

# Research Trends from a Decade (2011-2020) for Information Literacy in Higher Education: Content and Bibliometric Mapping Analysis

## Chao-Chen, Chen

Center for General Education, College of Humanities and Education, Chung Yuan Christian University  
Graduate Institute of Library & Information Studies, National Taiwan Normal University, Taiwan  
joycechaochen@cycu.edu.tw

## Ning-Chiao, Wang

School of Information Studies, University of Wisconsin–Milwaukee, USA  
sylviaawang8413@gmail.com

## Yun-Fang, Tu

Department of Library and Information Science, Research and Development Center for Physical Education, Health, and Information Technology, Fu Jen Catholic University, Taiwan.  
sandy0692@gmail.com

## Hsin Ju Lin

Graduate Institute of Library & Information Studies, National Taiwan Normal University, Taiwan  
azoo0814@gmail.com

## ABSTRACT

New terms and theoretical concepts in information literacy have emerged over the last decade, and these have led to revisions in the standards for information literacy. In order to determine whether information literacy research has reflected these trends, we collected SSCI literature for the 2011 to 2020 period related to information literacy in higher education (ILHE) and conducted analysis using bibliographic mapping and content analysis. Our research found that the volume of research on ILHE has increased in the last five years as compared to the five years before that, and that keywords related to literacy (such as “digital literacy” and “multiliteracies”) have been getting a great deal of discussion. After the Framework for Information Literacy for Higher Education (FILHE) was announced, curriculum design research based on the Information Literacy Competency Standards for Higher Education (ILCSHE) continued to outnumber that done based on the Framework.

## KEYWORDS

Information Literacy Competency Standards for Higher Education; Framework for Information Literacy for Higher Education; Information Literacy, Higher education; Bibliometric mapping analysis.

## INTRODUCTION

The term “Information Literacy” was coined by Zurkowski in the 1974 report to the National Commission on Libraries and Information Science. The Final Report of the American Library Association Presidential Committee on Information Literacy (1989), in which IL was defined as “To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” (p.1). However, with the development of technology and the diversification of media, new terms related to information literacy have continued to appear. In 1994, McClure stated that information literacy is the ability to use information to resolve a problem; and as types of information are hugely varied, so, too, are the ways of putting it to use and the abilities emphasized in that usage. McClure further divided information literacy into four classes of skills: “Traditional Literacy” (including reading, writing, and calculation abilities); “Media Literacy” (including the ability to understand non-printed media); “Computer literacy” (including the ability to use computer software); and “Network literacy” (including the ability to apply and evaluate network resources). Later, as a result of technological development, new literacy requirements arose, and so the term “new literacy” arose with them. New literacies are requirements that have developed in response to the rise of the internet and other information technologies such as text messages, wikis, blogs, social media, video platforms, music platforms, and emails. The vast majority of the combination of text, audio, and video; these digital technologies have changed and expanded our abilities to interact. As a result, the usefulness of the new literacies lies in the abilities to understand and learn from reading online. But these skills don’t just require the ability to “read”, but also to browse, to find online information, critically evaluate and synthesize (Miners and Pascopella, 2007). In 1996, the New London Group proposed the term “multiliteracies” (Cope and Kalantzis, 2009). “Multiliteracies” refer to being able to engage in textual literacy and expression in non-paper media, including identifying, explaining, creating, and interacting with meaning through

visual, oral, gestural, musical, and textual means. Above and beyond the linguistic concept of “literacy”, multiliteracy also includes understanding of social, economic, and wider cultural factors; these factors create frameworks for interaction. The meaning of “multiliteracy”, viewed from a linguistic perspective, has two major aspects. The first major aspect is making differentiated meaning within different cultural, social, or unique contexts (Cope and Kalantzis), 2020. This implies that reading and writing education that focuses solely on standard national language forms is insufficient; on the contrary, modern interaction and expression of meaning increasingly requires learners to be able to clarify differentiated meanings in different linguistic contexts. These differences may arise as a result of any factors including culture, gender, life experience, topic, society, subject field, etc.; every interaction in meaning is to a certain extent a multicultural one. The second major aspect is that, as a result of new information and communications technology (ICT) and media characteristics, methods for producing meaning and presenting information are growing by the day; modes of meaning in written language have an effect on oral, visual, aural, gestural, tactile, and spatial modes of meaning (Cope and Kalantzis, 2020). “Metaliteracy” is a new literacy mode proposed by Mackey and Jacobson. “Metacognition” is recognition and understanding through the self-reflection process; the concept focuses on how people learn and deal with information and takes into consideration people’s understanding of how they learn. Thus, “metaliteracy” refers to students’ reflection on their own literacy abilities. As defined by Mackey and Jacobson, metaliteracy is a term developed to understand how digital citizens reflect on their literacy needs within affective, behavioral, cognitive, and metacognitive domains in a global internet culture (Mackey and Jacobson, 2014).

