with Gephi, the tool initially chosen to visualize the networks. (see Figures 4.6-4.8).

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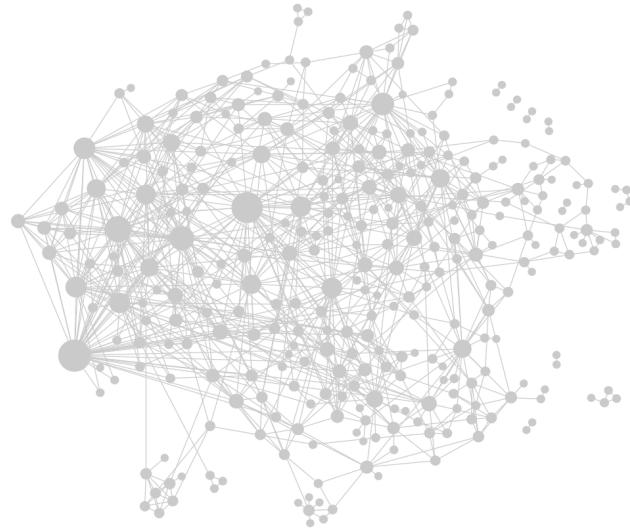
<sup>17</sup> The purpose of these algorithms is the distribution of elements in a plane following particular conventions. In most cases, these algorithms prevent clustering between data nodes by distributing the distance between the nodes, arranging them in geometric layouts, etc. Force-directed layout and Fruchterman Reingold are two common algorithms used in visualization.

<sup>18</sup> Both Citespace and WhoCites use network visualization (specifically a force-directed algorithm), but the data for visualization is obtained from massive digital databases that are already uncharted networks. In the case of Citespace, the data comes from the Web of Science; in the case of WhoCites, it comes from Google Scholar.

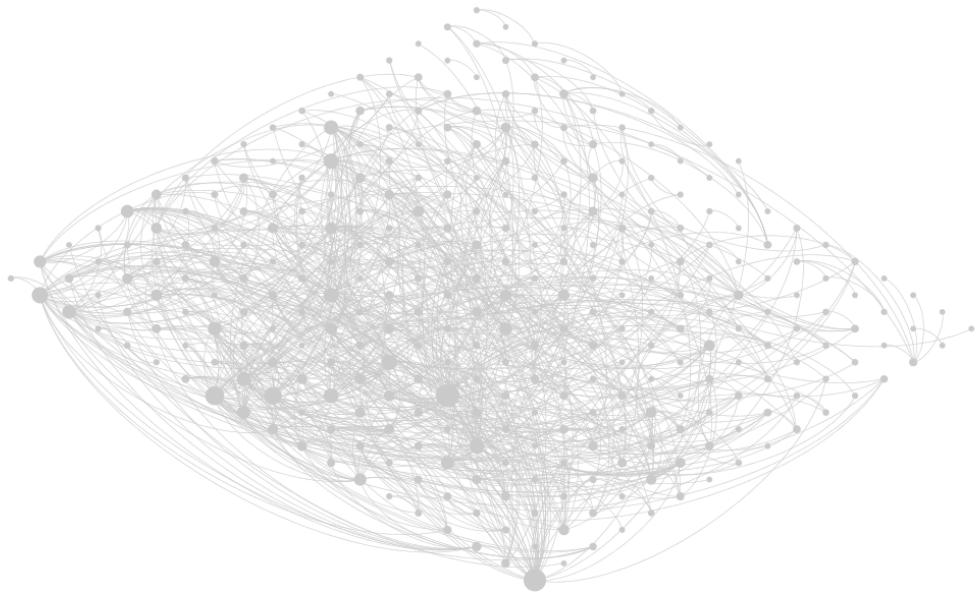
<sup>19</sup> Web-scraping entails harvesting data from a webpage, as opposed to acquiring it from a database.

<sup>20</sup> CSV stands for “comma-separated value,” and is a simple way to express table information.

**Figure 4.6** Visualization produced in Gephi showing the connections between documents in the database using a force layout algorithm. This algorithm works based on the interplay of attractive and repulsive simulated forces between the nodes. This simulated force also considers the size of the node (which is based on the number of connections) to create the visualization, where bigger nodes represent highly connected documents.



**Figure 4.7** Visualization produced in Gephi showing the connections between documents in the database using an Isometric layout algorithm. This algorithm distributes the nodes evenly over an isometric grid based on number of connections, from bottom left to top right.



**Figure 4.8** Visualization produced in Gephi showing the connections between documents in the database using a Yifan Hu layout. This algorithm, a variation of force-directed layout, positions the most connected nodes at the center and those with fewer connections at the margins of the graph.

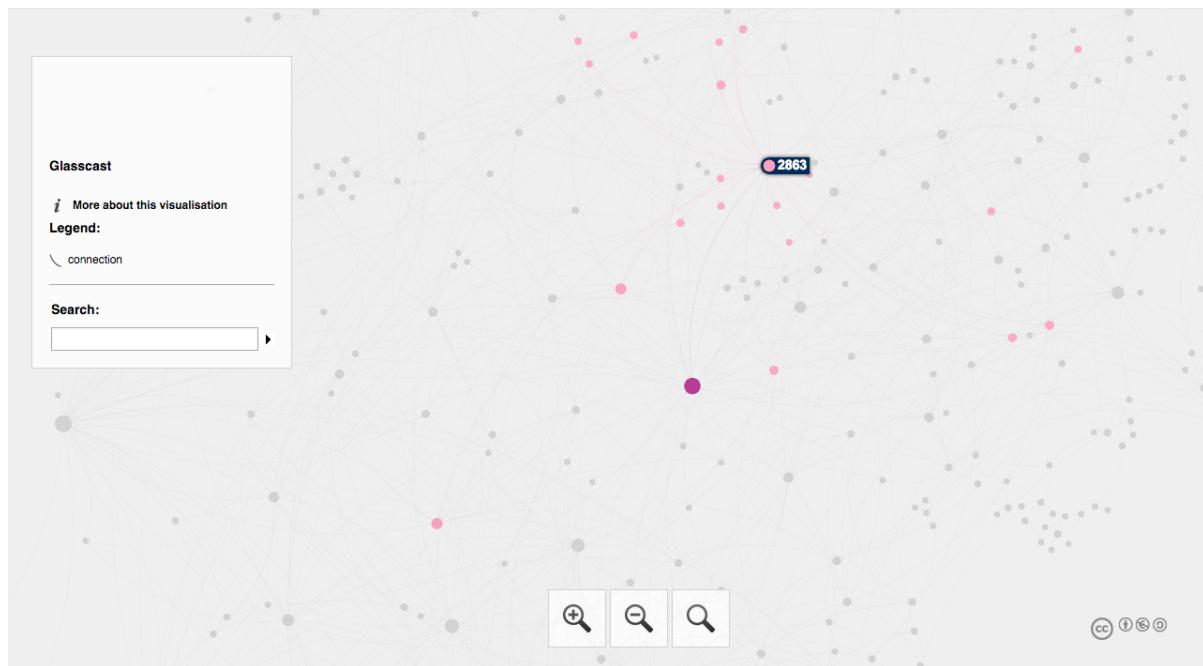


Gephi even allowed for the creation of an interactive visualization of the networks based on a javascript library called Sigma.js<sup>21</sup> (see Figure 4.9; readers may engage with the interactive visualization here: <http://errrnesto.github.io>.).

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<sup>21</sup> Just as D3.js, Sigma.js is a JavaScript library (pre-written JavaScript) that allows for the visualization of particular applications in standard browsers.

**Figure 4.9 Interactive representation of the network using a Sigma.js library through Gephi.**



#### 4.4 The Glass Cast: Visualizing networks over time

Challenges I faced at this point were twofold: 1) The visualizations of my data were unwieldy in terms of showing Knowledge Tokens and mediators because there was still too much overlap among data points. As stated before, in experimenting with various visualizations, I continuously culled the data concurrent with experimenting with visualization, eventually honing the corpus to 330 documents. 2) None of the visualization tools mentioned above include time as a factor. The issue of visualization of networks over time certainly has been tackled, but most of the work has been developed outside of the realms of Social Sciences and Humanities in fields such as Computer Science (e.g., Rad, Flocchini & Gaudet, 2015). As visualizing the mobilization of my search term was a crucial part of my research, I deemed the insufficiency of available models for representing networks over time a potential limitation.

The need to overcome this limitation drove me to the conceptualization of a visualization tool—a plugin for Zotero—that would serve this purpose. This tool—eventually called the Glass Cast (Dobson, Brown, Peña, Roeder, & Juárez, 2016; Peña & Dobson, 2015; Peña, Dobson, & INKE Research Group, 2013, 2014, 2015; Peña, Dobson, Juárez, & INKE Research Group, 2016)<sup>22</sup>—played a crucial part in the analysis of my data for this dissertation.

A search of available models and patterns for the representation of time revealed, not unexpectedly, that timelines were among the most common (Rosenberg & Grafton, 2010, Ferdio, n.d.). To seize the affordances of both network traditional visualizations and a timeline model, and to enable viewers to examine the network along the lines of time, discipline, and connection between texts and authors, I explored the possibility of developing a three-dimensional representation that could account for multiple variables, such as time, discipline and relationships. Such an approach had been used before to represent complex narratives (Dobson, Michura, Ruecker, Brown, & Rodriguez, 2011). The model would take a network visualization algorithm as a baseline, and then distribute the documents in my database (represented as spheres) across the *y* axis, positioning the newer documents at the top and the most dated at the bottom. This approach would solve some of the tensions that would normally emerge from trying to combine two different kinds of visualization, such as defining an algorithm that would distribute the data over a two-dimensional visualization.

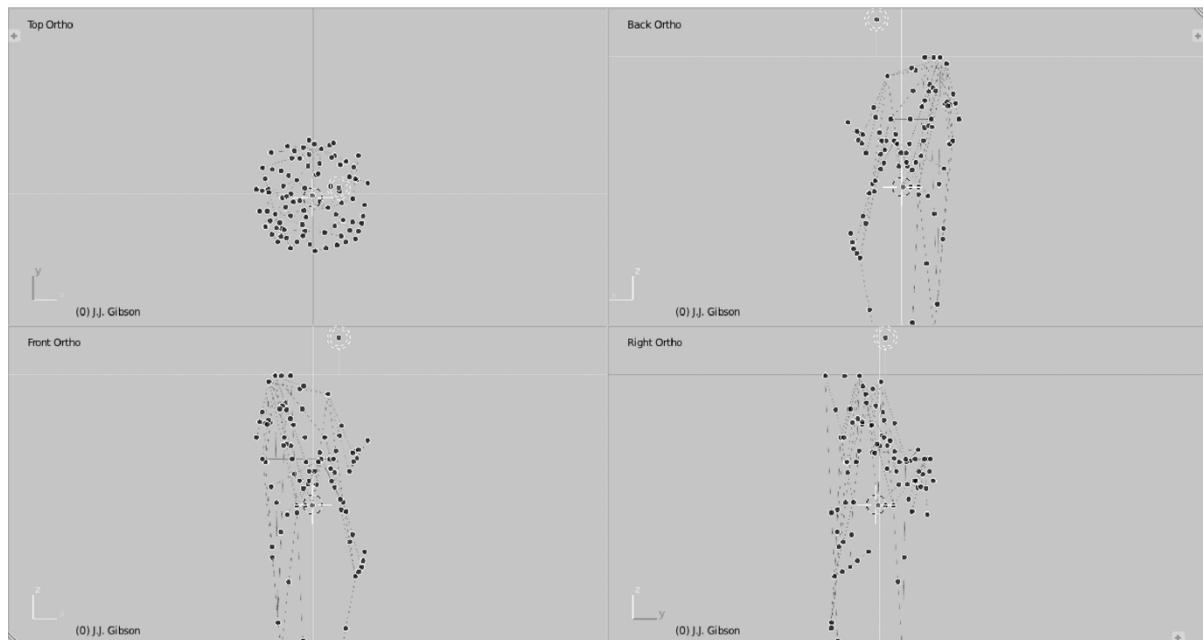
The first drafts of this three-dimensional model were developed in open editing tools such as Blender ([blender.org](http://blender.org)) and Unity ([unity3d.com](http://unity3d.com)) (see Figure 4.8). During the design process, I had to keep in mind that, as with the early two-dimensional network visualizations

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<sup>22</sup> INKE (Implementing New Knowledge Environments) is an interdisciplinary and collaborative collective of scholars funded by the Social Sciences and Humanities Research Council devoted to the exploration of several topics in the Digital Humanities ([inke.ca](http://inke.ca)).

produced with Gephi, the information I had available to produce the 3D model would have to come exclusively from the Zotero database. The conceptualization of the model followed patterns and design conventions as much as possible, even if those patterns were not present in the first drafts (Peña, Dobson, & INKE Research Group, 2013). For instance, just as with the two-dimensional models shown earlier, the size of the spheres indicated number of references (implicit or explicit) to that particular document and lines indicated links between documents (see Figure 4.10)

**Figure 4.10 Early drafts of the visualization tool in Blender. The image has been inverted (dark on light rather than light on dark) to facilitate its visibility in print media.**



Once the design was defined, I had to find a way to produce a 3D interface compatible with standard web browsers from the existing Zotero database. This phase took a few months of exploration. In the end, I selected the three.js library.<sup>23</sup> The final product is a web-based application that visualizes data in three dimensions within a web browser. This allowed me to

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<sup>23</sup> Three.js is a javascript library (pre-written JavaScript that allows for easier development of JavaScript-based applications). Three.js is specifically a 3D graphics framework.

generate visualizations of the connections between the 330 documents through time and across disciplines and enabled me closely to examine them in search of overlooked events, clusters, patterns and gaps over time in a visual, immersive way.

