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Enhancing students' professional information literacy: Collaboratively designing an online learning module and reflective assessments

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Abstract

Creating information literate students and future employees is an expected outcome of a tertiary education. This paper shares insights from a successful collaboration between an academic and three university librarians to create an online learning module designed to develop students' professional information literacy capability: identifying business information types, searching online databases, and evaluating quality using a new indigenous-informed evaluation approach. Student learning was measured using reflective tasks and assessments. The paper challenges teachers and librarians to consider ways they can collaborate to explicitly embed information literacy (IL) skills development into large disciplinary courses, particularly during the transition into tertiary learning, to enhance lifelong learning capability and meet future workplace IL demands.

Keywords

Aotearoa; business education; business students; critical thinking; information literacy; internet search skills; learning development; New Zealand; pedagogy; professional development

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1. Introduction

In the digital age and knowledge society, students must become creative and critical information users. As students are immersed in an information rich environment and learning contexts where self-accessing information is the expectation (Hosek & Titsworth, 2016), developing information evaluation capability is an important element of any tertiary students' learning journey. A strong theme emerging from the literature in the United States, the United Kingdom, Australia and New Zealand is that information literacy (IL) is a crucial – not optional – aspect of learning how to learn (Association of College and Research Libraries [ACRL], 2015; Bruce, 2008; Martin, 2013; Secker & Coonan, 2013). Becoming information literate is akin to learning the norms, behaviours, values, and knowledge of a new culture, and it is a profound educational

and professional issue in the era of globalisation, technological advancement, consumerism and democratisation supported by a knowledge-based economy (Hepworth, 2007). Thus, IL is not only important in educational contexts: it is a recognised attribute for employability (Inskip, 2014). Employers expect to see information literate graduates who can access, manage, create and communicate information effectively (Katz, et al., 2010; Head, 2012). It stands to reason, then, that efforts to create information literate students should also consider the workplace contexts we are preparing them for and identify key differences in academic and professional IL demands.

Understanding what workplace IL looks like and how it differs from academic demands is a growing body of IL research emerging since the mid-2000s following the sharing of Bruce's (1999) Seven Faces of Workplace Information Literacy model. This model challenged the idea that IL skills were generic and transferable. Lloyd (2005) recognised that the academic understanding of IL was so dominant that other experiences of it struggled to be understood. Her subsequent work (2006, 2007) reframed IL as a context-based phenomenon, that should be "understood as a socially and culturally influenced process and practice, shaped by the situated nature of interaction between people and through embodied experience in specific information experience in specific information landscapes" (Lloyd, 2006, p. 579). Using quantitative data from an occupational information database, Klusek and Bornstein (2006) correlated ACRL (2000) IL standards with employers' job specifications and found IL skills were seen as key competencies needed for most jobs in business and finance. This finding supported their philosophy that an individual who continues to learn, and who can locate, organise, and use information, and teach colleagues to do the same, is an example of a person who is information literate in the workplace. Subsequently, in 2015, the ACRL recognised that their past framework outlined specific learning outcomes and a list of corresponding skills, and that the specificity of these frameworks has discouraged use in contexts outside tertiary education, including workplaces. To encourage more people to actively engage with IL, the new holistic framework was based on "a cluster of interconnected core concepts, with flexible options for learning outcomes" (ACRL, 2015, p. 2). The ACRL now defines IL as "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" (2015, p. 2). Rather than listing the specific abilities required to be information literate, the new definition describes IL as a discovery process that has values embedded into it, emphasising the link to learning and knowledge creation in a range of contexts.

Advocates for IL argue that explicitly developing it within the disciplinary or professional context is essential; yet, it is also an aspect of learning left to chance by educators (Badke, 2011) and employers alike. In NZ, Ninces (2017) found that even though IL skills were highly valued, developing and measuring employee IL competencies was limited in workplace training and appraisal initiatives for small and medium businesses. In the tertiary sector, while library services may support students to access information via specific courses, or one-off library workshops focused on database searching to access peer-reviewed journal articles, discipline experts have responsibilities to explicitly contextualise information to promote deeper, engaged learning (Brabazon, 2007; Feekery, et al., 2016; Grafstein, 2002). This level of support seems even less likely in workplaces. Head (2012) found that training for workplace IL on the job was fostered through relationship-building with colleagues or trial and error. Given the acceptance of IL as a complex, context-specific competency, and the limited opportunity to explicitly develop these skills in the workplace, Hicks' (2015) call for universities to better prepare students for professional information contexts beyond academia is both relevant and timely.

