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# Higher Education students' perceptions towards Information Literacy: a study in Macau

*Percepciones de los estudiantes de educación superior sobre la alfabetización informacional: un estudio en Macau*

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## Resumen

Integrar la alfabetización informacional en el aprendizaje mejora el rendimiento de los estudiantes y, por ello, los bibliotecarios académicos pueden desempeñar un papel importante colaborando en el diseño y formación de programas en estas áreas. En Macao, no se conoce ningún estudio sobre el desempeño en alfabetización informacional de los estudiantes de enseñanza superior, por lo que buscamos realizar un diagnóstico. Para ello, se aplicó una encuesta a estudiantes de enseñanza superior para evaluar la percepción de los estudiantes sobre la alfabetización informacional y su auto-caracterización en relación al uso de recursos y el tipo de habilidades necesarias para el trabajo académico. También se realizó una entrevista semiestructurada a profesores al respecto. Los estudiantes se perciben a sí mismos con un bajo nivel de confianza en el desempeño de sus tareas académicas, lo que afecta a su desempeño. Los profesores se alinean con este diagnóstico, revelando las debilidades de los estudiantes en la búsqueda y presentación de la información. En general, las necesidades de información son evidentes entre los estudiantes, así como el uso de recursos de información preferidos en la realización de sus estudios. La formación dirigida a los estudiantes en la búsqueda, recuperación, análisis y uso de la información parece ser esencial, por lo que se prevé la construcción de un programa de formación a medida en Alfabetización Informacional.

**Palabras clave:** Alfabetización informacional. Educación superior. Aprendizaje. Habilidades informacionales. Estudiantes. Macao.

## 1. Introduction

Information literacy (IL) is the set of skills associated with research and information management that the students, particularly university students, need to prepare for their research and academic studies (ACRL, 2015). Despite the increased availability of information online, college students need to possess the self-discipline to succeed in a more autonomous learning environment. Otherwise, they will struggle to efficiently and rapidly acquire information and skills. Incorporating IL

## Abstract

Integrating information literacy into learning improves student performance and, for that reason, academic librarians can play a significant role by collaborating in the design and training programs in these areas. In Macao, there is no known study on the information literacy performance of higher education students, so we seek to diagnose this area. For that purpose, a survey was applied to higher education students to assess students' perception of information literacy and their self-characterization regarding the use of resources and the type of skills needed for academic work. A semi-structured interview was also carried out with teachers about the same reality. Students perceive themselves to have a low level of confidence in the performance of their academic tasks, which affects their fulfilment. Faculty are aligned with this diagnosis, revealing the students' weaknesses in the information search and presentation. Overall, information needs are evident among students as also is the use of preferred information resources in pursuit of their studies. The training aimed at students in search, retrieval, analysis, and use of information seems to be essential, which is why the construction of a tailor-made training program in Information Literacy is anticipated.

**Keywords:** Information literacy. Higher education. Learning. Information skills. Students. Macao.

instruction is a common practice for academic libraries, but some libraries prefer passive learning methods such as one-off sessions or workshops due to time and staffing limitations (Detlor et al., 2012). University of Saint Joseph (USJ) has offered independent IL instruction for students since 2015, accepting individual requests or in-class workshops. The main goals, as in other experiences (Belluzo, 2018), are to teach them to access and use information and library resources and enhance their research skills. Previous studies have shown librarians intend to develop

holistic research skills with students while their responsibility transforms from typical knowledge dissemination to collection navigation, and creates a close research interaction with patrons (Dixon, 2017, Oakleaf, 2009; Popham, 2003). This educational approach adopted by teaching students how to deal with an enormous amount of information, addresses information anxiety in their learning journey, and improves their long-term work competitiveness and well-being (Jan et al., 2020; Naveed et al., 2023; Xiao Ximing et al., 2008). A previous study has revealed a positive impact on students' self-efficacy (confidence and competencies) through information activities in IL over time (Naveed and Mahmood, 2022). Other study indicates that active learning leads to more positive student outcome compared to traditional passive approaches, regardless of the amount of active IL received (Detlor et al., 2012).