Within the literature 2010-2019 on information literacy, the most notable thing is the changes in orientation regarding information literacy theory. The ACRL published the ILCSHE in 2000, but later exploration and discussion of information literacy theory and concepts caused the ACRL to revise the ILCSHE. Prior to the revisions, many academic libraries had published many learning outcomes, tools, and resources for information literacy education. However, in a rapidly changing environment, the information ecosystems for everyday life and work are dynamic and uncertain; many scholars believed that the focus of information literacy should be placed on basic concepts for these ecosystems, and not solely within abilities related to information retrieval. The FILHE was announced in 2015, and formally took effect January 11, 2016. The Framework uses metaliteracy as its core concept. Metaliteracy refers to a set of comprehensive, general skills that students need to be information consumers and successfully participate in collaborative fields; it opens a completely new vision for information literacy. Metaliteracy requires students to participate in information ecosystems in terms of behaviors, emotions, cognition, and metacognition. Based on the concept of metaliteracy, the Framework puts special emphasis on metacognition, also called critical self-reflection, because this becomes even more critical in a rapidly changing ecosystem (ACRL, 2015). In addition, based on the basis of interconnectedness between core concepts, the Framework also places a great deal of import on threshold concepts in school subjects; and states that in a complex information ecosystem, students must play an important role in creating new knowledge, understanding the contours and dynamics of the information world, and using information and data in a way that complies with academic ethics. Teachers have a responsibility to design curriculum that allow students to participate in and invest in academic information and academic core concepts; librarians have the responsibility to identify how they can extend the core concepts of what students have learned in related academic fields, to build cohesive new information literacy curricula, and to collaborate more broadly with teachers.

As technology has continued to develop, so, too, new terms in information literacy continued to arise. Rapid changes in society and culture affect conceptual orientations for information literacy and have led to changes in the standards for information literacy. These, then, are the major developments in information literacy over the past decade. However, research studies related to information literacy reflected these changes over the past decade. Diachronic bibliographic mapping allows viewing the full picture for academic development over a specific period; visualization tools allow us to use a connection map and display the major contents of that academic domain. Thus, this study used the literature related to ILHE from 2011 to 2020, using bibliographic mapping and the VOSviewer visualization tool to perform analysis and gain an understanding of orientations and developmental trends in information literacy research over the past decade.

## **METHOD**

### **Article selection process**

This study collected data from the Web of Science’s SSCI (Social Sciences Citation Index) database, with keywords related to “information literacy in higher education” (ILHE) and publication dates from Jan 1, 2011 to December 31, 2020. This yielded a total of 1056 articles. Then, we screened out non-article publications, leaving 916 articles. We then performed manual examination of all article contents (including titles and abstracts), and eliminated repetitions, non-English content, retrospective reviews, and articles unrelated to the topic. This finally left 371 articles. We then performed a quantitative analysis of the articles. In addition, in order to gain a greater understanding of ILHE

research, we consulted Cheng, Hwang and Lai's research (2020), and from the 371 articles, 100 most-cited articles were selected to perform content analysis.

### Theoretical model, coding schemes, and analysis

In order to understand the development of ILHE, we first adopted bibliometric mapping analysis, using the VOSviewer tool to analyze the field's most commonly used keywords, most-cited authors, main journals, and contributing countries/areas. Next, to gain an in-depth understanding of the research topics related to ILHE studies over the past decade, this review adopted the Technology-based Learning Review model proposed by Hsu, et al. (2012) and Tu and Hwang (2020) and selected the 100 most-cited ILHE studies to perform content analysis. We examined five major areas: research objects and sample size, research methods, information literacy standards, research domains, and educational objectives. In addition, the most-cited papers and authors, journals, and most-used keywords were discussed. The coding methods used for the different dimensions were as follows:

- 1) Research Objects and Sample Size: Research objects were divided into librarians, teachers, undergraduate students, graduate students, and mixed. Sample size were divided into small (<30), medium (30-150), large (>150), and unspecified.
- 2) Research Methods: Quantitative research, qualitative research and mixed methods.
- 3) Research Domains: Science (Physics, Chemistry, Biology, Mathematics, Arts, Language, and Social Studies (including History), Engineering (including Computer courses), Health, Medical and Physical Education, Business and Management, Library and Information Science, mixed disciplines and unspecified.
- 4) Educational Objectives: Cognitive, affective, skills, learning behavior, correlation, information literacy and others.
- 5) Information Literacy Standards: Information Literacy Competency Standards for Higher Education, Framework for Information Literacy for Higher Education, courses with other reference standards, and no reference standards.

### Data distribution

Since the FILHE was formulated in 2015, we separate the decade of our survey into two periods (i.e., 2011-2015 and 2016-2020). From 2011 to 2015, there were 137 ILHE papers; from 2016 to 2020, there were 234. Of the 100 most-cited papers, 71 were from the 2011-2015 period, and 29 were from 2016-2020. See Figure 1.