In the university context, a challenge facing teachers of large courses is that library resource constraints make it difficult to offer face-to-face introductory workshops early in a student's degree. When student numbers exceed resources, libraries provide self-access online materials

disconnected from the discipline or immediate task. Alternatively, courses may offer a generic library lecture without immediate hands-on practice, which can reduce student engagement and information retention. The assumption that IL can be developed through such generic measures demonstrates that some educators hold a narrow definition of the concept and it maintains a remedial learning focus, rather than "a whole way of thinking about information and its use" (Badke, 2010, p. 132). To effectively enhance students' IL capability, Meyer et al (2008) argue that collaboration between teachers and librarians is essential when embedding IL instruction into students' learning experiences. Such instruction should focus on critical thinking and evaluation, and be contextualised through content and assessment so students see its value, relevance and importance as they become independent lifelong learners (Andretta, 2006; Bruce, 2008; D'Angelo, 2002; Godwin, 2006; Martin, 2013; Secker & Coonan, 2013).

This paper reports on a successful project collaboration between Angela (a communication lecturer, non-librarian IL researcher and 'academic champion' for IL) and three university business librarians (Katherine, Carla and Fiona) to create an online learning module centered on professional information sources for a large first-year business communication course. The module was designed to explicitly embed IL to develop students' ability to identify different business information source types, search databases and Google efficiently, and evaluate information for quality and relevance. Students' understanding and application of the module content were measured at four points in the course: 1) an immediate reflective survey, 2) a follow-up workshop activity, 3) a sources consulted appendix in the team assessment, and 4) a final assessed reflection on learning. The paper shares our observations of student IL performance following the module completion. It challenges teachers and librarians to consider ways they can collaborate to embed IL skills development into disciplinary courses, to smooth the transition into tertiary learning and enhance lifelong learning capability.

2. Background

The collaborative project outlined in this paper was part of a larger participatory action research project focused on focused on enhancing students' IL development in the transition from secondary to tertiary learning. The *Information Literacy Spaces* project fostered collaborative partnerships between teachers and librarians to develop innovative and enduring ways to embed IL into disciplinary classroom contexts in senior secondary school and tertiary institutions (see our project website *https://informationliteracyspaces.wordpress.com/* for further information). The various projects are quality examples of successful collaborations to enhance students' IL capability that McGuinness (2007) identifies, but rather than approaching IL as a problem to be solved, we recognized that IL is an essential competency for secondary and tertiary learning success and beyond.

At the outset of this project, we needed to ensure that participating librarians and teachers shared a common understanding of what the researchers meant by IL and how it was framed within specific disciplinary contexts. We wanted a definition that captured the cognitive demand needed for students to engage deeply with information and determine quality in the abundance of information they are exposed to online. A key theme emerging in holistic understandings of IL is the increased focus on the connection between information and critical thinking to support the research and learning process (ACRL, 2015; Bird, et al., 2011; Bruce, 2008; Coonan, 2011; Ladbrook & Probert 2011). Critical thinking is recognised as purposeful, reasoned, and goal-directed learning to support problem-solving and decision-making (Phillips & Bond, 2004). In making this connection, Weiler (2005) argues that "critical thinking is crucial to the learning process, to cognitive development and to effective information seeking" (p. 47). Because critical thinking is essential for determining the value of information and using it effectively (D'Angelo, 2002; Godwin, 2006; Phillips & Bond, 2004), it is a primary concern for university students and educators.