After the long-term operation of IL instruction at USJ, the head librarian concluded the limitations of the current structure. These include:

1. Staffing limitations: only one trainer is available for all students, including undergraduates and postgraduates.
2. Comprehension skills: during in-class workshops, the trainer may not be able to reach all students. Some students may only have a brief understanding of the concept and forget everything quickly.
3. Flexibility: students are required to either attend the class on-site or wait online for the librarian to respond during office closures.

The learning model of IL is dynamic. Nowadays, context combines libraries, research, and information technologies, promoting new social and behavioral structures and requiring different skills and competences to deal with the impacts and challenges that result from them (Belluzo and Rossetto, 2021). Bruce (2003, 2004) proposes a vision articulated around three axes: information literacy, training in information literacy, and investigation, deepened by arguments that information literacy is the sum of the different ways of experiencing information, proposing a relational approach, in which one starts by describing the phenomenon from the point of view of which one must experience and not just receive a set of skills demonstrating compliance with requirements (behavioral approach to information) or even whose emphasis is placed on building knowledge from mastery of a theme, as is done in the problem-solving approach' (constructivist). In this sense, training in information literacy aims to help learners change or expand their repertoire of experiences with information. Several case studies have shown the transformation of IL

instruction in the flexible learning strategy. 42 top-tier Chinese university libraries offer online mini-courses for single topics, virtual meetings, and recorded videos into a hybrid learning model, also the module on MOOC or popular social media platforms (Guo and Huang, 2021; Huang et al., 2016). Similar case studies from Western Countries adapt the IL instructions in Google Classroom (Ayu Dewi et al., 2022; Pinto et al., 2020). Additionally, librarians have observed that students have difficulty concentrating during lengthy courses. Instead, librarians have adapted by offering more mini-courses in recent years. Drive-by BI, a library liaison program at Texas A&M University, where librarians provide 15 minutes in-class overview of library resources and services to instructors in liberal arts classes (Arant-Kaspar and Benefiel, 2008). An online course adapted in the University of West Georgia called LibraryDens, which was designed as mini courses into eight modules covering topics such as starting research, finding resources, evaluating, citing, library policies for interlibrary loan and off-campus access (Croft and Barnhart, 2022). Additionally, the modules requested a pre-test and pro-test for students' self-assessment.

Librarians are looking for ways to reform the information literacy curriculum. Oakleaf and Kaske contributed a set of questions to guide librarians on the goals, value, mission and core of IL instruction (Oakleaf and Kaske, 2009). Besides, the *Framework for Information Literacy for Higher Education (Framework)* and *Information Literacy Competency Standards for Higher Education (Standard)* have important implications for IL curriculum planning. The framework provides six frames and a subset of knowledge practices and dispositions in each frame, as well as recommendations for librarians to implement the framework (Association of College and Research Libraries, 2015). The standards, which serve as references for the framework, are an earlier document with five standards and 22 indicators (American Library Association, 2000). Meanwhile, the document is complex and relatively broad in its concepts, making it challenging for librarians in their initial approaches. Nevertheless, some authors developed instruments to measure student self-perceptions of information literacy skills (Gross and Latham, 2009; Fisher, 2017; Foster, Doyle, Yukhymenko, 2018) to address the difficulty for librarians better when designing graduate student IL instruction (Doyle, Foster, Yukhymenko, 2019; Wang and Weiner, 2014), proving that these strategies are helpful for outreach, instruction design, and assessment activities. This tool for student assessment' named *Student Perceptions of Information Literacy Skills (PILS)*, was developed

based on ACRL Framework (2015) to provide information for curriculum planning.

Before developing an IL training strategy, professionals should verify the real needs of students (Julien et al., 2020; Weightman et al., 2017; Winkler and Kizil, 2020). Given this context, the purpose of this investigation is to collect data on the information literacy profile of USJ students and analyse how librarians plan their IL curriculum (1).

