

Overview of Research on Information Literacy in Higher Education of ASEAN Countries

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Abstract

Purpose: To investigate and analyze the general characteristics and content of research articles and key terms in research publications related to information literacy in higher education of ASEAN countries through content analysis and bibliometric analysis.

Methodology: The study is a mixed-methods approach, combining both quantitative and qualitative research. The research involves gathering and analyzing research articles systematically from the Web of Science database published between 2000 and 2022. It includes using search terms related to "information literacy" and "ASEAN". The data was coded using a coding sheet in Microsoft Excel to analyze and categorize topics based on predefined criteria. The results are visualized using VOSviewer version 1.6.18 to demonstrate the co-occurrence of keywords.

Findings: There is a limited number of research articles on information literacy in higher education of ASEAN countries, but a consistent trend in their publication. A study by Chen, X., Sin, S.-C. J., Theng, Y.-L., and Lee, C. S. garnered the most interest and were cited. Several articles focus on knowledge and research that do not specifically address the information literacy standards used for course design. The main keyword found in this study was "information literacy," which was the core aspect of research related to information literacy in higher education of ASEAN countries, linking or associating different components.

Applications of this study: The significance of this research is pertinent for various stakeholders in the field of education, encompassing educational institutions, educators, students, and researchers specializing in library science and information management. It directly impacts curriculum development, training methodologies, teaching strategies, and research endeavors focused on reinforcing and enriching the information literacy competencies of students engaged in higher education.

Keywords: Information literacy; Higher education; ASEAN; Content analysis; Bibliometric analysis

1. Introduction

The Association of Southeast Asian Nations (ASEAN) constitutes a collaboration among countries referred to as the ASEAN Community, which comprises 10 member countries in Southeast Asia, including Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia. It operates under three main pillars: the ASEAN Political Security Community (APSC), the ASEAN Economic Community (AEC), and the ASEAN Socio-Cultural Community (ASCC) (Ministry of Education, 2017). The objective is to empower the ASEAN community, establish a strong developmental foundation for its future, and enable it to compete globally. Despite clear improvements in the educational development collaboration within ASEAN, there remain issues concerning populations that lack access to basic education due to limited opportunities to attend school, resulting in high dropout rates (Ministry of Education, 2017). However, ASEAN (2021) has outlined the ASEAN Education Plan for 2021-2025 to enhance regional educational abilities, creating a part of lifelong learning management to promote educational inclusivity within ASEAN. This initiative aims to enhance the roles of educational institutions in managing lifelong learning through flexible educational and research collaborations, fostering interdisciplinary and cross-border studies, thereby enhancing ASEAN's capacity in inclusive education through various strategies and mechanisms, including educational funding allocation.

In addition to continuous growth in political and economic dimensions, ASEAN has fostered academic development and cooperation. There's a focus on educational development and promotion of connectivity in various academic disciplines, including library science and information studies, illustrated by initiatives such as the Congress of Southeast Asian Librarians (CONSAL) (Sacchanand, 2016). Furthermore, international academic conferences such as the International Conference on Asian Digital Libraries (ICADL) and the International Conference on Asian-Pacific Library and Information Education and Practice (A-LIEP) exemplify this trend (Sacchanand, 2022).

Information literacy is a vital skill in an era filled with new data and technologies transforming all aspects of learning and education (IFLA, 2022). Learning today extends beyond classroom boundaries, characterized as lifelong learning, a necessary skill for learners at all levels (Hart Research Associates, 2013). For higher education, information literacy entails not

just collecting information but also assessing and efficiently using it (UNESCO, 2020). Learners should be trained systematically in analysis, research, and learning to deepen their understanding of learned content and prepare as quality professionals aligned with the job market's demands (UNESCO, 2020).

Research in information literacy in each country contributes to understanding developments in this field, focusing on technology utilization in education (Inoue & Bell, 2005), transforming information literacy in library settings (Xue et.al, 2023), and the roles of librarians in information literacy (Mohtar & Mohamad, 2023). It also encompasses the development of information literacy standards (Kong et al, 2005), studying students' information-seeking behavior (Nu Htay et.al, 2022), along with other related skills such as digital literacy (Shankar & Hedberg, 2005; Rahmah, 2015) and media literacy (Lim & Nekmat, 2008).

Considering a broader perspective, the research and analysis of studies gathered and published in the Web of Science database from 2000 to 2022 play a crucial role in recognizing trends and developments in information literacy in the ASEAN countries. Understanding the significance and interest in information literacy is an excellent starting point for formulating developmental guidelines and enhancing the efficiency of data utilization in the educational and academic systems of these nations in the future.

In studying information literacy in the higher education (ILHE) of ASEAN countries, the collective research provides further insights and tools that can aid in developing new resources to support efficient learning through bibliometric analysis. There are numerous research works related to information literacy within different contexts (Pinto, 2015; Majid et al., 2015; Bhardwaj, 2017; Kollé, 2017; Pinto et al., 2020). By studying and analyzing the research publications gathered and disseminated in the Web of Science database between 2000 and 2022, becomes a crucial component in understanding the trends and advancements in information literacy within the current era for ASEAN countries. Recognizing and comprehending the importance of information literacy is a good starting point for creating development strategies and enhancing the efficiency of data utilization within the educational and academic systems of countries within this region for future research applications.

