



Peer-Reviewed Article

Visual Literacy: A 2022 Survey of LIS Education Programs

A.M. LaVey, *The Ukrainian Museum*

ABSTRACT

This 2022 study follows up on a 1999 study of visual literacy education in American Library Association-accredited library and information studies programs. Using the Association for College and Research Libraries' Visual Literacy Competency Standards for Higher Education, the article analyses those standards vis-à-vis current educational offerings in professional librarianship programs to discover if these program offerings are properly preparing a visually literate workforce.

KEYWORDS

Visual literacy, Information visualization, LIS pedagogy, Visual information science

SUGGESTED CITATION

LaVey, A.M. (2022). Visual literacy: A 2022 survey of LIS education programs. *Journal of New Librarianship*, 7(2), 31–42. <https://doi.org/10.33011/newlibs/12/5>

This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



The idea of the possibility for a single ideal language to serve as an optimal mechanism for the representation of reality is an illusion.

J.M. Lotman *Culture and Explosion* (2009)

Semiotician J.M. Lotman (1981) writes that visual languages are not universal and are culturally developed with a social function to exchange, preserve and accumulate knowledge. The visual is a language, and like any language it is not self-evident and needs to be learned to be understood. These languages are ordered communication sign systems, and therefore semiotic systems where visual signs are used to communicate ideas and concepts in the process of information exchange. This ability to communicate visually is linked to visual literacy.

Visual literacy is the understanding that information can be communicated visually. Educator Maria Avgerinou and information design scholar Rune Pettersson (2010) write that as a concept, visual literacy is the ability to code, decode and think visually, and as a construct, it is a group of skills, competencies and abilities that are learnable and teachable. Visual literacy scholar Barbara A. Seels (1994) suggests that visual literacy is not just the ability to code and decode, but also is a fundamental skill of a responsible citizenry especially in today's society with an overabundance of visual information in our everyday lives. Educators Richard A. Couch, Edward J. Caropreso and Helen B. Miller (1994) highlight that visual literacy is a lifelong educational process that we need to take an active role in, otherwise "we eventually lose both the opportunity and capacity to interpret visual information meaningfully."

In 2011 the Association of College and Research Libraries Board of Directors approved the *ACRL Visual Literacy Competency Standards for Higher Education*, a group of seven standards that students in higher education settings should be familiar with in today's highly visual society. ACRL's Visual Literacy Task Force (2012) defines visual literacy as "a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media" and suggests that a visually literate person in a higher education environment is able to:

1. Determine the nature and extent of the visual materials needed
2. Find and access needed images and visual media effectively and efficiently
3. Interpret and analyze the meanings of images and visual media
4. Evaluate images and their sources
5. Use images and visual media effectively
6. Design and create meaningful images and visual media
7. Understand many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and access and use visual materials ethically.

The Task Force (2012) notes that students are expected to use visual information in their academic work but are not always prepared to do so. The VLTF also suggests that visual literacy education is a collaborative effort between faculty, librarians and other professionals. In 2022, after conducting “empirical research from 2019-2021, interviewing stakeholders in a range of roles and disciplines,” the Task Force released a *Companion Document to the ACRL Framework for Information Literacy for Higher Education: Visual Literacy*, superseding the 2011 standards and identified four emerging themes for learning in visual literacy:

1. Learners participate in a changing visual information landscape
2. Learners perceive visuals as communicating information
3. Learners practice visual discernment and criticality
4. Learners pursue social justice through visual practice.

The Task Force (2022) writes that “visual literacy requires continuous and lifelong engagement” and this raises some questions about library and information sciences pedagogy and the professional preparation of librarians. How will these standards and emerging themes affect the educating and training of LIS students? Who are the educated visually literate information professionals who will teach visual literacy to these students? Where or how should these information professionals receive visual literacy education? Are LIS educators incorporating visual literacy in their curricula and if so, how? This article seeks to answer these questions.