To develop our shared understanding, Angela created the Feekery Information Literacy Model (Feekery, 2016) and the following holistic IL definition to place it at the centre of learning and guide our research project:

> Information literacy involves the processes, strategies, skills, competencies, expertise and ways of thinking which enable individuals to engage with information to learn across a range of platforms (both digital and traditional learning environments), to transform the known, and discover the unknown (Feekery, 2016).

2.1 Context

The context for the online IL learning module is a first-year compulsory course in a Bachelor of Business degree in New Zealand. Angela designed and regularly coordinates the course, which is offered concurrently internally and online with a combined cohort of 500-800 students per semester. As one of the eight compulsory courses students usually take in their first year of study, it is ideally positioned to offer explicit IL instruction early in our students' learning journey. The IL module is embedded as a key topic alongside other content (rather than an add-on), which means it is integrated into the curriculum regardless of who is coordinating the course, overcoming the challenge of the 'academic champion' (McGuinness, 2007). Angela also wrote a chapter about engaging with information and research that complements the online learning module in the textbook she co-authored specifically with her course in mind (Lawson et al., 2019).

3. Collaboratively designing the IL online learning module

When students enter university, they learn about the importance of engaging with scholarly texts, specifically journal articles, to learn the 'language' of their academic discipline. In a business communication context, students also engage with quality professional information to extend their knowledge of successful business practice. Such sources are commonly accessed via the internet or specific business databases and may not undergo the formal peer-review processes valued in academic publishing contexts. Therefore, it is essential to create meaningful ways to support students' academic *and* professional IL development so they can succeed in their studies and make informed decisions as future professionals.

Effective source selection centres on determining a source's relevance for a particular task and knowing what to reject (Head & Eisenberg, 2010). Therefore, students need to develop effective ways to evaluate information, especially due to the complexity and abundance of online information and the difficulty students have in determining its validity and credibility (Brabazon, 2006; Coonan, 2011). Brabazon (2006) argues that universities need to (re)teach how to evaluate quality to limit unquestioning selection and acceptance of information sourced via Google. She stressed that "finding information is not synonymous with understanding information" (p. 163) and increased access to information does not necessarily promote high quality research and writing. Badke (2020) also points out the dangers of the flat, artificially connected search results devoid from any context. As the volume of online information continues to increase, students' random internet searching and source selection based on accessibility will remain key concerns for tertiary educators.

In creating the module, we drew on learner-focused pedagogy (Biggs & Tang, 2011; Feekery et al., 2016; Huba & Freed, 2000; Weimer, 2003), which emphasises the importance of connecting to real world relevance when creating learning tasks and using experiential and reflective learning and assessment opportunities. To encourage student engagement, we highlighted the importance of informed decision-making based on best practice and good research. We emphasised that learning these skills would benefit both their academic learning now (immediate relevance) and their future professional practice and reputation (future relevance).

To measure the effectiveness of the model, we used the action research 'plan, act, observe, reflect' cycle (McNiff & Whitehead, 2011; McKay & Marshall, 2001) to implement the model and make required changes prior to the second semester delivery.

4. Implementing the online learning module

The online learning module, *Exploring Professional Information Sources,* is the focus of one week's instruction to enable students to develop their capability to identify, access and evaluate quality professional sources for both current academic tasks and future employment demands. We focused on professional information as another course was focusing on scholarly information including engaging with journal articles and understanding APA citation conventions. It is important to know what else is being done within the full curriculum around IL development to ensure any interventions are extending, rather than repeating, related learning opportunities.

Students watch a recorded lecture broadly focused on research, source use in academic and professional work, critical thinking, argument, logic and persuasion. The learning module is then provided as a three-part Moodle lesson.

4.1 Part 1 – Understanding professional information sources

Part 1 explores professional information sources. Fiona created a table of different source types that inform business practice (for example, annual reports, ethical/corporate social responsibility reports, trade magazines and professional blogs/podcasts). The table identifies the source type, describes the source with an overview of its function in business, and indicates where to find and access these sources, with relevant links to with relevant New Zealand and Australian examples. We then outline the difference between formal and informal documents and the purpose and function of professional information created and/or used by customers, companies or investors.

