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A Textual Review of Information & Digital Literacy in IFLA trend Reports (2013-2024)

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Structural abstract

Background and objective:

This article aims to discover prominent aspects and approaches of information literacy and digital literacy concepts in IFLA trend reports from 2013 to 2024 by implementing textual analysis within different corpus reports to investigate the contributions and relationships of various trends to information and digital literacy.

Methods:

To reach this purpose, Voyant tools used, which have important features such as Topics, Cirrus, TermsBerry, Relative frequency, and Bubblelines were implemented for identifying and investigating the patterns, structures, and specific analysis within contexts.

Results:

Findings of this research revealed that both information literacy and digital literacy are topics of discussion in IFLA trend reports 2016 and 2024 from multiple perspectives with a special focus on information literacy in IFLA trend report 2021. In terms of Bubblelines, the highest density was in IFLA trend report 2024. In dealing with relative frequency in information literacy, IFLA trend reports 2013, 2016, 2021 and 2024 had the highest relative frequency while digital literacy was the main topic of discussion in IFLA trend report 2016 and 2024.

Significance, value:

Implementing Voyant tools in this research as an innovative textual analysis method demonstrated that information and digital literacy are considered as important approaches in various IFLA trends throughout the years and are not only aligned with most of these trends but can also interpret multiple aspects of a corpus of reports according to their definitions and applications.

Keywords: Textual data analysis, data mining, information literacy, digital literacy, Voyant tools, IFLA trend reports, content analysis

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1. Introduction:

IFLA has always been a major organization for setting standards, trends, and establishing guidelines for library associations and institutions to handle information science-related tasks more efficiently and appropriately (Holley, 1996). As a matter of fact, trends are usually collections of various perspectives, viewpoints and dialogs among leaders, experts, and researchers in different disciplines and subjects. IFLA trends involve exploration and discussion about emerging topics in library and information science (Rudasill, 2015). The extent to which libraries may contribute to the changing information landscape can be determined by how they react to these trends, which are the most pressing issues facing the profession (IFLA trend report 2017, 2017). It is worthwhile to mention that however these trends represent possible pathways to different categories; they usually include broad matters in societal and political aspects, insights, and future scenarios that sometimes have some coverage to each other too.

In discussing trends, on the one hand, it is argued that a review of trends can have a significant impact on how to keep up with the latest global challenges by finding ways to deal with problems for the general public. On the other hand, it paves the pathway for better shaping the future, planning and setting goals for academic fulfillment and career achievements for librarians and information professionals (Dezuanni and Osman, 2024).

Literacy and educational concepts have long been a matter of concern within IFLA trends. The fact is that various social topics and global challenges are related to literacy content. Not only are information and digital literacy emphasized in academia and university environments, but they are also considered important life skills and the ability to survive in technology-evolving sectors. These skills are also crucial for lifelong learning, tackling life problems and difficulties in various conditions (Becker, 2018).

Therefore, this article aims to discover prominent aspects and approaches of information literacy and digital literacy concepts in IFLA trend reports from 2013 to 2024 by implementing textual analysis within different corpus reports to

investigate the contexts, contributions, and relationships of various trends to information and digital literacy.

The importance of conducting this research originates from the fact that IFLA trends are considered as collections of emerging and thought-provoking topics regarding complex global issues in library and information science as an interdisciplinary subject from the perspectives of scholars and academic professionals (Trend report, 2024) on the other hand, Voyant tools can be used to classify and distinguish important topics and keywords for better clarification and analyzing textual contents. As literacy concepts have always been a matter of discussion and analysis in scientific literature and publications, it is of a high importance to investigate the contribution of information and digital literacy to IFLA trend reports. Thus by implementing Voyant tools, related literacy concepts in various IFLA trends can be analyzed and compared such as the frequency of literacy content keywords, the relationship between prominent trends in terms of literacy, and the relative frequency of information and digital literacy. For reaching these purposes, some questions need to be analyzed and investigated. These questions were designed according to the research objectives and are aligned with unique features of Voyant tools for clarifying important issues regarding literacy topics in IFLA trend reports:

1) What are the terms and topics related to information and digital literacy covered and distributed in different IFLA trends from 2013 to 2024?

2) What are the highest frequency keywords, (Cirrus)[i] in relation to information and digital literacy in IFLA tend reports from 2013 to 2024?

3) What are the TermsBerry[ii] related to information and digital literacy in IFLA trend reports from 2013 to 2024?

4) What is the relative frequency[iii] of information literacy and digital literacy in IFLA trend reports over the years?

5) What are the important contexts within IFLA various trends in which information and digital literacy are widely used?

6) What are bubblelines[iv] and the frequency of information and digital literacy topics most prevalent or distributed in IFLA trend reports?

This article begins with a general definition of information and digital literacy, followed by a brief history of IFLA trends throughout the years. Ultimately, concepts and approaches related to information and digital literacy will be analyzed through textual analysis.

2. Literature review

2.1 Information literacy

The information literacy concept was first devised by "Paul Zurkowski" in his article titled "The information service environment Relationships and priorities" published in 1974 (Zurkowski, 1974). Kulthau (1987) referred to information literacy as functional literacy because it encompasses the use and application of information in various facets of life. Finding and using specific information sources, as well as analyzing the information-use process, can also be considered information literacy skills that contribute to the development of insights in academia and life span. The American Library Association (ALA) defines information literacy as "a set of framework abilities requiring individuals to recognize when information is needed and have the capability to locate, evaluate, and use effectively the needed information" (ALA, 2016). The ALA framework comprises six frames and a set of dispositions that are central to information literacy.[v] This involves rich and complex concepts: At the heart of this framework are conceptual ideas about information and research exists. For instance, it gives greater weight to higher-order thinking skills, which are closely related to critical thinking and entail data analysis and evaluation for the purpose of enhancing communication (Goodsett, 2018). Additionally, the Framework may initiate new discussions to share accountability for information literacy instruction and evaluation among academic staff, librarians, and administrators (D'Angelo et al., 2016).

In 2004, the Chartered Institute of Library and Information Professionals (CILIP) defined information literacy as "the ability to think critically and make

balanced judgments about any information we find and use" (CILIP, 2018). According to the CILIP definition, information literacy supports lifelong learning and enables people from all aspects of life the ability to accomplish their goals (Secker, 2018).

UNESCO also defined information literacy and released a conceptual framework for it as "the capacity of people to recognize their information needs; locate and evaluate the quality of information; store and retrieve; make effective and ethical use of information and apply it to create and communicate knowledge" (Catts and Lau, 2008: 7).

