Students' perceptions of Information Literacy skills: new perspectives trough a Portuguese experience with PILS

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Abstract. The modern information ecosystem poses significant challenges due to the vast and rapid production of information across diverse media. Distinguishing accurate information from misinformation and disinformation is increasingly critical, necessitating proactive measures such as education campaigns and public awareness initiatives. The literature underscores the importance of enhancing critical thinking skills and the ability to evaluate information sources to empower citizenship, individual autonomy, and creativity. Policymakers are urged to prioritize these goals, advocating for the training of proactive critical thinkers through validated strategies for information literacy (IL). Academic libraries have shown commitment to combating disinformation, though deeper research is needed. This study investigates academic students' perceptions of their IL, utilizing the PILS scale, adapted into European Portuguese. Findings emphasize the relevance of IL skills to address disinformation, offering valuable recommendations for teaching and academic library practices, particularly within the Portuguese higher education context.

Keywords: Information literacy, disinformation, PILS, academic students, perception, assessment, Portugal.

1 Introduction

1.1 Information Literacy and ACRL

Students are expected to develop foundational skills during their academic journey that will be crucial for their professional lives. These competencies include proficiency in new technologies, effective verbal and written communication, analytical and synthesis capabilities, critical thinking, the ability to work independently and collaboratively,

integration into multidisciplinary teams, a focus on quality, leadership potential, and other related skills. Achieving competence in information literacy (IL) is also considered essential, as it serves as a fundamental skill enabling students to access, process, evaluate, and communicate relevant information within their specialized field in a precise and effective manner, utilizing appropriate information sources [1, 2]. Higher education increasingly emphasises fostering information management skills for students, particularly related to the digital context. This includes searching, evaluating, processing, and communicating information effectively. Additionally, increasing prevalence of disinformation requires proactive measures, including public awareness campaigns and widespread education. The literature emphasizes the need to improve individuals' ability to evaluate information sources, foster critical thinking to combat disinformation and strengthen citizenship, individual autonomy, and creative potential. It also calls on policymakers to prioritize these objectives in their agendas, advocating the training of proactive critical thinkers through validated IL strategies.

The revised definition by the CILIP IL Group [3] offers a profound perspective: IL is the ability to critically evaluate and make informed judgements about information encountered, enabling active citizenship and social engagement. It intersects with other literacies, such as digital, academic, and media literacy, and is aligned with the reflective practices emphasised in the ACRL Information Literacy Framework for Higher Education [4]. IL drives a theoretical and practical construct, equipping students with meaningful skills to deal with information effectively. For years, information professionals have used frameworks to integrate IL into academic curricula. While these skills were traditionally measured through performance indicators, changing educational paradigms now require a more holistic application. Consequently, librarians are adopting flexible strategies to incorporate IL into their pedagogical practices. The main distinction with the past lies in the shift toward a more philosophical interpretation of limit concepts. These overarching ideas provide a foundational understanding and promote discipline-specific ways of thinking and practising. This perspective emphasises the reasons behind the use of information rather than the surface of its application. Consequently, the teaching and learning of threshold concepts must focus on the student experience. Information professionals are increasingly attuned to teaching methodologies, assuming their roles as educators-trainers in response to an evolving world [5, 6]. Its focus on student-centred education drives investments in digital libraries, databases, and repositories, promoting critical thinking and the reinterpretation of resources. By facilitating access to diverse sources, libraries empower students to engage and create complex ideas [7].

Another significant difference arises in the change from task-oriented learning objectives (e.g., accessing or critically evaluating information) to a framework comprising interconnected core concepts or frames. These frameworks, which are broadly applicable across academic disciplines, include: Authority is constructed and contextual; Information creation as a process; Information has value; Inquiry as inquiry; Scholarship as conversation; Research as strategic exploration. Each frame incorporates a knowledge practice section, illustrating how mastery of the concept can lead to its application in new contexts and contribute to knowledge creation. Furthermore, the Framework [4] identifies dispositions, reflecting students' preferences and attitudes towards learning. Information professionals are encouraged to explore these underlying concepts beyond mechanical tasks such as locating or citing information. This deeper understanding prepares students

to engage critically and meaningfully with information, fostering a reflective approach to IL and its role in academic and broader contexts [8, 9].