In the 1999 paper “Visual information science: its need and place in the curriculum of library and information science education,” visual literacy scholar Yan Ma conducted a survey of 55 LIS programs and discovered that visual literacy coursework was not in the curriculum of any of the American Library Association-accredited programs. In 2015, four years after the release of the ACRL standards, Ma issued a continuing call for the inclusion of visual literacy in LIS education so that information professionals will be professionally prepared to contribute to visual literacy. Ma also suggested that visual literacy education would require a paradigm shift in LIS pedagogical praxis.

In a nod to Ma, I conducted a survey of visual literacy courses in the 2021 top 10 “Best Library and Information Studies Programs” as reported by *U.S. News and World Report*.¹ I scoured course listings and descriptions for any use of the word “visual.” Eight of the 10 schools offer coursework in data/information visualization, and two schools offer a course in visual analytics, in addition to a variety of other single courses like “Introduction to Data Science” and

¹ At the time of submission, the 2021 list was the most recent and includes (in numerical order) University of Illinois Urbana-Champaign, University of North Carolina at Chapel Hill, University of Washington, University of Maryland College Park, University of Texas at Austin, Rutgers University, Syracuse University, University of Michigan, Indiana University Bloomington and the University of Tennessee Knoxville.

“Data Storytelling” that contain visual information elements. See the appendix for the full list and course descriptions.

Like Ma’s survey 23 years ago, I found that there is still no specific coursework at the surveyed institutions that contain or reference the phrase “visual literacy,” despite the fact that the ACRL standards were published 11 years ago. But let us take a closer look at the top course offering: data/information visualization. Three of the programs list the course as “Data Visualization,” while five list “Information Visualization” (see appendix). Data visualization analyst Angela Zoss (2021) defines data visualization as anything that converts data sources into a visual representation and suggests that information visualization is a type of data visualization. However, for the purposes of this article we will consider the two terms to be synonymous and will use the term information visualization.

Information scientist Hsuanwei Michelle Chen (2017) defines information visualization as the representation of data in a visual context, and notes that visualization allows for the discovery of new information that amplifies cognition and helps to understand the significance of data. Librarian James W. Marcum (2002) adds that visualization is used to amplify scholarship and make its findings more understandable.

Taken from the eight course descriptions mentioned above, here are some of the topics being taught in LIS information visualization coursework:

- Overview of historical and modern techniques for visualizing data
- Construction of communicative visualizations
- History of visualization techniques
- Perception and understanding of visual information
- Frameworks for identifying the need for information visualization
- Visualization construction
- Techniques and approaches to extract information relevant for experts and non-experts
- Design of presentations using texts, graphics, images, sounds
- User interpretation, navigation, and interaction with visualizations
- Visualization in information retrieval, and interfaces in library and information processes
- Design principles for visualization
- The ability to design effective information visualizations.

Rutgers University also includes the following student outcomes, stating that upon successful completion of this course, students will be able to:

- Understand human visual perception and how it relates to creating effective information visualizations.
- Understand the key design principles for creating information visualizations.
- Recognize the major existing techniques and systems in information visualization.

- Evaluate information visualizations tools.
- Design new, innovative visualizations.²

A syllabus from Syracuse University notes that students will learn to critically analyze visualizations, be introduced to the R programming language and Adobe Illustrator in order to create “rich visual artifacts that communicate data stories,” and bring an ethics-based perspective to the development and interpretation of visualizations.³

As mentioned, the term “visual literacy” was not found anywhere in the textual analysis, but a closer reading of these courses allows us to see that visual literacy, through information visualization coursework, is being taught in LIS programs.⁴ Using the information above gleaned from course descriptions, I have mapped course attributes from all ten schools to the ACRL Visual Literacy Competency Standards for Higher Education. From the chart below we can see that creating visual information is the top skill being taught in information visualization coursework, but that all seven visual literacy standards are being implemented and used by LIS educators. This is a new development contrasting with Ma’s 1999 investigation in which she noted that none of the coursework included all aspects of visual literacy.