2. Purpose

- 1) To investigate the characteristics and distribution of ILHE research in ASEAN countries
- 2) To analyze keywords in research on ILHE research in ASEAN countries through bibliometric analysis

3. Methodology

This research constitutes a content analysis and bibliometric analysis to explore the characteristics of research related to information literacy at the higher education of ASEAN members, encompassing ten countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar, and Cambodia. The study involved the gathering and compilation of research work systematically from the Web of Science database published from 2000 to 2022. The search terms employed were "information literacy" and "ASEAN," with the document types limited to articles published exclusively in English.

The study selection process included two researchers who evaluated titles, abstracts, and full-text articles of relevant studies. The author cited Chen et al. (2021), Cheng et al. (2020), and Lai (2020) following the specified criteria, and the researchers adhered to predefined inclusion criteria, focusing on articles that following conditions: they involve information literacy in higher education as a primary research topic, are published in English, were published between 2000 and 2022, and are publicly available or archived periodical articles. Articles that did not follow these criteria were excluded. Coding records were utilized as research tools during this phase. Data were systematically collected from relevant articles, with the author documenting and synthesizing the topics of interest found in the articles. The manual screening process included a thorough examination of each title, abstract, and full paper to decide whether to include or exclude the articles. Relevant literature was identified through a systematic review, and a meticulous examination and synthesis of the information literacy research in higher education were undertaken to produce key findings addressing the research questions.

The collected research data were sorted and categorized into different topics based on the study objectives, such as authors' names, publication years, keywords, and sources. Moreover, the study conducted a comprehensive analysis of the co-occurrence of keywords to identify associations and relationships between concepts. This systematic review and analysis were executed following the principles and methodologies stipulated in previous research works, such as Hsu et al. (2012), Lai (2020), Tu & Hwang (2020), Hwang & Tu (2021), Xia & Zhong (2018), and Chen et al. (2021). These methodologies were adapted and applied in this study to establish a coding scheme. The dimensions of coding schemes were as follows: participants and sample sizes, research methods, research domains, information literacy standards, and educational objectives. The research data were organized using a coding sheet

in Microsoft Excel. For creating data visualization by VOSviewer version 1.6.18 to demonstrate the interconnections between various keywords in the research work.

4. Research results

4.1 Characteristics of Information Literacy Research in the Higher Education of ASEAN Countries

In the initial search and review, a total of 2,075 articles related to information literacy at the higher education level were found. Subsequently, the articles were filtered based on document type and language; only 291 English-language articles published from 2000 to 2022 conformed to the established criteria. After examining the full content of these articles, it was discovered that 125 were irrelevant to information literacy at the higher education level and were not associated with ASEAN countries, using the first author as the primary criterion. Consequently, 25 articles were selected for content analysis in this study.

As shown in Table 1, upon analyzing author data, the research work with the most citations in information literacy of ASEAN's higher education is the study by Chen, X., Sin, S.-C. J., Theng, Y.-L., and Lee, C. S. under the title "Why Students Share Misinformation on Social Media: Motivation, Gender, and Study-level Differences." This article is the most cited in ILHE research, with 101 citations. This research aimed to understand the reasons for sharing inaccurate information on social media by undergraduate and graduate students in Singapore. The research findings revealed that over 60% of survey respondents shared inaccurate information, with reasons linked to information perception as well as social display and interaction.

Table 1 The top five most cited ILHE research of ASEAN countries from 2007 to 2022

ILHE research	Total of citations
1. Chen, X., Sin, S.-C. J., Theng, Y.-L., & Lee, C. S. (2015). Why students share misinformation on social media: Motivation, gender, and study-level Differences. <i>The Journal of Academic Librarianship</i> , 41(5), 583-592. https://doi.org/10.1016/j.acalib.2015.07.003 .	101
2. Anthonymsamy, L., Koo, A.C., & Hew, S.H. (2020). Self-regulated learning strategies in higher education: Fostering digital literacy for sustainable lifelong learning. <i>Education and Information Technologies</i> , 25, 2393–2414. https://doi.org/10.1007/s10639-020-10201-8 .	34

ILHE research	Total of citations
3. Sin, S.-C. J. (2015). Demographic differences in international students' information source uses and everyday information seeking challenges. <i>The Journal of Academic Librarianship</i> , 41(4), 466-474. https://doi.org/10.1016/j.acalib.2015.04.003 .	31
4. Guo, Y. R., Goh, D. H.-L., Luyt, B., Sin, S.-C. J., & Ang, R. P. (2015). The effectiveness and acceptance of an affective information literacy tutorial. <i>Computers & Education</i> , 87, 368-384. https://doi.org/10.1016/j.compedu.2015.07.015 .	17
5. N.N. E. (2017). Tracing information literacy of computer science undergraduates: a content analysis of students' academic exercise. <i>Malaysian Journal of Library and Information Science</i> , 12(1), 97–109. https://ejournal.um.edu.my/index.php/MJLIS/article/view/6991	10