The Framework's core concepts provide a basis for organising information, research, and academic development ideas. These conceptual elements align with curricula while transcending disciplinary boundaries, expanding approaches and uses of information in academic contexts. The objectives can, therefore, correspond to multifaceted students, with different methods and strategies of understanding. Understanding enables individuals to explain and interpret phenomena, apply knowledge, view concepts critically, and develop self-awareness.

The Framework recognises IL as a social process, positioning students as active participants in learning. Going beyond competencies, the Framework adopts a social constructivist approach, emphasising social and political dimensions of IL. Previous studies [10, 11] highlight the value of introducing the Framework to librarians and educators across campuses to reconfigure knowledge and practices in IL. Given that conceptual focus, these ideas were integrated into learning processes throughout the academic year, rather than briefly covered in introductory sessions, and these implementations showed encouraging results. Adopting the Framework represents an essential evolution, aligning it with modern practices of creating and using information. This is why it has been translated into several languages, including Portuguese [12], and why discussions about IL training have been reinvigorated, with new perspectives and energy being injected into the field.

1.2 Information Literacy assessment and PILS

The assessment of information skills, particularly among academic students, has long been a topic of interest. Various studies have delved into learning outcomes to understand the mechanisms behind IL and explore ways to intervene in this field [13–16]. Other research has focused on the tools used to measure student performance [17–20]. Additionally, some authors emphasise the significance of evaluating the results obtained, reflecting on the learning process related to IL and the areas being assessed. This approach provides valuable insights for a deeper understanding of how the subject is studied [21–23]. Across all these studies, a shared concern emerges: identifying strategies to develop students' information skills based on assessing their current abilities.

The ACRL Framework adopts a pedagogical perspective that emphasises the social context of information, recognising it as a dynamic and multifaceted phenomenon. In higher education, this approach shifts the focus to the roles and responsibilities of students, educators, and librarians. Students are empowered with greater autonomy to access and use information, while educators are tasked with designing curricula that integrate core IL concepts within academic disciplines. Librarians are responsible for creating innovative programs and strategies to deepen student engagement with IL by fostering collaboration between students and faculty [10, 24–26]. However, from an assessment perspective, the Framework emphasises a holistic approach, encouraging a reassessment of the way students' IL skills are measured and how this can be done [8, 9, 26–30]. These dimensions must guide the design of learning assessments in varied contexts, as described by ACRL. Assessment methods should be aligned with the principles of the Framework, incorporating reflective practices, collaborative learning opportunities and project-based assessments. These strategies focus not only on technical

skills, such as locating and citing information, but also on critical thinking, adaptability, and the ability to engage with information in broader academic and social contexts. This approach ensures that assessment reflects the transformative potential of the Framework and prepares students effectively to navigate complex information landscapes.

The Student Perceptions of Information Literacy Skills scale [PILS] [31–33] has proven an appropriate way to learn about students' IL perceptions. Therefore, it was the instrument chosen in this study. The PILS scale assesses individuals' self-assessed IL skills, from beginners to experts. Within the Framework, the knowledge practices and dispositions of novice and expert researchers are studied concerning each other. This approach reflects the developmental nature of IL, which grows through greater understanding and prior experience rather than a binary measure of proficiency. As explained by the authors, for example, the "Authority is constructed and contextual" concept highlights the differences between novices and experts. Experts identify authoritative voices while considering unconventional sources as potentially reliable, depending on the context. In contrast, novice researchers often rely on basic indicators of authority, such as the type of publication or the author's credentials. Beginning researchers are often advised to use academic sources or websites from trusted domains (.gov, .edu), which are useful entry points for learning how to evaluate information. However, advanced researchers must apply IL skills in specific contexts and disciplines, adapting their assessment strategies to situational needs. This developmental perspective highlights the importance of differentiated and context-sensitive IL practices.

This study aims to explore students' perceived ability to navigate information and disinformation, drawing on the ACRL Framework [4]. It also examines university students' perceptions of their IL skills using the Student Perceptions of Information Literacy Skills (PILS) scale [31–33], and focuses on adapting PILS for the Portuguese context. In addition to translation and linguistic adaptation, the study analyzes key metric properties of the scale applied to first-year university students as they transition into higher education.

2 Methods

2.1 Participants

Following the approach of the scale's authors, we selected an exploratory sample of first-year psychology students (N=100) from ISPA-Instituto Universitário (Lisbon, Portugal) and UTAD (Universidade de Trás-os-Montes e Alto Douro), who completed the questionnaire. The sample consisted of 80 women (80%), with a mean age of M=21.94 (range 17–52 years), and 20 men (20%), with a mean age of M=21.91 (range 18–41 years). Seventy per cent of the sample were students aged 17–20.