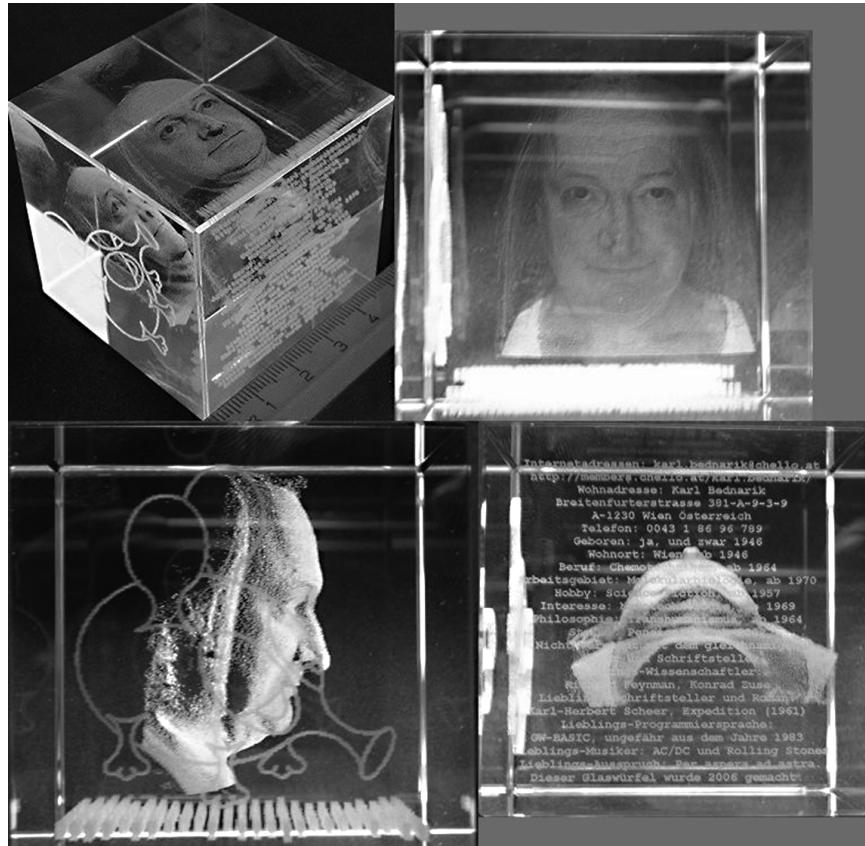
As intimated earlier, the tool I created for the purpose of this work is called, somewhat curiously in retrospect, the “Glass Cast.” It is described here:

The Glass Cast is a 3D interface . . . intended for the visualization of knowledge networks that takes into consideration parameters such as authorship, time, subject discipline and connections between documents in a corpus. The working metaphor is the sort of cast sculpture whereby the object of representation appears as a negative space within a block of clear material such as glass or plastic. Smaller versions of such sculptures invite physical interaction: viewers might pick them up and rotate them to gain different perspectives. In the case of modelling a knowledge network with this metaphor in mind, a top view presents connections between citations while a side view presents citations over time. Users may rotate the structure to gain different perspectives on the network, as well as zoom in or out to increase and decrease granularity. (Peña, Dobson, & INKE Research Group, 2014, p. 3)

I say this prototypical visualization tool was curiously named because the “Glass Cast” metaphor in fact failed when our research team completed studies with users of the interface (Peña & Dobson, 2015): most participants did not understand the metaphor, perhaps because they had not seen a glass cast sculpture (see Figure 4.11). Users, who tended to compare the visualizations produced by the Glass Cast to starry skies, suggested other metaphors, many pertaining to astronomy, such as “constellation.” Nevertheless, in spite of

its curious name, using the Glass Cast to visualize relationships among documents in my data set revealed patterns that the predominantly chronological analysis performed for the literature review could not account.

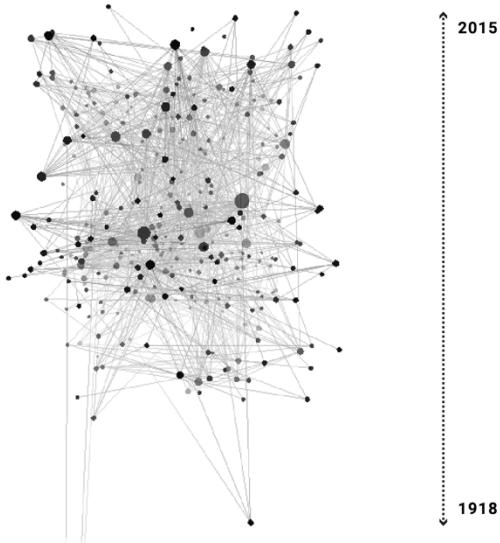
**Figure 4.11 Orthographic view of a Glass Cast sculpture. *Glasinnengravur. Die Abbildungen im Würfel stellen* by K. Bednarik [https://commons.wikimedia.org/wiki/File:GLASWURF\\_BEDNARIK.JPG](https://commons.wikimedia.org/wiki/File:GLASWURF_BEDNARIK.JPG). Used under Creative Commons Attribution 3.0 Unported: <https://creativecommons.org/licenses/by/3.0/>**



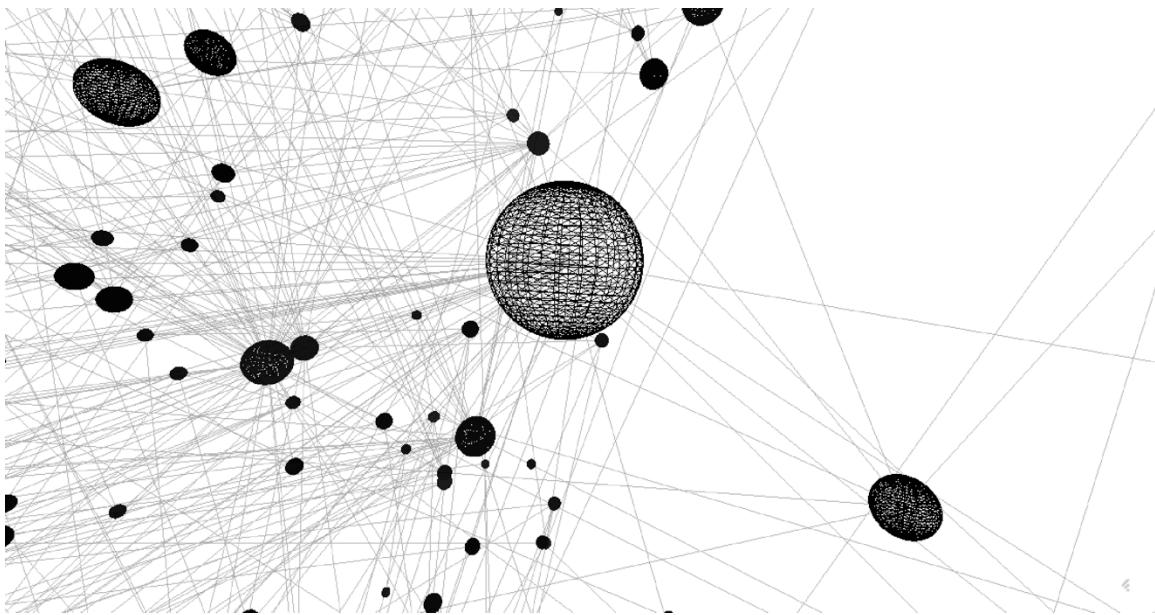
The 330 documents that comprised the data for this study and their connections were now displayed in a navigable 3D environment (see Figure 4.12). For me, already familiar with the data, the connections and the coded patterns, this interactive display finally illuminated events described in Chapter 3. In the two-dimensional visualizations presented before (see Figures 4.6 through 4.8), the “most-connected” documents are clearly identifiable due to their size relative to each other. In the case of this visualization, one can not only identify such documents, but also see the approximate time range in which the document was

published. This visualization and some of its functionalities assisted me in revisiting the full story about the mobilization of “visual literacy” across disciplines and shed light on controversies that have emerged over 75 years of usage. The Glass Cast has basic navigation and information features intended to facilitate its use. One can move around the environment to access individual nodes, which represent documents. Hovering over a node displays the name of the author and the year of publication of the item (see Figure 4.13 and Figure 4.14). Clicking on the node highlights the item and its connections and displays a left panel that lists the document and its connections (see Figure 4.15; an interactive version is available here: <http://errnesto.github.io>).

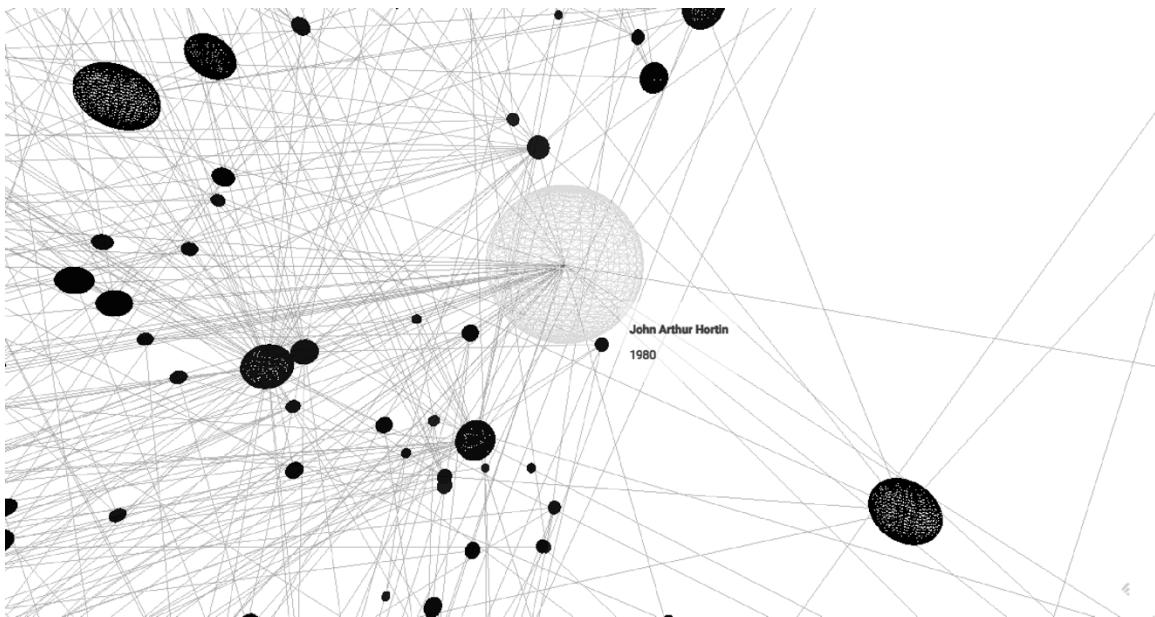
**Figure 4.12 A fragment of the visualization produced by Glass Cast from my data (330 citations in Zotero).** This view shows prominent documents and nodes of activity between 1918 and 2015. More recent documents are at the top; older documents are at the bottom (the oldest one, dating to 1786, is not represented here due to its relative position in the model). Larger dots represent articles that are often referenced by other writers. The image is inverted (presented in negative) to ease its display in print.



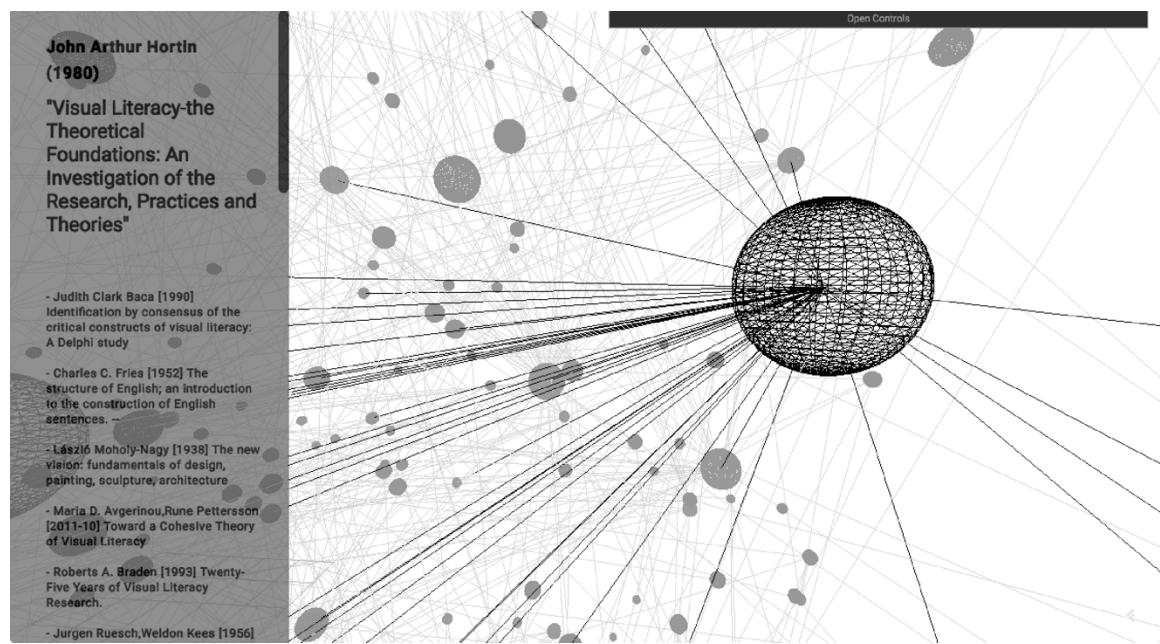
**Figure 4.13** A close-up of the visualization of my data produced by Glass Cast (the image is inverted to ease its viewing in this medium). Each sphere represents a document. The large Sphere here is Hortin (1990). The size of this dot reveals that this author is cited often. Lines represent links between documents. To view the actual Glass Cast, visit the following URL: <http://errrnesto.github.io>.



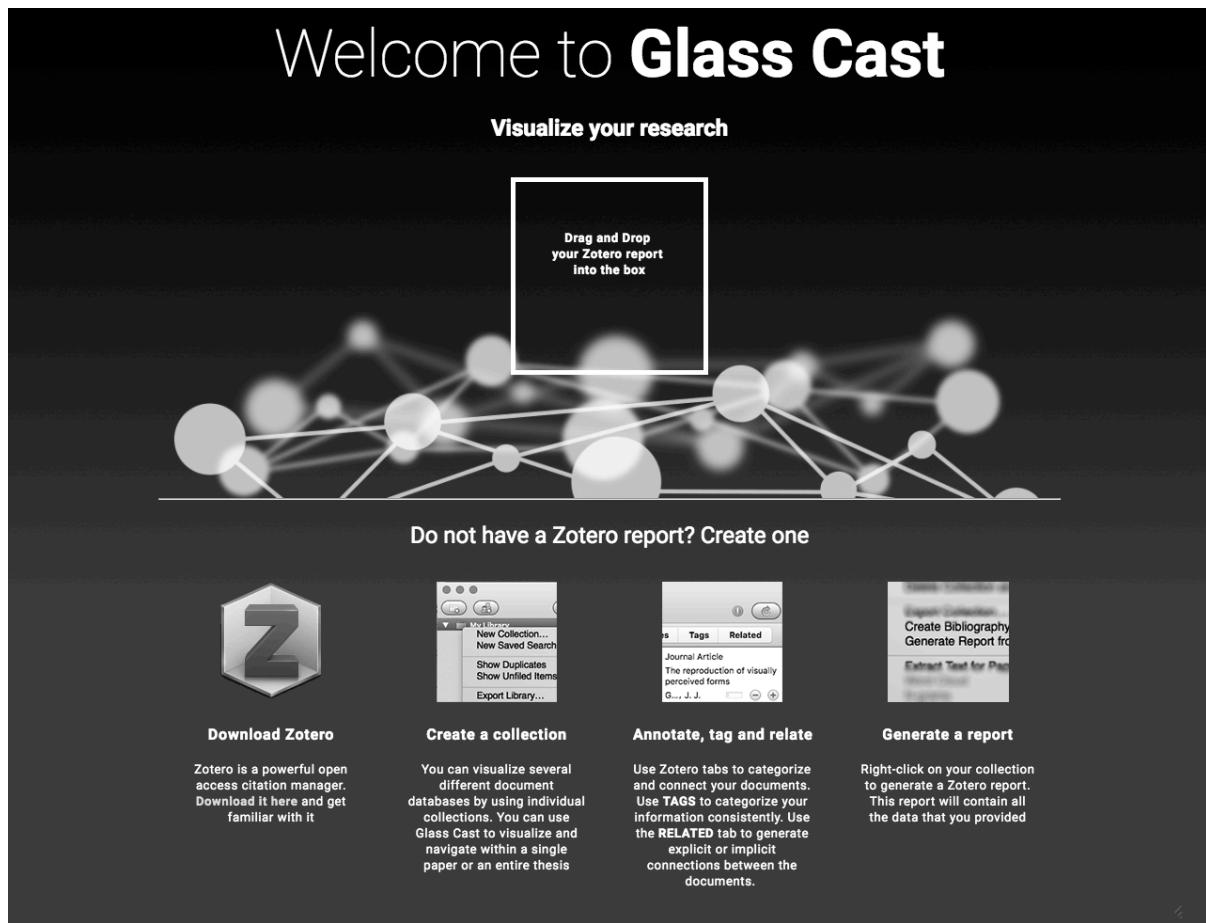
**Figure 4.14** Hovering over spheres brings up the author name and date. (The image is inverted to ease its display in this medium.)