From 2000 to 2022, there were 25 articles concerning ILHE of ASEAN countries. No research related to this subject was found between 2000-2006. Therefore, this research study focuses on the period 2007-2022, divided into two phases: 2007-2014 (6 articles) and 2015-2022 (19 articles). In the latter period, there was no research in 2018. From the total of 12 articles, the majority were predominantly authored by researchers from Malaysia, followed by Singapore (7 articles), Thailand (3 articles), Indonesia (2 articles), and the Philippines (1 article), as illustrated in Figure 1. The research outcomes demonstrate the growth in information literacy research in ASEAN's higher education, though the number isn't substantial, it's consistent, aligning with earlier studies that indicated most research originated from Western countries (Sproles et al., 2013; Chen et al., 2022). Still, there's an increasing presence of research from Asia.

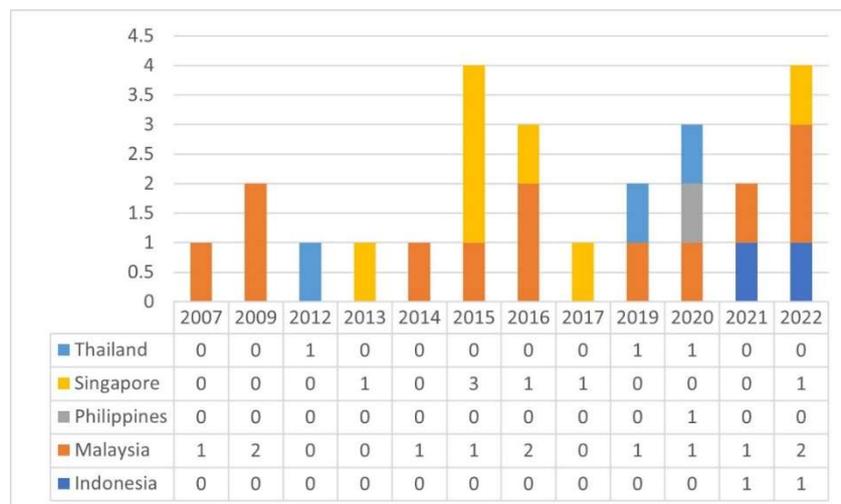


Figure 1 Overview and distribution characteristics of ILHE research in ASEAN countries since

From the research output from 2007 to 2022, the top three journals publishing research in information literacy within ASEAN's higher education include the "Malaysian Journal of Library & Information Science" (6 articles), "Journal of Academic Librarianship" (4 articles), "Internet and Higher Education Information Development," and "Journal of Librarianship and Information Science" (2 articles).

4.2 Analysis of Information Literacy Research in Higher Education of ASEAN countries

4.2.1 Participants

Undergraduate students are the largest participants of interest to researchers studying information literacy in higher education of ASEAN countries between 2007-2022 (12 articles). Following this are mixed sample groups (4 articles), teachers (4 articles), graduate students (2 articles), unspecified participants (2 articles), and librarians (1 article) in sequence, as shown in Figure 2. For instance, Foo and colleagues' (2013) study evaluated the information literacy skills of higher education students in Singapore regarding search, assessment, and use of information. They also suggested that managing information literacy in universities remains crucial.

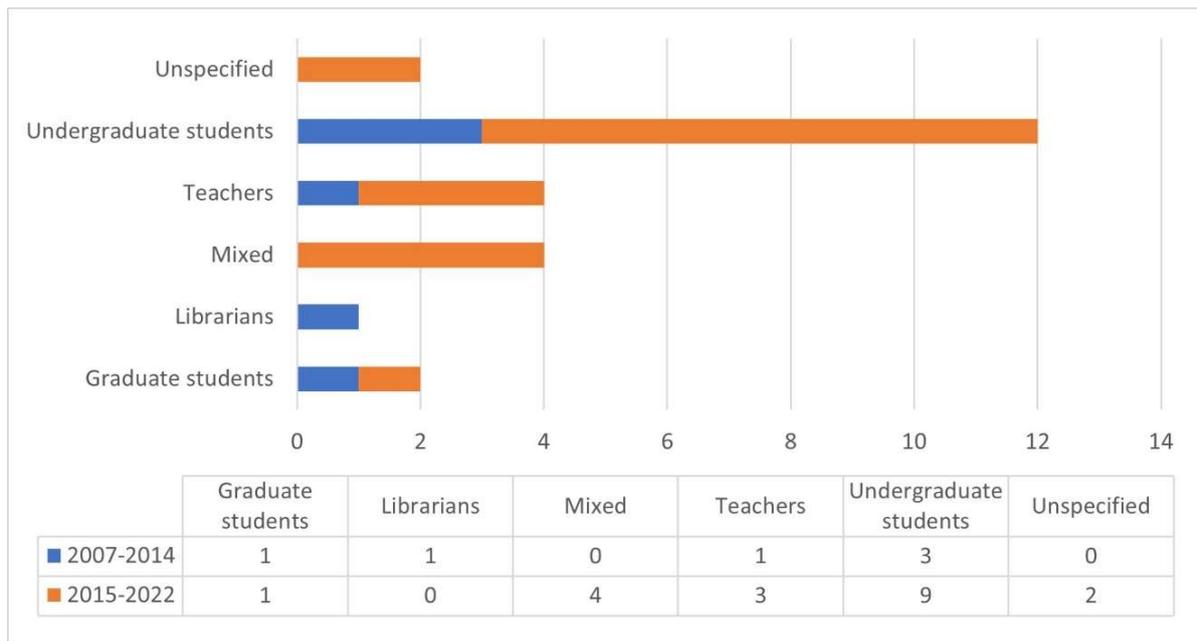


Figure 2 Participants in research on ILHE in ASEAN countries in the period 2007-2022