4.2 Part 2 – Finding information

Part 2 focuses on finding information. We start by warning about the dangers of relying on the first few Google results given that our information searches are manipulated by algorithmic gatekeepers we have no control over. We share Eli Pariser's (2011) TED talk *'Beware of the Filter Bubble'*, which explores the challenge of finding unbiased and unpersonalised search results within our personalised information bubble based on browsing history, 'likes' and other online behaviours. While the impact of filter bubbles on information consumption is being debated (Dubois & Blank, 2018; Leetaru, 2017), students need to be aware that this phenomenon may be influencing their search results and consider this when searching for quality professional information online.

The section then introduces ways to search three library databases Katherine determined were most relevant to business students. We recognised that students lose access to their institution's search tools once they leave tertiary study and are faced with the daunting task of finding quality information on the web, where anyone can publish anything, and misinformation and fake news is rife. Therefore, we also provide links to public library websites and online databases accessible outside the university context, including Business and Industry Online Resources and Digital Resources. Given professionals will frequently use Google (and often prefer this over other databases), we share hints on how to filter and narrow results lists and introduce Google Scholar as a way to access academic texts post-graduation (with the paywall limitation explained).

We then explain how to create meaningful keyword searches using keywords relevant to their assignment topic. We link to existing library videos and resources, so this does not involve creating any new materials. Directing students to such resources within the course encourages them to access resources they may otherwise bypass or not know how to find independently. Finally, we offer advice on 'next' steps should they find they have too few, too many, or irrelevant results.

4.3 Part 3 – Evaluating information

Part 3 connects to evaluating information. We explain that carefully considering source selection is essential in an information environment where anyone can write and post anything, and where filter bubbles and echo chambers (Grimes, 2017) bounce our own ideas back at us. Angela's research found students focus on ease of access and content over quality when selecting information (Feekery, 2013). They also may not consider the information context, intended audiences, or author bias in information.

Evaluating information effectively means considering a range of quality indicators and weighting each accordingly. Checklists can support this process; for example, the Evalu8it Website (Harris, 2018) and the CRAP [Currency, Reliability, Authority, Purpose] test (Orenic, 2008) encourage students to consider various evaluation factors. However, we recognise that critical information literate learners need to engage in a deeper information evaluation process than these tick-box checklist approaches foster (Feekery & Jeffrey, 2019). As many sources will not meet all quality indicators, students must consider their research purpose and information needs within their information search context.

To support students' evaluation capability, Angela and Carla developed the *Rauru Whakarare Evaluation Framework* (RWEF), an indigenous-informed framework that introduces students to a new way of thinking about information evaluation (Feekery & Jeffrey, 2019). The holistic spirituality of the five embedded Māori (indigenous people of NZ) concepts (Whakapapa – Background, Orokohanga - Origins, Mana – Authority, Māramatanga – Content, and Aronga – Lens) creates a more meaningful approach to evaluation than Western linear concepts allow. For example, unlike Authority that is demanded or received by position or qualification, Mana has to be given by those who value the person in an authoritative position. When you cite a person's work, you are giving them Mana. Similarly, while Content connects to *what* the source contains, Māramatanga means enlightenment, and therefore shifts the focus to *how* the content informs understanding or enhances knowledge. A mini-recorded lecture and detailed written descriptors are provided to unpack these concepts and their role within a holistic evaluation process (available on our research website: *https://informationliteracyspaces.wordpress.com/rauru-whakarere-evaluation-framework/*). When using the RWEF as a guide to find, select and evaluate information, students are encouraged to explore these interconnected evaluation factors, rather than a series of disconnected yes/no questions.

This evaluation framework has now been adopted in our library's general introductory workshops, so should our students be taken to the library with an elective course outside the Business School, the messaging around effective source evaluation is consistent. It is revisited in the other compulsory paper in the business degree focusing on evaluating journal articles mentioned earlier. It has also been requested for use by several secondary schools and other tertiary institutes throughout NZ, indicating the value of bringing indigenous ways of knowing into mainstream learning contexts.

