Visual Literacy Research Spectrum: Paradigm Expansion for the Field of Information

Following up with the call and presentation of "Visual Literacy for Library and Information Science Education" at the ATINER's 2015 conference, the author presented a paradigm expansion in visual literacy research for the information field. ACRL Visual Literacy Competency Standards for Higher Education in 2011 and its 2022 the Framework for Visual Literacy in Higher Education have presented a pressing task for research in visual literacy for the information field. Developing and leading an interdisciplinary research of visual literacy will enhance and advance the research, education, and professional services of the information field in this visual information world. This proposed research paradigm expansion focuses expanding from text-based information research and its services to a whole paradigm expansion and shift of information research methodology changes, advancements, and embracement of interdisciplinary spectrum for research opportunities to establish a critical and social construction of knowledge by examining the encoding and decoding of meaning process in the visual information world. The researcher has been doing research in visual literacy since 1992 and teaching visual literacy for the information field since 1999. As past President of the International Visual Literacy Association and guest editor of the Journal of Visual Literacy in 2015, the authors shares her insights and experience of research results on visual literacy for the field of information with the readers. This article shows some examples of visual literacy research, research methods, and theoretical framework for the information field.

Keywords: *visual literacy, paradigm expansion, information research, meaning.*

Introduction

In the author's article in 2023, it states that "the information field is in the midst of advances in technology, internet access, and the rise of the pervasive visual information world. Visual information flows freely in this flat world without boundaries or structures or in various/different shapes and formats (Ma, 2015). When text-based or textual information is visualized, the meaning of the information becomes the center of research. When meaning becomes elusive or a shared process/activity in working with visual information, the social construction of knowledge/meaning has become essential to a new research paradigm. Research methodologies need to focus on the encoding and decoding processes to allow the social construction of knowledge/meaning for visual information by communities of users, which is a key concept of this article and research endeavor. This social construction of meaning/knowledge is based on communities of readers/viewers/users/patrons who create meaning. When meaning is created and constructed/deconstructed by readers/viewers/users/patrons in a shared community, research methodologies and theoretical frameworks to study meaning construction are critical and essential to the success of such a research process. The proposed

paradigm shift focuses on the information nature shifted from textual information to visual information. The paradigm expansion focuses on expanding existing research methodologies and theoretical frameworks to support this paradigm shift. The paradigm inclusion invites interdisciplinary research and embraces diverse research methodologies and theoretical frameworks to study visual information. This paradigm shift, expansion, and inclusion empathize with the social construction of knowledge/meaning in the studies of visual information by communities of users.

Why is visual literacy in the information field? Information in visual form or visual information requires and invites users'/viewers' interpretation and interaction. This is a paradigm shift. Interaction with textual information is different from that with visual information. Meaning construction then becomes essential in visual information research. This article addresses the meaning and construction of visual information and presents examples of visual literacy research for the information field. Some key definitions of concepts are helpful for readers of different disciplines to understand the content.

What is the Information Field?

"Information science is that discipline that investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with the body of knowledge relating to the origination, collection, organization, storage, retrieval, interpretation, transmission, and utilization of information." Borko, H. (Borko, 1968, p. 3).

"… information science brings together and uses the theories, principles, techniques and technologies of a variety of disciplines toward the solution of information problems. Among the disciplines brought together in this amalgam called information science are computer sciences, cognitive science, psychology, mathematics, logic, information theory, electronics, communications, linguistics, economics, classification science, systems science, library science and management science. They are brought to bear in solving the problems with information — its generation, organization, representation, processing, distribution, communication and use." (Williams, 1987/1988, p. 17).

"Information science is the science and practice dealing with the effective collection, storage, retrieval, and use of information. It is concerned with recordable information and knowledge, and the technologies and related services that facilitate their management and use. More specifically, information science is a field of professional practice and scientific inquiry addressing the effective communication of information and information objects, particularly knowledge records, among humans in the context of social, organizational, and individual need for and use of information. The domain of information science is the transmission of the universe of human knowledge in recorded form, centering on manipulation (representation, organization, and retrieval) of information, rather than knowing information." (Saracevic, 2009, p. 2570). (The Association for

Information Science and Technology (ASIS&T). 2023, September 30. *What is Information Science.* P.1)

What is Information?

The field of information is an interdisciplinary study with theories and practice. It is acknowledged that there are various definitions of information throughout the history. Here are just a couple of the definitions to show the challenging nature of defining information. Identify three principal uses of the word INFORMATION:

> Information-as-process …
> Information-as-knowledge …
> Information-as-thing …
> Buckland, Michael. (Buckland,1991, p.3).