4.2.2 Sample sizes

A large sample size (>150) represents the primary interest of researchers studying information literacy in higher education within the ASEAN countries between 2007-2022 (11 articles). This is followed by small sample sizes (<30) (8 articles) and medium sample sizes (30-150) (6 articles) in order, as shown in Figure 3.

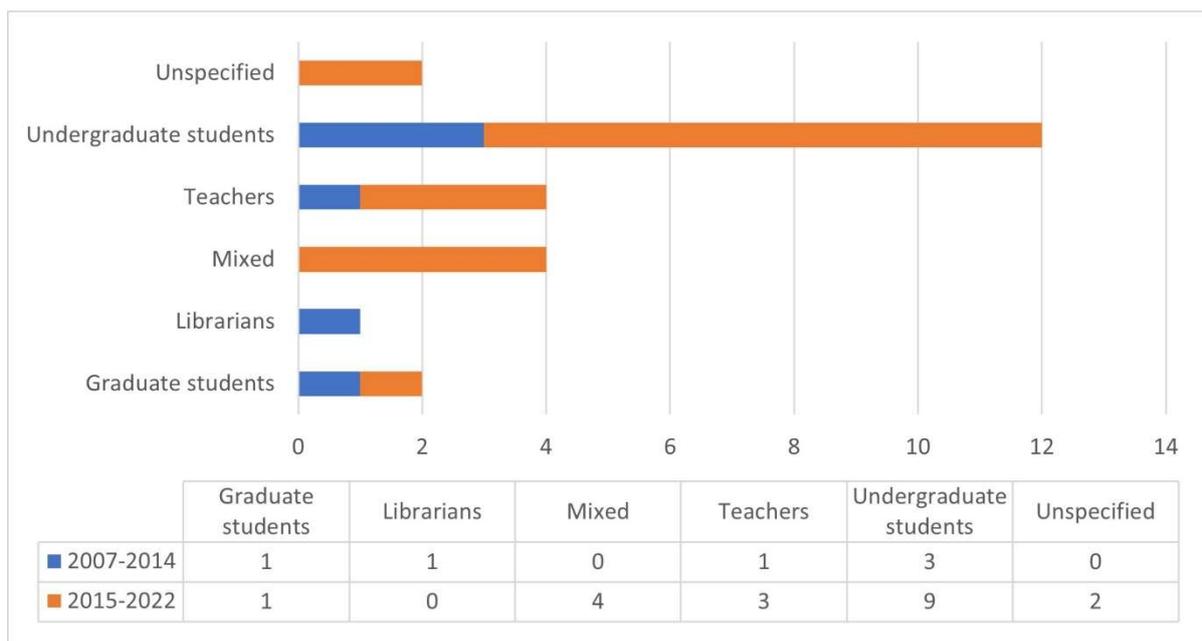


Figure 3 Sample size in research on ILHE in ASEAN countries in the period 2007-2022

4.2.3 Research methods

As shown in Figure 4, it is evident that most research predominantly utilized quantitative research methods (10 articles), followed by qualitative research (8 articles) and mixed methods (7 articles). When categorized by time, the majority of research from 2007-2014 used quantitative, qualitative, and mixed methods (2 articles), whereas from 2015-2022, research primarily focused on quantitative methods (8 articles), followed by qualitative research (6 articles) and mixed methods (5 articles).

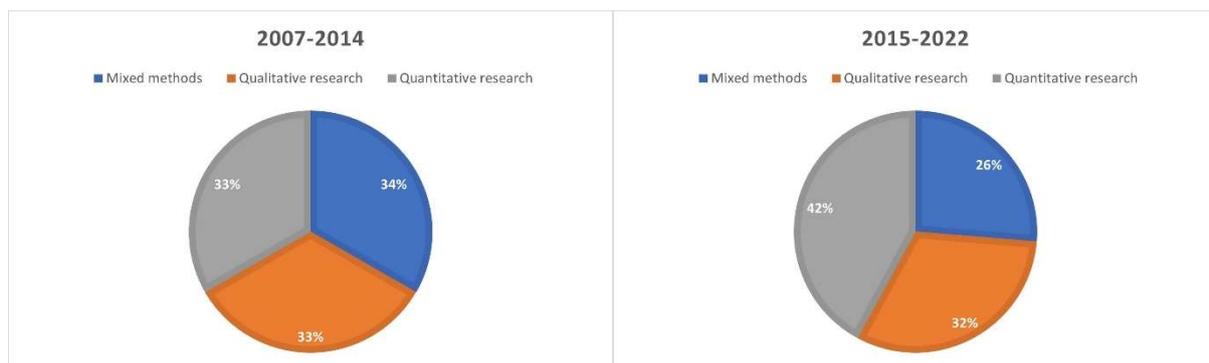


Figure 4 Research methods in research on ILHE in ASEAN countries in the period 2007-2022