**Figure 4.15** Highlighting (clicking on) a document reveals an information panel. This panel lists the active document and its connections.



**Figure 4.16. Landing page of the Glass Cast**



#### 4.4.1 The affordances of visualization: Sample cases

As mentioned above, using my corpus as sample data during the later stages of development of the Glass Cast led to the exploration of those documents and their connections from several points of view. So much so, that by the time the data was fed into the current version of the Glass Cast, I had a fairly clear idea of what the visualization would look like. Nevertheless, the visualization revealed very interesting details such as missing connections between documents that I assumed would be connected based on known relationships between the authors. Before offering a detailed discussion of the results of my analysis through the Glass Cast, I offer an example of the sort of connections that were

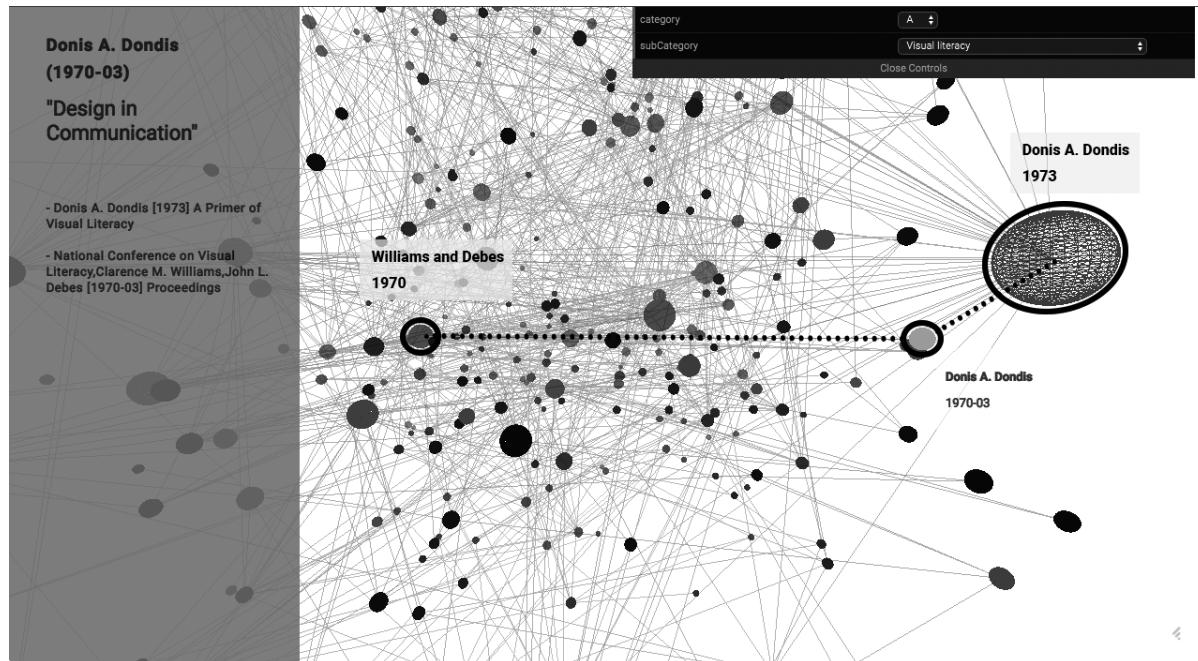
revealed through this analysis, connections I believe could only be revealed through visualization.

#### **4.4.1.1 The Debes-Dondis case**

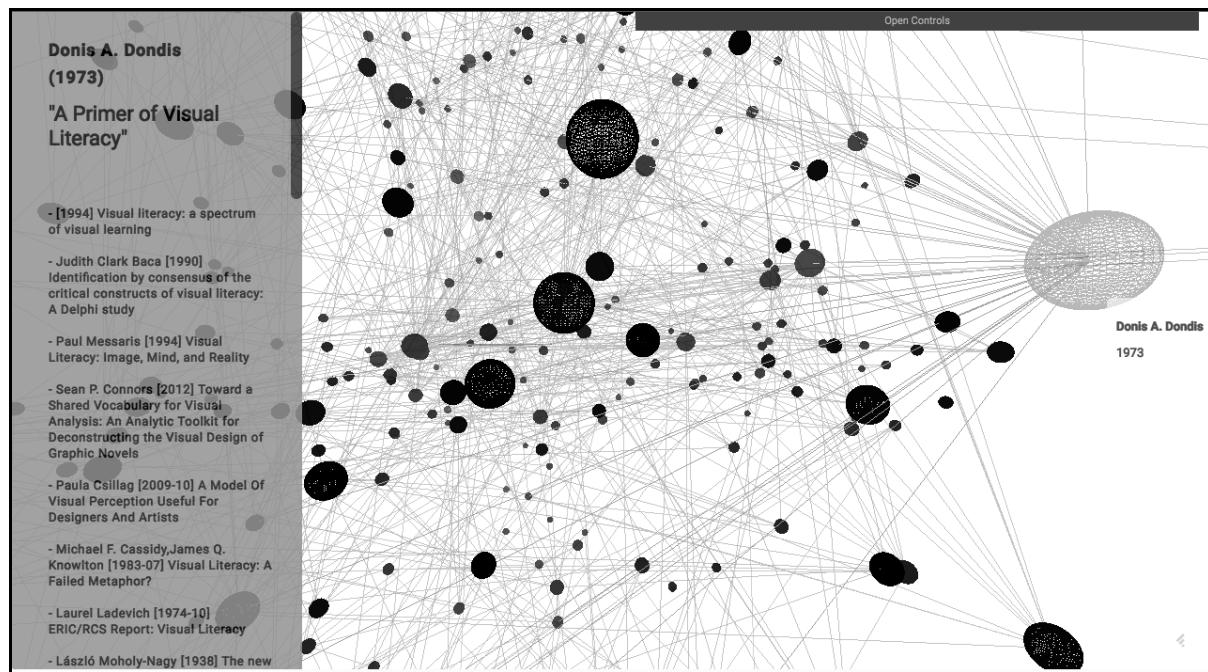
One of the most prominent cases of a missing explicit connection during the analysis of the data through the Glass Cast came in the form of what I now deem to be a conscious omission of reference. As I mentioned in previous chapters, one of the better-known representatives of visual literacy within design education is *A Primer of Visual Literacy* (Dondis, 1973). As a designer, I was familiar with this reference before starting this research project; however, I had no knowledge of John Debes, who was described as the creator of the concept *visual literacy* in many of the documents I came across in this study. Initially, I assumed my prior lack of knowledge of Debes was due to insufficient academic curiosity; however, during the initial research for the literature review, a connection between Debes and Dondis emerged. This connection came in the form of the documented participation of Dondis (1970) in the first National Conference of Visual Literacy co-organized by Debes (Williams & Debes, 1970). The participation of Dondis in this event is reported in Chapter 3 of this dissertation. During the exploration of the data through the Glass Cast, I noticed what I assumed was a broken link between the first documented use of Visual Literacy by Dondis and her seminal work on Visual Literacy (see Figure 4.17). I later verified all explicit connections between *A Primer of Visual Literacy* (Dondis, 1973) and documents authored by Debes (see Figure 4.18). Although there are common references between the two authors (e.g., Arnheim [1954]; Gombrich [1950]), neither Debes nor Dondis reference the other. The lack of references to Debes in Dondis' seminal work is puzzling, particularly given that Dondis' first documented contact with the term "visual literacy" seems to have been the first

National Visual Literacy Conference organized by Debes four years prior to the publication of *A primer of Visual Literacy* (Dondis, 1973). Whatever the reasons for this omission, the event could have had important historical implications for the mobilization of the term. It could explain, for instance, why Debes, despite producing related work during most of the 1970s (e.g., Debes & Williams, 1978), was never a major figure in the mobilization stream of Design, and the branching out of the design stream from the Visual Literacy Movement.

**Figure 4.17. Connections between Dondis' participation in the First National Visual Literacy conference (Williams & Debes, 1970) and *A Primer of Visual Literacy* (Dondis, 1973), a document critical in the advancement of Visual Literacy in the field of Design.**



**Figure 4.18. Documents connected to *A Primer of Visual Literacy* (Dondis, 1973), either used as references by Dondis or referring to Dondis. Interestingly, despite common references used by both Debes and Dondis, there is no explicit connection between the two writers. That is, neither cites the other at any point in their scholarship.**



It took the team of individuals who collaborated with me in development of the Glass Cast (Peña, Dobson, Juárez & the INKE Research Group, 2016) around three years to produce the working prototype I used to visualize my data. The Glass Cast, when fed with the 330 documents and connections that comprise my data, is an interactive model of this dissertation, a visual literature review, if you will. The Glass Cast is a crucial non-verbal component of this research project, and this thesis is not complete without it. Readers may find the prototype with my thesis data loaded for visualization here: <http://errrnesto.github.io>. Another representation of my work in this chapter is the computer code behind the three-dimensional model, which is available in an open repository (i.e., <https://github.com/errrnesto>). That code is also available through the thesis website. There is also a record of the Glass Cast's exhibition in an international conference in information design (Peña, Ernesto, Juárez, Omar, Dobson, Teresa, & INKE Research Group, 2016).

Chapters 5 and 6 offer analysis of the trends and patterns in the dataset as revealed by this visualization and discuss implications. In doing so, these chapters respond to the remaining research questions.

## Chapter 5: Waves of Visual Literacy

In this chapter, I lay out an analysis of the evolution of the concept of visual literacy as informed by the process of data analysis with the Glass Cast. In so doing, I respond to the following research question: *How have different historical approaches shaped the understanding of visual literacy?* In particular, I will discuss three distinct “waves” of research in visual literacy through the past 80 years, each with a unique focus.

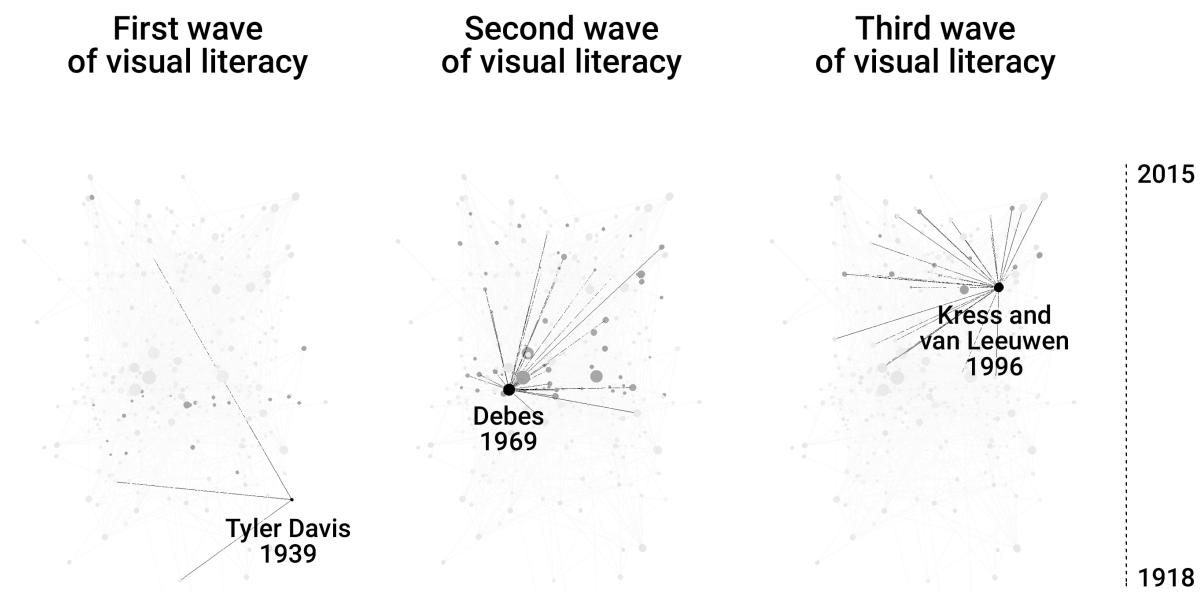
As mentioned before, the search for an operational definition of visual literacy has been a long-standing endeavour. Under the auspices of the IVLA, at least two Delphi studies<sup>24</sup> were undertaken in the past 25 years (Baca, 1990; Brill, Dohun, & Branch, 2007), as well as various reviews (e.g., Avgerinou & Ericson, 1997). Much research has been done outside of the IVLA as well (e.g., Little, Felten, & Berry, 2015). One could argue the search for both a consensus definition and theoretical foundation from within an organization that dominated the landscape of visual literacy during most of its official history would be a relatively straight-forward task, particularly given 50 years to accomplish it. In this chapter, I offer potential reasons for the lack of conclusiveness that has surrounded the historical development of the concept of visual literacy. These reasons are those suggested by visualization of my data (330 full texts and their metadata, including the features I tagged in such texts, as described in Chapter 4) through the Glass Cast. I also discuss factors that may have prevented the successful implementation of curricula oriented toward visual literacy.

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<sup>24</sup> A Delphi study is one in which the Delphi technique has been used to acquire consensus by requesting expert opinion from practitioners.

## 5.1 Three waves of visual literacy

Figure 5.1 The distribution of documents in a Glass Cast visualization showing (according to the coding conventions outlined in Chapter 4) a first, second and third wave of visual literacy, respectively. The position and number of the dots indicate the time (from 1918 to 2015) and quantity of documents in my database containing the phrase “visual literacy” in each of these three waves. The size of dots shows the prominence and uptake of some documents: the larger the dot, the more connections. The oldest articles are at the bottom of the image; the most recent articles are at the top.<sup>25</sup>



As discussed in Chapter 3, most literature suggests “visual literacy” as a unique concept is about 50 years old and that the Visual Literacy Movement (Fransecky & Debes, 1972, p.7; Moore & Dwyer, 1994, p. 14ff), led by John Debes, is responsible for its spread. My research has shown a much earlier first usage (Davis, 1939; see Figure 1.1) in the context of art education in North America. After a hiatus provoked by the World War II, the concept appears to have been reclaimed and further developed by art educators and media scholars (e.g., McLuhan) during the 1940s and most of the 1950s. The passing into law of the