Four traditions in definition of information:

- information as a resource
- information as a commodity
- information as perception of patterns
- information as a constitutive force in society

(Braman, 1989, p. 233)

What is Visual Information?

By these definitions and many other definitions of information throughout the history for the information field, it is equally to define visual information. The author defines visual information is part and type of information. Visual information is information that is transmitted through a visual communication medium. Visual information is encoded with messages by the author/designer/ producer. The users/viewers decode the intended message and create meaning while they interact with the visual information. Medium carries messages, and medium is not neutral.

What is Information Literacy?

According to the Association of College and Research Libraries, information literacy is defined as "The set of skills needed to find, retrieve, analyze, and use information. Information literacy is more closely tied to course-integrated instruction but it extends far beyond coordination between the reference librarian and the individual faculty member. Even a cursory review of the Information Literacy Competency Standards (link) will show that there is much more to information literacy competence than library-related research. Students must demonstrate

competencies in formulating research questions and in their ability to use information as well as an understanding of ethical and legal issues surrounding information. This requires a campus culture of collaboration and focus on student learning. (Association of College and Research Libraries. September 29, 2023. *Information Literacy Glossary*)

What is Visual Information Literacy?

Based on the Association of College and Research Libraries' definition of information literacy, the author defines visual information literacy is a set of abilities requiring individuals to recognize when visual information is needed and have the ability to find, retrieve, evaluate, and use effectively the needed visual information. However, visual information is different from textual information or information in text form. Individuals need to have visual literacy education in order to read, understand, interpret, and create visual messages. In order to study visual information literacy, visual literacy is an essential part of the process.

Visual Literacy and Information Literacy

ACRL provides the description of Visual Literacy and Information Literacy as stated "The *Visual Literacy Standards* were developed in the context of the *Information Literacy Competency Standards for Higher Education*, and are intended to complement the *Information Literacy Standards*. The *Visual Literacy Standards* address some of the unique issues presented by visual materials. Images often function as information, but they are also aesthetic and creative objects that require additional levels of interpretation and analysis. Finding visual materials in text-based environments requires specific types of research skills. The use, sharing, and reproduction of visual materials also raise particular ethical and legal considerations. The Standards address these distinct characteristics of images and visual media and challenge students to develop a combination of abilities related to information literacy, visual communication, interpretation, and technology and digital media use. (Association of College and Research Libraries. September 30, 2023. *Visual literacy Competency Standards for Higher Education*).

What is Visual Literacy?

In the 60s, visual literacy started to be the focus for scholars to define it. John Debes' offered the following definition of the term:

> "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 masterworks of visual communication." (Debe, 1969). It is acknowledged that there are different definitions of visual literacy.

Research Design & Methodology

Theoretical Background

This article is a presentation of research methodologies and different theoretical frameworks used to study visual literacy for the field of information.

Visual Literacy Research for the Information Field

There is little literature on visual literacy research for the information field to study the meaning construction of visual information. Expanding from traditional research methods and applying current research methods, visual literacy research requires interdisciplinary approaches, theoretical frameworks, and the encoding and decoding processes to design research approaches, research questions, and analyze visual messages. In the following research publication examples, each research statement or summary of research experience is based on completed research studies. The author shares some examples with readers by asking research questions, research models, and publications. These sample research studies invite more visual literacy research effort and studies in visual literacy for the field of information.

Presentation of Research Studies in Visual Literacy for the Field of Information

What happens when information is presented in a visual form with encoded messages?

What critical questions can be asked for research?

The following visuals and visual texts in Figure 1 and Figure 2 are used as examples for research of icons used as index pointers for information storage and retrieval on the web. They illustrate the encoding process of the visual texts.

Sample research questions were from the published articles on visual literacy research of information storage and retrieval studies are provided with references.

Figure 1. *Icons on the Internet*

(November 22, 2022. Google.com)

Sample Research Questions:
What does this icon mean?
What is the original domain of this icon?
What is the use of this icon on the internet for indexing or searching purposes?
How are the icons used to index resources on library homepages?
What are the codes embedded in the icons on the websites for indexing and retrieval?

This research presents that the Web allows users to interact with graphic interface to search information in a hypermedia/multimedia environment. Graphics including color lines serve as indexes or reference points on the World Wide Web for searching and retrieving information including texts, visuals, and sound materials in a non-linear fashion. This study examines the codes embedded in the icons on library homepages of Webs. Icons in this study refer to iconic indexual signs. Codes are syntax patterns that are culturally constructed. They have paradigmatic meanings.