In terms of achieving information literacy goals and objectives, IFLA plays a major role in setting standards, indicators and trends related to information literacy by tremendous efforts and cooperation with other organizations. IFLA also supports and establishes guidelines for implementing information literacy in libraries by being in contact with relevant parties to share successful experiences in information literacy instruction in educational environments. According to IFLA, lifelong learning is another main purpose of information literacy: "Lifelong learning is a good habit that must be acquired and accompanied by the adoption of a positive frame of mind. The willingness to change and a curiosity or thirst for knowledge is very helpful preconditions to lifelong learning." (Horton, 2006)

As IFLA is an international organization that deals with providing information resources for all communities and people, lifelong learning in comparing to other important IFLA definitions on information literacy is more focused and emphasized. There are also various IFLA trends throughout the years that are focused on the importance of information literacy from multiple aspects and perspectives that will be analyzed and investigated in this research

The digital literacy concept must also be analyzed and defined. In this part, comprehensive definitions of digital literacy is presented and investigated.

2.2. Digital literacy

Digital literacy was first established and introduced by Paul Gilster (1997) in his book "Digital Literacy." He offered the definition based on capability to comprehend and use information in different formats on computer. Gilster believes that digital literacy is not simply a "book about how to get around the Internet." Furthermore, analysis and interpretation of the data are equally important. Learning and doing tasks in a digital environment can help one acquire fundamental thinking abilities and core competencies in the digital literacy platform (Gilster, 1997). David Reinking stated, "Evolving forms of electronic reading and writing" in his lecture in "National Reading Conference", pointed digital literacy as "fundamental changes and challenges in the way to disseminate information" (Reinking et al., 1998). According to Eshet-Alkalay: "In light of the rapid and continual development of digital technology, individuals are required to use a growing variety of technical, cognitive, and sociological skills in order to perform tasks and solve problems in digital environments. These skills are referred to in the literature as digital literacy" (Eshet-Alkalay, 2004). Ferrari (2012) also presented another definition of digital literacy, mentioning the skills and attitudes necessary for identifying, locating, evaluating, retrieving, storing, and organizing information. Furthermore, constructing new knowledge based on digital technology by concentrating on innovativeness and new thinking styles is of high importance.

There are different definitions of the concept of digital literacy. A typical definition of digital literacy deals with creation and communication. Therefore, digital literacy, in terms of not only interacting with information but also credibility and reliability of information, is of high importance (Lankshear and Knobel, 2006).

There is no doubt that technology has connected more people than ever before. This has contributed to a global village in which users tend to become "digital citizens". Therefore, it is vital to develop digital skills and distinguish digital web content, which will lead to digital literacy. Thus, detecting and evaluating

the accuracy and relevancy of information on the web requires digital skills (Leu et al., 2008).

It is noteworthy to mention that digital literacy skills are widely applicable to skills involving the utilization of digital information; however, digital skills are vital for dealing with issues and misinformation on digital platforms and environments that demand technical and technological skills and expertise. Digital literacy deals with online communication and is necessary for individuals to survive in the digital era. This includes basic competencies, digital information and computer literacy, critical thinking, and digital communication. These skills are indispensable for effective navigation in the digital age, critical assessment of information and online engagement (Umar and Dangwaran, 2023).

Therefore, knowing how to implement technology in relation to digital literacy depends on multiple formats and platforms. Furthermore, definitions of digital literacy have some similarities in terms of technological abilities needed to locate, comprehend, assess, produce, and share digital information to understand outcomes, and evaluate the quality of information in a suitable and efficient manner.

2.3. A broad review of IFLA trend reports throughout the years:

Before analyzing and discussing the fact about IFLA trend report, it is advisable to discover the exact meaning of "trend" and its definition: "A trend is considered to be a general direction of change; it is related to ways of behaving and proceeding that are developing and becoming more common" (Britannica, 2024). In other words, it is a process in which something is developing or changing. "The original IFLA Trend Report is the result of a dialog between the library field and experts from a range of disciplines" (Al Badi et al., 2023). IFLA Trend reports are dynamic and ever-evolving collections of online resources for library and information professionals and provide fresh perspectives from both inside and outside the library industry, offering up new

avenues for exploration and thought-provoking questions. The IFLA trend report series, established in 2013 and updated in 2016, 2017, 2018, and 2019, with continuation in 2021 to 2024, supports reflections as crucial components of organizational and individual development, combining the viewpoints of influential people in various fields.

The IFLA Trend Report named “Riding the waves or caught in the tide” was released in August 2013 and identified new technologies and online education for democratic global learning, highly connected societies, the limits of privacy, and data protection, and the evolution of the widespread data economy (Rudasill, 2021). The goal of IFLA's 2016 update report was to examine and disseminate the findings of three years of intense discussion and debate among the world's libraries. IFLA trend report 2016 encompasses different sections, new aspects, and revisions over the former trend report in 3 years ago (IFLA Trend Reports 2016, 2016).

IFLA trend report published in 2017 included important topics on how libraries can implement 3D printing technologies into their perspectives, how libraries should provide opportunities for educating all individuals and, finally, how libraries can combat misinformation on the internet and media (IFLA Trend Reports 2017, 2017).

“The 2018 IFLA Trend Report Update” examined the difficulties posed by uncertainty and provided suggestions for how libraries can adapt to their social and civic role both now and in the future by being better prepared, standing up for what they believe in, and being willing to take advantage of opportunities. (IFLA Trend Reports 2018, 2018)

Following in the footsteps of earlier editions, the 2019 Update of IFLA’s Trend Report shared opinions and insights on some of the major concerns and advancements that defined the environment in which libraries function (IFLA Trend Reports 2019, 2019).

IFLA trend report 2021 included 20 aspects of the library science field in the context of political, social, economic, and technological trends for the next decade and shaping the future (IFLA trend report 2021, 2021).

Following the previous year, the main objective of the 2022 IFLA trend report 2022 was building a sustainable future based on a variety of tools for building valuable environments in the field of library and information science based on the ideas and recommendations of experts and leaders (IFLA trend report 2022 update, 2022).

IFLA trend report 2023 represents the continuation of the former trend reports in 2021 and 2022. It involves promoting internet access to disseminate public health information, from fostering innovation to protecting and providing access to heritage (IFLA trend report 2023 update, 2023).

IFLA trend report 2024, named, "Facing the future of literacy with information" has 7 sections and multiple subsections in which each one deals with different structures and purposes and has a broad review of different subjects on various perspectives. It also involves the complexity and challenge of dealing with important global problems and objectives (Dezuanni and Osman, 2024).

2.4 Textual analysis

Textual analysis is a research method that involves closely and critically examining written, spoken, or visual communication. It explains how to analyze a text to find its underlying themes, messages, and symbols in order to understand the authors' intentions, drives, and points of view. In addition to a straightforward descriptive approach, textual analysis aims to uncover a text's hidden structures and intricate relationships. In order to fully grasp the content, it entails reading, understanding, and interpreting the text in the context of its larger sociocultural, historical, or political setting. (Mayring, 2002).