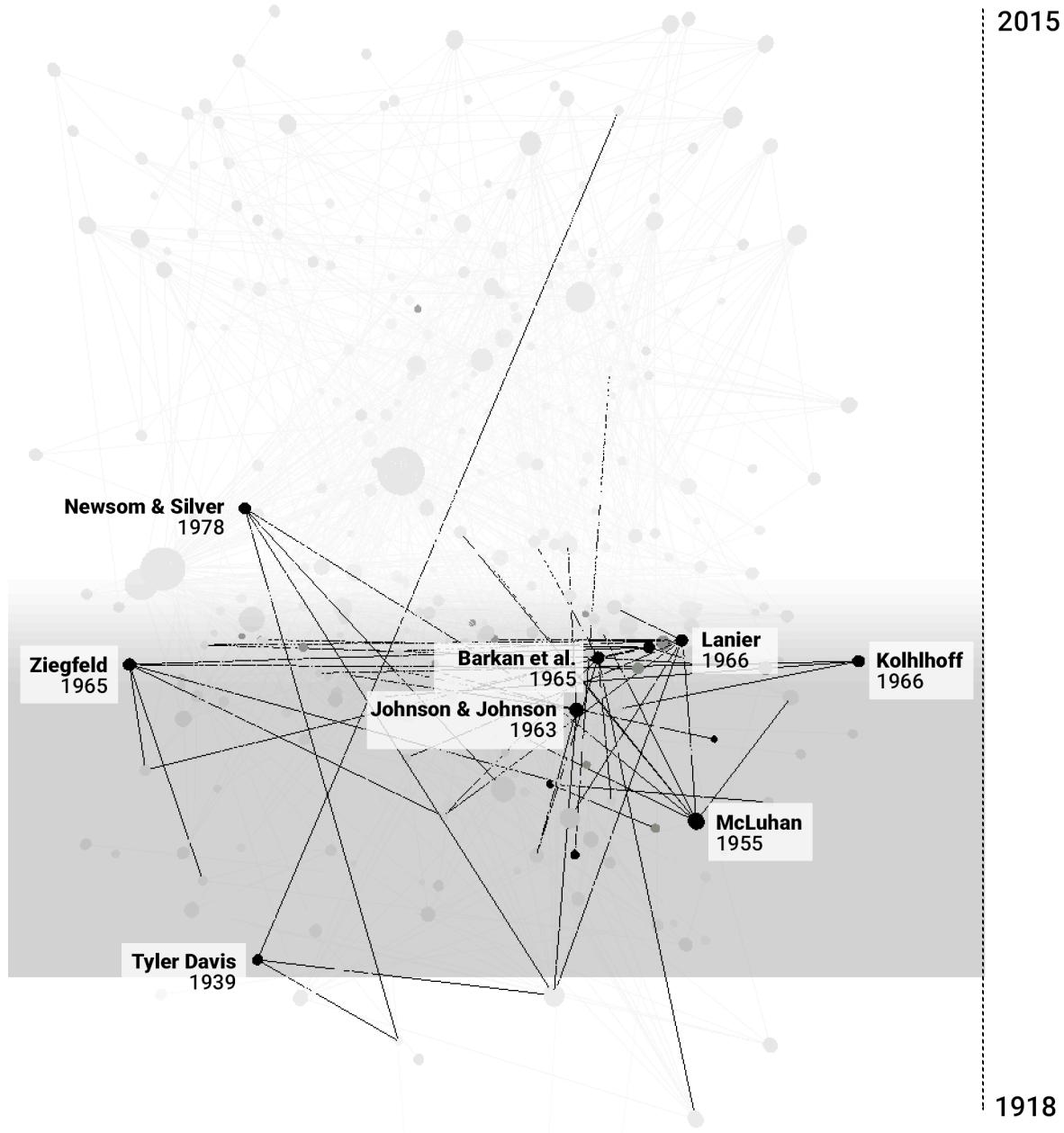
<sup>25</sup> Glass Cast visualizations in this chapter are limited because of the difficulty in translating a three-dimensional environment to a planar one. There is possible occlusion of dots (representing documents) or aberration due to perspective. Readers are encouraged to visit the Glass Cast for a three-dimensional perspective: <https://errnesto.github.io/>.

National Defense Education Act (NDEA) in 1958 (Flemming, 1960; Norberg, 1958) mobilized the concept beyond Art Education and the then fledgling field of Media Studies, and associated it more strongly with technology-oriented subjects. The term was claimed by Debes (1969; see Figure 5.1) and moved forward by the IVLA and its journal (now known as *Journal of Visual Literacy*).

The mid 1990s witnessed a renewed interest in visual literacy by a new generation of scholars not associated with the IVLA; however, the lack of references to Debes or the IVLA in the works of several representatives of this new generation (e.g., Kress & van Leeuwen, 1996 [see Figure 5.1]; Messaris, 1994; NLG, 1996) suggests these scholars might have been unaware—or dismissive—of the work of Debes and the IVLA. What became clear through visualization of the dataset with the Glass Cast was that it is possible to identify three different and seemingly unconnected historical moments—waves—in which understandings of the concept and term “visual literacy” have been brought into light. These three different historical moments or *waves* are described in more detail below.

### 5.1.1 First wave

**Figure 5.2** A general view of documents contained in the first wave of visual literacy and their connections, as presented in the Glass Cast interface. The gray area represents what I call here the “first wave of visual literacy.”



The first wave of visual literacy is the 30-year period following the first occurrence of the term in my corpus (Davis, 1939; see Figure 5.2). During this time the concept of visual literacy was strongly associated with art education. Key scholars associated with this wave

are Barkan (Barkan, M., Ziegfeld, E., McFee, J. K., Kuhn, M., Jefferson, B., & Lanier, V. (1965) Lanier (1966), Johnson (1963) and Ziegfeld (1965) (see Figure 5.2). There are also references related to photography (e.g., Hyatt, 1958) and Media Education, with McLuhan emerging the key mobilizer in the latter stream (Grier, 1941; McLuhan, 1955).

It is worth addressing the role of McLuhan in this wave. Figure 5.2 shows McLuhan as the largest “dot” or “node,” meaning this document within my dataset is the most referenced in this time period. The document in question is “A Historical Approach to the Media” in *Teachers College Record* (McLuhan, 1955). McLuhan is one of the first scholars to explicitly use the phrase visual literacy and is one of the very few scholars that framed visual literacy in the context of television during the first wave. However, as opposed to Grier (1941), who writes about television in the context of Art Education, McLuhan discusses the implications of the popularization and adoption of television itself. Note that all of the lines connecting McLuhan to the network move upward, meaning these lines signal references to McLuhan in later work. McLuhan’s prominence in this figure (i.e., the size of the node) in fact reflects the uptake of his ideas in the later stages of the first wave, after the National Defence Education Act. Beyond McLuhan (1955), who became a mediator for visual literacy within Media Studies, Lanier (1966a, 1966b) actively advocated for the use of “newer media” in Art Education.

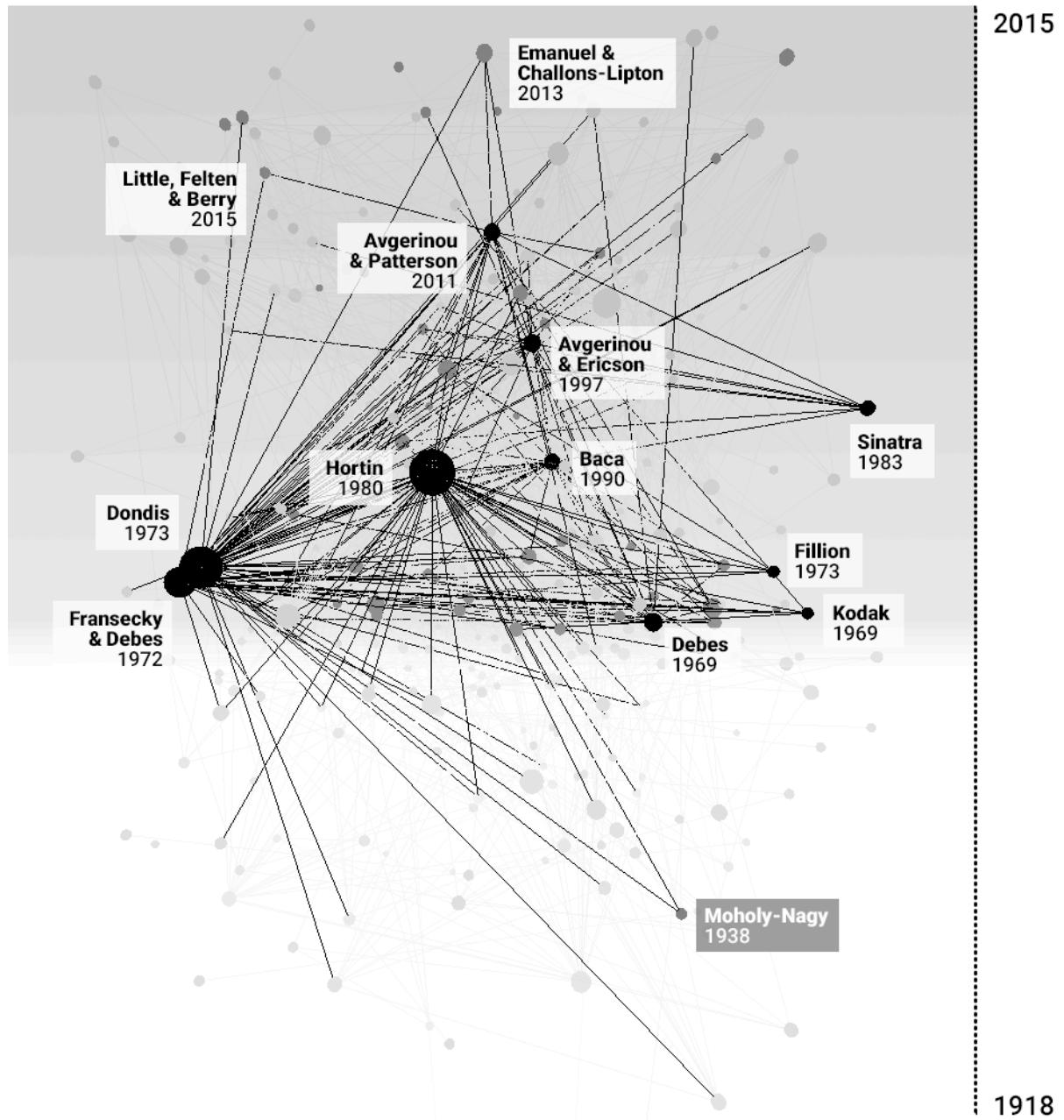
Another interesting feature of this visualization is the proximity of many key documents at the upper threshold of the first wave zone (in gray). These documents are largely retrospective and postulative: they are collections of essays and reflections on Art Education as a field and considerations of how the field may inform visual literacy understandings and instructional methodologies going forward, particularly in light of

technology developments such as television (e.g., Barkan, Ziegfeld, McFee, Kuhn, Jefferson, and Lanier, 1965). This set of documents appears to have been triggered by the National Defense Education Act of 1958, a point to which I will return.

One document shown in this visualization is apparently outside of the first wave timeline, which deserves an explanation. The document protruding at the top left (Newsom & Silver, 1978) is titled *The Art Museum as Educator: A Collection of Studies as Guides to Practice and Policy*. This is a compilation of earlier studies that champion museums as learning environments. Although this book is published in 1978, the studies included programs developed as early as 1896, most of which fall within the range of the first wave.

### 5.1.2 Second wave

Figure 5.3 A view of key documents contained in the second wave of visual literacy and their connections, as presented in the Glass Cast interface. The gray area represents what I call the “second wave of visual literacy.”

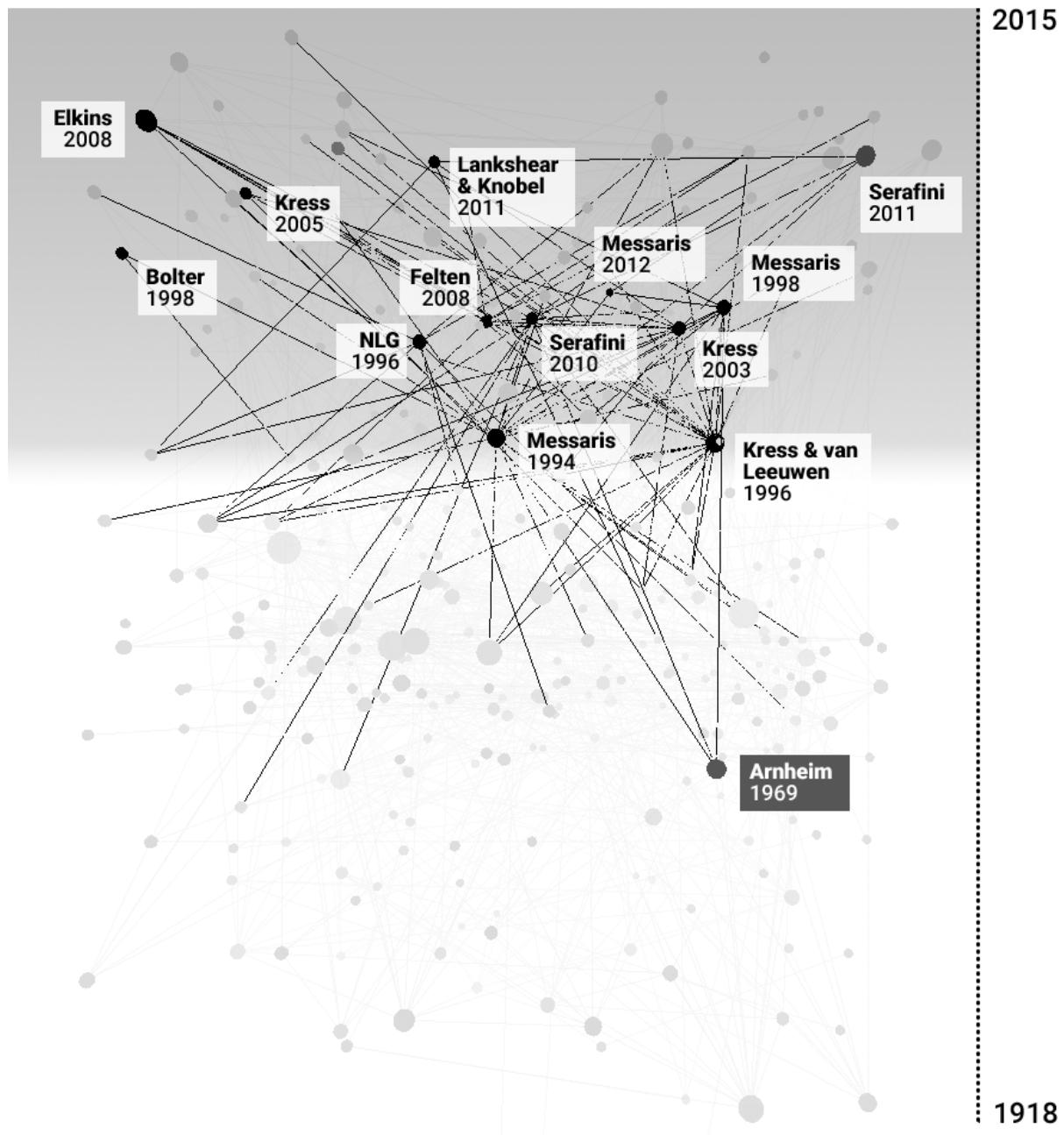


The transition between the first wave and the second wave of visual literacy appears to have been prompted by the National Defense Education Act of 1958 and the popularization of television and audiovisual technology in general. The second wave is

characterized by the overwhelming influence of The Visual Literacy Movement discussed in Chapter 3, starting about 1966 and extending until the present day. Key events during this wave were the alleged coinage of “visual literacy” by John Debes (1969), and the eventual foundation of the International Visual Literacy Association. Key scholars associated with this wave are Debes (1968, 1968b, 1969, 1974b, 1974a, 2013), Fransecky, (1969, 1973; Fransecky & Debes, 1972), Dondis (1970, 1973), Avgerinou (Avgerinou & Ericson, 1997; Avgerinou & Pettersson, 2011) and Sinatra (1986) (see Figure 5.3). The Glass Cast visualization of this wave shows a shape pattern that almost mirrors the first wave visualization, with greater activity (in terms of connections) after the late 1960s. This visualization shows the explosive uptake of the term, but also reflects the comparatively smaller amount of prior influences (note that the connecting lines primarily move upwards, showing how those documents are taken up by subsequent scholars; there are fewer connections to articles in the past). This view also shows the influence that some key documents (i.e., Dondis, 1973; Fransecky & Debes, 1972) had on the advancement of the term. Again, the size of each node is dependent on the number of connections (see Figure 5.3). Hortin (1980) and Baca (1990) are particularly interesting because the directionality of the connections (most of them incoming) shows that they contain extensive literature reviews. Each is, in fact, a thesis on visual literacy.