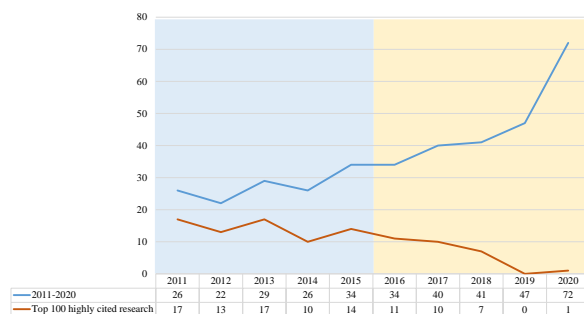


Figure 1. Distribution of ILHE studies and 100 top-cited papers for the 2011-2020 period

## FINDINGS

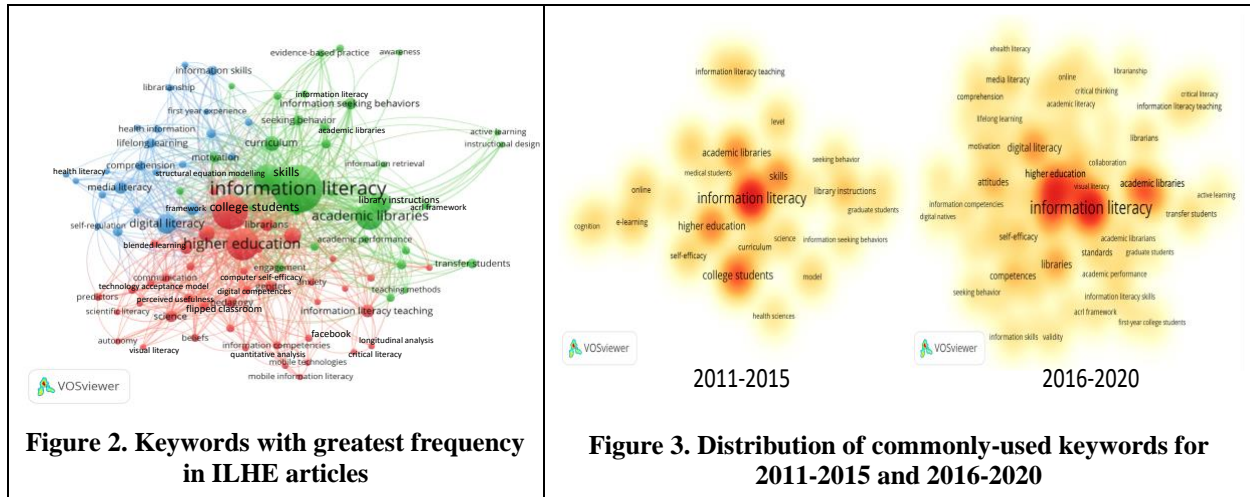
### Bibliometric mapping analysis findings

#### Most frequently-used keywords in ILHE articles

As Figure 2 shows, the four most common keywords for ILHE studies are information literacy (f=162), college students (f=81), higher education (f=72) and academic libraries (f=51). In addition to these most-frequently-seen keywords, skills (f=50), library instruction (f=33) and digital literacy (f=27) are also commonly-seen keywords. Within the 371 articles, there were 88 articles in which the keywords appeared at least 5 times. Using VOSviewer to display the cluster relations for these keywords, Figure 2 shows that these keywords fall into three major clusters. Keywords in the first cluster (red) include college students, higher education, models, self-efficacy, and information literacy teaching. This cluster is primarily about exploring students' self-efficacy, pedagogical models for information literacy, and information literacy in the classroom (e.g., Latham and Gross, 2013; Chen, 2015; and Pilerot, 2016). Keywords in the second cluster (green) primarily include information literacy, academic libraries, skills, library instruction, curriculum, information seeking behaviors, and seeking behavior. This cluster is primarily focused on researching student information literacy skills, how school curricula are implemented, and student behaviors when seeking information (e.g., Kingsley et al., 2011; Korobili et al., 2011; Gross, 2012; and Kim and Shumaker, 2015). Primary keywords for the third cluster (blue) are: digital literacy, media literacy, frameworks, comprehension, critical thinking, information skills, etc. This cluster primarily discusses the importance of media

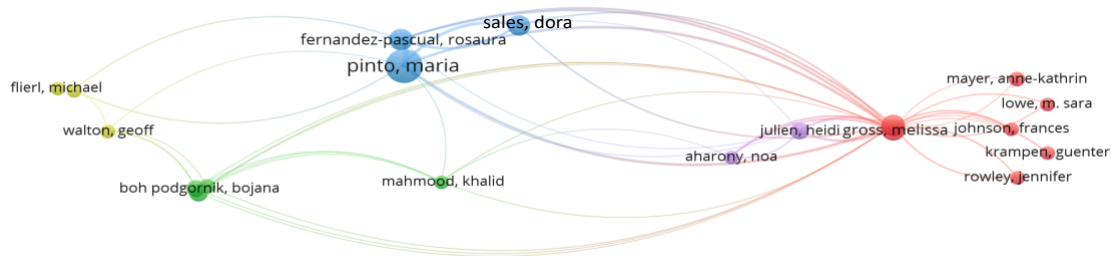
literacy and digital literacy and emphasizes how using the ILCSHE can increase curriculum extensibility, and can also cultivate students', teachers', and librarians' problem-solving, collaboration, critical thinking, and reflection abilities (e.g., Junisbai et al., 2016; Douglas and Rabinowitz, 2016; Greene et al., 2018; and Blau et al., 2020).

As Figure 3 shows, keyword used in the literature for the two periods 2011-2015 and 2016-2020 were overall similar, with only minor differences. The primary keywords were information literacy, college students, higher education, and academic libraries; during the 2016-2020 period, digital literacy and media literacy appeared more often than in the previous five years.