## 2. Methods

A mixed-method methodology is used to diagnose student IL profiles at USJ. A questionnaire is administered to university students to assess their perception of learning different types of resources and concepts in IL. Additionally, teachers are interviewed as privileged informants to provide complementary insight into the application of resources in their teaching modules.

### 2.1. Survey

This questionnaire consists of closed questions divided into three themes. The first part aims to understand how students perceive the use of information in studying and learning, including their perception of the type of work, assessment, and research skills required by their teachers, as well as their self-perception of their proficiency level in research. The second part seeks to identify which types of information sources students prefer and which ones they feel most comfortable with, including Wikipedia, websites, social networks, or library resources. Finally, the third part asks students about their familiarity with some terms associated with information research and academic work.

The questionnaire was distributed to active students with valid enrolment, and a total of 73 responses were collected, including sixty-seven undergraduates, five graduates, and one doctoral student. All but one survey was validated. The questionnaires were collected in person during the last quarter of the year 2022, and sociodemographic data was collected in the first part, such as age group, gender, and year attended. The second and the third consisted of 30 detailed questions to assess students' self-assessment of their IL skills and their use and understanding of the most common resource typologies. The answers were compiled in Microsoft Excel and translated into numerical responses (1, 2, 3, 4, 5) in the order they were answered. A selection of the main results was aggregated to be displayed in graph form.

### 2.2. Semi-structured interview

To gain insight into student information literacy, we conducted semi-structured interviews with three teachers from different subject areas. Due to a local epidemic, the interviews were conducted online. The interviewees shared their observations about practical skills expected of students, their familiarity with librarians, and other relevant information.

The semi-structured interview questions were as follows:

1. Do you require your student to use legal/official/governmental sources in your assignments?
2. Do you find any information-searching problems among your students?
3. Does your student understand how to credit the work in the right format?
4. Do you clearly understand the 'Information Literacy' concept when librarians talk about this?
5. Have you joined the library workshop before?
6. Have you requested your students join the library workshop before?
7. What can the library do to improve the content?

A qualitative method was developed to analyze perspectives and discrepancies among students, professors, and librarians regarding information literacy programs. The method involved selecting academic teachers to be interviewed, determining their interests, sending an invitation email, and conducting a content analysis of the responses.

## 3. Results and discussion

The results obtained from analysing both the student surveys and the content of the semi-structured interviews are presented, followed by a discussion of the findings.

### 3.1. Survey

In the first set of questions, respondents answered topics related to their academic practices (need to develop written work, type of written work, feeling about written work). From the sample of 72 students, 89% of respondents admitted to having written tasks every semester. However, when asked: "How do you feel when you need to start an academic task?" their confidence in starting some activity seems fragile (Figure 1). Thus, 17 respondents indicated that they felt able to handle the tasks with confidence, 27 respondents mentioned that they felt anxious but were able to

manage it, 16 said that they did not know how to get started, and 12 respondents indicated that they did not feel anything in particular towards academic work.

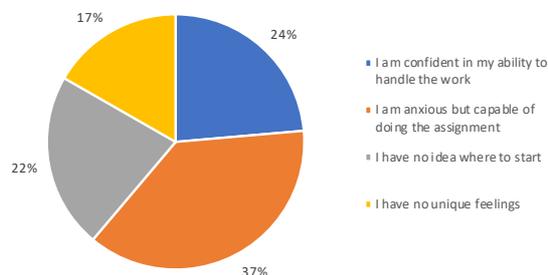


Figure 1. Feelings facing academic work

These results reveal a low confidence level in student performance, particularly at the start of the written assignments. This can be due to reasons such as 1) lack of understanding of the subject or topic and inability to understand the basic requirements of the assignment; 2) lack of understanding of using accurate combinations of research and data sources to support academic work, resulting in time constraints; or 3) lack of proficiency in the language of instruction (English), which affects writing, resulting in the inability of students to complete writing projects, as many are Chinese and their mother tongue is not the same as that is required in an academic environment.

Faced with these challenges, the librarian can only intervene to respond to the second hypothesis, contributing to the development of students' basic skills in information literacy and an introduction to library resources.