ACRL Visual Literacy Standard	Information visualization course attribute
1. Define visual information needs	1. Provides a framework for identifying the need for information visualization
2. Find visual information	1. Visualization in information retrieval, and interfaces in library and information processes
3. Interpret & analyze visual information	1. Perception and understanding of visual information 2. User interpretation
4. Evaluate visual information	1. Evaluate information visualizations tools 2. Critically analyze visualizations
5. Use visual information effectively	1. Techniques and approaches to extract information
6. Create visual information	1. Construction of communicative visualizations 2. Visualization construction 3. Design of presentations 4. Design effective information visualizations 5. Design principles for visualization

² <https://comminfo.rutgers.edu/academics/courses?courses=554&program=32>.

³ <https://github.com/cpkoywk/IST-719-Information-Visualization/blob/master/Syllabus.pdf>.

⁴ Note: I did not collect information on whether or not the course is currently being taught.

7. Use visual information ethically	Bring an ethics-based perspective to development and interpretation of visualizations
-------------------------------------	---

However, while Ma (2019) considers visual literacy coursework as mandatory training for information professionals and LIS students, all of these courses are offered as electives. Making these courses optional does not allow standardization at the professional level, leaving a great number of LIS professionals without these skills or even knowledge about them. Academic librarian Judith Schwartz's 2018 study "Visual literacy: Academic libraries address 21st century challenges," found that 54 percent of surveyed academic and special librarians were not aware of the ACRL standards at all, yet 70 percent of them agreed that visual literacy is a key literacy needed to be successful in the 21st century.

If LIS professionals are not learning visual literacy skills in a classroom setting, what other options do they have for professional development? Academic librarians Kristin J. Henrich (2014) and Lindley Homol (2017) suggest that librarians have to educate themselves through self-study and professional development courses. Online learning platforms offer a variety of learning opportunities such as massive open online courses, seminars, courses, or online certifications for general audiences. Examples include the Massachusetts Institute of Technology's "Persuading with Data" or Harvard University's "Data Science: Visualization," while some are aimed at LIS audiences like the Medical Librarian Association's "Practical Data Visualization for Librarians" and Library Juice Academy's "Introduction to Data Visualization." However, Chen (2017) argues that it is the responsibility of LIS leaders to invest in their staff by offering information visualization training in order to offset the institutional lack of expertise and skills.

Information visualization and therefore visual literacy skills grow in need every day. A Google Scholar citation analysis returns about 19,900 papers published in 2022 alone that include within the title the term "data visualization," 2,900 for "data visualisation," 3,180 for "information visualization" and 876 for "information visualisation." Of course these citations are generally on the subject of visualization, not the use of them in academic and scholarly research.

In fall of 2021, when I started researching this article, the ALA Joblist and *The Chronicle of Higher Education* together were currently listing hundreds of employment opportunities for data librarians whose job descriptions include information visualization. For example, Georgia State University was looking for a data visualization librarian who would "support data visualization efforts by students and faculty across the university," Dartmouth College was looking for a Data & Visualization Librarian who would "be knowledgeable in emerging trends, tools, technologies, and practices supporting data and visualization in the social sciences," and The University of Houston was looking for a "Digital Strategies and Data librarian...responsible

for designing, developing, sharing, and implementing digital-forward strategies in library collection development, user experience, technology, research data curation, digital production and collections, web maintenance and development as well as data analytics and visualization.”

It is evident that there is a need and there are opportunities for visually literate librarians, yet visual literacy skills are still not mainstream course offerings or required in top-rated U.S. LIS educational programs. Many respondents to Schwartz’s study seem to think visual literacy instruction is someone else’s job and therefore is not a fully developed professional offering in many academic libraries. For example, in library school my request for assistance on an Omeka project went unfulfilled by the digital initiatives librarian, who told me to “look online.”