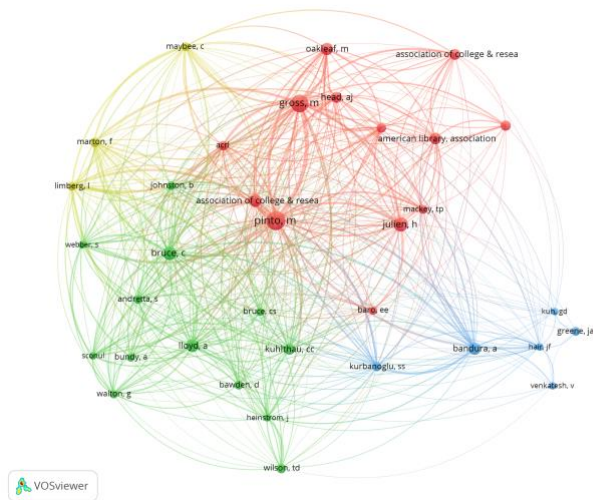
#### Most-cited authors

In 371 articles about ILHE, the most frequently-cited authors were, in order, Gross (citations= 193, documents= 8), Latham (citations= 193, documents= 8), Pinto (citations= 128, documents= 19), Walton (citations= 60, documents= 3), and Lupton (citations = 49, documents = 3). See Figure 4.



**Figure 4. Authors with greatest number of citations (citation analysis; documents ≥ 3)**

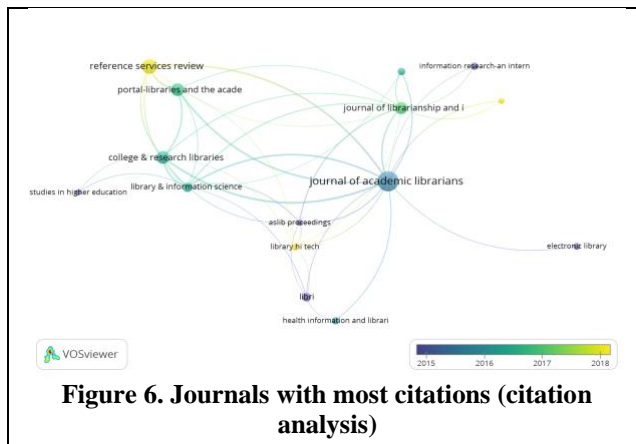
Details on highest co-citation are shown in Figure 5. In order, they are Pinto (citations= 124), Gross (citations= 107), Julien (citations= 71), Bruce (citations= 62), Lloyd (citations= 54), Association of College & Research Libraries (ACRL) (citations= 54), Oakleaf (citations= 52), and Bandura (citations= 51). Comparing the ten most-cited authors with the ten most co-cited authors shows that Pinto and Gross are authors both highly cited and highly co-cited in the ILHE field.



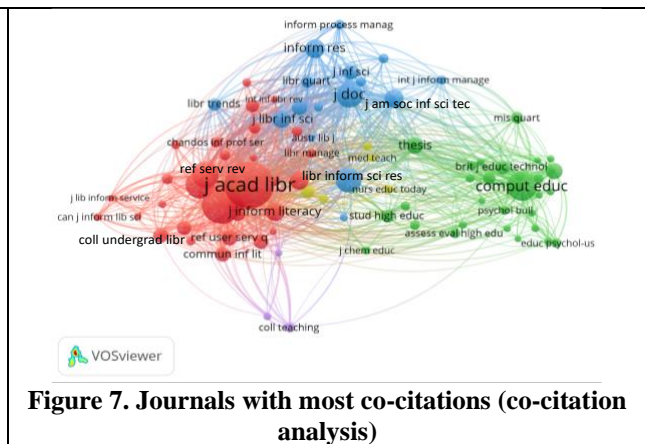
**Figure 5. Authors with greatest number of citations (co-citation analysis)**

### Most-cited journals

The 371 articles come from 98 different journals. Figure 6 shows the distribution of highly-cited articles in the various journals. The most-cited journal was the *Journal of Academic Librarianship* (citations= 477, documents= 53), followed in order by *College & Research Libraries* (citations = 194, documents= 22), *Portal: Libraries and the Academy* (citations= 132, documents= 23), *Library & Information Science Research* (citations= 124, documents= 13), and *Studies in Higher Education* (citations= 102, documents= 5). Figure 7 shows that the most co-cited journal was the *Journal of Academic Librarianship* (citations= 497), followed in order by *College & Research Libraries* (citations= 351), *Computer Education* (citations= 222), *Portal: Libraries and the Academy* (citations= 206), the *Journal of Documentation* (citations= 178), the *Reference Services Review* (citations= 177), *Library & Information Science Research* (citations= 166), *Information Research* (citations= 110), the *Journal of Information Literacy* (citations= 106), and the *Journal of the American Society for Information Science and Technology* (citations= 105).