Another issue was related to the autonomous construction of competencies. Students were asked how have they been trying to develop research skills.

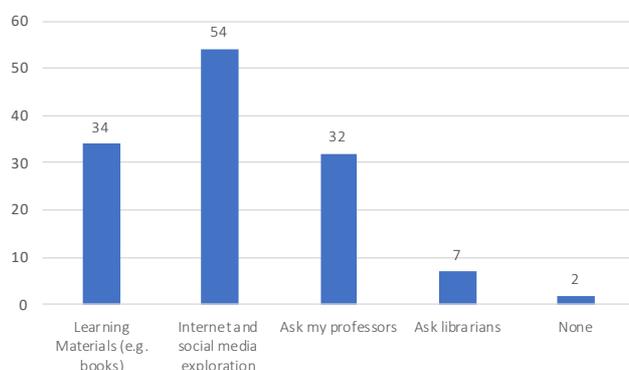


Figure 2. Ways to develop research skills

It can be seen (Figure 2) that the internet plays an essential role in students' skills development, although books or other study materials, as well as teachers, are two important options for this purpose. However, few are those who claim to use librarians. Therefore, about 42% of respondents indicated using the Internet and social networks to improve their research skills, while 25% said they consulted their professors, and only 5% said they consulted a library.

Next, students were asked what sources they usually choose for their academic work. The four frequently used sources for research were Wikipedia, Internet sites, libraries, and social networks, evidenced in the declared research behaviour of students. Wikipedia scored the highest for preferred knowledge discovery channels, while social media scored the lowest (Figure 3).

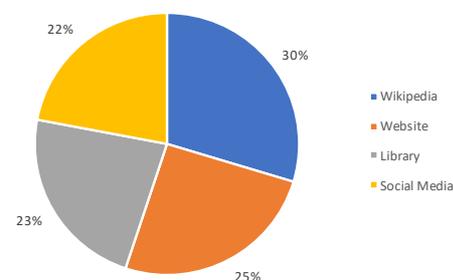


Figure 3. Information Sources Preferences

Concerning Wikipedia, 30% of respondents preferred it as a source of information, with the majority finding it easy to find relevant content. In this sequence, 39% stated that they used Wikipedia data in their work, and more than 60% of respondents were aware of the list of references, while 8% never observed it. A total of 27% of respondents indicated that they did not understand or had never noticed that any registered user could edit and alter the content of this information source.

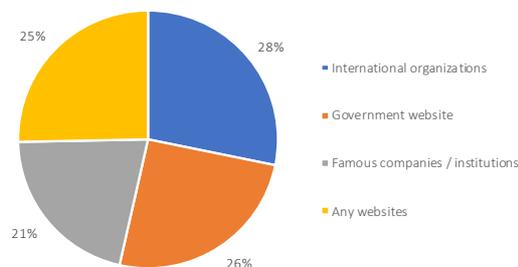


Figure 4. Information acquisition channels

As for the Internet, 30% of respondents used this resource as a source of information, and most considered it the simplest way to start a search. Respondents ranked international organizations, government websites, well-known companies or organizations, and any websites based on their usage habits, with the results ranked (highest to lowest) as follows: international organizations, government websites, any well-known web pages, companies, or organizations (Figure 4). 65% of respondents agreed that they would examine the type of site before reading its content, and 52% would not use it even if there is data relevant to their work.

Social media seems to become an emerging source of information, as 22% of those declare to use it as a frequent search resource. Respondents ranked Facebook, Instagram, Weibo, mobile app(s), and blogs based on their usage behaviours, with results ranked from highest to lowest (Figure 5) as follows: Facebook, Instagram, mobile app(s), Blogs, and Weibo (the same percentage of results). 47% of respondents said they were most interested in the accounts of well-known people or organizations; 10% of respondents stated that they used to send messages daily, while 45% sent messages 1-2 times a week, with 69% of them examining the content before sending.