In reviewing text analysis methodology related to library and information science texts, some important research in this field has been stated:

Lengyel and Racsko (2024) chronologically analyzed the international strategic trends by (IFLA 2013-2024, ALA 2017-2022) related to the digital ecosystem of libraries by content analysis using MaxQda text analysis software. They defined different codes and topics related to various trends throughout the years.

Reasons and major factors for improvements and solutions for tackling possible problems were proposed by establishing guidelines for reflecting public expectations and competencies of colleagues in the digital transformation process in the library sector. Sharath and Rao (2024) used primary and secondary data gathered from official websites, as well as the author's own experiences, to offer internship insights and perform a textual analysis of GNOU's internship guidelines. Hackett (2018) examined a small-scale study of stories about information literacy and public libraries through text analysis. The result revealed that information literacy is not a concept specifically linked to public libraries, according to analysis. In order to promote a better understanding of information literacy and its potential to expand the role that public libraries and their staff can play in education, this paper suggests increased cooperation between academic research, higher education and the public library sectors. Gwyer (2015) also conducted a retrospective analysis of published literature to identify trends by comparing the most recent major trends with reports and articles in the 1986 issue of the New Review of Academic Librarianship. The abilities required to create pertinent services in these novel settings were determined. Andersson (2015) employed textual analysis to assess information literacy in higher education governing documents. The method uses a data-driven coding frame with multiple categories to help define the level of clarity with which the information literacy is demonstrated in the texts. The results of the study reveal that information literacy in higher education is rarely covered specifically in course syllabi.

3. Research methodology:

This research aims to study IFLA's various trends from 2013 to 2024 to identify information and digital literacy-related terms, topics, and contexts through textual analysis using Voyant Tools[vi].

Voyant tools have been implemented in numerous research projects as they emphasize the use of computational methods to enhance conventional close reading. Through the provision of quantitative data, the identification of word

usage trends, and the facilitation of deeper readings of huge text corpora, Voyant tools can assist scholars and researchers in validating discoveries, especially in digital humanities. Furthermore, its distinctive features are not only about powerful flexibility and precise functionality, but also Voyant tools provide dynamic visualizations and unique compatibility with different textual contents, which is considered as important and appropriate instrument for experts and researchers (Voyant Text Analysis, 2024). This provides the reliability and validity of Voyant Tools as a beneficial tool for textual analysis.

Implementation of text mining tools, such as Voyant tools, as a reliable instrument in library and information science contexts encompasses various research as text mining enhances librarians' search capabilities, improving precision, sensitivity, and cross-database translation (McGowan, 2023). Combined with intuition, Voyant tools also reduce bias, promoting objectivity and reproducibility by guiding librarians in using search terms and detailing step-by-step investigative processes. For the validity and reliability of Voyant tools, as Miller (2018) states, text mining is considered a technique that supports analytical procedures and the explication of scholarly investigations, and Voyant Tools (voyant-tools.org) represents an accessible and thoroughly documented open-source text mining tool. Hendrigan (2019) demonstrated how Subject librarians can use Voyant Tools to understand faculty research interests. By analyzing article titles from databases like Web of Science, the tool revealed dominant research themes within departments (e.g., fuel cells, optical coherence tomography). Librarians' knowledge of faculty research can aid collection development and instruction more efficiently and conveniently, especially in complex, multidisciplinary fields. The study by Gulati et al (2023) used text mining to analyze 81 open-access articles about "smart libraries" from Google Scholar. The Voyant Tools were used to identify frequently used words and corpus collocates. Results showed that "smart," "information," "data," "technology," and "service" were most frequent keywords in the study that provided insight into the smart libraries ecosystem. Another research by

Kairaitytė-Užupė et al (2023) examined a corpus of 404 open access articles on digital humanities using "Voyant Tools," an open-access text analysis application. It explored how Voyant Tools aids in identifying dominant research fields and discourse themes through quantitative methods, distant reading, and interactive capabilities. According to research by Gregory et al (2022) digital texts can be analyzed through data visualization. A cataloger, metadata librarian, and archivist can use Voyant Tools to create subject metadata for congressional correspondence. The study showed that Voyant Tools can also be used to determine the collection's content, extract keywords, and create deeper knowledge for both professionals and researchers.

As mentioned earlier this study aims to find relevant responses to the research questions and objectives via a content analysis of IFLA trend reports from 2013 to 2024 by Voyant Tools specific features. This study was conducted and data was extracted in April 2025 by implementing Voyant tools for textual analysis. To achieve this purpose, IFLA trend reports from various years were uploaded into the source program, and information and digital literacy keywords and topics were analyzed using search boxes available in different features of Voyant tools for evaluation and analysis through the investigation of the produced and extracted conceptual graphs and figures. These results will be analyzed according to the research questions.

4. Results and analysis:

4.1 What are the terms and topics related to information and digital literacy covered and distributed in different IFLA trends from 2013 to 2024?

The topics[vii] option in Voyant tools was implemented to find and search for information and digital literacy-related topics created and found in the report corpus. To find relevant topics, information literacy and digital literacy were searched in the search box of the topic field in the context[viii] section of Voyant tools. The topics were confined to the 10 most related keywords retrieved according to different trends. Figure 1 shows the important information and digital literacy-related topics found in different IFLA trends.

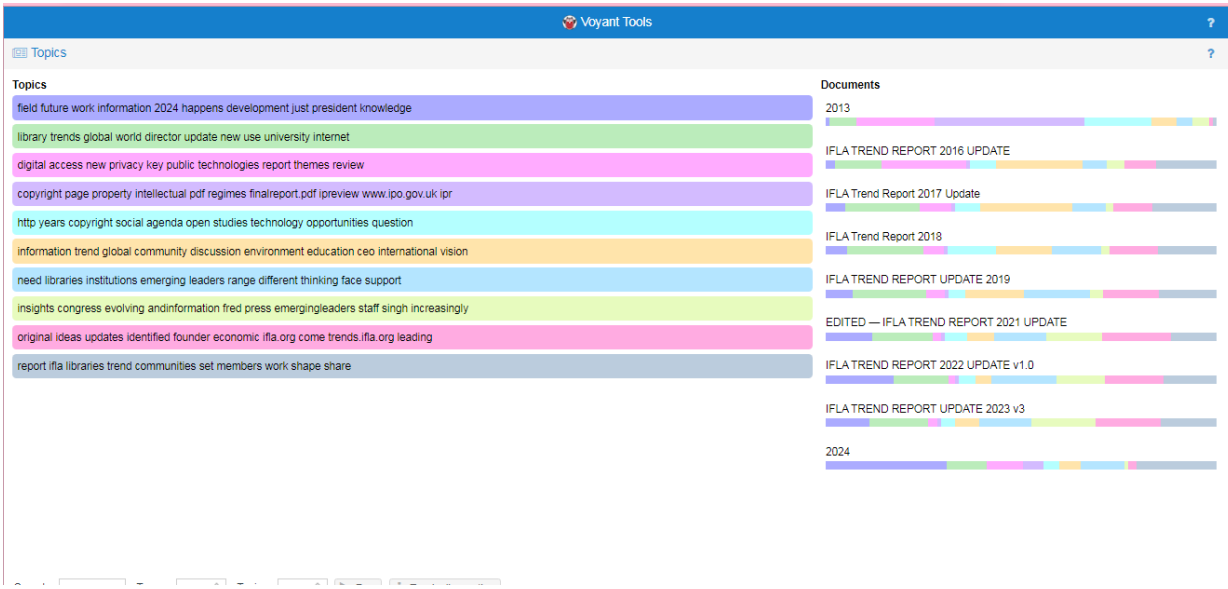

Figure. 1. Topics related to information and digital literacy distributed by various IFLA trends throughout the years