Marcum (2002) suggests that LIS needs to expand its definitions of librarianship in order to include new forms of expertise and recast information literacy to embrace multiple literacies, including visual literacy. He further challenges librarians to not hide behind inadequate training and to learn visualization skills, otherwise they will be marginalized. While LIS educators need to develop visual literacy coursework based on Ma’s 1999 framework—the study of visual information science related to visual information collection, analysis, processing, transmission, utilization, and communication in modern and digital libraries and information centers—the responsibility of becoming visually literate falls on LIS students and practicing professionals. The nature of information and this profession changes every day, and those who think that visual literacy instruction is not their job and do not seek professional development will ultimately be left behind professionally and be unable to serve their designated communities to the fullest.

References

- Avgerinou, M., & Pettersson, R. (2011). Toward a Cohesive Theory of Visual Literacy. *Journal of Visual Literacy*, 30(2), 1-19. Education Resources Information Center. DOI: 10.1080/23796529.2011.11674687.
- Chen, H.M. (2017). Information Visualization. *Library Technology Reports*, 53(3), 1-30. doi:10.5860/ltr.53n3.
- Couch, R., Caropreso, E. and Miller, H. (1994). Making meaning from visuals: Creative thinking and interpretation of visual information. In D.M. Moore and F.M. Dwyer (Eds.), *Visual Literacy* (pp 277-292). Educational Technology Publications, Inc.
- Henrich, K.J. (2014). Visual Literacy for Librarians: Learning Skills and Promoting Best Practices. *The Idaho Librarian*.
<https://theidaholibrarian.wordpress.com/2014/05/27/visual-literacy-for-librarians-learning-skills-and-promoting-best-practices/>.

- Homol, L. (2017) Data Visualization. *Tips and trends*. <https://acrl.ala.org/IS/wp-content/uploads/Tips-and-Trends-Su17-1.pdf>.
- Lotman, Y.M. (1981). *Semiotics of Cinema*. University of Michigan.
- Ma, Y. (2019) Meaning Construction in Data Visualization [Conference presentation]. *IFLA Meeting Data Intelligence in Libraries*, August 22-23, Frankfurt, Germany. <http://library.ifla.org/id/eprint/2746/1/s15-2019-ma-en.pdf>.
- Ma, Y. (2015). Constructing and Reading Visual Information: Visual Literacy for Library and Information Science Education. *Journal of Visual Literacy*, 34(2), 1-22. doi:10.1080/23796529.2015.11674727.
- Ma, Y. (1999). Visual information science: its need and place in the curriculum of library and information science education. In R. Griffin, E. Gibbs, J. Williams, & B. Weigmann (Eds.), *Visual literacy in an Information Age* (pp. 235-239). The International Visual Literacy Association.
- Marcum, J.W. (2002). Beyond Visual Culture: The Challenge of Visual Ecology. *portal: Libraries and the Academy*, 2(2), 189-206. doi:10.1353/pla.2002.0038.
- Schwartz, J. (2018). Visual literacy: Academic libraries address 21st century challenges. *Reference Services Review*, 46(4), 479-499. doi:10.1108/RSR-04-2018-0048.
- Seels, B.A. (1994). Visual literacy: The definition problem. In D.M. Moore and F.M. Dwyer (Eds.), *Visual Literacy* (pp 97-112). Educational Technology Publications, Inc.
- U.S. News and World Report. (2021). Best Library and Information Studies Programs. *Best Graduate Schools*. <https://www.usnews.com/best-graduate-schools/top-library-information-science-programs/library-information-science-rankings>.
- Visual Literacy Standards Task Force. (2022). *Companion Document to the ACRL Framework for Information Literacy for Higher Education: Visual Literacy*. doi:10.13140/RG.2.2.18772.88960.
- Visual Literacy Standards Task Force. (2012). Visual literacy competency standards for higher education: Approved by the ACRL Board of Directors, October 2011. *College & Research Libraries News*, 73(2), 97-104. doi:10.5860/crln.73.2.8709.
- Zoss, A. (2021). Data Visualization. *Duke University Libraries*. <https://guides.library.duke.edu/datavis>.