5. Measuring outcomes: Students' IL understanding and application

Teachers are often concerned that students focus on assessment over learning (Weimer, 2003). Therefore, we connected to learning at four points following the online learning module completion: a reflective task, a follow-up workshop activity, and two different assessment tasks. As part of the larger research project, we gained student consent to analyse their reflections and assessments from both 2018 semesters.

5.1 Point 1: Understanding the content – compulsory reflective survey

After finishing the module, students complete a compulsory activity to ensure they immediately reflect on what they learned (the course has a series of compulsory activities students must complete as a pass/fail component. If they fail to complete at least 7/10 tasks, they fail the course. Given students can miss three, we can't guarantee all will engage with the online learning module). Completion rates for the online module have increased over four consecutive semesters. Statistics in Semester 1, 2018 were disappointing: 68% for distance students and 40% for internal students. From Semester 2 onwards, we explicitly emphasised the value of being information literate for both the final assessment task and students' future learning. By Semester 1, 2019, the completion rate was notably higher with 74% of internal students completing the task. For distance students, 73% of Semester 1 students completed the task and, in Semester 2, 76%, the highest completion rate of all ten compulsory tasks that semester. This percentage aligns with the number of students who successfully completed the course.

The reflective survey poses five questions designed to highlight students' understanding of key concepts covered in the module (see Table 1). While the depth of reflection varied, we are satisfied that most students who completed the survey had engaged with the module content and did not just enter random, uninformed thoughts.

Table 1: Reflective survey questions and sample answers

Compulsory Workshop Activity – Reflective Survey	
Question	**Sample 1**
Question 1 – **Source Types:** Identify useful information source types (academic and professional) are you likely to use for your Team Report?	Journals, trade magazine articles from the IT industry and also a bit of generic internet searches to see what is out there both internationally as well as NZ. This is in order to give us a variety of different tools to choose from in order to pick the best one for our team. Given the power of the web and seamless accessibility of tools online, we don't want to limit ourselves to being country-specific.
Question 2 – **Professional Information Sources:** What is the difference between formal and informal sources of professional information?	Formal sources of information are factual, regulatory such as legal, and often follow set conventions as to presentation and content. The language is objective and non-emotive: a statement of facts such as business reports or annual financial statements produced by an organisation. Informal sources of information, although also official, are created by the consumer, customer or other stakeholder with different purposes for the same information, across a range of users. There is no set style, language or convention used because the purpose is different for different target audiences.
Question 3 – **Finding Information:** What have you learned about creating keyword	A lot! You don't always find what you are looking for! Narrowing the search through key words is crucial. You can use sentences or key words but not all search engines behave the same way and you end up with irrelevant articles that you did not ask for. Some of the tips I tried were using the

searches in databases?	"advanced search" feature when the result produced too many articles. Other methods I used were using multiple key words separated by a "," or a "+" or an "OR" or a colon or semi colon (depending on the site). I also found it useful to search the key word in the title only or in Title and abstract only. This helped tremendously in narrowing the search down to meaningful articles. This is because a word like "communication" is too wide and the search results are vast. I also tried putting common phrases in " " but found that my other tactics were good enough for narrowing the search.
Question 4 – **Searching Google:** What are some of the hints you can use to narrow your searches in Google?	Google handles sentence searches quite well. I found the "any time" filter quite useful to put a date limit on what I want to look for. The country filter is also a good feature. Additionally, depending on what you are looking for, the images or video search is good. For e.g. I am looking for some shelving for my living room and couldn't think of the word to describe what I wanted. When I went to images and looked at pictures of shelves, I realised that in the "furniture world", it is called modular shelving! From the image I was able to click through to places I can buy it from. Awesome! There are also news and search options so again, if I'm looking for something that is newsworthy, then I know that I can just search in "news" – A bit like the SKY TV function – either search through all programmes or specific categories i.e. news or movies or entertainment etc. I did not know about the .co.nz and .org.nz after the keyword function. Very handy and I will be using it more.
Question 5 – **Source Evaluation:** Write an overview of how to evaluate sources using your understanding of the Rauru Whakarare Evaluation Framework – Whakapapa (Background), Orokohanga (Origins), Mana (Authority), Māramatanga (Content) and Aronga (Lens).	Given the amount of information available, even though relevant, the Rauru Evaluation framework helps to narrow down what you eventually decide to use. The source should be credible as well the author of the piece. Information on the authors and their credentials help to eliminate articles that are not credible. Other clues to the author's credibility are the grammar and language used. The main website, publication or organisation should also be looked at for reputation and credibility. Background on the source – why it was created and for whom and geographical coverage would indicate relevance for what I'm searching up. I tend to look up the references used by authors at the end of the article to get a sense of the evidence used by them. The content itself should be easy to understand and provide insight into my research. For this, depth of information and balanced arguments assist with providing meaning to my research. It is also important that the author has looked at the topic objectively and from more than one perspective.