According to figure 1, topics related to “copyright, page, property, intellectual, regimes”, (the purple color) are mostly covered in IFLA trend reports 2013, while topics such as “digital, access, new, privacy, technologies, report, themes, review” (the violet color) are the highest covered keywords in IFLA trends 2016. Important topics, such as “library, trends, global, world, director, update, new, use, university, internet” (green lable) are covered in IFLA trend reports 2017, 2018, and 2019.

Intellectual property and copyright regimes are important features of the IFLA trend report 2013 that have a connection to information and digital literacy. Additionally, these keywords have been focused on different parts of the IFLA 2013 trend report in relation to other phrasal words regarding information and digital literacy inside the text: “intellectual property in digital age”, “digital contents and its relationship to copyright laws”, “information literacy and digital content”, “copyright and internet” and so forth.

In analyzing related topics to information and digital literacy within IFLA trend reports 2016, important subjects such as: “information literacy skills and access to technology”, “information literacy and its relation to libraries”, “information literacy and privacy”, “digital technologies and librarian” are the main topics of discussion.

In IFLA trend reports 2017, 2018 and 2019 as indicated in orange color in figure 1, information, global community, discussion, environment, education and vision are important topics stated. Other topics inside the texts related to information and digital literacy mentioned in IFLA trend reports 2017, 2018, 2019 are: “library and technologies” “library in information age” “global information environment”, “global internet”, “access to internet”, and “access to information”.

According to figure 1, in dealing with topics related to information and digital literacy in IFLA trend report 2021, 2022, 2023 and 2024, various topics such as knowledge, development, information, communities, and libraries have been discussed within different colors. The important detail about related topics in information and digital literacy is that similar topics are often matters of discussion in various trends and have been repeated and focused, according to their purposes.

4.2 What are the highest frequency keywords, (Cirrus) in relation to information and digital literacy in IFLA tend reports from 2013 to 2024?

To determine the frequency of keywords related to the topic of the research; information and digital literacy were searched in the Cirrus section of the Voyant tools. Figure 2. shows high-frequency keywords (clouds) in report corpus.

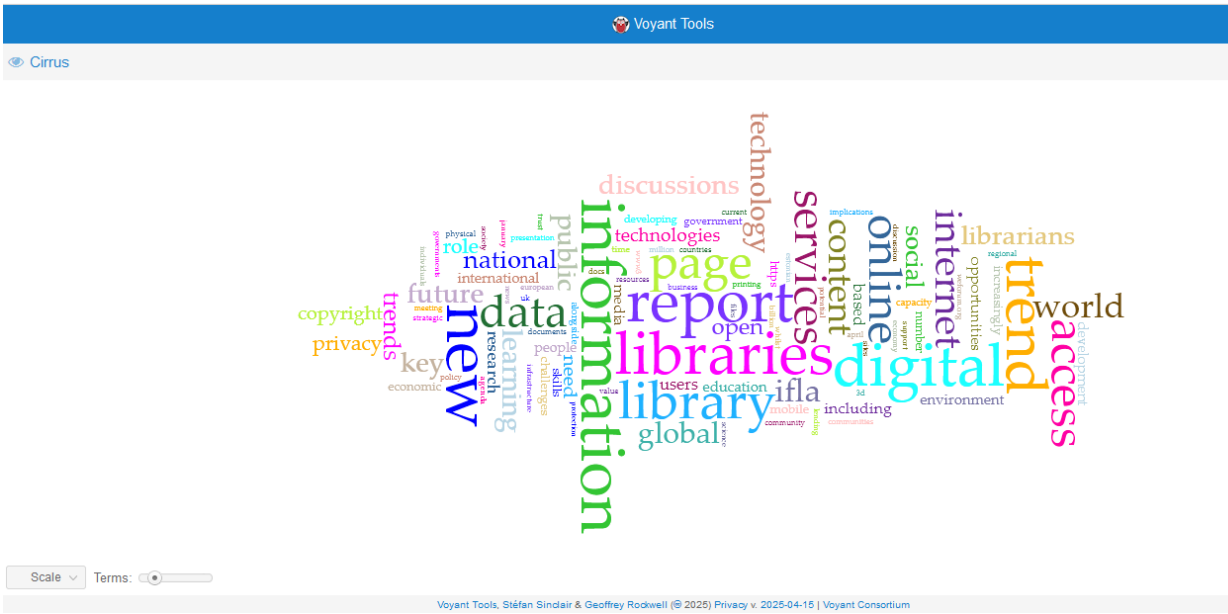

Figure.2. High-frequency keywords (word clouds) in relation to information and digital literacy

Table 1 demonstrates the number of 15 high-frequency words in Figure.2 related to information and digital literacy in the IFLA reports corpus from 2013 to 2024.

	Words	Frequency
1	libraries	220
2	information	220
3	report	218
4	digital	218
5	trend	196
6	new	182
7	library	180
8	online	137
9	page	130

10	data	130
11	access	128
12	services	125
13	internet	118
14	IFLA	99
15	content	95

Table 1. The number of high-frequency keywords in the IFLA trends reports corpus extracted from the Voyant tools

According to Table 1, libraries and information by 220; report and digital by 218, and "trend" by 196 are among the highest frequency keywords in the IFLA report corpus, respectively, while "access" by 128, "services" by 125, "internet" by 118, "IFLA" by 99, and content by 95 are the lowest frequency keywords within these trends.

4.3 What are the TermsBerry related to information and digital literacy in IFLA trend reports from 2013 to 2024?

In interpreting TermsBerry, it is noteworthy to mention that the purpose of the TermsBerry tool is to combine the usefulness of examining how high-frequency words co-occur—that is, how frequently they occur in close proximity to one another—with the capacity of visualizing these terms.

The terms spiral outward, with the highest-frequency terms appearing in the middle and in larger bubbles. The blackness of terms indicates the percentage of papers in which they occur; thus, the darker the term, the more documents it occurs in.