4.2.4 Research domains

As shown in Figure 6, unspecified research domains and library and information science were the most discussed research knowledge sets in ILHE research of ASEAN countries between 2007-2022 (6 articles), followed by social studies (including history) (5 articles), and mixed disciplines (4 articles). When segmented by time, research from 2007-2014 mainly explored research knowledge sets related to library and information science (2 articles) and mixed disciplines (2 articles), followed by engineering (including computer courses) (1 article) and social studies (including history) (1 article). In contrast, from 2015-2022, research primarily focused on unspecified (6 articles), followed by library and information science (4 articles) and social studies (including history) (4 articles).

4.2.5 Information literacy standards

As depicted in Figure 6, most articles did not specify reference information literacy standards used for designing higher education curricula within the ASEAN countries. Only a single study referred to globally recognized information literacy standards, such as the Information Literacy Competency Standards for Higher Education (1 article). From 2015-2022, the research discussed curricula with referenced information literacy standards (2 articles).

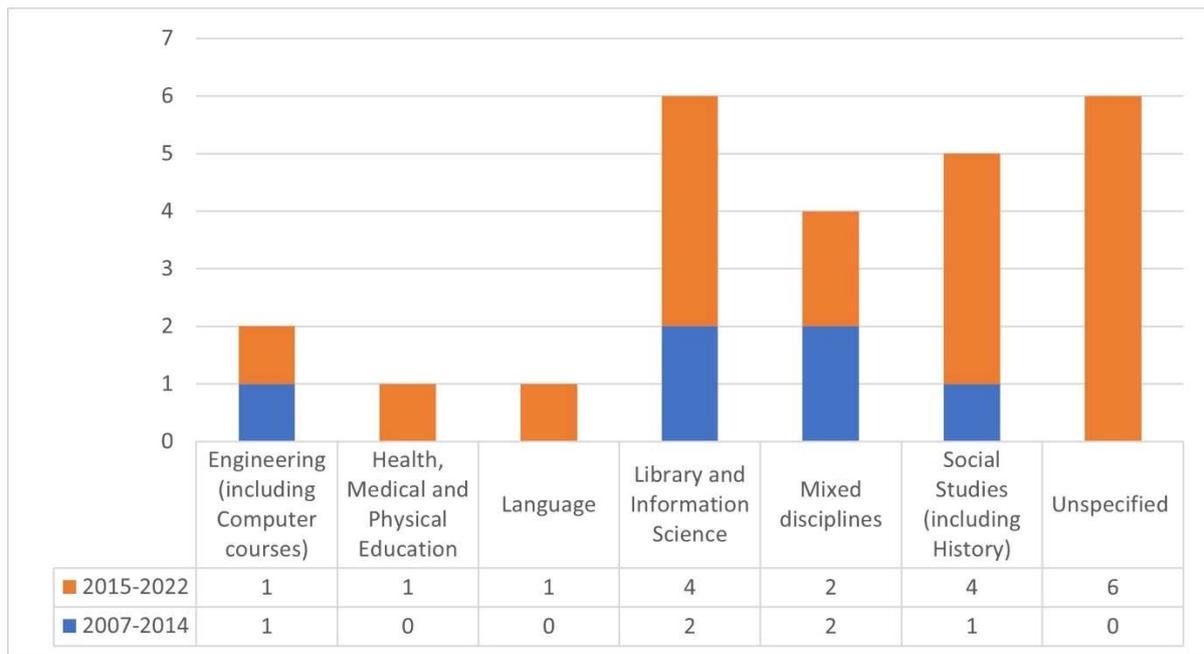


Figure 5 Research domains in research on ILHE in ASEAN countries in the period 2007-2022



Figure 6 Information literacy standards in ILHE research of ASEAN countries in the period 2007-2022

4.2.6 Educational objectives

Each article is related to various educational objectives. Research on information literacy in higher education of ASEAN countries between 2007-2022 mainly focused on educational objectives associated with affection (16 articles), followed by learning

effectiveness (skills) (8 articles) and cognition (8 articles), as shown in Figure 7. When categorized by time, from 2007-2014, most research emphasized educational objectives related to affection (4 articles), learning (skill) performance (4 articles), followed by cognition (2 articles). In contrast, from 2015-2022, research primarily emphasized educational objectives associated with affection (12 articles), followed by cognition (6 articles), and learning behavior (skills) (5 articles). For instance, Guo et al. (2015) investigated the influence of Embodied Agents (EAs) on motivation, enjoyment, knowledge retention, and intention to use among university students. They also studied factors influencing students' intention to use online information literacy teaching aids and their emotions.