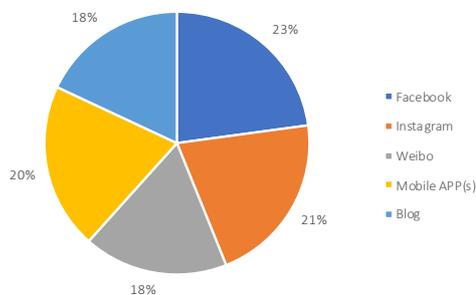


Figure 5. Social networks' use

Similar attitudes towards library use were echoed by respondents, as 32% stated that library resources were simpler to search, 34% affirmed that it was simple to discover relevant material, and 34% declared that libraries were not a conduit for preferred search. Unexpectedly, 52% of respondents never visited the university library or other libraries frequently, and only 4% of respondents visited libraries regularly. 54% of respondents indicated the space and book collection as the main reason for using the library, while 23% used libraries for research. E-books and traditional books were the most accessed library resources, with 22% and 21%, respectively,

followed by 12% for periodicals, 11% for encyclopedias, and 7% for dissertations. Additionally, 40% of respondents stated that they had never attended a library workshop, 14% had attended orientation sessions, 11% had assisted independent training, and 35% had been enrolled in an induction workshop (1st year, 1st time).

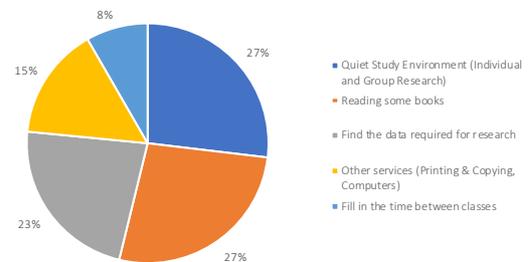


Figure 6. Objective of using the library

In the last section of the survey, an attempt was made to assess students' use and understanding of the most common types of resources.

Given five expressions related to the informational context, students were asked to evaluate their knowledge about each one. The comprehension of each that can be seen by the synthesis of responses in the following table (Table I) reveals that respondents have a moderate understanding of the concepts of citation and plagiarism and understand the research concepts. Nevertheless, they declare some difficulty in understanding more specific concepts, such as boolean operators, which are essential to perform an advanced search.

	Simple search	Boolean search	Advance search	Citation	Plagiarism
Never heard	15%	43%	18%	12%	9%
Not Fully understand	33%	48%	43%	30%	27%
Completely understand	52%	9%	39%	58%	64%

Table I. Commonly used terms (information context)

Additionally, 90% of respondents said teachers require literature citations, 76% say they learned

citation methods in class and 73% use reference management software in their academic work.

Finally, given the information needed for academic tasks and about mastering research skills, 10% of respondents believe they are qualified researchers, 14% believe that they do not have research skills, and 39% and 27% believe they have basic research skills and will be able to complete their studies, while 10% believe they have strong research skills.

The results reflect a discrepancy between the initial perception of the study authors (and their expectations) and the student's self-assessment of their declared abilities, with just 14% of students self-assessing themselves as completely unskilled and only a few choices to consult a librarian if they have any questions.

The results also reveal that the influence and presence of the library are weak in the face of the universe of information available to students, that the relationship between students and the library is based mainly on the use of space, that messages from the library do not reach the users effectively and that librarians, students, and teachers fail to establish a cooperative relationship. Therefore, although librarians already dedicate lots of time and effort into IL training, the results are disappointing and fall short of librarians' expectations. These results are consistent with previous studies (Al-Aufi et al., 2017; Kim and Shumaker, 2015; Prasetyawan et al., 2021) whose conclusions point in the same direction: there are different perceptions among the various stakeholders in academia (librarians, teachers, students) about the search for information, the self-assessment of their skills, and on needs expressed or felt about academic work and the consequent need to deal with or manage information.

Nevertheless, they all point toward developing, implementing, and maintaining information literacy training programs in a structured and regular manner. This will help students to reach a more appropriate level of knowledge in information literacy, helping to stimulate and develop research skills while making them more autonomous in their academic path.