Figure 2. *Icons on the Internet*

(November 28, 2022. Google.com)

Sample Research Questions:
What does this icon mean?
What is the original domain of this icon?
What is the use of this icon on the internet for indexing or searching purposes?
How are the icons used to index resources on library homepages?
What are the codes embedded in the icons on the websites for indexing and retrieval?

This this research, the authors compared the traditional indexing principles with the structures of icons.

Figure 3. *Film*

Wikipedia. (2022, December 18th.) *Crouching Tiger and Hidden Dragon* https://en.wikipedia.org/wiki/Crouching_Tiger,_Hidden_Dragon

Sample Research Questions:
How does this movie position its viewers?
What are the cultural codes in this film?

This research provides an analysis of how a visual text (CTHD) positions the viewer and creates its own subjectivity. It examines how community of viewers creates meaning while they interact with the visual text.

Figure 4. *Website Design and Postmodern Art*

(Galter Health Sciences Library and Learning Center. September 30, 2022. https://galter.northwestern.edu/)

Two research studies applied reader-response criticism to examine postmodern art and weside design. The first research applies reader-response theory to investigate subject positions of gender, age, race, and profession through a poststructural analysis of a postmodern Chinese art work. It studies the relationship between and among viewers, artist, and the visual text. It applies textual analysis, survey, and interviews.

Sample Research Questions for the study are:

What are the codes that invite readers to read the fake Chinese characters?
How are viewers positioned by the artwork?
What meanings are constructed when viewers interact with the visual text?

In 2002, the author expanded the research methods and reader-response criticism to study website design in the Galter Health Sciences Library. This study examines the relationship between and among designers, text, and users of the Galter Health Sciences Library Web site. It asks such questions as "How do Web site designers construct their subject?" or, "Whom do the web designers think their users are?" The study ascertains the intentions of the designers of the GHSL Web site; examines the meanings made by the users through interviews; compares the similarities and differences of designers' intentions with their organization of knowledge represented in the GHSL Web site; and compares the similarities and differences between the designers' intentions and views of the users.

Figure 5. *Poster*

(By J. Howard Miller - U.S. National Archives and Records Administration, Public Domain. September 30, 2023. https://commons.wikimedia.org/w/index.php?curid=80242715)

Research Questions: What does this poster remind you of? What does this poster mean to you? How are the viewers positioned?

(These are some sample research questions that the author challenges her students in her visual literacy class)

Figure 6. *Advertisements*

(JC Penny. (2022, December 22nd) https://www.jcpenny.com

Sample Research Questions:
Who is included in this advertisement?
Who is excluded?
Whom do the models represent? Why?
Who has the buying power?
How are the viewers positioned?
(These are some research questions that the author challenge her students in her visual literacy class)

Figure 7. *Advertisements*

(Silk Market, Hangzhou, China. (2004)

Sample Research Questions:
Why are Western-looking mannequins on display in these department stores and silk markets in China?
Who is the customer?
How are customers positioned?
What are the codes embedded in the mannequins that invite/influence customers to buy the products?

This research studies the structure and the mannequins, the buying powers, and how the buyers are positioned by the mannequins.

Figure 8. *Advertisements*

(New Century Market, Hangzhou, China. (2004)

Sample Research Questions:

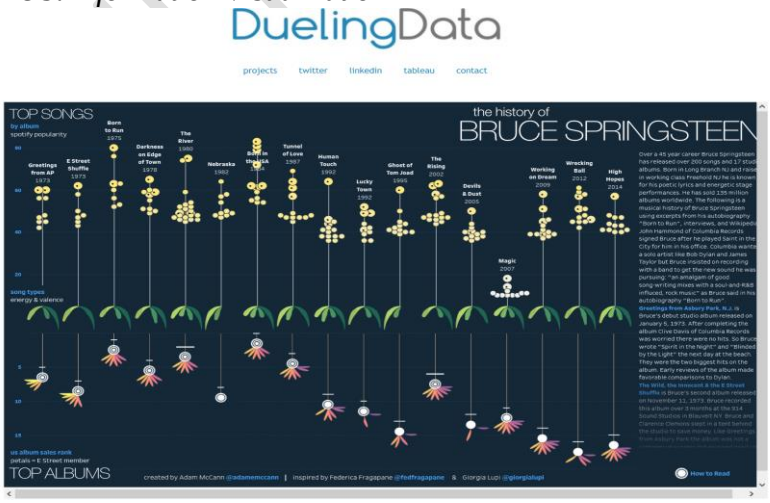
Why are Western-looking mannequins on display in these department stores and silk markets?