**Figure 6. Journals with most citations (citation analysis)**

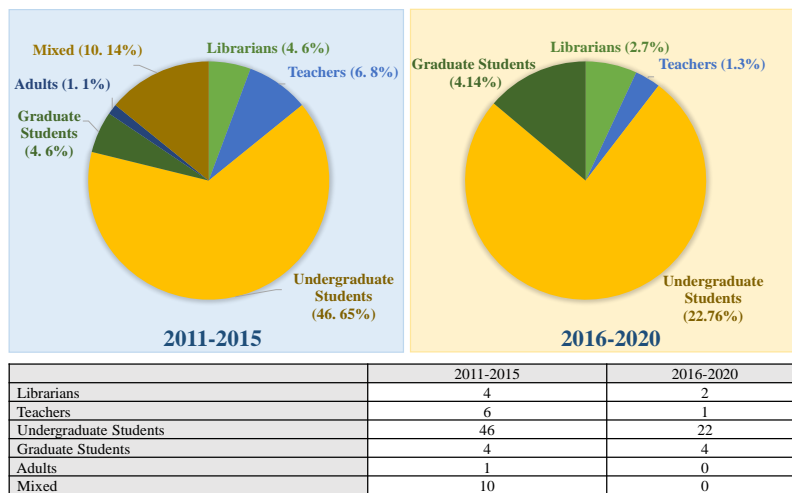


**Figure 7. Journals with most co-citations (co-citation analysis)**

### Content analysis findings

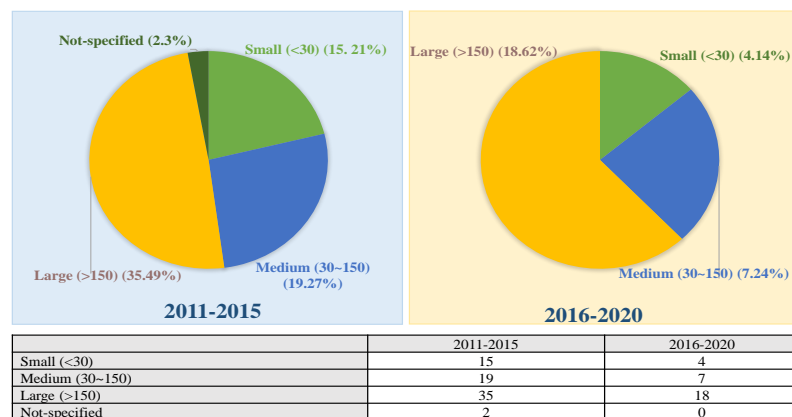
#### Research Objects and Sample Size

Over the 2011-2015 period, the research subjects for the 100 most-cited papers among ILHE studies were predominantly undergraduate students (46.65%). Second was mixed (10.14%); librarians and graduate students were tied for third (4.6%). For the 2016-2020 period, research subjects were still predominantly undergraduate students (22.76%), with second being graduate students (4.14%) and third being librarians (2.7%). See Figure 8. Generally speaking, undergraduate and graduate students are the main research subjects of ILHE studies. As Saunders (2012) put it, information literacy is a popular topic in the library and information science field, and is widely considered to be a foundational skill required for college students. Mery et al. (2012) also pointed out that students who join information literacy classes test higher than students who do not join such classes.



**Figure 8. Distribution of research objects for the periods**

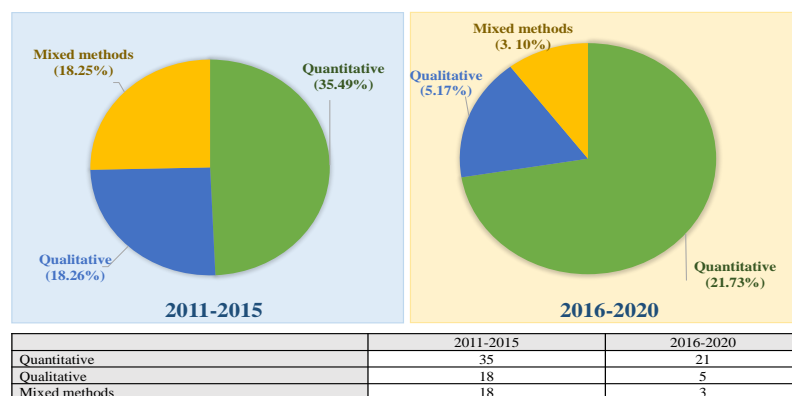
For the 2011-2015 period, the most common sample size was Large (>150), at 35.49%. Second was Medium (30-150), at 19.27%, and third was Small (<30), at 15.21%. The 2016-2020 period resembled the 2011-2015 period. For example, in 2017, Lanning and Mallek used a large sample size to explore what factors affect college students' possession of information literacy. See Figure 9.



**Figure 9. Distribution of sample size for the periods**

### Research methods

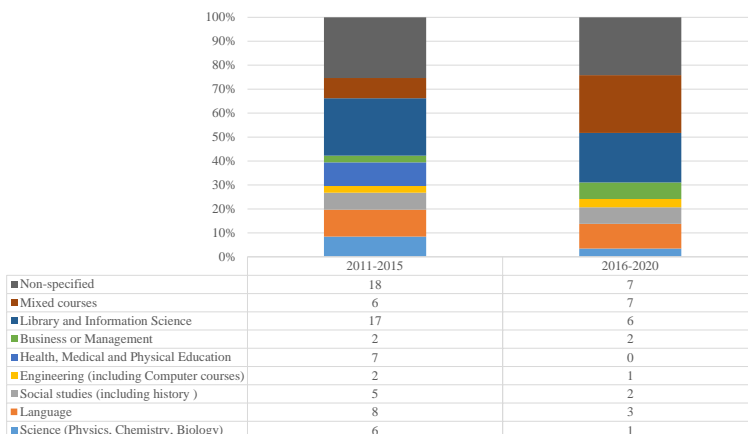
Within the 2011-2015 period, the research methods for the 100 most-cited papers among ILHE studies were predominantly quantitative research (35.49%), followed by qualitative (18.26%) and mixed methods (18.25%). The situation for 2016-2020 was similar; see Figure 10.