2.2 Procedures and data collection

We would like to express our gratitude to the authors for giving us permission to adapt and validate the PILS scale in Portuguese. We followed a process similar to that of the authors [34, 35]. The translation process was carried out in accordance with the standard

procedures, with experts in both Portuguese and English. Where the original term could be translated into Portuguese in several ways, we requested that all translations be retained. The translation was then discussed among Portuguese psychologists and information professionals who are proficient in English and familiar with affect assessment models. The aim was to confirm the content validity of the items (see Annex A).

The students were contacted after authorisation was obtained from the university and the professors. At the start of classes, the professors were asked to set aside the last fifteen minutes for the students to do the scale. At that time, students were informed about the objectives of the study, assured of anonymity and confidentiality, and that their participation was voluntary.

The researchers emphasised that their involvement was essential for the study's success and that those who showed interest would be granted access to the final results. The survey was to be completed online, either on a computer or a mobile phone, and the teaching staff of the degrees involved were available to provide support. Subsequently, the information was entered into the general database. A total of 100 valid surveys were obtained. Technical details of the sample collection: Design: stratified probabilistic sampling by degree and university. Academic year: 2024–25. Collection period: November 2024–November 2025. Methodology: online via computer or mobile phone (QR code).

2.3 Measure

The 36-item PILS was designed to measure the following seven constructs: authority is constructed and contextual (six items); information creation as a process (five items); information has value (five items); research as inquiry (five items); scholarship as conversation (four items); searching as strategic exploration - tools and tasks (six items); and searching as strategic exploration - atitude (five items), based on the Doyle et al. [36]. The response scale was adapted from Dreyfus's five-stage model of adult skill acquisition [34, 35]. Specifically, students had the opportunity to rate their own skill level on a 7-point Likert scale: 1=novice, 2=advanced novice, 3=emerging, 4=advanced emerging, 5=developing, 6=advanced developing, and 7=expert. The questionnaire ended with a brief (and optional) identification of the respondents, which included their gender, age, and level/course.

3 Results

A general overview of the results obtained when applying PILS scale is presented, taking into account its seven dimensions (see Table 1). It is observed that the measures of central tendency (mean) present similar average values just under 5 points on a 1 to 7 scale, and variable dispersion is perceived in the responses.

Table 1. Descriptive results PILS by item

Dimensions of PILS	Mean	Std Dev
Authority Is Constructed and Contextual		
I understand how to select and evaluate authoritative sources to develop credibility for their arguments.	5.02	1.14
I evaluate research ideas and practices to identify potential biases.	4.63	1.40
I feel comfortable with conflicting opinions in research and evaluating the evidence that supports differing perspectives.	5.14	1.24
I recognize that there are many ways to define authority on a topic or in a discipline.	5.21	1.30
I feel comfortable calling myself a researcher, and am confident as an authority on my topic.	3.71	1.57
I value diversity of worldviews and opinions within my discipline.	5.62	1.14
Information Creation as a Process		
I understand how to choose an appropriate format (like a graph, image, text, or video) for communicating information.	4.92	1.43
I know how to use different types of information formats to communicate the same message in different ways.	4.91	1.49
I understand that different information tools (like a research paper, a poster, or a presentation) have their own benefits and limitations.	5.43	1.24
I understand that different types of information have different values or uses, depending on the situation.	5.23	1.33
I enjoy discovering and using new tools for communicating and creating information.	5.05	1.55
Information has Value		
I know how to use the work of others to support my ideas by using proper citation techniques.	5.28	1.30
I can define and know how to use intellectual property laws and copyright.	4.79	1.41
I can define and know how to use fair use and open access resources.	5.04	1.38
I understand that my personal information has value online, and make informed choices to manage my preferences for how this information is used.	5.07	1.47
I feel comfortable as an active creator in the information economy, rather than as a passive consumer.	4.31	1.53
Research as Inquiry		
I can determine the appro riate extent of assigned research projects.	4.90	1.39
I can organize and combine the information I locate into a coherent conclusion.	4.98	1.29
I can develop simple research questions.	4.81	1.48
I can develop critical research questions.	4.44	1.54
I am persistent when seeking information.	5.10	1.38
Scholarship as Conversation		
I understand why I am responsible for citing information I use.	5.84	1.32
I seek out multiple perspectives when developing an understanding of a topic.	5.30	1.18
I critically evaluate the perspectives that I use to develop an understanding of my topic.	5.22	1.27
I recognize my work is a contribution to the body of research surrounding my topic.	4.96	1.36
Searching as Strategic Exploration - Tools and Tasks		
I can define the scope of an assignment.	5.23	1.35
I can create search strategies to locate and collect the information I need.	5.11	1.29
I can identify potential kinds of sources (newspaper, article, laws, policies, statistical data) when searching for information.	5.22	1.33
I can identify the appropriate search tool (search engine, library catalog, database) to use when searching for information.	5.22	1.32
I recognize the ways in which search tools organize information.	5.08	1.44
I can refine the results of a search by using different search terms.	5.12	1.40
Searching as Strategic Exploration - Attitude		
I understand that the first search may not always produce the desired result.	5.68	1.24
I recognize that not all information sources are going to be relevant.	5.70	1.31
I understand that at times I may need to seek assistance when searching for information.	5.71	1.30
I remain persistent when faced with a challenging search.	5.12	1.30
I keep an open mind when searching for resources.	5.44	1.28