5.2 Point 2: Applying the skills – workshop activity

In the workshop following the online module completion, we revisit the RWEF by asking students to search Google for a source for their upcoming team report and apply the framework to determine the source's quality and relevance. Through this activity, tutors can identify students struggling with the learning module ideas. Students participate in small group discussions where those who did understand could share their insights with those who needed further explanation. We recognise that, rather than delivering the online learning module content as a one-off task, revisiting its key ideas at multiple stages is enables deeper learning.

5.3 Point 3: Justifying source selection – Sources Consulted reflective assessment

Connecting the task to 'real world relevance' is essential: students are told that, while they may not be required to use APA in business reporting, they will need to clearly justify their information choices should a manager or client wish to review the information for themselves. The 'Sources Consulted' document appended to the virtual team report (the key group assessment output) requires students to justify sources they selected to inform the report discussion, analysis and recommendations . Through this assessment component, we determined that students were applying the learning module knowledge in practice. As shown in the Table 2 example, students were able to:

- accurately identify sources types;
- provide a clear justification for the inclusion of the source based on the RWEF concepts; and
- outline the contribution each source made to their analysis.

There was evidence that students were actively using evaluation metalanguage both in English (for example credibility) and Māori (for example Mana) to justify their source selection (see 5.4).

Table 2: Sources Consulted entry example

Criteria	Source 1
Source Identifier (Put the **title** of the source here.)	Cloudwards
Source Type (What type of information source is it?)	Website
Accessed From (Where did you find it?)	https://www.cloudwards.net/review/google-drive/
Evaluation Considerations (Strengths and Limitations) (How did you evaluate the source quality? Why did you choose to use this source?)	The source was evaluated using the Rauru Whakarare Evaluation Framework. This source was chosen for both quality and comparison reasons to Google Drive. - Very recent article - 12.02.19. - The Author is Branko Vlajin and his profile is listed and respectable. - Website looks professional and reputable. - Spelling and grammar are accurate. - The topic is well covered and is balanced. - Very easy to navigate. - Gives a lot of insight into Google Drive as a whole and helps to add value to my arguments. - The site sends mixed messages – on one hand it says all opinions are their own and they only rank the best as highest, but it also states they are paid by companies they rank. There is therefore the possibility of a biased opinion. - No weaknesses or assumptions mentioned. - The site does a lot of this kind of research so is quite experienced in fairly ranking the sources and not trying to benefit or disadvantage the author or reader. - The source appears to be created with the purpose to inform

	anyone interested about whether Google Drive is good or not. - The source doesn't appear to be peer reviewed. - While there isn't a reference list as such sites are referenced throughout the text to back up arguments. Arguments are also backed up by user experience.
Contribution to your Analysis (How did this source contribute to your understanding of the key communication tasks and the selection of tools you are recommending?)	This source really helped me to weigh up whether Google Drive was a good option for creating and sharing documents. It clearly outlined what it was along with pros and cons and it was a great source to help me start making decisions about it.

5.4 Point 4: Reflecting on information use experiences

The virtual team task ends with a reflective response to eight questions connected to the team communication learning experience, including a specific IL general question: *How did you apply what you learned about accessing and evaluating quality information sources for this task?* Responses made direct reference to aspects of the online learning module.