**Figure 10. Distribution of research methods for the periods**

### Research domains

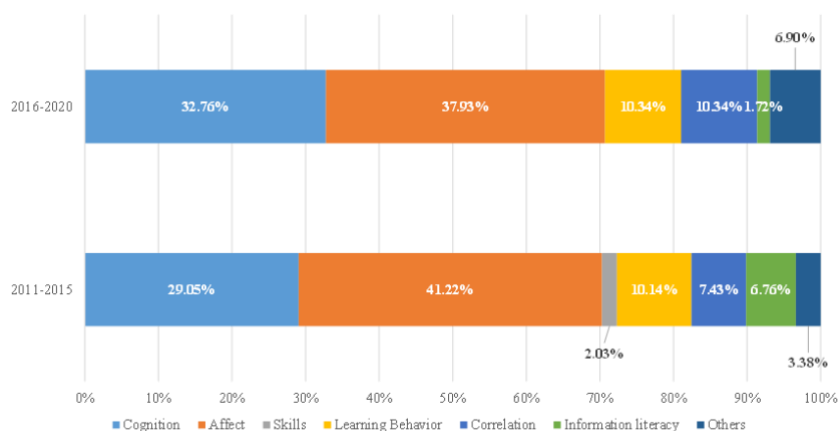
The research domains for the 100 most-cited papers among ILHE studies were predominantly unspecified (25%), followed by library and information science (23%), mixed domains (13%), and language (11%). For example, the study by Marshall et al. (2012) focuses primarily on multilingual, multicultural, and practical literacies, and does not focus on any single academic subjects; the multi-subject approach of Boer et al. (2011) explores how to promote whole-brain information literacy; the study by Julien et al. (2018) primarily focuses on how librarians in college libraries provide information literacy guidance, and also probe into their methods and challenges they face; while Tong and Moran (2017) focuses on transfer students' information literacy skills and differences between them and native students. See Figure 11.



**Figure 11. Distribution of research domains for the periods**

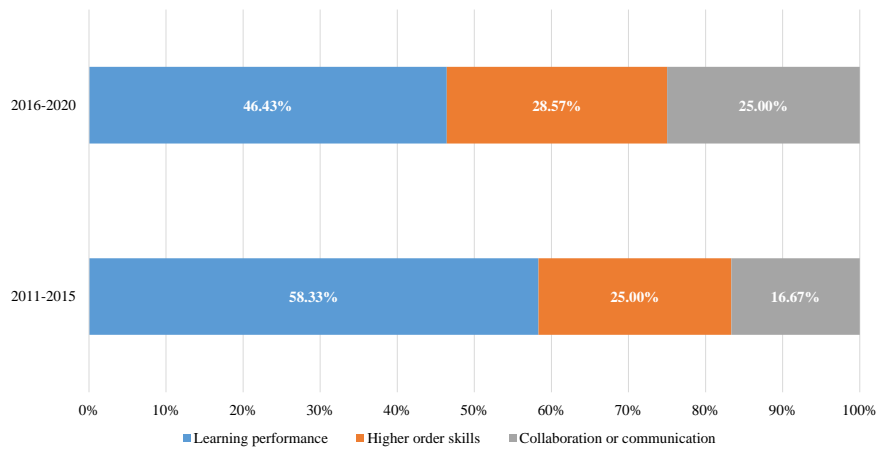
### 3.2.4 Educational Objectives

In educational objectives for the 100 most-cited papers of information literacy, learner in affect is predominated, accounting for 41.22% of the total over the 2011-2015 period and 37.93% over the 2016-2020 period. Next was the cognitive dimension, accounting for 29.05% of studies 2011-2015 and 32.76% of studies 2016-2020. Roughly tied for third were learning behavior and correlation dimensions, with skills as a relatively un-studied dimension. This shows that information literacy education is primarily about increasing student confidence, guaranteeing students possess higher-order thinking abilities, and further cultivate their abilities to resolve problems either alone or in a group (Junisbai et al., 2016; Sin, 2016); it is not just about information retrieval skills. See Figure 12. It is of note that these methods and the metaliteracy emphasized in the FILHE are different but equally worthy approaches to the same noble goal.