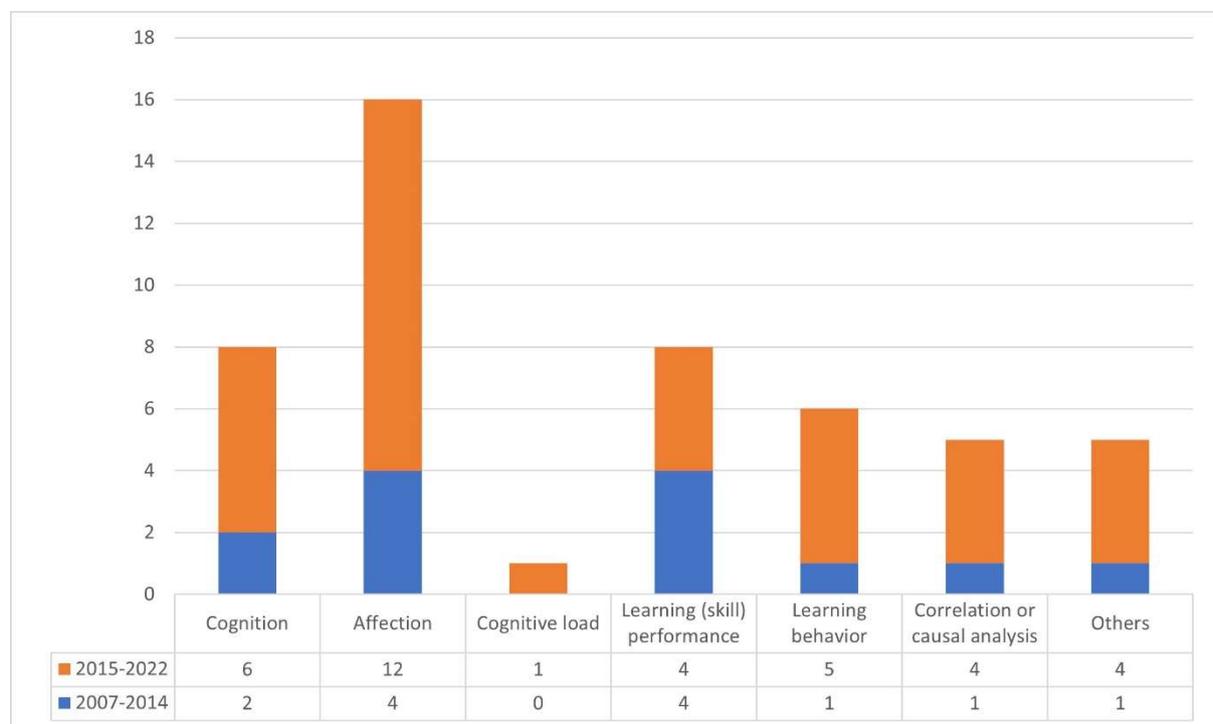


Figure 7 Educational objectives in ILHE research of ASEAN countries in the period 2007-2022

4.3 The co-occurrence analysis of keywords utilized in research focused on information literacy in higher education of ASEAN countries

The analysis of bibliometrics with co-occurrence analysis involves examining the prominent keywords used in the realm of information literacy research in higher education of ASEAN countries. Key terms predominantly utilized in this field within ASEAN countries during the specified period are identified, such as "information literacy" (f = 7), "academic libraries" (f = 2), "digital literacy" (f = 2), "information seeking behaviors" (f = 2) "undergraduate students" (f

= 2), and "citation analysis" ($f = 1$). Among these, "information literacy" holds the highest frequency of use, implying its central importance in the related research within this period.

The author depicts the analysis through data visualization using VOSviewer version 1.6.18, as illustrated in Figure 8. The graphical representation maps and aids in comprehending the significant topics in the realm of information literacy research within the specified ASEAN countries during the period 2007 to 2022. This is accomplished by observing the size and color changes of the data points or nodes, where the size indicates the relevance or strength of the relationship between these keywords within the research. The diversity of colors denotes significant keyword clusters that are interrelated within and among various groups. Additionally, the variations in the importance of the keywords over different time periods can be observed. The visualization signifies the differences and evolution of key terms that surface within distinct timeframes of the research, illustrated through the gradient shift from blue to yellow, representing varying degrees of prominence and relevance. This bibliometric analysis aims to provide an overview of the evolution and significance of information literacy-related research in higher education within the ASEAN countries and how particular keywords gained importance over time.

The research findings indicate that the majority of key terms are predominantly found between 2007 and 2022. The segment shaded in blue signifies key terms found before 2007, progressing in color levels until the yellow shade, which represents in the 2022. The study discovered that the primary keywords used in ILHE research within the ASEAN countries between 2007 and 2022 can be categorized into nine main groups:

Group 1 (Red) comprises key terms primarily focusing on higher education. These key terms significantly include "undergraduate students," which pertains to bachelor's degree students, alongside other related terms such as "distance learning," "information literacy experience," "information literacy in the workplace," "informed learning," "teacher educators," and "workforce information literacy." This group is deemed crucial in the field of information literacy in higher education due to its significant relevance to developing essential skills and information perception necessary for students in diverse educational settings. This, in turn, influences their abilities in practical application and experience-based knowledge in the real-life context of higher education.