The data from consenting students (n=200) was coded to identify: 1) specific databases being used, 2) explicit reference to the RWEF and/or its concepts, either in Māori or English, and 3) use of general evaluation metalanguage (bracketed numbers represent at least one specific mention of the concepts in a student's response).

When finding and accessing information, library databases (64) were mentioned more frequently than Google Scholar (28) or Google (31), indicating that students felt capable of finding quality information through the library databases rather predominantly using the internet. Sixty-four students directly indicated they used the RWEF as a whole to determine source quality. Sixteen students used the Māori terms and all five criteria were mentioned in these students' responses. For students who used the English terms, content (28) appeared most often, followed by authority (22), background (17), origins (16) and lens (13)

In all responses, students used the metalanguage of evaluation to outline how they determined a source's usefulness (see Figure 1). While specific RWEF terms may not be being used by some students, keywords embedded within the framework are being considered. Author and date were most commonly mentioned, followed by bias, credibility, quality and relevance. Scholarly and peer-reviewed sources were mentioned, and accuracy was seen as important, particularly when engaging with online information. These data show us that, in future offerings, we need to be more explicit about asking students to consider the context of information and currency in terms of the value the source brings to building disciplinary knowledge, and not just the date.

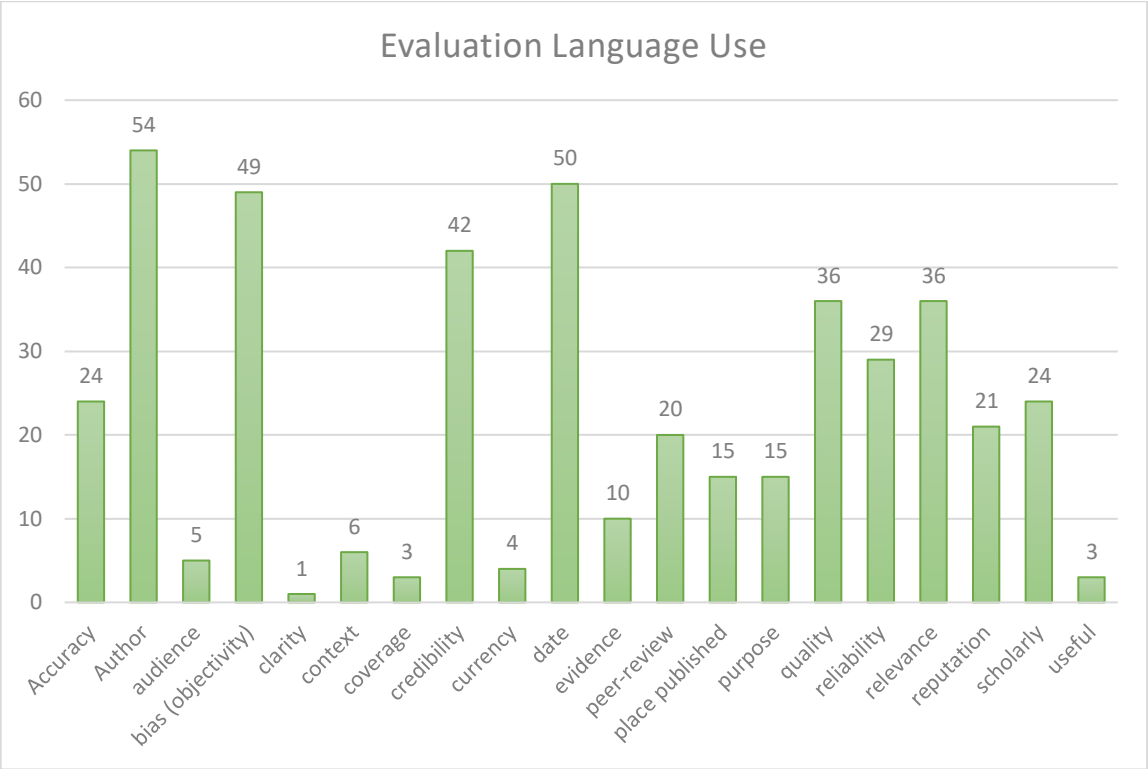

Figure 1: Use of evaluation metalanguage in student responses

Student responses showed that recognising different source types and applying the evaluation process was now a more explicit part of their research processes.