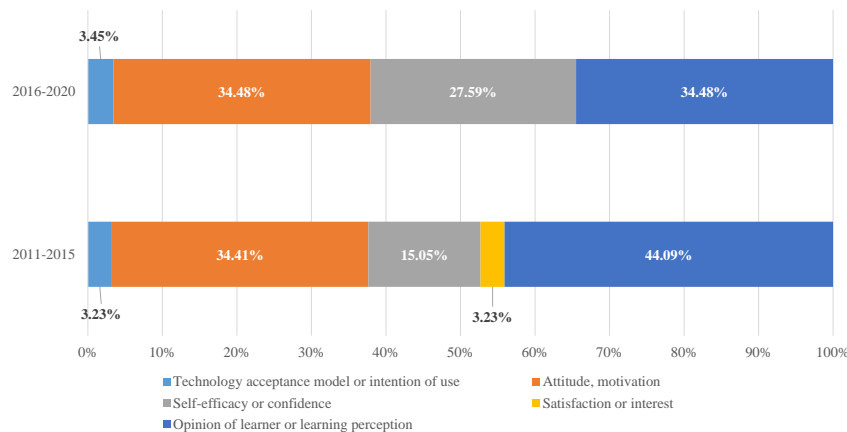
**Figure 12. Distribution of educational objectives for ILHE studies in the two periods**

In terms of the cognitive dimension, most studies over the 2011-2015 and 2016-2020 focused on learning performance topics. Next was higher-order skills, and third was the orientation toward collaborative learning. For example, Bryan and Karshmer (2013) point out that their study used non-linguistic modes (kinesthetic, graphic, and physical models) to do library curriculum instructions, and that enhanced students' learning abilities and aided in advancing students' information literacy. See Figure 13.



**Figure 13. Cognition.**

The affective dimension primarily focuses on acceptance of/intention to use technology, attitude/motivation, self-efficacy/confidence/expected outcomes, satisfaction/interest, and learner opinions/learning experiences (interviews/open-ended questions). As Figure 14 shows, the largest proportion (44.09%) of the 100 most-cited papers for the 2011-2015 explored learners’ opinions and learning perceptions regarding information literacy; learners’ attitude/motivation was second (34.41%), and third was learners’ self-efficacy/confidence (15.05%). For the 2016-2020, learners’ opinions/learning perceptions and attitude/motivation were highest (34.48% each), with self-efficacy/confidence second (at 27.59%) and acceptance of/intention to use technology third (3.45%). Generally speaking, learners’ self-efficacy/confidence is an important research topic within information literacy education. For example, Chen (2015) and Squibb and Mikkelsen (2016) point out that students’ learning achievement is enhanced when their schools integrate information literacy into the curriculum, and that students gain confidence from the learning process. Maybee et al. (2017) also point out that when teachers integrate information literacy into their curricula, students are able to effectively use information on topics that they want to explore. MacLeod (2018) stated the study contributes knowledge that can direct student training of digital literacies for improving the learning processes of cloud classrooms in higher education.



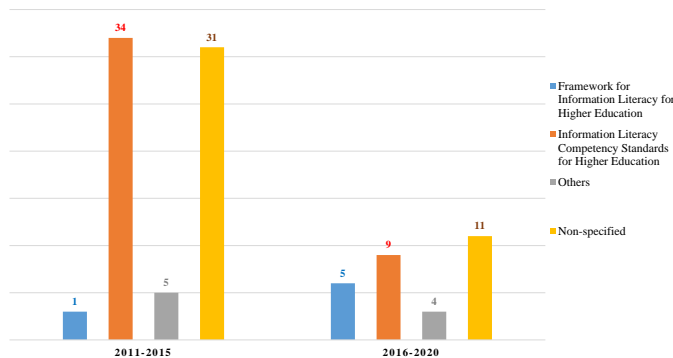
**Figure 14. Affect**

### *Information literacy standards*

Of standards referred to by the 100 most-cited papers, the ILCSCHE accounted for the largest proportion (43%), with no standard next (42%), other standards third (9%), and the FILHE fourth (6%). See Figure 15. The Framework wasn’t released until 2016, so we performed period-based analysis. Within the 100 most-cited papers 2011-2015, the ILCSCHE accounted for the largest number (34 articles); second was unspecified (31 articles), third was other standards (5 articles), and fourth being the Framework (1 article). That one article referring to the Framework is Zhao and Mawhinney (2015), which primarily explores differences in information literacy between native English-speaking engineering students and non-native English-speaking engineering students. The article mentions that the students gradually moved from being consumers to being producers; put another way, when students become “contributors to scholarship rather than only consumers of it” (ACRL, 2015), they already possess metaliteracy. In



light of this new situation and current research results, the researchers recommend that librarians use this opportunity to put their skills to use; librarians should not only guide students in how to retrieve information, but also in how to effectively use that information, which will be of benefit to both native and non-native English speakers. For 2016 to 2020, the majority of papers referred to unspecified (11 articles), with the second-largest number referring to the ILCSHE (9 articles), third referring to the Framework (5 articles) and fourth referring to other standards (4 articles). The five articles that referred to the Framework are Squibb and Mikkelsen (2016), Dempsey and Jagman (2016), Pilerot (2016), Julien et al. (2018) and Gross et al. (2018). They primarily explore how using the Framework allows greater clarity in how it is beneficial to students, and how using the Framework effectively enhances students' academic participation and cultivates students' information literacy skills. Julien et al. (2018) and Gross et al. (2018) both state that, while there may have been some resistance to the FILHE during the implementation process, not only did using the new standard improve their teaching, it also opened new doors to information literacy.