Group 2 (Green) refers to information literacy at the advanced education level. It includes the key term "citation analysis," focusing on analyzing data citations. Additionally, it incorporates other essential terms like "final year project reports," "information skills,"

"performance indicators," "pre-service teachers," and "research skills." These terms are crucial in developing information literacy and the associated skills required at the higher education level, emphasizing aspects related to research, teaching, and the evaluation of educational performance.

Group 3 (Blue) establishes connections with education and research-based libraries by featuring keywords such as "academic libraries," fostering connections to "course instruction," "faculty-librarian collaboration," "general education courses," "influencing factors," and "information literacy integration." This group significantly contributes to the development of information literacy skills and the management of educational processes in higher education.

Group 4 (Yellow) encapsulates terms like "blended learning," "digital learning," "lifelong learning," "self-regulated learning strategies," and "SmartPLS". These terms play a critical role in shaping the adaptability of students or professionals in effectively applying their knowledge within their daily lives.

Group 5 (Purple) includes primary keywords like "information seeking behavior," related to information-seeking conduct. Additionally, it encompasses other key terms such as "information needs," "humanities scholars," "personas," "qualitative study," and "user studies," emphasizing the importance of behavior in seeking information that influences information literacy in higher education to enhance understanding and proper application of data in education.

Group 6 (Blue) focuses on "digital literacy," highlighting the crucial skills in utilizing technology for communication and information in the digital realm. Keywords such as "digital literacy mindfulness," "online information searching strategies," "structural equation model," and "university students". It addresses the critical need for adapting to the digital realm, promoting competencies necessary in a technology-driven world.

Group 7 (Orange) comprises key terms such as "online tutorial," a lesson accessible through online channels. Other significant keywords include "affective embodied agent," "enjoyment," and "intention to use,".

Group 8 (Brown) centers around the most crucial keyword, "information literacy," signifying the ability to efficiently search and process information for comprehension and application, including the ability to analyze and understand the quality of information for decision-making and problem-solving. Other vital keywords are "formative assessment,"

"intrinsic feedback," and "self-efficacy." This group is pivotal in developing skills and knowledge for daily life within the scope of higher education resulting from the learning process.

Group 9 (Light Pink) centers around "instructional design," representing the planning and design process for teaching. Other significant terms including "asynchronous online learning" and "humor," play a significant role in shaping innovative and efficient educational practices in advanced educational settings.