To find TermsBurry for the related keywords, information and digital literacy were searched in the search box for this purpose in the Voyant tools. According to Figure 3, " Information", "libraries", " trend", "digital", "library", and "future" are bold, darker, and located in the center of the bubbles indicate the high percentage of documents they appear in; however, the keywords around these dark bubbles show the close proximity of the related words to each other, which are "IFLA", " people", "public", "world", "new", " content" and so on.

TermsBerry can be implemented as a supplement and complementary to Cirrus because the proximity and connection of related words can be better distinguished and analyzed. Figure 3. indicates the TermsBerry keywords related to information and digital literacy in the IFLA trend reports corpus throughout the years.

Figure 3. TermsBurry keywords related to information and digital literacy in the report corpus

4.4 What is the relative frequency of information literacy and digital literacy in IFLA trend reports over the years?

This question can be divided into two parts. To find the proper response for this research question, first, the relative frequency for information literacy, and then the relative frequency for digital literacy is analyzed and compared.

4.4.1 What is the relative frequency of information literacy in IFLA trend reports throughout the years?

To determine the relative frequency, information literacy was searched in the search box in the Trends[ix] Feature in Voyant tools, and the results were extracted. Figure 4 shows the relative frequency of information literacy within IFLA various trends. According to the figure below, information literacy has different relative frequencies within trends in various years. The figure indicates that Information literacy has the highest frequency in IFLA trend report 2024, as different topics and subjects of information literacy are discussed and covered in this trend. However, information literacy in IFLA trend reports in 2013 and 2016 have almost the same frequency of 0.0003, whereas IFLA trend report in 2021 and 2024 have relative frequencies of 0.0005 and 0.0006 respectively.

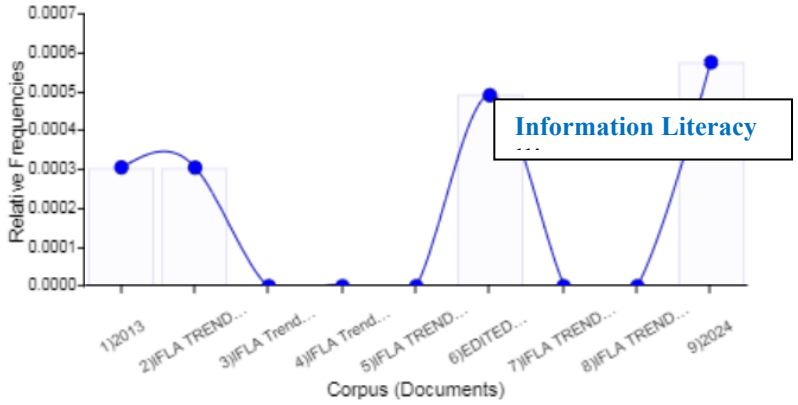

Figure 4. Information literacy in IFLA various trends as a sequence in 2013-2016-2017-2018-2019-2021-2022-2023-2024

4.4.2 What is the relative frequency of digital literacy in IFLA trend reports over the years?

To determine the relative frequency, digital literacy was also searched in the search box in the Trends Feature in Voyant tools, and the results were extracted. Figure 5 shows the relative frequency of digital literacy within the various IFLA trends. According to the following figure, digital literacy has two important relative frequencies: digital literacy has the highest frequency in the IFLA trend report 2024 by the relative frequency of 0.00018 as different topics and subjects related to digital literacy are analyzed and stated in this trend, while IFLA trend

report 2016 is the second most important trend regarding digital literacy, with a relative frequency of 0.00005.

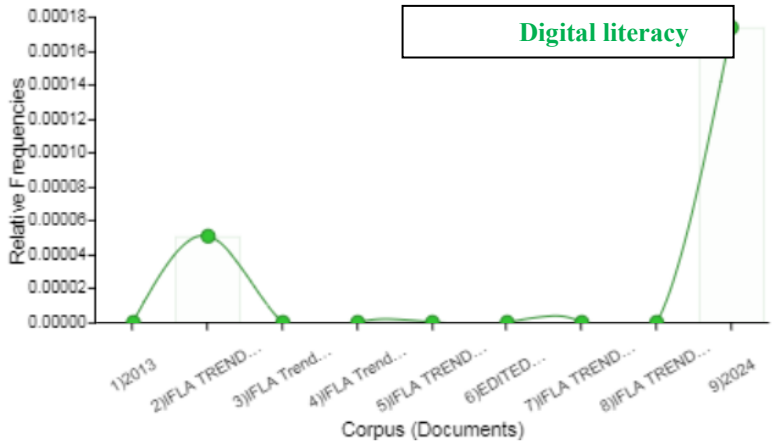

Figure 5. Digital literacy in IFLA various trends as a sequence in 2013-2016-2017-2018-2019-2021-2022-2023-2024

4.5 What are the important contexts within IFLA regarding the various trends in which information and digital literacy are widely used?

Important parts of the texts in IFLA's various trends throughout the years were analyzed and investigated by the Voyant tools context analysis section to find out in what contexts information and digital literacy are exactly mentioned and defined. The results of the analysis are as following:

IFLA trend reports	**The information literacy approach**	**The digital literacy approach**
2013	- "The importance of information literacy skills as a tool for authenticating information and differentiating between content (p.12) - Information literacy skills offer flexible nonformal and	

	informal skill accumulation pathways". (p.17)	
2016	- "Significant implications for the future provision of information literacy skills and the evolving ethics of information management". (p.7) - "Libraries can play a unique role in promoting information literacy, access to technology, as well as the new digital skills". (p.8) - "Libraries will always have a specific and ongoing responsibility for promoting information literacy from cradle to grave". (p.10) - "Information literacy for students, specifically the use of databases, catalogs and archives for academic research, remains a critical area of library guidance". (p.13) - "This raises questions as to whether the traditional fields of information literacy and privacy now need to be linked and extended to encompass new concepts". (p.27) - "Concerns were expressed that libraries could be at risk of forfeiting their natural role as pace setters in key areas, including information literacy, intellectual property and data management". (p.31)	"Libraries are at risk of increasingly forfeiting their natural role as pace-setters in key debates around information and digital literacy, intellectual property and management". (p.6)
2021	- "An important new dimension of information literacy, both in the context of effective research skills and in life more broadly".	