**Figure 15. Distribution of information literacy standard, by period**

## CONCLUSIONS AND DISCUSSION

This study used bibliometric mapping analysis and content analysis to explore information literacy in higher education (ILHE) research trends from 2011 to 2020. The primary findings are as follows:

- 1) From 2011 to 2015, there were 137 ILHE articles, and 234 articles from 2016 to 2020, which shows that information literacy research has grown over the past five years. Viewed in terms of keyword distribution, higher education, college students, information literacy, and digital literacy were high-frequency keywords. Over the 2011-2020 period, digital literacy, media literacy, multiliteracies, and metaliteracy were also frequently-explored keywords. This shows that information literacy is affected by social and technological development; content becomes richer and richer, but also becomes more and more divergent. The *Journal of Academic Librarianship* is the most highly-cited journal; and the *Journal of Academic Librarianship* is also highly co-cited. This demonstrates this journal's importance in ILHE studies. In ILHE research, the two most highly-cited and highly-co-cited scholars are Melissa Gross and Maria Pinto. They are the most-cited (co-citation) authors in this field. In terms of research methods, quantitative research predominates; most studies use questionnaires or rating scales to investigate subjects' opinions on information literacy pedagogy, then analyze students' thoughts about information literacy pedagogy, information-seeking behavior, etc. In terms of research objects, undergraduate students predominate; and large (>150) is the most common sample size. "Unspecified" was the most common research domain.
- 2) In terms of information literacy educational objectives, most studies focus on affective dimension, including acceptance of/intention to use technology, attitude/motivation, self-efficacy/confidence, satisfaction/interest, and learner opinions/learning experiences. Within these, there was a relatively high proportion of studies on learner opinions/learning experiences. This shows that within the affective dimension, studies primarily focus on investigating learner opinions of and experiences with information literacy education. This was followed by the cognitive dimension, including learning performance, higher-order skills, and collaboration/communication. Within these, learning performance accounted for the highest proportion, primarily exploring learners' outcomes after applying informational literacy in the classroom. The skills dimension within the educational objectives was relatively little-discussed. Almost no studies related to metaliteracy – as emphasized in the Framework published in 2016, and which requires students to participate in research within information ecosystems in terms of behaviors, emotions, cognition, and metacognition – have appeared (ACRL, 2015).

- 3) The standards applied in information literacy education were, for the 2011-2015 period, primarily the ILCSHE; and for the 2016-2020, the largest number of studies applied unspecified. There remain few studies that refer to the FILHE, though there is a growth trend.

Based on the preceding research conclusions, this study makes the following recommendations:

- 1) As times have changed, terms related to information literacy have continued to arise. Information literacy content has become rich and diverse; it is no longer merely a topic of concern to the traditional library and information science but has become an issue that scholars in all domains care about. The question of whether librarians have the strength to handle multiliteracies, digital literacy, metaliteracy, and other educational content is a topic worthy of concern; multidisciplinary collaboration and study are a necessity. Librarians need even more to collaborate with teachers in designing the pedagogical goals, contents, and teaching methods used in information literacy curricula. Although information literacy is a core skill that college students need to acquire, information literacy teaching methods and content in different domains vary, and there is still not much research about this. Also, multidomain and multidisciplinary collaboration has become an important trend in academic research. The ability to dialogue between domains is an issue that information literacy education must face.
- 2) Changes in concepts about information literacy have led to changes in the standards for information literacy and have gradually produced influences on information literacy curriculum design. The Framework for Information Literacy for Higher Education emphasizes metacognition, critical self-reflection, and threshold concepts. These concepts varied from the information literacy of the past, which placed its greatest emphasis on college library retrieval skills. Librarians need even more to collaborate with teachers in designing the pedagogical goals, contents, and teaching methods used in information literacy curricula. Although information literacy is a core skill that college students need to require, information literacy teaching methods and content in different domains vary, and there is still not much research about this. Also, multidomain and multidisciplinary collaboration has become an important trend in academic research. The ability to dialogue between domains is an issue that information literacy education must face. In addition to the frequently applied domains (e.g., health, medical and physical education), it could be valuable to try to explore the relationship between students' information literacy skills (i.e., their ability to collect, evaluate, and utilize the various types of information) and higher-level thinking. As this study shows, Europe and North America still lead in research on information literacy in higher education. However, information literacy in higher education systems is intimately tied with the environment. There remains a lack of research into what information literacy circumstances and issues exist in different educational environments. Discuss the relationship among students' information literacy skills, problem-solving, and critical thinking.
- 3) The future possibility for ILHE can be rooted in technologies and different fields, it is suggested that educators and researchers consider discussing the influence of social media and new technologies (e.g., artificial intelligence) on the information literacy abilities of students, teachers, and librarians. The ILCSHE have been rescinded; the FILHE has been revised and released. However, during the 2016-2020 timeframe, only five of the most-cited articles referenced the Framework; most research continued to be based on ILCSHE curricula, and there is still a dearth of empirical research done on Framework-based pedagogy. Teachers interested in this should refer to the ACRL Framework for Information Literacy Sandbox in designing curricula, shorten the time required to get off the ground, and engage in empirical evaluation research on pedagogy.

This study was subject to some limitations. For example, this study used primarily the SSCI database; the literature was limited to articles; and the language was limited to English. The time were limited so that we just selected the 100 most-cited ILHE studies from 2011 to 2020 for content analysis. The full picture of the research of ILCSHE may still not be presented. In addition, this study used bibliometric mapping analysis, and therefore, the results were also subject to limits in terms of analytical dimensions. The various dimensions await further and deeper analysis to grant fuller understanding.

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