Mean scores were computed for the seven subscales by averaging their corresponding items (see Table 2). Mean values ranged from 4.85 to 5.53, showing that, on average, students rated themselves as advanced emerging, developing, and advanced developing users of information. The highest mean scores were on the searching as strategic exploration - attitude and on the scholarship as conversation subscales; whereas the lowest mean scores were on the information has value and on the authority is constructed and contextual subscales.

The scale's reliability of the questionnaire was tested, calculating the Cronbach's

alpha coefficient, overall and for each dimension of PILS. All the values exceed the recommended minimum of 0.7, which indicates a credible level of reliability and internal consistency.

Table 2. Correlations and reliability estimates for the PILS dimensions

	Mean	Std Dev	Cronbach's	PILS Correlations						
Dimensions of PILS			**alpha**	**ACC**	**CIP**	**ITV**	**ICQ**	**CAD**	**SSE-FT**	**SSE-A**
Authority Is Constructed and Contextual (ACC)	4.89	0.98	0.84	1.00	.716**	.730**	.753**	.613**	.678**	.586**
Information Creation as a Process (CIP)	5.11	1.21	0.91	.716**	1.00	.814**	.864**	.722**	.847**	.681**
Information has Value (ITV)	4.90	1.17	0.88	.730**	.814**	1.00	.844**	.717**	.785**	.678**
Research as Inquiry (ICQ)	4.85	1.26	0.93	.753**	.864**	.844**	1.00	.715**	.861**	.709**
Scholarship as Conversation (CAD)	5.33	1.05	0.83	.613**	.722**	.717**	.715**	1.00	.775**	.663**
Searching as Strategic Exploration - Tools and Tasks (SSE-FT)	5.16	1.20	0.94	.678**	.847**	.785**	.861**	.775**	1.00	.747**
Searching as Strategic Exploration - Attitude (SSE-A)	5.53	1.12	0.91	.586**	.681**	.678**	.709**	.663**	.747**	1.00

Regarding content validity, the correlation matrix shows statistically significant positive relationships among the seven PILS dimensions and the general LI facet. These moderate to strong correlations indicate that the variables tend to increase together. The strongest associations are observed between ITV and ICQ, ITV and PEE_FT, and CIP and ICQ. While these results highlight meaningful links, they do not imply causality.

4 Discussion and Practical implications

The ACRL Framework is a crucial resource, guiding educators and information professionals in fostering a reflective approach to IL. It integrates key concepts such as the contextual nature of authority, the evolving process of information creation, the value of information, research as inquiry, knowledge as dialogue, and strategic information searching—encouraging deeper academic engagement. To translate these principles into effective practice, assessing IL competencies is essential. The PILS scale plays a pivotal role, bridging the Framework's theoretical foundations with practical skill evaluation. By measuring students' self-perceived IL proficiency from novice to expert, PILS aligns with the Framework's emphasis on conceptual development and adaptability. Its integration into curricula enhances IL education, equipping students with critical academic and professional skills.