	(p.18) - "As Trend 18 points out, the importance of information literacy can finally be properly recognized". (p. 20) - "Governments and others recognize fully the importance of information literacy as a long-term response to the rise of misinformation". (p.25)	
2024	- "The urgent need to address skills gaps along with the benefits brought about by improved media and information literacy for safety and wellbeing". (p.32) - "Media and information literacy benefits individuals and communities". (p.34) - "UNESCO states that, Information literacy and lifelong learning have been described as the beacons of the information society, illuminating the courses to development, prosperity and freedom." (p.35) - "Media and information literacy are more important than ever and are much needed in the wider community". (p. 63) - "Librarians and information professionals can play an important role in promoting critical thinking, fostering media and information literacy, and in maintaining the integrity of our democratic processes". (p.63) - "As noted in the IFLA Trend report, Media and Information Literacy consists of the knowledge, the attitudes, and the sum of the skills needed to know when	"The Economist Intelligence Unit notes that digital literacy among employee critical, and this will not only happen through the education system". (p.33) "Pew Research surveyed digital society experts to predict potential trends in dig life in light of the rise of AI and found that, "They wish for improved digital liter that will revive and elevate trusted news and information sources in ways that att attention and gain the public's interest". (p.34) "Further, as digital literacy expanded in some places, the gaps with others expan as well". (p.58) "In this scenario, we explore the challenges faced by older adults in the digital a the importance of digital inclusion and the specific role that libraries play promoting digital literacy, community connection and support (TREND 7) am this demographic". (p.97) "Building Local Research Capacity: The gathering discusses how the library build local capacity for research through workshops on data analysis, scient methods, and digital literacy". (p.129) "A standout feature of the library is a 3x4 meter interactive visual map of community, prominently displayed to enhance engagement, digital literacy, and tr community assets". (p.131) "The visual map is interactive, inviting community participation to ensure it rem accurate and relevant. It is a valuable tool for enhancing digital literacy and foste a culture of continuous learning and self-improvement". (p.131) "Lifelong Learning and Digital Literacy: Programs and resources for all a promote continuous education". (p. 132)

	and what information is needed". (p.73) - "Where they could, they had to focus on media and information literacy both in public institutions but especially in mandated curricula. However, focusing on information literacy just in schools was never going to be enough". (p.116) - "For example, we might see that a decline in trust in government might actually be counteracted by an increasing focus on building information literacy skills". (p. 155)	

Table 2: Information and digital literacy contexts in IFLA trend reports with reference to page numbers extracted from Voyant tools

Table 2 illustrates important contexts about information and digital literacy covered in IFLA trend reports for 2013, 2016, 2021, and 2024. It is evident that IFLA trend reports often cover multiple topics related to global policies and perspectives about issues related to library and information science; however, educational contexts dealing with information and digital literacy encompass the large parts of these trends. Thus, reviewing literacy-related topics helps better clarifications of related concepts investigated in various trends.

4.6 What are bubblelines and the frequency of information and digital literacy topics most prevalent or distributed in IFLA trend reports?

For the response to this research question, the bubblelines option in Voyant tools was implemented to determine the frequency of digital and information literacy distribution within various trends. In the bubblelines distribution, the purple bubble is considered information literacy, while the pink bubble is related to digital literacy in various IFLA trends in Voyant tools. Figure 6 shows the distribution of digital and information literacy occurrences according to various trends. As the figure 6 shows, the IFLA trend 2024 involves the

highest density of bubblelines covers information and digital literacy, while IFLA trend 2016, IFLA trends 2013 and 2018 have the bigger size and density of bubblelines in compare to other trends.

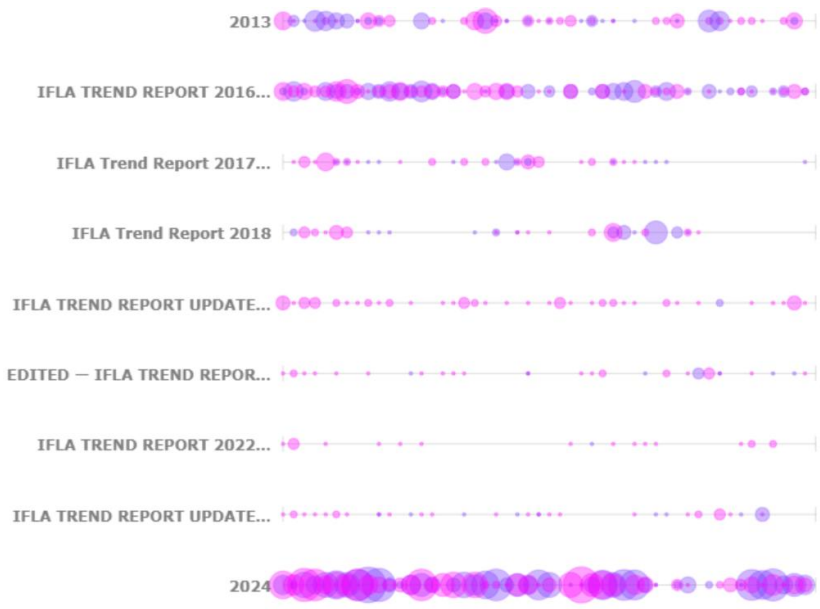

Figure 6. High density of bubblelines in information and digital literacy

5. Discussion

This research sought to implement various features of Voyant tools, such as Cirrus, TermsBerry, topic words, relative frequency, and bubblelines, to investigate related keywords regarding information and digital literacy in IFLA Trends reports from 2013 to 2024. For this aim, information and digital literacy within various trends were investigated.

To find out the related topics, a topic search was conducted in the Topics section of the Voyant tools. The result was that some topics were in popularity in

certain trends, as the subjects discussed in those trends varied according to circumstances and important issues published in different years. It is noteworthy to mention that some topics are repeated and discussed within several trends that indicate they are in demand in various years; however, some of these topics were highly emphasized and investigated in certain years. For instance, “digital, access, new, privacy, technologies, report, theme” were highly focused on IFLA trend 2016. However, other keywords such as “library, trends, global, world, director, update, new, use, university, internet” were also emphasized and repeated in other trends (2017,2018 and 2019); therefore, it is inferred that some IFLA trends are the continuation and complementation of former trends as they have been the topics of discussion and debate in the subsequent years.

In analyzing the high-frequency keywords relating to information and digital literacy in the report corpus, some terms were highly repeated and frequently covered in various trends. Since IFLA trends mostly related to “library”, “information”, “digital”, “trends”, as well as “access” to “online” “services” and “internet contents”; these keywords were highly focused and emphasized. Thus, identifying high-frequency keywords can help audiences better generalize and connect related issues across various trends. Furthermore, having a clear and broad contextual analysis can draw a linkage among trends, and finally, follow important issues in different years.

In analyzing TermsBurry for the related keywords, information and digital literacy were searched in the search box for this purpose in the Voyant tools. The closeness and relationship between the linked terms were clearly identified and examined; thus, TermsBerry used as an addition and complement to Cirrus. The bold, darker words "information," "libraries," "trend," "digital," "library," and "future" that were in the middle of the bubbles indicated how frequently they appeared in documents; however, the keywords surrounding these dark bubbles which are "IFLA," "people," "public," "world," "new," "content," and so forth demonstrated how closely they were related to the terms in the center of the bubbles.

According to the findings of this research, in discussing the response to the relative frequency of information literacy and digital literacy in IFLA trends; it is necessary to mention that both information literacy and digital literacy were the main topics of discussion in IFLA trend reports 2024 and 2016, as by analyzing these two trends, important parts of texts are related to information and digital literacy in multiple perspectives, as mentioned as important contexts in Table 2. However, information literacy was also covered separately in the IFLA's trend report 2013 and 2021 without the digital literacy concept.