### 3. 2. Interviews

Teachers recognize the library's role in information research but do not objectively reveal, as a requirement for the requested academic work, an integration of the information sources to be used. The systematized ideas allow us to question: whether teachers know the importance of information sources to support academic work, so why do not consider requesting evidence of their

use? Perhaps additional work is needed to raise awareness of the appropriate use of information and clarify the sources available in the library.

The interviews revealed that the types of materials students required varied greatly from different departments. For instance, the student of Professor A in the performing art specializations was required to collect government data and produce graphical reports. Yet, they had less necessity to locate academic literature, less or no opportunity to practice good information searching, and were relatively unfamiliar with citation formats. Students of Professor B were more likely to be from the business and legal professions, and they were required to utilize legal, official, and government information. Yet, they did not always clearly understand information-seeking and citation forms.

Finally, both Professor A and Professor B attended library workshops. Professor A indicated she had a clear understanding of the concept of library information literacy, but did not believe that it was the most important thing for students at the undergraduate level since the department does not have many writing requirements or required writing-based assignments such as term papers.

On behalf of the interviewer question, a supplemental note from Professor A was added for never receiving instruction about interlibrary loans and document delivery service. Regarding the search steps on the library website, sometimes she prefers to access the internet quickly and conveniently. Professor B indicated that he had not had the opportunity to discuss the importance of library information literacy with his students.

Additionally, it should be considered a dynamic communication channel and platform. The study with actual users presents the apparent gap between the library and users for information spreading. A question was brought about whether the new IL program could fill up the hole with actual practice.

## 4. Conclusions

This is the first investigation of student perceptions of their information literacy skills at the USJ Library in PAR research. A survey was administered to audiences from in-class workshops and walk-in readers. The researcher in charge expected to interact more closely with interviewees and adapted the print survey for this initial investigation. However, compared with electronic questionnaires, interviewees are prone to misunderstand the questions and provided incorrect responses, such as multiple answers to a single question and blank answers. As consequence of the reflection on results, the research should

include a multi-person test for a larger group to ensure a set of reasonable and easy-to-understand questions.

Furthermore, the print survey will be restricted to those audiences who attend the workshops or individual training. As an initial investigation, a digital survey may reach more students on campus. The researcher in charge chose to convert the data directly into codes according to the order of answers and produced analysis charts.

The collected results demonstrate students' perceptions of their information needs and preferred information resources in their studies. Most students experience information anxiety due to their information skills and concerns about their learning journey. Yet, only a small group of students have asked their professors or librarians to enhance their search skills. Compared to library resources, students prefer to search through the internet, Wikipedia, and social media, due to their easy-to-use and quick-answer features. Most interviewees have difficulty with library resources as they do not have easy access to what they need. Librarians should consider improving the directory of library resources, simplifying the library guidelines or videos, and creating pop-up reference stations on campus.

Another finding is the actual communication gap between libraries and their patrons. The results found that most students are not aware of the training programs offered by the library or have never attended any library session before. It seems that librarians need to consider the strategy of information distribution to the audiences and maintain a more active dialogue with both teachers and students.

As more university libraries adopt the IL curriculum in hybrid or online formats, librarians should consider the possibility of a new teaching model to expand their audience. However, it is currently unknown whether this model would be accepted based on the results of a recent survey. Thus, further investigation into the students' interests may be necessary for this research.

According to the literature review, designing tailor-made training programs results in greater student involvement and a better understanding of information. The objective of building a comprehensive information literacy program in the library is to assist students in acquiring various resource access abilities, encouraging more students to gain fundamental academic research skills, and cultivating active learning behaviours and proactive thinking. When universities lack an IL teaching plan, it is difficult for students to integrate fragmented knowledge and skills into their work and they may lose long-term motivation, especially newcomers.

Librarians understand these circumstances and can collaborate decisively to transform conceptual work into a more complete, comprehensive educational, and pedagogical plan.

## Notes

- (1) This study stems from the Doctoral Programme in Education (School of Education, University of Saint Joseph, Macau).

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