In our research sample, the PILS revealed good internal consistency, with a Cronbach's alpha value of .98. The PILS scale can be used to measure graduate student perceptions of IL, and the results can be used as an outreach tool to create a dialogue between graduate students, faculty, and librarians. When considered in light of students' tendency to overrate their own IL abilities [10], PILS could be particularly useful as a self-reflection tool. The PILS scale was designed to examine discrepancies in how graduate students, faculty, and librarians perceive students' IL abilities. It assesses graduate students' self-perceived IL skills, fostering communication among these groups. Since students often overestimate their proficiency, PILS serves as a valuable self-reflection tool. Librarians can also integrate it with other assessment methods to evaluate IL competency. By tracking changes in students' self-perceptions over time and linking them to concrete evidence of IL application, such as research journals, faculty and librarians gain deeper insights into IL development. While one of the objectives of this

study was to assess the performance of the PILS scale in the Portuguese context, it is equally important to consider what the results reveal about students' perceptions of their IL skills. The analysis suggests that students often rate themselves highly in certain dimensions, particularly source evaluation—while simultaneously showing less confidence or skill in the practical application of IL in academic settings. These findings suggest possible overconfidence in self-assessment and emphasize the value of educational interventions that encourage critical thinking and metacognitive awareness among students regarding their information practices. Future research will analyze PILS implementation on campus, exploring its implications for IL outreach and pedagogy.

5 Conclusions and Recommendations

PILS measures seven distinct constructs of IL and can also capture a general IL factor. This study confirms the subscales' internal consistency, supporting their reliability. PILS enables academic librarians to evaluate students' self-perceptions of IL knowledge and dispositions, aiding outreach, instructional design, and assessment. Although the Portuguese version demonstrates promising psychometric performance, further validation—through expanded samples and additional analyses—is needed to confirm reliability and metric accuracy. A methodological concern raised in this adaptation relates to the scale's cognitive load, as highlighted by one professor: 'It is unrealistic to expect participants to retain the meaning of all seven points in their working memory. Most will likely respond along a continuum from 1 (limited experience) to 7 (extensive experience).' Addressing such challenges will be key to refining the scale for future applications. Continued research and adaptation will help strengthen PILS as a valuable tool for assessing IL in academic settings.

As a future step, we aim to conduct a longitudinal study using the PILS scale across different stages of students' academic paths. This will enable us to track changes in self-perceptions of IL over time, and to determine whether these changes correspond with targeted instructional interventions or increased academic maturity. This study will provide a more comprehensive understanding of IL development, supporting evidence-based improvements in both teaching practices and academic library services.

Acknowledgements. The authors would like to thank the institutions and students (Ispa and UTAD) who made this study possible. This research was supported by National Funds through FCT-Portuguese Foundation for Science and Technology, I.P., under the scope of APPsyCI (Applied Psychology Research Center Capabilities & Inclusion), FCT-UIDB-05299-2020, https://doi.org/10.54499/UIDB/05299/2020, and of UIDEF - Unidade de Investigação e Desenvolvimento em Educação e Formação, UIDB/04107/2020, https://doi.org/10.54499/UIDB/04107/2020.

Annex A

PILS: Original items and their respective Portuguese translation

1. I understand how to select and evaluate authoritative sources to develop credibility for their arguments.
   Compreendo como selecionar e avaliar fontes fidedignas de modo a credibilizar os meus argumentos.