### 5.1.3 Third wave

Figure 5.4 A view of key documents contained in the third wave of visual literacy and their connections, as presented in the Glass Cast interface.



The transition between the second and the third wave of visual literacy appears to have been triggered by a cultural shift in the general understanding of the concept of literacy, a shift that eventually gave way to the multiliteracies movement in Literacy Education and

concurrent movements in other fields. The third wave starts about 1995 and extends to the present moment. Notably, the second and third wave partially overlap; however, they are distinct insofar as they do not reference each other. This is the time during which scholars outside of Museum and Art Education and the influence of the IVLA have most contributed to the advancement of the concept. The third wave of visual literacy correlates with the consolidation of the Multiliteracies and Multimodality movements (Jewitt, 2008).

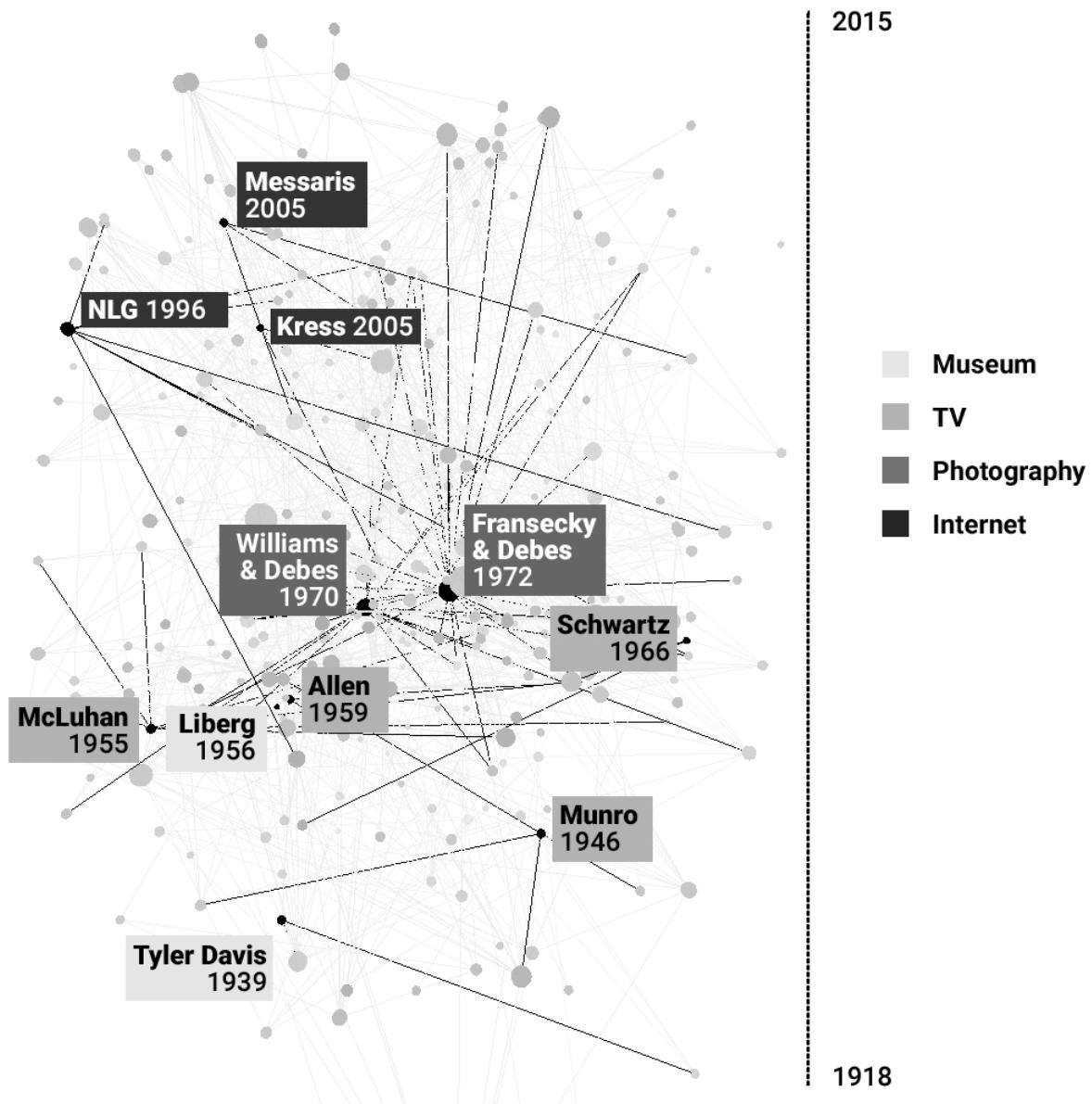
Prominent representatives of this wave are, in Education, members of the New London Group (1996) (e.g., Kress [2003; 2005] and Kress & van Leeuwen [1996]), Messaris (1994, 1998, 2012) in Film Studies, and Jay David Bolter (1998; 2001) in Media Studies (see Figure 5.3). There is greater distortion of the spheres in this image in relation to the year due to the translation from a three-dimensional to two-dimensional perspective. The three-dimensional visualization in the Glass Cast itself shows a more balanced distribution of connections before and after the proposed beginning of this wave. As noted previously, readers are encouraged to examine the data in the Glass Cast itself. Comparatively, the number of documents in the third wave seems smaller than in the second wave (see Figure 5.3 and 5.4). Likely this is because discourse about visual literacy during the third wave in literacy education is mostly contextualized by the concepts of multiliteracies and multimodalities, of which visual literacy is only one part.

## 5.2 Common traits between the waves

Although the waves described above are largely unconnected—in the sense that representatives of the last two seem mostly unaware of previous usages of the concept—there are several commonalities between them that shed some light on the evolution of the concept. These commonalities are listed below.

### 5.2.1 Visual literacy and technology

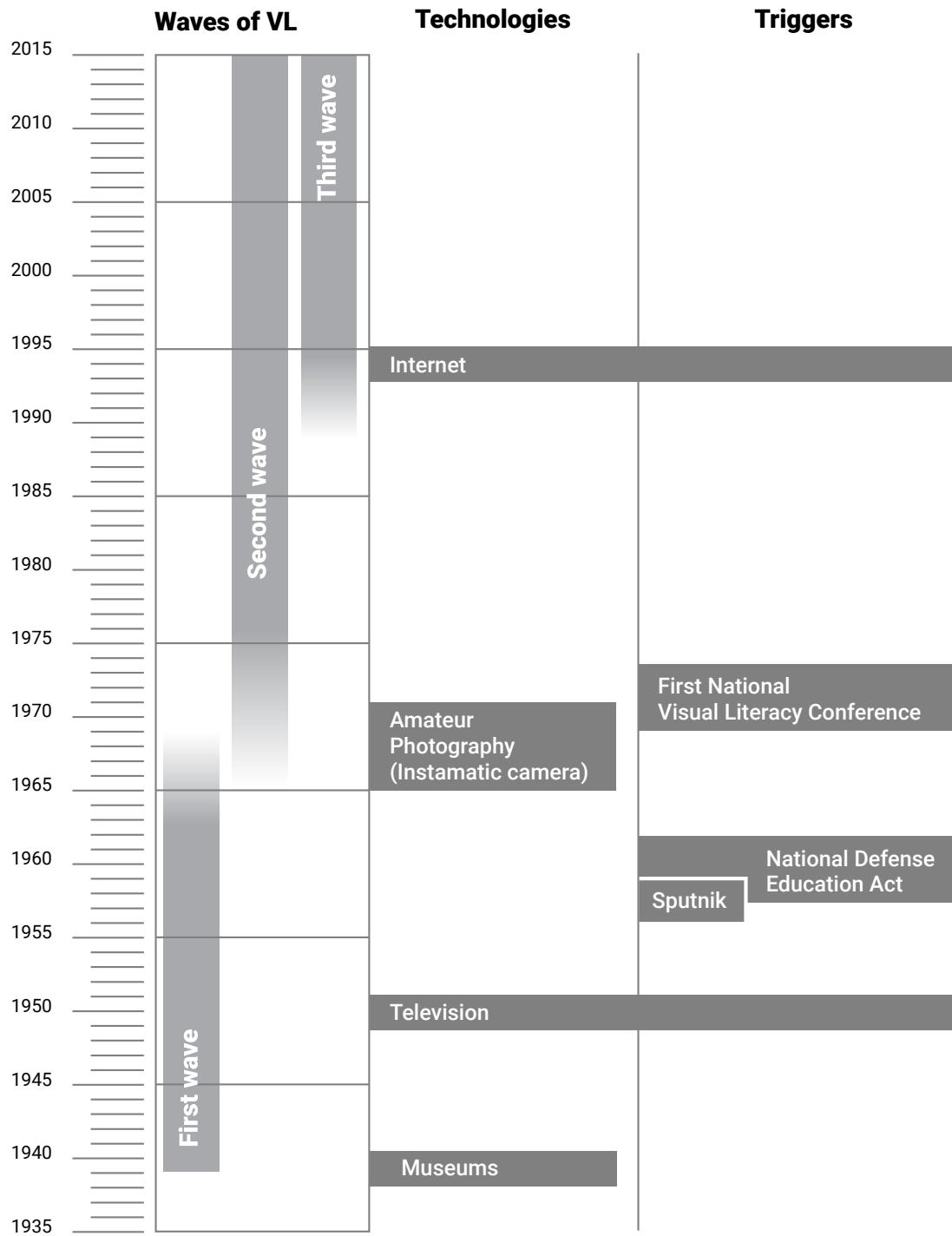
Figure 5.5 Documents in which the term visual literacy appeared in context of specific technologies.



As intimated elsewhere, arguments for the advancement of visual literacy have coincided with the emergence or prevalence of particular technologies. Figure 5.5 shows when particular authors acknowledge visual literacy in relation to a particular technology. In the case of the first wave of visual literacy, these technologies were the museum in the context of Art Education (Davis, 1939; Liberg, 1956) and television in the context of

Audiovisual Instruction and Educational Technologies (Allen, 1959; Grier, 1941; Joyner, 1956; McLuhan, 1955; Munro, 1946; Schwartz, 1966). In the case of the second wave of visual literacy, the main technology referenced was the photographic camera, a tool explicitly endorsed and promoted by Debes and the Visual Literacy movement due to their close relationship with Eastman Kodak (Johnson, 1977; Stuart, 2005). Finally, the emergence of the Internet and other digital technologies dramatically shifted the discourse around visual literacy in academic literature and popular media (e.g., Bamford, 2011; Bolter, 1998; NLG, 1996; Messaris, 2012). The Internet emerged clearly as the trigger for the Third Wave. I offer a timeline of technology triggers in relation to the three waves in Figure 5.6.

**Figure 5.6 A timeline of the waves of visual literacy and suggested technology triggers over a period of 80 years.**



It is important to note here that although the Internet is not the only technology to be identified as a trigger in this research, its emergence sparked a democratization of the means of production and publication of information in a way that has never been seen before. As well, the Internet placed images in relationship with written text in a way that the other technologies mentioned here did not, and simultaneously gave people—especially young people—access to these environments. My close reading of documents in my visual literacies bibliography suggests this is clearly what drew the keen attention of third-wave literacy researchers, media scholars, and others (e.g., NLG, 1996, Bolter, 1998). New Internet-based methods of knowledge mobilization, including library digitization projects, also increased access to scholarship, which may account for the explosion of connections between documents from third-wave scholars. To this end, I did notice longer bibliographies drawing on literature from broader timeframes in third-wave (post-Internet) scholarship.

#### *5.2.1.1 The commodification of visual literacy*

The commodification of visual literacy is manifested particularly in the second and third wave. According to business experts, Kodak was considered one of the healthiest companies economically in the United States in the 1960s, partially due to early incursions into amateur photography, a market that covered 25% of the sales of Kodak in 1966 (Ziegler, 1966). Moreover, Kodak has been implicitly credited with the rise of amateur photography (Fineman, 2004), likely due to the development of the Kodak Instamatic camera. The Kodak Instamatic featured a very simple film magazine replacement system and was notably cheaper than other film stock. Reportedly, between the conception of the Instamatic model in 1963 and 1970, the company produced more than 50 million cameras (Eastman Kodak, 2014). In 1972, Kodak launched five models of a pocket version of the successful Instamatic,

producing 25 million cameras in roughly three years. Kodak's promotion of "visual literacy" clearly triggered broader acceptance of the concept. Before the participation of Kodak there were 30 years of research in art and museum education and educational technology (e.g., Allen, 1959; Davis, 1939; Javitz, 1949; Johnson, Johnson, Stoops, Mattil, & Freundlich, 1963), the emergence of the television (e.g., Grier, 1941; Schwartz, 1966), the work of influential media scholars (e.g., McLuhan, 1955, 1960, 1964; Taylor, 1951; Tottenberg, 1966), and an Act passed into law (Flemming, 1960; Norberg, 1958; United States' Office of Education, 1958). None of these events, however, seemed to put visual literacy "on the map," so to speak, as prominently as Kodak did.

Many questioned the motivation behind the participation of Kodak in promoting visual literacy. Dworkin (1970), a participant in the First National Visual Literacy conference, warned about the increasing influence of "an industrial-commercial-educational complex" (p. 132). Other scholars were more blunt in their suggestions:

While it would be unfair to characterize the newly hatched Visual Literacy Conference as a vehicle for selling Kodak products, strong support by that company at least suggests that seeing the world through a lens is the approved way to gain visual literacy. (Marantz, 1972, p. 72)

The indisputable dominance of Kodak over the amateur photography market and the mass production of its products (between 1963 and 1970, Kodak produced 50 million cameras, almost one for every 4 Americans living in 1970 [Eastman Kodak Company, 2018]) made it the perfect platform for quick consolidation of the movement into an international organization. Funded partially by Eastman Kodak (Baca, 1990), the Visual Literacy Movement likely shaped the concept to fit the interests of the corporation. In fact, Debes and

his collaborators' statements went well beyond a mere suggestion of the photographic camera as being the ideal resource for the acquisition of visual literacy:

Since the invention of photography, visual communication has been possible on a wide scale and has implied a growing visual literacy. However, just as widespread verbal literacy had to wait until printing was easy and typewriters were common, visual literacy didn't really become possible until visual communication was made easy by visual technology and possible on a mass scale. (Fransecky & Debes, 1972, p. 11)

Fransecky and Debes here suggest that the reinvention of the concept of visual literacy after Kodak's interests *made possible* the widespread uptake of both the concept and its related skills. I would argue that making the concept visual literacy dependent on a particular technology, insofar as being incompetent with that technology would make a person *illiterate*, has made the concept a perfect theoretical commodity for visual media related corporations.