In finding out the frequency distribution (bubblelines) of the information and digital literacy among various trends, the highest density of bubblelines was in IFLA trend report 2024, while IFLA trend reports 2016, 2013, and 2018 also ranked as the important density of bubblelines in information and digital literacy compared to other trends.

6. Conclusion:

IFLA trend reports are published to reflect different solutions and contributions to worldwide problems by finding alternative ways to deal with these challenges and issues. Multiple topics are often discussed and stated to demand concerns and deep thought. This research utilized Voyant tools as a textual analysis to assess and evaluate information literacy and digital literacy approaches in the IFLA trend reports from 2013 to 2024. To reach this purpose, the original trend reports contents by IFLA published in various years were analyzed using various features of Voyant tools to respond to the questions of the research about information literacy and digital literacy.

The results of this research demonstrated that information and digital literacy are considered important approaches in IFLA trend reports, and most topics related to information and digital literacy are broadly covered in IFLA trend reports 2013, 2016, 2021, and 2024.

As information and digital literacy have long been a matter of concern in IFLA trends within various years, it is axiomatic that they are completely aligned with

these trends and can interpret multiple aspects of related trends according to their definitions and applications.

Ultimately, implementing Voyant tools textual analysis for discovering relevant topics in information and digital literacy in different IFLA reports can contribute to better explanation and interpretation of each trend by visual representation or diagrams that can help readers and researchers draw a linkage between trends and find similarities and realize the distinction between the related topics.

Limitation and suggestion:

Important limitation of this study is that the extracted data in different parts of Voyant tools features only confined to information and digital literacy, while IFLA trend reports cover various topics and perspectives to be discussed. Therefore, it is suggested that for future research, multiple IFLA trends be interpreted and analyzed to find general purposes, important topics, and keywords from multiple aspects, as well as relevant subjects in library and information science. Therefore, the current results must be interpreted carefully, and should not be generalized to other areas.

As qualitative and quantitative analyses on documents related to library and information science are limited and rare, it is suggested that similar research be conducted by implementing other textual analysis tools for analyzing different corpora of documents and literature relevant to multiple topics in librarianship.

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References:

(ALA) American Library Association (2016). Framework for information literacy for higher education. Association of College and Research Libraries. Access date 15.09. 2025 Available at http://www.ala.org/acrl/standards/ilframework.

Al Badi, Waleed, Alvandian, Laurie, Au, Anna, Gomulka, Magdalena, Charles, Louise-Anne, and Shalani Dilinika, J. M. (2023). IFLA Trend Report 2022 Update. Access date 10,08 2025, Available at https://www.researchgate.net/profile/EstherBravoGovea2/publication/384919810_IFLA_Trend_Report_2022_Update/links/670e2aecfe22924808adc481/IFLA-Trend-Report-2022-Update.pdf

Andersson, Helena. (2015). Information literacy in the governing documents of higher education: A qualitative textual analysis. Sweden: University of Boras. Master thesis. Access date 10.7.2025 Available at https://urn.kb.se/resolve?urn=urn:nbn:se:hkr:diva-15788

Becker, B. W. (2018). Information literacy in the digital age: Myths and principles of digital literacy. *School of Information Student Research Journal*, *7*(2), 2. https://doi.org/10.31979/2575-2499.070202

Britannica (2024). Britannica Dictionary definition of "TREND". Access date 10.03.2025 Available at https://www.britannica.com/dictionary/trend

Catts, Ralph and Lau, Jesus (2008). Towards information literacy indicators. Paris. UNESCO, 1–44. Access date 29.3.2025 Available at https//www.storre.stir.ac.uk/bitstream/1893/2119/1/cattsandlau.pdf

CILIP (2018). CILIP definition of information literacy 2018. Access date 10.3.2025 Available at https://infolit.org.uk/ILdefinitionCILIP2018.pdf.

D'Angelo, Barbara J.; Jamieson, Sandra; Maid, Barry; Walker and Janice R. (2016). Information literacy research and collaboration across disciplines. Boulder. Colorado. "The WAC Clearinghouse, Fort Collins, University Press of Colorado". Access date 10.4.2025 Available at https://wac.colostate.edu/docs/books/infolit/collection.pdf

Dezuanni, Michael and Osman, Kim. (2024). IFLA Trend Report 2024: Literature review (Initial Edition).International Federation of Library Associations and Institutions, The Hague, Netherlands. Access date 11.5.2025 Available at https://eprints.qut.edu.au/252397/

Eshet-Alkalay, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. Journal of Educational Multimedia and Hypermedia. 13(1), 93–106.

Facing the future with confidence: IFLA's Trend Report Update 2018 (2018). Access date 12.5.2025 Available at https://www.ifla.org/news/facing-the-future-with-confidence-ifla-s-trend-report-update-2018/

Ferrari, A. (2012). Digital competence in practice: An analysis of frameworks, European Commission-JRC-IPTS, Luxembourg Publications Office of the European Union.

Gilster, P.(1997) Digital literacy. New York : Wiley Computer Pub.

Goodsett, Mandy (2018). Determining the extent to which information literacy online learning objects follow best practices for teaching and assessing critical thinking. Master thesis. Cleveland USA. Cleveland State University.

Gregory, K., Geiger, L., and Salisbury, P. (2022). Voyant tools and descriptive metadata: A case study in how automation can compliment expertise knowledge. *Journal of Library Metadata*, *22*(1-2), 1-16.

Gulati, S., Sinhababu, A., and Chakravarty, R. (2023). Understanding the research landscape of smart libraries using text mining and data visualization: A use case of Voyant Tool. *COLLNET Journal of Scientometrics and Information Management*, *17*(1), 159-174.

Gwyer, R. (2015). Identifying and Exploring Future Trends Impacting on Academic Libraries: A Mixed Methodology Using Journal Content Analysis, Focus Groups, and Trend Reports. *New Review of Academic Librarianship*, *21*(3), 269–285. https://doi.org/10.1080/13614533.2015.1026452

Hackett, D. (2018). An elephant in the room? Information literacy in the narrative of UK public libraries. Journal of Information Literacy, 12(1), 4–26.

Hendrigan, H. (2019). Mixing digital humanities and applied science librarianship: Using voyant tools to reveal word patterns in faculty research. *Issues in Science and Technology Librarianship*, (91).

Holley, R. P. (1996). IFLA and International Standards in the Area of Bibliographic Control. *Cataloging & Classification Quarterly*, *21*(3–4), 17–36. https://doi.org/10.1300/J104v21n03_03

Horton, Forest Woody (2006). Information literacy and lifelong learning. In: Lau, Jesus IFLA guidelines for information literacy in life-long learning. (pp.1-60). IFLA.