Appendix

Coursework from the top 10 “Best Library and Information Studies Programs 2021” according to *U.S. News and World Report*:

1. University of Illinois--Urbana-Champaign
 - a. Data visualization
 - i. Data visualization is crucial to conveying information drawn from models, observations or investigations. This course will provide an overview of historical and modern techniques for visualizing data, drawing on quantitative, statistical, and network-focused datasets. Topics will include construction of communicative visualizations, the modern software ecosystem of visualization, and techniques for aggregation and interpretation of data through visualization. Particular attention will be paid to the Python ecosystem and multi-dimensional quantitative datasets.
 - b. Advanced Data visualization
 - i. In this seminar-style course we will discuss advanced topics in visualization techniques. This will cover topics such as the history of visualization techniques, the perception and understanding of visual information, and new frontiers in displaying quantitative information. We will explore the modern technical stack for creating and sharing visualizations, including topics in javascript, python, and reactive frameworks. Prereqs: programming courses. Students are expected to either be familiar with, or be prepared to familiarize themselves with, Python, Javascript, GitHub, and other computational tools. Data Visualization (IS445) is optional, but encouraged.
2. University of North Carolina at Chapel Hill
 - a. Information Visualization
 - i. An introduction to information visualization through reading current literature and studying exemplars. The course reviews information visualization techniques, provides a framework for identifying the need for information visualization, and emphasizes interactive electronic visualizations that use freely available tools. Students will construct

several visualizations. No programming skills are required. Instruction Mode: in person on campus learners

- b. Visual Analytics
- c. Art and Visual Information Management
3. University of Washington
 - a. Intro to Data science
4. University of Maryland
 - a. Data Visualization
 - i. This course explores the application of data science techniques to unstructured, real-world datasets including social media and geo-referenced sources. The course will focus on techniques and approaches to extract information relevant for experts and non-experts in areas that include smart cities, public health and disaster management. The course will examine state-of-the-art research in the field and will put an emphasis on mastering current literature and trends. Students will be required to read and present papers in class as well as to participate in technical discussions. The course will also have an important practical component with students working on a variety of research problems through a data lens.
 - b. Visual Analytics
5. University of Texas at Austin
 - a. Introduction to Digital Humanities
 - b. Data Storytelling
 - c. Interacting with Information in Advanced Visualization Environments
 - d. Special Topics in Information Science: Visualization
6. Rutgers University
 - a. Information visualization and presentation
 - i. Design of presentations using texts, graphics, images, sounds. User interpretation, navigation, and interaction with visualizations. Visualization in information retrieval, and interfaces in library and information processes. Effective display and presentation of information in organizational contexts, using various formats, both print and electronic.
 1. Upon successful completion of this course, students will be able to:

-
- a. Understand human visual perception and how it relates to creating effective information visualizations.
 - b. Understand the key design principles for creating information visualizations.
 - c. Recognize the major existing techniques and systems in information visualization.
 - d. Evaluate information visualizations tools.
 - e. Design new, innovative visualizations.
 7. Syracuse University
 - a. Information Visualization
 - i. A broad introduction to data visualization for information professionals. Students will develop a portfolio of resources, demonstrations, recipes, and examples of various data visualization techniques.
 8. University of Michigan
 - a. Information Visualization
 - i. Introduction to information visualization. Topics include data and image models, multidimensional and multivariate data, design principles for visualization, hierarchical, network, textual and collaborative visualization, the visualization pipeline, data processing for visualization, visual representations, visualization system interaction design, and impact of perception. Emphasizes construction of systems using graphics application programming interfaces (APIs) and analysis tools.
 - b. Graphic Design and Visual Communications
 9. Indiana University Bloomington
 - a. Information Visualization
 - i. Introduces information visualization, highlighting processes which produce effective visualizations. Topics include perceptual basis of information visualization, data analysis to extract relationships, and interaction techniques.
 - b. User Interface Design for Information Systems
 10. University of Tennessee-Knoxville
 - a. Introduction to Data Analytics and Visualization
 - i. Introduces the concepts of big data and data analytics in academics, businesses, sciences, the Web, etc. To master basic concepts and

processes of data analytics. To practice data mining techniques and skills (ETL). To design effective information visualizations.

b. Environmental Informatics