2. I evaluate research ideas and practices to identify potential biases. *Avalio ideias e práticas de investigação para identificar potenciais vieses de informação.*
3. I feel comfortable with conflicting opinions in research and evaluating the evidence that supports differing perspectives. *Sinto-me à vontade com opiniões divergentes em investigação e avalio as evidências que suportam diferentes perspetivas.*
4. I recognize that there are many ways to define authority on a topic or in a discipline. *Reconheço que há muitas formas de definir a autoridade da informação num tópico ou numa disciplina.*
5. I feel comfortable calling myself a researcher and am confident as an authority on my topic. *Sinto-me à vontade para me considerar um potencial investigador e estou confiante enquanto autoridade na minha área.*
6. I value the diversity of worldviews and opinions within my discipline. *Valorizo a diversidade de visões e de opiniões na minha área de estudos.*
7. I understand how to choose an appropriate format (like a graph, image, text, or video) for communicating information. *Sei como escolher um formato adequado (como um gráfico, uma imagem, um texto ou um vídeo) para comunicar informação.*
8. I know how to use different types of information formats to communicate the same message in different ways. *Sei como utilizar diferentes formatos de informação para comunicar a mesma mensagem de formas diferentes*.
9. I understand that different information tools (like research papers, a poster, or a presentation) have their own benefits and limitations. *Compreendo que diferentes suportes de informação (como um artigo, um póster ou uma apresentação) têm as suas próprias vantagens e limitações.*
10. I understand that different types of information have different values or uses, depending on the situation. *Compreendo que diferentes tipos de informação (legislação, guidelines, dissertações) têm diferentes valores ou utilização, dependendo da situação.*
11. I enjoy discovering and using new tools for communicating and creating information. *Gosto de descobrir e utilizar novas ferramentas para comunicar e criar informação.*
12. I know how to use the work of others to support my ideas by using proper citation techniques. *Sei como usar o trabalho de outrem para apoiar as minhas ideias, utilizando técnicas de citação adequadas.*
13. I can define and know how to use intellectual property laws and copyright. *Sou capaz de definir e utilizar a legislação da propriedade intelectual e dos direitos de autor.*
14. I can define and know how to use fair use and open access resources. *Sou capaz de definir e utilizar recursos de acesso aberto de forma correta.*
15. I understand that my personal information is valuable online and make informed choices to manage my preferences for how this information is used. *Compreendo que a minha informação pessoal tem valor na Internet e faço escolhas informadas para gerir as minhas preferências quanto à forma como essa informação pode ser utilizada.*
16. I feel comfortable as an active creator in the information economy, rather than as a passive consumer. *Sinto-me à vontade enquanto produtor de informação, em vez de ser um consumidor passivo.*
17. I can determine the appropriate extent of assigned research projects. *Sou capaz de identificar as características de cada projeto académico que me é atribuído.*
18. I can organize and combine the information I locate into a coherent conclusion. *Sou capaz de organizar e combinar a informação que recupero numa conclusão coerente.*
19. I can develop simple research questions. *Sou capaz de elaborar perguntas simples investigação.*
20. I can develop critical research questions. *Sou capaz de elaborar questões críticas de investigação.*
21. I am persistent when seeking information. *Sou persistente na pesquisa de informação.*
22. I understand why I am responsible for citing information I use. *Compreendo que devo ser responsável por citar a informação que utilizo.*
23. I seek out multiple perspectives when developing an understanding of a topic. *Procuro múltiplas perspetivas quando desenvolvo a compreensão de um tema.*
24. I critically evaluate the perspectives that I use to develop an understanding of my topic. *Avalio criticamente as perspetivas que utilizo para desenvolver a compreensão do meu tema.*
25. I recognize my work is a contribution to the body of research surrounding my topic. *Reconheço que o meu trabalho é um contributo para a investigação da minha área de estudos.*

26. I can define the scope of an assignment. *Sou capaz de definir o propósito de uma tarefa.*

27. I can create search strategies to locate and collect the information I need. *Sou capaz de criar estratégias de pesquisa para recuperar a informação de que necessito.*

28. I can identify potential kinds of sources (newspaper, article, laws, policies, statistical data) when searching for information. *Sou capaz de identificar potenciais tipos de fonte (revistas, artigos, legislação, relatórios, dados estatísticos) quando pesquiso informação.*

29. I can identify the appropriate search tool (search engine, library catalog, database) to use when searching for information. *Sou capaz de identificar a ferramenta de pesquisa adequada (motor de pesquisa, catálogo da biblioteca, base de dados) para pesquisar informação.*

30. I recognize the ways in which search tools organize information. *Reconheço a forma como as ferramentas de pesquisa (bases de dados, blogues, Wikipédia) organizam a informação.*

31. I can refine the results of a search by using different search terms. *Sou capaz de refinar os resultados de uma pesquisa utilizando diferentes termos de pesquisa.*

32. I understand that the first search may not always produce the desired result. *Compreendo que a primeira pesquisa pode nem sempre produzir o resultado desejado.*

33. I recognize that not all information sources are going to be relevant. *Reconheço que nem todas as fontes de informação serão relevantes.*

34. I understand that at times I may need to seek assistance when searching for information. *Compreendo que, por vezes, posso precisar de pedir ajuda na pesquisa de informação.*

35. I remain persistent when faced with a challenging search. *Mantenho-me persistente quando confrontado com uma pesquisa difícil.*

36. I keep an open mind when searching for resources. *Mantenho uma mente aberta quando pesquiso nos recursos de informação.*

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