IFLA Trend Reports (2017). Access date 17.8.2025 available at https://www.ifla.org/news/trending-ifla-releases-trend-report-update

IFLA trend report (2021). Access date 17.8.2025 available at: https://repository.ifla.org/handle/20.500.14598/1830

IFLA trend report (2022) update. Access date 17.8.2025 available at https://repository.ifla.org/handle/20.500.14598/2456

IFLA trend report (2023) update. Access date 17.8.2025 available at https://repository.ifla.org/handle/20.500.14598/3233

IFLA trend reports (2024). Access date 17.8.2025 available at https://www.ifla.org/wp-content/uploads/ifla-trend-report-2024.pdf

Kairaitytė-Užupė, A.; Ramanauskaitė, E. and Rudžionis, V. E. (2023). Scientific Information Analysis Using Text Analysis Tool "Voyant Tools. *Information & Media*, *97*, 25-48.

Kuhlthau, Carol. C. (1987). Information skills for an information society: A review of research. Information Analyses; ERIC Publications. ERIC Clearinghouse on Information Resources, Syracuse, NY. Access date 25.9.2025 available at https://files.eric.ed.gov/fulltext/ED297740.pdf

Lankshear, C. and Knobel, M. (2006). Digital literacy and digital literacies. Digital kompetanse,(1) 12-24.

Lengyel, T. M. and Racsko, R. (2024). Qualitative analysis of international strategic trends pertaining to the digital ecosystems of libraries. *Journal Of Applied Technical And Educational Sciences*, *13*(4), 1-16 https://doi.org/10.24368/jates369

Leu, Donald J., Julie Coiro, Jill Castek, Douglas K. Hartman, Laurie A. Henry, and David Reinking. (2008). Research on instruction and assessment in the new literacies of online reading comprehension. In Parris, Sheri R., and Cathy Collins Block (Eds.). Comprehension instruction: research-based best practices. (pp. 321-346). New York: Guilford Press.

McGowan, B. S. (2021). Using text mining tools to inform search term generation: an introduction for librarians. *portal: Libraries and the Academy*, *21*(3), 603-618.

Mayring, Philipp (2002). Qualitative content analysis: Research instrument or mode of interpretation In: Mechthild Kiegelmann (Ed.), The role of the researcher in qualitative psychology (pp. 139-148). Tübingen: Ingeborg Huber

Miller, A. (2018). Text mining digital humanities projects: Assessing content analysis capabilities of voyant tools. *Journal of Web Librarianship*, *12*(3), 169-197.

Reinking , D.; Labbo, L., and McKenna, M. (1998). Technology and literacy education in the next century: Exploring the connection between work and schooling. Peabody Journal of Education, 73(3/4), 273-289.

Rudasill, L. M. (2015). The IFLA trend report: looking beyond the walls in library planning. *Journal of Library Administration*, *55*(2), 153-164.

Rudasill, L. M. (2021). The IFLA's trend report and library horizons. Bibliotecas. Anales de investigación, *10*, 197-203.

Sharath, G. V. K., and Rao, T. S. (2024). An exploration of introducing internships as an integral facet of distance learning in library and information science. *Berkala Ilmu Perpustakaan Dan Informasi*, *20*(2), 421-434. https://doi.org/10.22146/bip.v20i2.13808

Secker, J. (2018). The revised CILIP definition of information literacy. Journal of Information Literacy, 12(1), 156-158. https://doi.org/10.11645/12.1.2454

Trend Report (2024). Inspiring and enhancing professional practice: Trend report. Access date 15.09. 2025 Available at
https://www.ifla.org/trend-report/

Umar, M. Y. D. and Dangwaran, T. Y. M. (2023). Exploring the relationship between digitalization and electronic information resources use among undergraduate student of Gombe State University. Library Philosophy and Practice (e-journal). 7815. Access date 15.09. 2025 Available at https://digitalcommons.unl.edu/libphilprac.

Voyant Text Analysis: A guide to text mining tools and methods (2024). Access date 15.10. 2025 Available at https://guides.library.upenn.edu/penntdm/tools/voyant

Zurkowski, P. G. (1974). The information service environment relationships and priorities. Washington DC. National Commission on Libraries and Information Science. Related paper. (5) 1–30. Access date 15.09.2025 Available at https://files.eric.ed.gov/fulltext/ED100391.pdf

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[i] "Cirrus is a word cloud that visualizes the top frequency words of a corpus or document", The cirrus feature generates a cloud with the words that are most frequently used in the corpus. https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/cirrus

[ii] The TermsBerry tool is intended to mix the power of visualizing high-frequency terms with the utility of exploring how those same terms co-occur (that is, to what extent they appear in proximity with one another) https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/termsberry

[iii] The meaning of "*Relative frequency"* refers to the ratio of the frequency of a particular event in a statistical experiment to the total frequency. Merriam-Webster.com Dictionary (https://www.merriam-webster.com/dictionary/relative%20frequency). Retrieved on 18 Apr. 2025.

[iv] Each document in the corpus is represented as a horizontal line and divided into equal-length segments (50 segments by default). Each selected word is represented as a bubble whose size indicates the word's frequency in the corresponding segment of the text. The larger the bubble, the more frequently the word occurs. https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/bubblelines

[v] The six concepts are: "1) Authority Is Constructed and Contextual 2) Information Creation as a Process 3) Information Has Value 4) Research as Inquiry 5) Scholarship as Conversation 6) Searching as Strategic Exploration". "This framework is constituted as a cluster of interconnected core concepts, with flexible options for implementation, rather than a set of standards or learning outcomes, or any prescriptive enumeration of skills". ALA (2016).p.7. http://www.ala.org/acrl/standards/ilframework Retrieved January 20, 2024

[vi] Voyant Tools is a free web-based, open-source program for text analysis. It can be utilized to perform qualitative analysis by providing a quantitative perspective on textual data. In addition to students and the general public, it encourages academic reading and analysis of texts or corpora through visualization, especially by experts in digitalthe digital humanities. It can be applied to the analysis of user-uploaded or online texts. Sampsel, L. J. (2018). Voyant Tools. *Music Reference Services Quarterly*, *21*(3), 153–157. https://doi.org/10.1080/10588167.2018.1496754

[vii] "The Topics tool provides a rudimentary way of generating term clusters from a document or corpus and then seeing how each topic (term cluster) is distributed across the document or corpus". https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/topics

[viii] "The Contexts (or Keywords in Context) tool shows each occurrence of a keyword with a bit of surrounding text (the context)." It can be useful for studying more closely how terms are used in different contexts". https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/contexts

[ix] "Trends show a line graph depicting the distribution of a word's occurrence across a corpus or document". Trends is a visualization that represents the frequencies of terms across documents in a corpus or across segments in a document, depending on the mode". https://voyant.map-your-hero.hum.uu.nl/docs/#!/guide/trends