Kodak is not the only instance of direct corporate involvement in promoting a conception of visual literacy. Adobe Systems Inc. markets itself as “the global leader in digital marketing and digital media solutions” (Adobe Systems Incorporated, 2015), and has adopted features of the discourse that Debes used for promoting cameras as an ultimate tool for visual literacy, as this recent article title suggests: “Adobe Says Drawing Should Be Like Writing—A Skill We Teach Everyone” (Wohlsen, 2014). Adobe also commissioned a paper by the Art and Design University of Technology in Sydney: “The Visual Literacy White Paper” (Bamford, 2011). This document is listed as a key source for the Association of College and Research Libraries “Visual Literacy Competency Standards for Higher

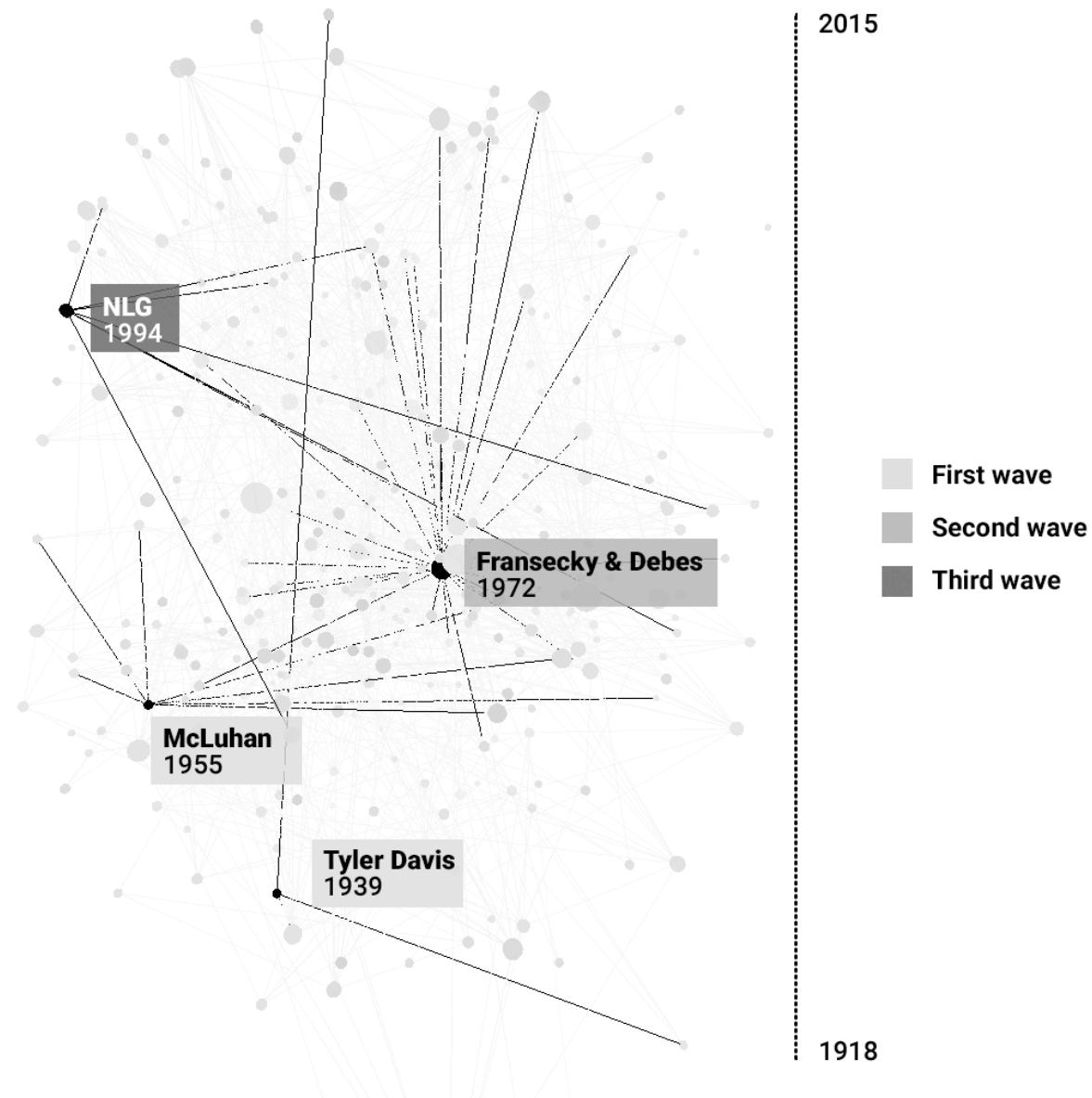
Education” (ACRL Board of Directors, 2011). One might argue that the inclusion of a document that encourages the use of Adobe proprietary software hosted in a webpage that features standards issued by the largest division of the American Library Association is innocuous; however, consider that the one paper presented in the 2015 conference of the Association of College and Research Libraries (ACRL) that dealt directly with visual literacy (“Visual Literacy Synthesized: A Content Analysis of Syllabi to Build a Better Visual Literacy Course” [Mickel & Teaf, 2015]) recommends only the use of Adobe Photoshop for meeting the ACRL Standards 3,4 and 5. The ACRL standards were discussed in Chapter 3; Table 5.1 provides more detail in relation to Standards 3, 4 and 5.

**Table 5.1 The ACRL Visual Literacy Competency Standards for Higher Education, Standards 3-5 (ACRL Board of Directors, 2011)**

Standard	Description	Performance Indicators
Three	The visually literate student interprets and analyzes the meanings of images and visual media.	<ol style="list-style-type: none"> <li>1. The visually literate student identifies information relevant to an image’s meaning.</li> <li>2. The visually literate student situates an image in its cultural, social, and historical contexts.</li> <li>3. The visually literate student identifies the physical, technical, and design components of an image.</li> <li>4. The visually literate student validates interpretation and analysis of images through discourse with others.</li> </ol>
Four	The visually literate student evaluates images and their sources.	<ol style="list-style-type: none"> <li>1. The visually literate student evaluates the effectiveness and reliability of images as visual communications.</li> <li>2. The visually literate student evaluates the aesthetic and technical characteristics of images.</li> <li>3. The visually literate student evaluates textual information accompanying images.</li> <li>4. The visually literate student makes judgments about the reliability and accuracy of image sources.</li> </ol>
Five	The visually literate student uses images and visual media effectively.	<ol style="list-style-type: none"> <li>1. The visually literate student uses images effectively for different purposes.</li> <li>2. The visually literate student uses technology effectively to work with images.</li> <li>3. The visually literate student uses problem solving, creativity, and experimentation to incorporate images into scholarly projects.</li> <li>4. The visually literate student communicates effectively with and about images.</li> </ol>

### 5.2.2 The acknowledgement of “other kinds of literacies”

**Figure 5.7** Documents in which *literacies*—beyond the understanding of letters—are explicitly acknowledged. These references appear in documents in which the term “visual literacy” was mentioned during the first, second and third waves of visual literacy.

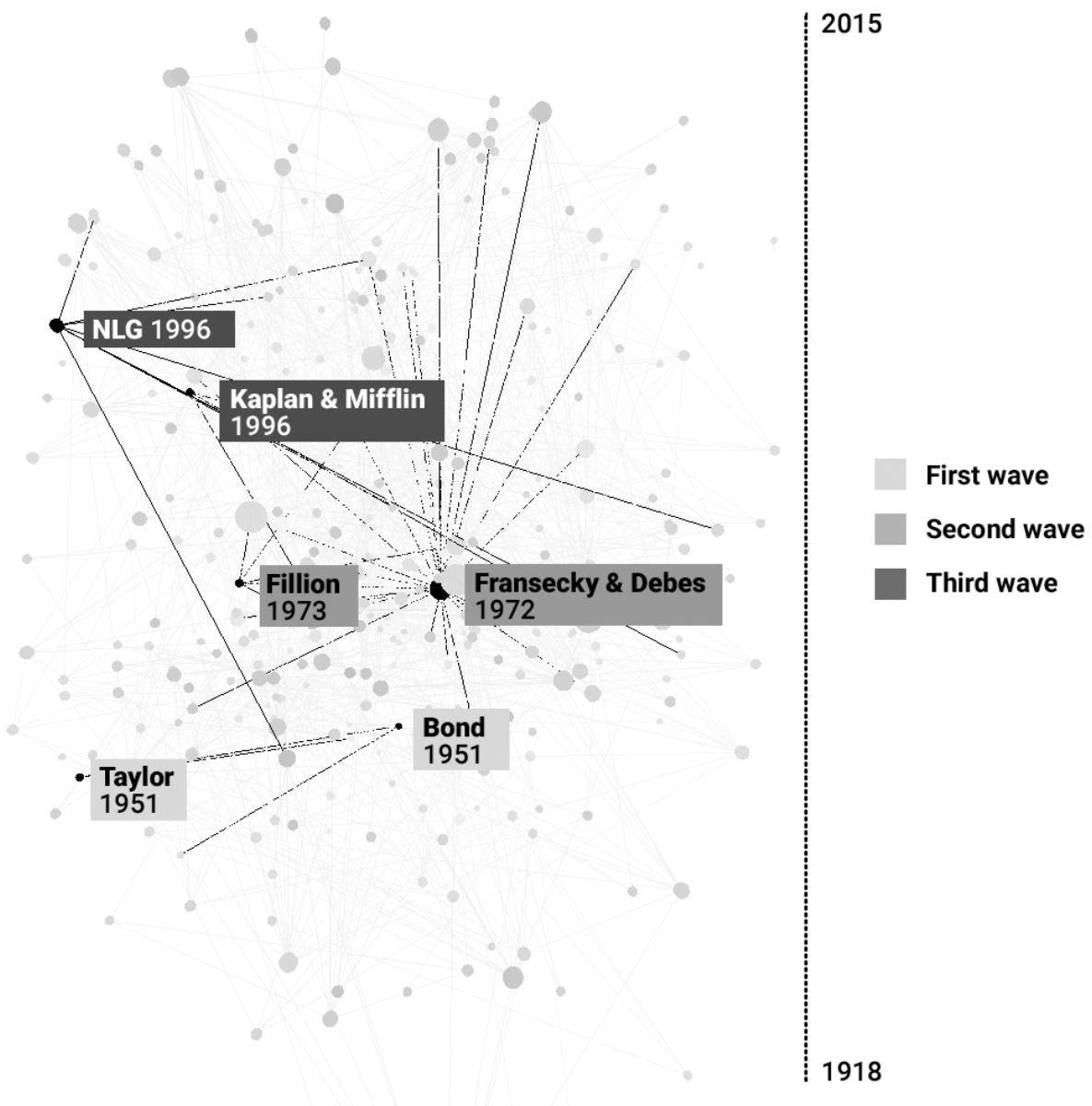


During each of the waves, visual literacy has been directly contrasted with traditional understandings of literacy (the ability to read and write). In the case of the first wave, the first characterization of the visual as one of potentially many literacies came from Davis (1939): “Mere reading and writing are no longer sufficient. Literacy of many kinds is necessary for

taking a responsible part in a more complex world” (p. 13). Within the same wave, McLuhan (1955) denounced a similar dichotomy from a media perspective: “As our original book technology has been succeeded by movie and television we have lost book literacy without acquiring visual literacy” (p. 104). During the second wave of visual literacy, movements toward an expanded meaning of literacy, one that included visual artifacts and visual elements of texts, emerged: “Visual literacy suggests a broader model of discourse, a new literacy, intertwined with the ‘traditional’ and important verbal language activities” (Fransecky & Debes, 1972, p. 7). This idea of an expanded notion of literacy was strongly promoted by the New London Group (1996) at the beginning of the third wave in “A pedagogy of multiliteracies: Designing social futures,” which has been identified as “the central manifesto of the new literacies movement” (Leander & Boldt, 2013, p. 22). In this key document, the New London Group (NLG) suggested the visual is one of many equally important literacies. Two years before the publication of this work, in the same year the NLG met to prepare their manifesto, Messaris (1994) also proposed the idea of “other literacies” (p. 165).

### 5.2.3 The presumption of a “more visual” society

Figure 5.8 Documents in which the idea of a more visual society is entertained in a way or another. All of these occurrences are situated within documents that explicitly reference “visual literacy.” The documents shown here span all three waves.



The idea of a society more engaged with visual information—a notion clearly triggered in the 20<sup>th</sup> century by the emergence of primarily visual technologies such as film and television, as well as by the Internet—has served as the cultural frame for advancing the concept of visual literacy. Scholars of the first wave were explicit in this assertion. For instance, Francis Henry

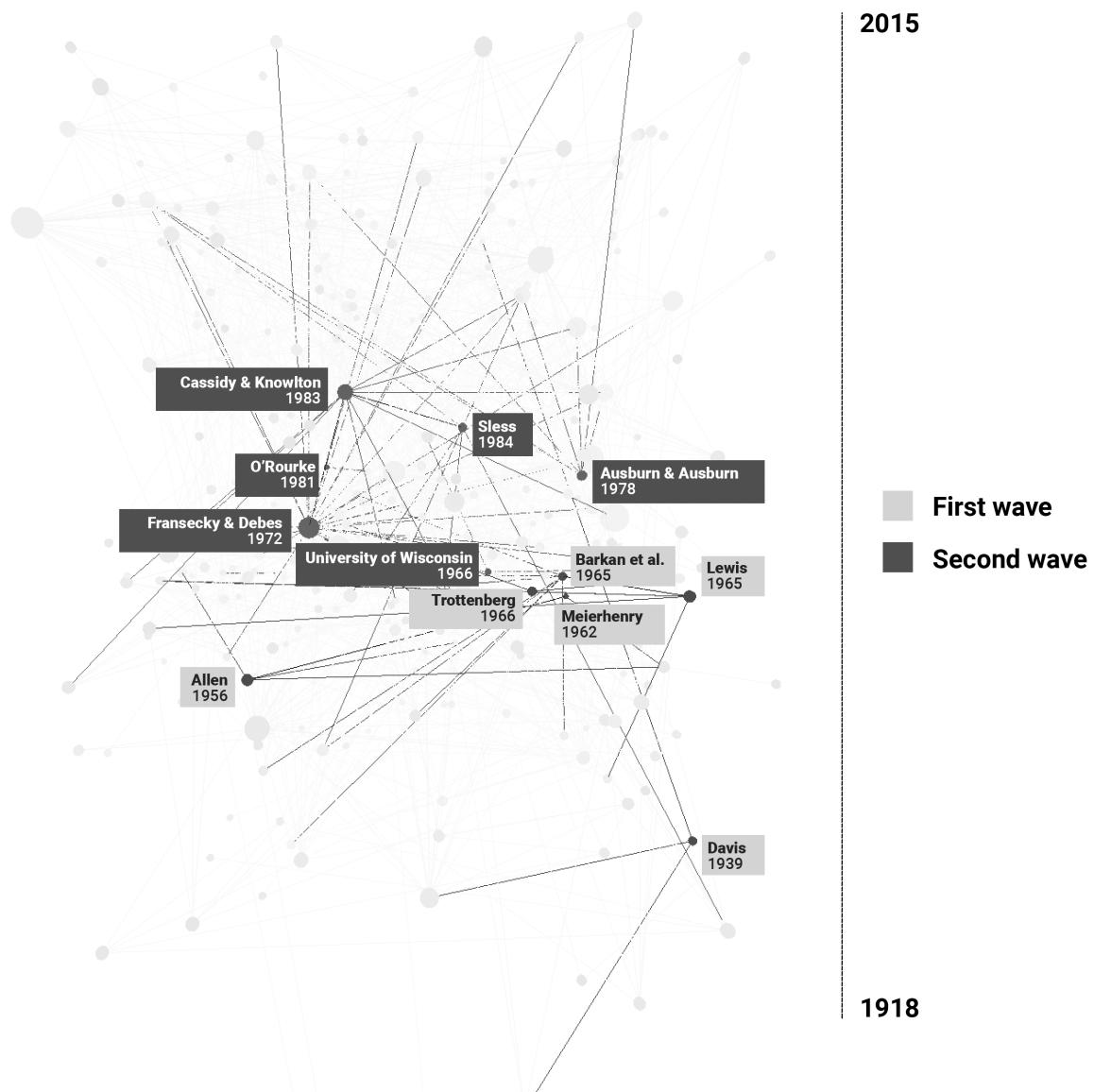
Taylor, director of the Metropolitan Museum of art from 1940 to 1955 stated: “An unprecedented visual literacy has come into being in which people read pictures as they have not done for hundreds of years, leaving to words the obligation of conveying abstract ideas not communicable in graphic terms” (Taylor, 1951, p. 217). Bond (1954) observes: “the days when newspapers regard pictures merely as ‘something to break up the type’ have long since passed” (p. 264). During the second wave of visual literacy, Fransecky and Debes (1972) characterized this increasing appeal of visual rhetoric as a generational phenomenon. About the characteristics of “the new student,” the authors assert: “In general, today’s child is more visual, better informed and intellectually more skilled... The visual consciousness of the ‘television generation’ is but one facet of the differences between today’s young people and the adult generation” (p.5). Echoing Fransecky and Debes, Fillion (1973) points out:

We are deeply [immersed] in a visual culture. It becomes imperative that a degree of sophistication be developed with the student so that he is able to relate [to] the visual and verbal stimuli about him with perception and understanding. (p. 308)

This argument is also forwarded by representatives of the third wave of visual literacy, although it is framed in regard to communication environments (chiefly the Internet) where “visual images and their relationship to the written word” are perceived as being “increasingly significant” (NLG, 1996, p. 61). The idea that culture is becoming more image-oriented is pervasive, and can be consistently found over the last 25 years in different realms of education (e.g., ACRL Board of Directors, 2011; Beier, 2013; Kaplan & Mifflin, 1996; Kress, 2003; Little, Felten, & Berry, 2015).