Who is the customer?

How are customers positioned?

What are the codes embedded in the mannequins that invite/influence customers to buy the products?

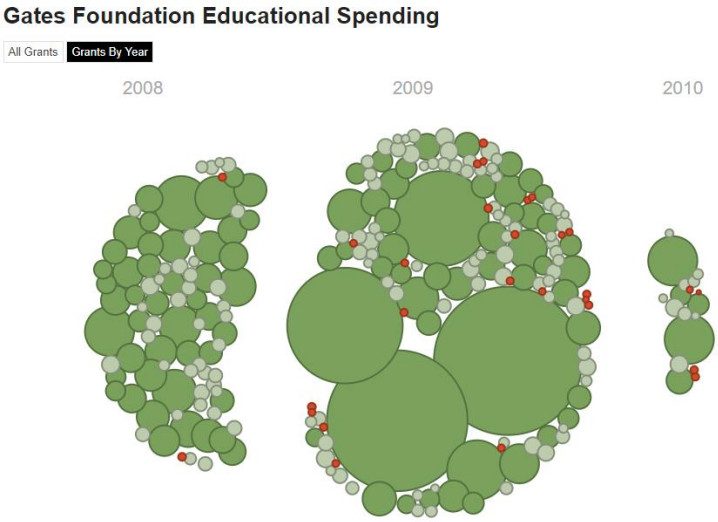
Figure 9. *Information Visualization*



McCann, A. (2022, November 28th) *The history of Bruce Springsteen*. http://duelingdatalarge.blogspot.com/2018/08/history-of-bruce-springsteen.html

Sample Research Questions:
What happens when textual information is visualized?
Why are such designs or colors chosen? How effective is this information presentation?
Does data visualization help visualize data/information better than textual data/ information representation?

Figure 10. *Information Visualization*



(2022, December 11th). *Grants by Year*. https://vallandingham.me/images/vis/bubble_chart/bubbles.jpg
Sample Research Questions:
What happens when textual information is visualized?
Does data visualization help visualize data/information better than textual data/information representation?

This research addresses and shares with the library and information professionals the importance and process of meaning construction in data visualization. It is a critical study to analyze how meaning is construction in data visualization to provide insights for the information profession in data visualization for design purposes to understand the users better and serve them well in the global digital data age.

The examples mentioned above presented the encoding process by the authors/artists/designers/film directors.

Encoding means precisely that --selecting the codes which assign meanings to events, placing events in a referential context that attributes meaning to them (fictional codes perform this work too; it is not limited to the codes of "actuality" and naturalism). (Hall, 1973).

In the field of library and information science, encoding refers to the information storage process where meanings are assigned. Encoding means assigning codes to metadata in the organization of information, subject analysis,

data structure, database design, interface design, information systems, and in the process of information storage.

Encoding is practiced at the time books/recourses are selected, recommended, collection management, assignment metadata to visual texts. The author has focused on the research examples on decoding more that encoding in this article.

Decoding is defined as meaning which is decoded by the receiver. For a visual text, one needs to be taught and guided to learn how to decode visuals correctly. One aspect of visual literacy is the skill of interpreting and creating meaning from the stimuli that surround them. In the field of library and information science, decoding is defined as the process of information retrieval. The user/patron formulates information retrieval strategies to search for information either by him/herself or with the assistance of an intermediary information professional. The decoding process is usually assisted by reference information professionals, and it happens with a reference interview.

These sample research studies presented above demonstrate how research in visual literacy is carried. The author invites more research studies to continue and expand visual literacy research in the field of information.

Conclusion

Information field is a professional practical field. Visual information has challenged the profession on how to carry out research on visual information. This is fundamentally a paradigm shift. The expanded research methods and interdisciplinary theoretical frameworks introduced in this article strengthen the traditional and current research methods and theoretical frameworks for the research in information field. With the illustrated research examples of visual literacy studies, it is hoped that more visual literacy research will be carried out in the information field. The research will be in the encoding process and decoding process to fully understand the visual texts. How will artificial intelligence assist or resist original research to embrace new/different research methods and appropriate theoretical frameworks to study visual literacy for the information field will be the new endeavor for researchers.

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