> **STUDENT 1 -** *I learnt that finding quality sources is very important as it allows you to make informed and carefully researched conclusions. I tried to find either professional or academic sources, as I learnt that these are peer reviewed and therefore the most reliable. I looked for reports, product descriptions, product reviews and blogs. What I found hugely beneficial were product reviews as they allowed me to gain insight into the strengths and weaknesses of each tool. They also gave detailed user reviews that helped my team to create our recommendations. When evaluating these product reviews, I considered the purpose of the source, who it was created by and who it was created for. This helped me to determine how useful the source was and what information it would provide me with.*

One student indicated that the new evaluation process developed her skills in finding quality information and enabled her to support teammates when they selected dubious sources for the team assessment.

> **STUDENT 2 -** *I learnt that not all online sources are credible. I now have more skills in obtaining scholarly sources and evaluating their use. This proved advantageous for me when writing our team report as when I was required to provide evidence of my research, I was able to provide peer reviewed research that supported my work. Moreover, when I was required to edit our team report, I was able to identify that there were some sources within our report that were not scholarly or quality. Some authors had quoted websites that did not have a strong credibility, such as Wikipedia, and I was able to identify and suggest alternative sources of information to support the author's section. This exercise has made me appreciate the difference that a credible source makes within a research project and how having strong sources justifies my answers and shows readers that I have reasoned beliefs behind my claims.*

For more experienced students taking the first-year course later in their degree, the evaluation framework was identified as a valuable tool for making a previously implicit process more explicit.

> **STUDENT 3 -** *The Rauru Whakarare Evaluation Framework provided a logical structure to questions I already ask myself when evaluating information. Often my source evaluations take place at an almost unconscious level, so the framework made my evaluative thinking more explicit, and more conscious, which I feel make me think more deeply about my choices of source. This resulted in my written evaluation having a strong logical flow.*

Reviewing the reflective responses allowed us to identify misunderstandings and refine the learning module as part of the action research process. Common misunderstandings were addressed in subsequent workshops and assessment feedback. For example, several students indicated they trusted organisational sources, like Microsoft websites, because they are reputable professional organisations, but they failed to identify the inherent commercial bias organisational information outlining the benefits of their products.

6. Lessons learned

Teachers can support their students to become critical information users within their disciplinary context; they cannot leave IL development to chance. They can meet this responsibility by collaborating with librarians to explicitly weave IL skills development into coursework and assessment, particularly in first-year courses as students transition into the demands of tertiary learning. This involves having an understanding of the broader learning context students are engaged in so that these skills development opportunities can be targeted and enhanced rather than repeated across the curriculum. Academics also need to recognise that we are preparing students for the future professional careers alongside their academic success. Developing an understanding of the professional information demands our students will face can inform our focus when creating IL learning opportunities.

In this paper, we have shared how a Communication lecturer and three business librarians collaborated to develop an online learning module to enhance students' IL capability for a class of 500+ first-year business students studying internally or at a distance. The collaboration lifted the burden of creating all course materials off the shoulders of the teacher. We combined our experience and expertise to produce a learning resource that encouraged students to explore professional information sources and develop strategies to identify different ways of accessing information, recognise different source types, understand their purpose, and evaluate their quality and relevance to their information need.

The embedded reflective learning opportunities ensured that students had explicit opportunities to apply and reflect on their research practices more than once after completing the learning module. The assessments and reflective responses indicated that students knew the importance of making informed information choices for both their academic learning and future professional lives. Many students were confident using evaluation metalanguage in reflective assessments four weeks after the online learning module was completed.

We hope that the insights shared here will encourage other educators and librarians to consider ways to collaborate within their learning contexts and discipline areas to embed targeted IL learning opportunities for students. The outcomes are definitely rewarding for all of us – teachers, librarians and students alike.

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