### 5.2.4 A call for formal instruction

**Figure 5.9 Documents in which authors make a call for formal instruction of visual literacy. These calls appear in sources referring to visual literacy and one source referring to graphicacy.**



Many writers call for reform of curricula and pedagogies to accommodate the needs of successive generations of students who are fluent with new forms of visual media. Davis (1939) refers to visual perception as something that must be taught, specifically in secondary schools. After WWII and public uptake of television, conversations about visual literacy and its place in formal education started to shift from art education towards “new educational

media” or “audio-visual materials.” Some researchers seemed dubious about the merits of and potential methods for developing visual literacy in learners (e.g., Meierhenry, 1962); others proposed methods (source). Many argued, like Allen (1959), that visual literacy “develops with increased exposure to visual presentations” (p. 87). By the mid 1960s there was an increase in research representing visual literacy as highly desirable (e.g., Barkan, Ziegfeld, McFee, Kuhn, Jefferson, & Lanier, 1965; Lewis, 1965), and the claim for the need of visual literacy extended into new fields. For instance, Balchin and Coleman (1966) coined the term “graphicacy” to refer to “the intellectual skill necessary for the communication of relationships which cannot be successfully communicated by words or mathematical notation alone” (p. 23). By the end of the first wave of visual literacy, scholars like Tottenberg (1966) complain that colleges were failing to prepare visually literate students.

The second wave of visual literacy proposed the need to teach visual literacy was urgent. As noted in Chapter 3, the first effort to implement academic programs oriented to the development of visual literacy occurred in 1966, with the Visual Communication Education program, or VICOED (Deschin, 1966; Scurr, 1981; University of Wisconsin, 1966; see Chapter 3). After VICOED and the celebration of the first National Visual Literacy Conference in 1969, new programs emerged as a way to comply with the call to develop visual literacy skills in students at every level (e.g., Ausburn & Ausburn, 1978; Eastman Kodak, 1978; Fransecky & Debes, 1972; Marantz, 1972). These efforts seemed to diminish during the 1980s, although they were still present (Cassidy & Knowlton, 1983; O’Rourke, 1981; Sless, 1984). Arguments for teaching visual literacy have continued in recent years (e.g., Eilam & Ben-Peretz, 2012; Flynt & Brozo, 2010). In some cases, these arguments still use Debes and the IVLA as a reference (e.g., Bamford, 2011), in others, new frameworks

have been developed to justify the development of pedagogies oriented to multiple literacies (i.e., NLG, 1996).

### **5.3 Discussion: Models of visual literacy**

Commonalities aside, one key area of debate in the literature reviewed for this thesis concerns how “teachable” visual literacy is. During the time the concept was associated with art education (First Wave), there seemed to be some agreement that the acquisition of visual literacy was a consequence of formal art education, which fostered a set of skills that would allow students to make sense of images (e.g., Barkan et al., 1965; Brelstaff, 1963; Johnson, Johnson, Stoops, Mattil, & Freundlich, 1963). Moreover, visual literacy would complement verbal literacy (e.g., Johnson, Johnson, Stoops, Mattil, & Freundlich, 1963; Lewis, 1965; Liberg, 1956). The idea of extending the reach of visual literacy to make it available to every student entailed extending to other subjects the pedagogical approach that art educators were successfully using in art classrooms.

Museums became a key educational technology during the first wave of visual literacy (Davis, 1939; Javitz, 1949; Liberg, 1956). This notion was not necessarily new; museums were championed by the first iteration of the Isotype initiative in 1925 when infographic representations of statistical data became the main exhibition of Vienna’s Museum of Society and Economy (Burke, 2009); in fact, Neurath referred to the venue of the exhibition as a teaching museum (Neurath, Haller, & Kinross, 1991).

When the notion of “visual literacy” was adopted for audiovisual instruction, questions about its teachability emerged. The Visual Communication Education program (VICOED), one of the first documented programs designed to develop visual literacy in students within fields other than Art and Design, eventually ceased due to insufficient

funding and lack of consistency in programs (Scurr, 1981). The second wave of visual literacy started with a clear mandate in regards to the use of the photographic camera as the main tool (Fransecky & Debes, 1972). Its theoretical influences derived from others already successfully used in pedagogies for visual literacy (Sless, 1985). By the mid-1970s scholars started to make a distinction between visual literacy as proficiency in the language of visual media (e.g., Foster, 1979) and visual literacy as “a function of visual experience” (Platt, 1975, p. 6). Based on their belief that the understanding of visual experiences is a perceptual and natural process, some scholars started to question the merits and feasibility of teaching visual literacy.

This line of questioning has prevailed since the early 1980s (e.g., Cassidy & Knowlton, 1983; Feldman, 1976; Messaris, 1994, 2012; Velders, 2000; Zyl, 1989) and resulted in splitting the understanding of visual literacy into two broad notions since the mid-1970s. On one hand, visual literacy is regarded as a set of skills or competencies for visual communication that can be taught formally in the classroom (e.g., ACRL Board of Directors, 2011; Bamford, 2011; Edutopia, 2012a; 2012b; Herring, Mishra, & Koehler, 2014). This first model of visual literacy, which I will refer to as the “direct instruction model,” is prevalent across several subfields within education. According to this perspective, it is possible for an individual to be “visually illiterate” (Williams, 2000, p. 110) if that person has not been formally taught certain conventions of visual communication or has not been exposed to a particular visual grammar. On the other hand, visual literacy has been framed as a naturally acquired skill: because it is informed by individual perception, personal experience and socialization, it does not require explicit instruction (e.g., Messaris, 2012). Within this second perspective—the “natural acquisition model”—any person who has the capacity to perceive

visual information develops a visual literacy by assimilating such information through observation and experience. Under this model, visual illiteracy could only be a consequence of some form of visual disability or impoverished visual environment since every acquired token of visual data that provides knowledge could contribute to literacy. The difference between these two models has been noted by scholars like Bolter (1998), but much earlier accounts appear as early as the mid-1970s. For instance, Feldman argues that:

At present, most persons . . . are visually literate in the sense that they are capable of receiving and acting on the signals sent out to them by electronic and printed pictures. They are not visually literate if by literacy we mean the ability to understand the rhetoric, the persuasive devices, employed in visual communication. (Feldman, 1976, p. 197)

### **5.3.1 Two understandings: Direct instruction versus natural acquisition**

I would argue that the direct instruction and natural acquisition views on visual literacy described in the previous section represent two extremes that loosely map onto Street's (1984) "autonomous" and "ideological" models of literacy. According to Street, who Lankshear and Knobel (2011) describe as a pillar of the new literacies movement, the autonomous model is based on the assumption that literacy in itself (that is, autonomously dissociated from its context) has positive effects on social and cognitive processes (Street, 1984). As Street asserts, this approach "is simply imposing western conceptions of literacy on to other cultures or within a country those of one class or cultural group onto others" (2003, p. 2). The ideological model, on the other hand, emerges from an understanding of literacy as a set of social practices that are enriched by cultural context and serve specific needs and goals. According to the ideological model, literacy does not necessarily need to be

learned through formal education nor is it any less valuable than the literacy derived within the autonomous model. A common argument within the direct instruction or prescriptive model of visual literacy overlaps with Street's autonomous model of linguistic literacy. This argument claims that teaching a particular visual grammar provides individuals with defensive resources against manipulative visual arguments generated within that grammar (Williams, 2000). Similarly, in the ideological model of visual literacy, the communicative value of visual resources within a particular cultural context would be considered. Messaris' (1994, 2012) contention is that visual literacy is heavily influenced by perception. As such, the acquisition of the ability to understand visual images does not demand an extensive literacy.

I would argue the main challenge these two opposing views of visual literacy posit for curriculum development is that, despite being incompatible in at least one crucial aspect, it is possible to find them used interchangeably in educational contexts. It is also common to find representatives of both perspectives cited in the same work without any indication of their conflicting views, as if the concept of visual literacy was a product of an implicit agreement (e.g., Williams, 1999, 2000a, 2000). Moreover, some interpretations of visual literacy that appear to draw on Street's (1984) ideological model of literacy seem to concede the possibility of someone being visually illiterate because that person lacks knowledge of a particular (Western) visual grammar. For instance, in *Reading Images: The Grammar of Visual Design*, Kress and van Leeuwen (2006) state:

But the skill of producing multimodal texts of this kind, however central its role in contemporary society, is not taught in schools. To put this point harshly, in terms of this essential new communication ability, this new 'visual literacy',

institutional education, under the pressure of often reactionary political demands, produces illiterates. (p. 17)

I would argue the idea that “illiteracy” (visual or otherwise) depending on expertise in relation to a particular skill set, mirrors Street’s autonomous model of literacy. I refer to this, again, as a “direct instruction model” of visual literacy. It is not uncommon to find both approaches used within a single text with no acknowledgement that the approaches are conflicting (e.g., ACRL, 2011; Kress & van Leeuwen, 1996). This perpetuates and normalizes the contradiction between the two models of visual literacy.

Ultimately, the absence of communication between different disciplines conceptualizing visual literacy through the last century seems to have resulted in three largely unconnected waves of visual literacy, which may have prevented use of previous knowledge and criticism to scaffold emerging perspectives and to inform inconsistencies in respect to the concept. This appears to have led to repeated reinvention instead of refinement: this research demonstrates that several scholars in different historical moments claimed to have coined the term rather than advancing it. This occurred either explicitly, as in the case of Debes (1969), or implicitly, when scholars failed to acknowledge previous occurrences in literature, as in the case of the New London Group (1996). Had there been greater collaboration and knowledge sharing, perhaps inclusion of visual literacy would have materialized in general curricula more rapidly. In the next chapter, I conclude this work, offering, *inter alia*, a proposal to untangle the different interpretations of visual literacies that the events described here suggest.

# **Chapter 6: Conclusion**

## **6.1 Implications for literacy education**

In this chapter, I consider implications of this research in the context of responding to my third research question: *What practical outcomes could a comprehensive overview of visual literacy bring to teaching the concept?* Because this dissertation is written within a Department of Literacy Education, I focus the following discussion on how visual literacy is understood within that field.

During the mid-1970s, the value of the term “visual literacy” started to be questioned. This shift roughly corresponded with the “social turn” in understandings around the concept of literacy in general (e.g, Halliday, 1978; Street, 1984). Some criticism that the participants of the Visual Literacy Movement received during the second wave focused precisely on the use of visual literacy as a metaphor in the sense that *literacy* (the understanding of written language), along with the metalanguage of literacy, is applied inappropriately to the question of how people make meaning from information presented in the form of images or image-intensive media. Some, for example, described this metaphor as “very mixed” (Feldman, 1976, p. 195) and others as “failed,” enough even to be discarded (Cassidy & Knowlton, 1983). Writes Feldman,

It may be objected that "literacy" when applied to the reading of images entails the use of a very mixed metaphor. After all, the word literacy refers to letters, which are conventionally established symbols of sounds – phonic images, so to speak. Everyone agrees about the meanings of these phonemes. (p. 195)

Literary and literacy scholars would likely contest Feldman's somewhat naïve claim that "everyone agrees" about the meaning of phonemes, which demonstrates a lack of consideration of the complexity of language development and use in diverse environments. Any examination of variances in World Englishes is a case in point (e.g., Kubota & Ward, 2000; Hundt & Gut, 2012). Nevertheless, his observation has some validity: for individuals to communicate effectively in a given language there must be some level of agreement about the sense of lexical items and syntactical structures. Can such a model be mapped onto visual literacy? Some theorists argue that comparison between written language and visual means of expression is fraught. If anything, they argue, the process of learning to interpret visual information cannot be achieved through any form of formal instruction about, say, "visual grammars"; rather, it is analogous to innate language acquisition, which is deemed more natural<sup>26</sup> and universal<sup>27</sup> (e.g., Cassidy & Knowlton, 1983; Zyl, 1989). Sless (1984), however, defends the merits of the metaphor and regards the interpretation by Cassidy and Knowlton (1983) as narrow. Instead, Sless (1984) problematizes what he sees as a mediocre application of the visual literacy metaphor and critiques the Visual Literacy movement for ignoring a long tradition of more sophisticated approaches to the general notion of visual objects as a form of language in visual manifestations of art and design. Among the examples cited by Sless are Kepes's (1944) "language of vision," and Bonsiepe's (1965) "verbal/visual rhetoric." The latter is an approach successfully used in disciplines oriented precisely to

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<sup>26</sup> In the sense that it can be acquired by mere socialization, without the need of formal instruction.

<sup>27</sup> In the sense that every civilization has spoken language even if there is no written manifestation of that language.

the analysis and production of visual discourses like graphic design (Heller, 2005; Lupton & Ehses, 1996).

Considering the circumstances described in Chapter 5, it is valid to raise some specific questions: Could the apparent paucity of pedagogies oriented to visual literacy across the curriculum—beyond the subjects of visual art and graphic design, where these kinds of pedagogies have been successfully implemented—be partially due to insufficient clarity on the nature of visual literacy? How might this lack of clarity and effectiveness in implementation be addressed?

Understandably, the existence of at least two different mindsets of visual literacy could hinder the implementation of instructional strategies for visual literacy, particularly if these understandings endorse conflated and opposing views of the teachability of the concept. Within the field of Literacy Education, the New London Group (1996) offers the notion of “meaning-making” through visual means as a broad definition for visual literacy, shifting literacy from a linguistic mindset to a semiotic one (NLG, 1996, p. 65). The embracement of semiotic approaches to visual information has been a standard for several decades in disciplines like Graphic Design, with Peirce’s (1974) theory of signs providing the main theoretical framework for this particular field of study (Ehses, 1976; Ockerse & van Dijk, 1979; Storkerson, 2010). Granted, the NLG (1996) introduced design as a key concept in their manifesto; however, use of the term “design” in their work bears little relationship to design methodologies, thus, design as a term is detached from design as a discipline. The semiotic approach that the NLG offers takes Halliday’s (1978) theory of Social Semiotics and frames it as inherently linguistic, instead of as a multimodal approach (one in which a linguistic sign would be just one manifestation of a

broader definition of sign). The result is, again, an implicit association of visual literacy with native linguistic metaphors—metaphors that constrain all manner of visual representation to the affordances of the linguistic sign. Nevertheless, this approach has its merits: the underpinnings of literacy education are in linguistics and a radical disassociation from this field of study would leave literacy educators with less familiar vocabulary to engage in conversations about visual modalities.