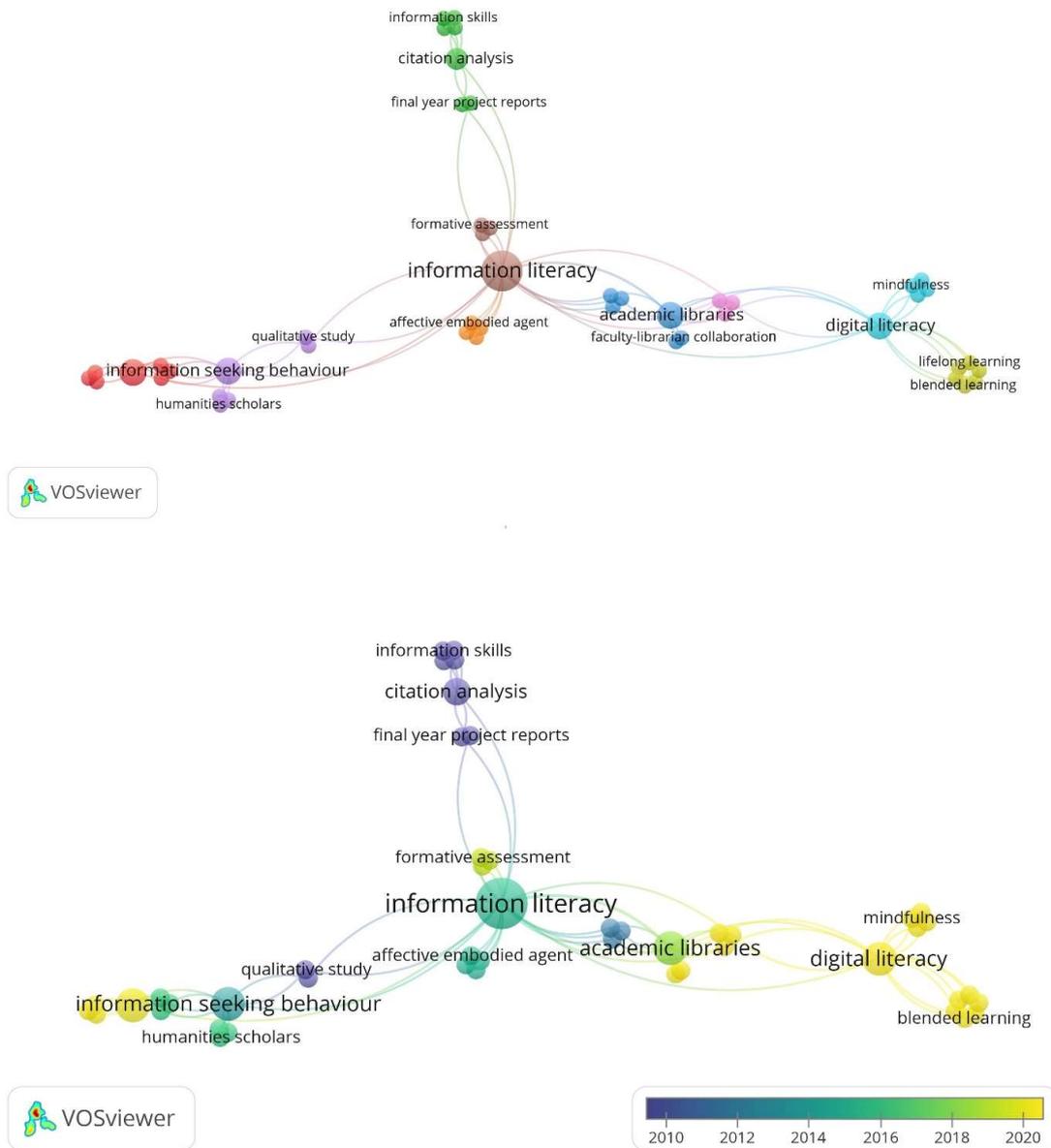


Figure 8 Most frequently used keywords in ILHE research of ASEAN countries from 2007-2022 by author keywords

5. Discussion

The researchers analyzed content and bibliographic dimensions in information literacy research in higher education of ASEAN countries using the Web of Science database with the search terms "information literacy" and "ASEAN." From the data collected, only 25 articles followed the criteria and were used for this study. The study revealed several trends and potential future research directions in the field of information literacy research in higher education within ASEAN countries. First, despite the relatively small number of articles meeting the study's criteria, there is a growing trend in the number of research articles published between 2007 and 2022, indicating increasing interest and importance in the field of information literacy in higher education. Second, the actual number of research works might be higher than the study's findings suggest, as some research could be published in other international databases or local languages and databases within the ASEAN countries. This suggests the potential for further exploration and expansion of databases to uncover additional research. Third, there is an opportunity to explore the situations and characteristics of information literacy research in specific ASEAN countries such as Brunei, Vietnam, Laos, Myanmar, and Cambodia. Publications related to this topic might be available in local databases and languages of these countries, offering valuable insights into regional perspectives.

In research issues, the trend in information literacy research within ASEAN countries shows a focus on undergraduate students, but there's a shift towards a more comprehensive approach involving mixed sample groups, teachers, and graduate students. This shift may indicate a growing interest in understanding information literacy at different educational levels and contexts. There's also a shift towards quantitative research methods, reflecting a desire for empirical and statistically driven insights. However, the concurrent use of qualitative and mixed methods suggests a recognition of the need for nuanced understandings. In the future, further research can expect further exploration of interdisciplinary perspectives, increased attention to diverse educational objectives, and the continued refinement of research methodologies to enhance our understanding of information literacy in higher education within the ASEAN region.

The study utilized bibliometrics analysis to identify key trends and patterns in information literacy research in higher education, reflecting the diverse aspects of this field and its interconnectedness with various educational and technological domains. Overall, the study's findings indicate a multidimensional approach to studying information literacy in higher

education within ASEAN countries, encompassing diverse participants, robust methodologies, and a broad range of research domains. The evolving emphasis on quantitative methods and the persistent focus on specific educational objectives reflect the dynamic nature of this field and its importance in shaping educational practices and policies in ASEAN countries.

Overall, the study's findings indicate a multidimensional approach to studying information literacy in higher education within ASEAN countries, encompassing diverse participants, robust methodologies, and a broad range of research domains. The evolving emphasis on quantitative methods and the persistent focus on specific educational objectives reflect the dynamic nature of this field and its importance in shaping educational practices and policies in ASEAN countries.

6. Limitations and Recommendations

The authors recommend discussing expanding the scope and diversity of data collection in the research process for research further. It emphasizes utilizing reliable databases such as Google Scholar, PubMed, Scopus, and ResearchGate, along with studying from multiple databases. The author also recommends expanding or broadening the scope of keywords related to information literacy, such as data literacy, AI literacy, and others. Additionally, specifying the country names in the search for information would be beneficial for retrieving and gathering articles for a more comprehensive study. This approach will help researchers to study a wider range of contexts related to information literacy. Furthermore, the authors also suggest gathering information from local databases of the studied country to increase the volume of data. The advice includes studying various types of documents and employing diverse keywords to enhance the chances of collecting relevant data from various sources related to the research dimensions possible.

As information literacy is a crucial skill for learners at all educational levels, the text proposes specific and targeted studies at different educational levels, such as primary and secondary education. It also suggests broadening the scope of disciplines or subjects to be studied to increase the diversity and comprehensiveness of the data used for analysis. Moreover, it highlights the potential benefits of analyzing research works that demonstrate similarities and differences in information literacy within the ASEAN region. To improve the richness and inclusivity of information literacy in research articles, ensuring a comprehensive and diverse understanding of the subject matter.

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