Propitiously, the definition of visual literacy as “meaning-making through the visual” offered by the NLG is broad enough to include scenarios in which the acquisition of resources for meaning-making are consequences of both experience (i.e., the “natural acquisition model”) and formal training (i.e., the “direct instruction model”). If we are to accept this overarching understanding of visual literacy, then the natural acquisition (NA) and direct instruction (DI) models of visual literacy (unteachable and teachable, respectively) could be combined within this notion (more as a spectrum or continuum between two axes than opposed extremes). The former model (NA) would include perceptive visual phenomena in which individuals with normal vision and cognitive capabilities would be inherently literate. The latter (DI) would include all the culturally contextual and specific literacies and grammars in which individuals are not literate until they are taught such conventions. Using Cassidy and Knowlton’s (1983) idea of comparing visual literacy with language acquisition, we could position “language” as an overarching concept. Within this overarching concept is both the language that we acquire before formal instruction and the specific linguistic conventions we learn through formal instruction.

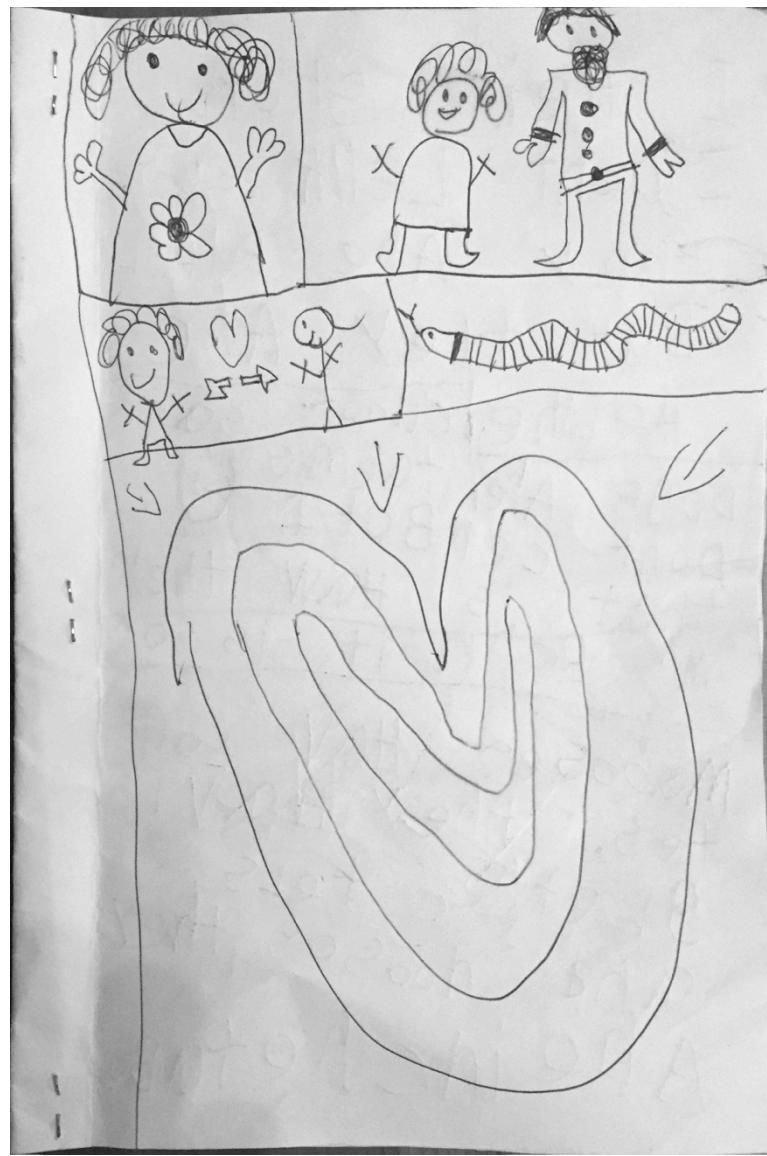
Literacy Education, it would appear, has been faced with a long-standing call to teach a topic defined as both teachable and unteachable while using approaches adapted from a discipline familiar to the practitioners (Linguistics), but inadequate to the subject of study. This is like being asked to build a shed without a plan—using tools with which one is familiar, but which are not right for the task. In order to teach “visual literacies” within literacy education while conforming to the mindset of the new literacies movement (literacy as meaning-making), and employing linguistic metaphors to facilitate the understanding of educators, there must be a clear difference between the overarching concept of visual literacy as meaning-making through the visual, and visual literacy as specific visual conventions. That said, it should also be clear that visual conventions are part of visual literacy.

I propose that the term visual literacy should stand for the broad notion of meaning-making from visuals in compliance with current understandings of literacy within literacy education (e.g., Flood, Heath, & Lapp, 2015), and that the specific contextual conventions be referred to as “visual genres.” In a literary sense, genre is defined as “a type of literary work characterized by a particular form, style, or purpose,” (“genre, n.” n.d.). Visual genres are likewise characterized by a particular form, style or purpose. Under this approach, signs (units of meaning manifested in every mode, not only visual) are contained in other more complex signs or “representational patterns” according to the cultural context of the viewer or interpreter. Interpreters of visual modes use their “visual literacy” in the same way that interpreters of language use their “literacy”: that is, a speaker or writer uses available linguistic units to pronounce an utterance and its interpretation depends on the knowledge shared between the

interlocutors. In the specific case of the visual, a sign is any meaningful form or quality (colour, shape, pattern, texture). These signs can range from those obtained from observation or experience, as in the case of signs that resemble actual objects (e.g., a realistic drawing or a photograph), to those determined by convention (e.g., traffic signs) in a spectrum of possibilities.

A “visual genre” in this view is a collection of representational patterns stable enough to make any variation of its expected composition noticeable (e.g., Reiakvam, 1993). For instance, the visual genre baby clothing in particular contexts is a collection of relatively stable patterns that include small size, a particular shape, and a certain palette of colours, among other aspects. A simple image search for “baby clothing” in any Internet browser would give a glimpse of the normalization of this particular genre. But, baby clothing, and any other genre, is completely contextual: baby clothing in a Mayan community in Mexico is comprised of different representational patterns than baby clothing elsewhere. These representational patterns and the visual genres that encompass them can be analysed and investigated, but they can also be applied to visual discourses. I would argue that some of the patterns of representation in particular visual genres are obvious enough to be assimilated and later reproduced, even if not consciously identified. In fact, just as with speech genres, children can relatively easily reproduce visual genres by observing and intuitively imitating representational patterns in their play without any formal instruction even if they do not rationalize the signs that comprise them. Figure 6.1 shows an example of this.

**Figure 6.1 Renata's Poetry Book cover (2018) by R. Peña. Used with permission of the author.**



Renata Peña (6 years old at the time of this drawing) observed conventions in the literature and media with which she engages and reproduced representational patterns of comic books (sequential panels, from left to right and top to bottom) to present a series of meaningful events in her life: meeting Santa Claus, meeting her friend Sophie, and seeing a Garter snake during an outdoor learning session. In addition to her interpretation of comic-book layout conventions, in the top right panel she uses a combination of signs

(beard, large buttons, a belt, and distinctive shirt cuffs) to convey her representation of Santa Claus. She also uses the conventional sign of a heart (a *symbol* in Peircean terms) to convey friendship in the middle left panel and again in the last panel to convey “events that I have loved.” This piece shows that, at 6, Renata is visually literate enough to assimilate visual conventions and intuitively repurpose them in the production of new discourses.

The depth to which visual genre analysis and production could take place in a classroom would depend on the task, but even inviting students to identify visual genres and discuss representational patterns, followed by inviting them to use these patterns to produce visual discourses by any available means, would enhance students’ awareness and understanding of visual modalities. This approach can be used to find and discuss representational patterns in local and familiar genres by drawing attention to their importance, and can be used to compare representational patterns between genres. Under this understanding it is possible to be unfamiliar with certain genres, but it would be impossible for a person with standard vision to be “visually illiterate,” as some scholars have suggested (e.g., Kress & van Leeuwen, 1996; Moholy-Nagy, 1950; Trottenberg, 1966; Williams, 1999, 2000).

## **6.2 Practical applications and significance**

As explored in Chapter 3, the publication of “A Pedagogy of Multiliteracies” (New London Group, 1996) was the main trigger behind the mobilization of visual literacy in the context of Literacy Education, and a key catalyst for increased academic interest in the term in this field since the 1990s. The NLG calls for the adoption of pedagogies that would consider other forms of literacy, including the visual, and also put

the notion of Design as a key concept in the development of a metalanguage for multiliteracies. Although the NLG use Design as a framework for semiotic activity, the authors seem to pass on the opportunity of seizing already successful approaches from design-based disciplines. The multiliteracies manifesto seems to treat the idea of Design as a premise, but not as a methodology.

Being a Design educator and also a Literacy educator, I think I am in a position to suggest ways to respond to the call of the NLG (1996) to embrace richer forms of meaning-making (specifically in regards to visual literacy) by drawing upon methods and approaches that are familiar to me from Design. Some of these methods and approaches can be adapted to address different understandings of visual literacy. Here I describe one of these possible approaches.

Based on strategies commonly found in Design Education, I have used versions of the notions of content and expression employed by Ehses (1994), and the concept of genre-bending (Berliner, 2001), to lead discussions with students. Such discussions are invariably oriented towards visual literacy. These exercises entail the following: 1) the identification of representational patterns in popular genres, and 2) the application of these patterns to content that is not usually represented using such patterns. For instance, one might ask students to identify the representational patterns in a magazine cover and then suggest they apply those patterns to content usually associated with other forms of expression. They might consider, for example, the position and size of the typeface, colour palette, use of photography versus illustration, and so on, while comparing the magazine cover to a poster for an academic conference. This exercise helps students realize how familiar they are with specific visual genres and allows them to both analyze

and produce visual discourses. It helps them separate content from expression, text from genre—insofar as it is possible. McLuhan (1964), of course, is one of many scholars who would argue that content and genre are inextricably connected, as indicated by his well-known thesis, “the medium is the message” (p. ii). I raise this notion of McLuhan’s with students, and invite them to consider its implications, but I also invite them to attempt to disentangle text and genre as part of this exercise, to the extent they are able.

The same approach can be taken with unfamiliar genres: for instance, I present students with visual artifacts not commonly found in their cultural setting and ask them to identify representational patterns and then apply those patterns to either familiar or unfamiliar forms of expression. For instance, I present students with samples of dated advertisements and ask them to apply the patterns they might find to contemporary forms of visual media such as an animated gif or an Internet meme. The purpose of these exercises is not to evaluate the product, but to use the process as an avenue for discussion of what it means to be visually literate. Students through this process become more aware of visual artifacts prevalent in their context. In using such an approach, teachers can emphasize that it is the visually literacy students already bring to the task—their personal funds of knowledge (González, Moll, & Amanti, 2005; Moje, Ciechanowski, Kramer, Ellis, Carrillo, and Collazo, 2004)—that allows them reinterpret specific visual genres. These activities are not designed to produce artifacts for assessment, but to spark conversations. I see these approaches as basic but powerful examples of *speculative design*, a form of creative exercise in which the purpose is not the production of things, but ideas (Dunne, 2013).

The discussion presented above is an outline of one way toward effective implementation of pedagogies for visual literacy in classrooms. It is also a resource to clarify confounded views of visual literacy over the years. Ultimately, as Sless (1984) points out, “If Visual literacy is to be rescued as a term . . . we need to interpret it more generously” (p. 226). Bearing this in mind, possible approaches for future research might include:

1. To engage in analyses of visual discourses using the notion of visual genres introduced here, including analysis of young people’s understanding and use of visual genres in literacy classrooms.
2. To develop curricula oriented to teach *about* visual literacy (rather than to teach visual literacy). As an educator, I have the opportunity to take the outcomes of this research into my classrooms. Over the next years, I see myself developing and publishing materials for the use of teacher candidates and other education professionals.
3. To explore the notion of visual literacy, or its equivalent, in one of my other languages (e.g., Spanish or German). I believe doing so would yield a rich research narrative that would serve as an interesting and informative counterpoint to this one.
4. To undertake further development of the Glass Cast interface for data visualization to make the interaction between this tool and Zotero seamless enough to facilitate its use for other researchers with their own bibliographies, in multiple languages and across languages. Moreover, I intend to further explore

different ways of visualizing the implicit historical narratives that emerge with the mobilization of particular knowledge tokens.

### 6.3 Limitations of this study

Like any other research, this project faced limitations, some of which are as follows:

1. As mentioned in Chapter 1, my search terms were limited to “visual literacy” and correlates in English, which could be considered a necessary limitation. I required some way of limiting the scope of the data to what would be manageable in the context of a single dissertation.
2. It is impossible to fairly represent the amount of work that went into programming and design of the Glass Cast, and producing the visualizations and related outcomes in this written dissertation. For instance, the ideal format of Chapter 3 might have been an interactive narrative plot, perhaps like Randall Munroe’s *Movie Narrative Charts* (Munroe, n.d.), an approach that has been used to untangle complex narratives (e.g., Leslie, Elvery, & Spraggan, 2014). A challenge in the contemporary moment is that the written form of the dissertation prevails even as more visual research forms are burgeoning. It is difficult for doctoral students to risk challenging the canonical form, even given a highly supportive committee. For scholars whose work is multimodal, finding a way of representing work in both written and other forms without extensive duplication of effort is virtually impossible.

### 6.4 Final insights

In this thesis, I set out to answer the following questions:

- 1) How do notions and theories of visual literacy differ through time and across disciplinary fields?*
- 2) How have different historical approaches shaped the understanding of visual literacy?*
- 3) What practical outcomes could a comprehensive overview of visual literacy bring to teaching the concept?*

To answer these questions, I completed an exhaustive literature review, resulting in an initial working bibliography of 2400 articles. I then culled this dataset to a full-text corpus of 330 key articles on the subject. I used tools for data visualization to examine patterns both in the larger working bibliography and within my full-text corpus, including a tool I designed myself: the Glass Cast. I started this project expecting to fill the gaps in my own knowledge of the term between the contexts of Graphic Design (e.g., Dondis, 1973), Media Education (Messaris, 1996), and Literacy Education (NLG, 1996). In the end, my research revealed a rich history of visual literacy dating from 1939, well before the moment most scholars suggest is the origin of the term (that is, Debes, 1969). My visualizations through the Glass Cast revealed waves of research associated with the development of particular technologies and encouraged me to reconsider my original conceptions of the term.

I have learned a great deal over the course of this research project, not only about visual literacy and the circumstances of its mobilization, but also about the implications of looking for answers in unfamiliar places and the challenges that come with such an approach. I also have a clearer idea of how to tackle the topic of visual literacy in my own classroom. My hope is that the outcomes of this research project will be of benefit to

other educators, informing their teaching of visual literacy and, as Sless (1984) suggested, enabling them “to interpret the concept more generously” (p. 226).

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# Appendices

## Appendix A: Glass Cast Database

The following list of 330 works comprised the database for the visualization tool known as Glass Cast, described in Chapter 4.

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