

# **Systematic Review of Effective Library Instruction for Business**

## **Students**

Céline Gareau-Brennan<sup>a\*</sup> and Janice Y. Kung<sup>b</sup>

*<sup>a</sup> Cameron Sciences, Engineering, & Business Library, University of Alberta, Edmonton, Canada; <sup>b</sup> John W. Scott Health Sciences Library, University of Alberta, Edmonton, Canada*

Correspondence details \*corresponding author: Céline Gareau-Brennan,  
[crg@ualberta.ca](mailto:crg@ualberta.ca)

Provide short biographical notes on all contributors here if the journal requires them:

Céline Gareau-Brennan (BA, MBA/MLIS) is the Business Librarian at the Cameron Sciences, Engineering, & Business Library at the University of Alberta. Email: [crg@ualberta.ca](mailto:crg@ualberta.ca)

Janice Y. Kung (BCom, MLIS) is a Health Sciences Librarian at the University of Alberta. Email: [janice.kung@ualberta.ca](mailto:janice.kung@ualberta.ca)

### **Final Publication:**

Céline Gareau-Brennan & Janice Y. Kung (2021) Systematic Review of Effective Library Instruction for Business Students, Journal of Business & Finance Librarianship.

DOI: [10.1080/08963568.2021.2015849](https://doi.org/10.1080/08963568.2021.2015849)

## **Systematic Review of Effective Library Instruction for Business Students**

The most successful library teaching strategies for post-secondary business programs have yet to be determined. The aim of this systematic review is to investigate the effectiveness of library instruction (with a focus on pedagogy) in business undergraduate and graduate programs. The researchers searched seven databases, selected studies that met the inclusion criteria, and extracted data following PRISMA guidelines. To achieve the study's primary objective, the researchers included any library educational intervention in a business program conducted by librarians or library staff. The quality of included studies was evaluated based on a modified instrument designed to critically appraise educational interventions. The instrument consists of nine questions that relate to content, context, outcomes, study design, and methods. Thirty-five studies met the inclusion criteria and data was extracted based on subject area, content coverage, mode of instruction (in-person vs virtual), faculty collaboration, assessment strategies, and library educational interventions used to teach business students. Common educational interventions included hands-on activities, live demonstrations, active learning, group work, and lectures. The most compelling strategies include active learning, providing engaging sessions (e.g. flipped classroom), and faculty collaboration. Since most of the studies did not state clear learning outcomes, it is difficult to ascertain what type of interventions were truly effective in improving library sessions.

Keywords: library instruction, information literacy, business education, systematic review, faculty collaboration

## **Introduction**

There are a multitude of ways for librarians to teach library instruction in business schools. These library instruction sessions tend to include and emphasize subjects that expand students' information literacy skills. As communicated by Makani-Lim (2015), there is consensus amongst business professionals and academics about the importance of developing information literacy skills for business students, regardless of the differences in the instructional approaches. In addition, Rodríguez (2018) outlines five reasons to include information literacy in the business school curriculum. Literature around the value of business information literacy also specifically points to the impact that information literacy has on the bottom line and how a "lack of information literacy can also hurt a company's productivity" (Makani-Lim, 2015, p. 310). Business professors often recognize the value of this knowledge and look to incorporate it in their courses (Gunn & Miree, 2012). Librarians are well positioned to develop and deliver this instruction and there are many examples of them working with professors to do so (Makani-Lim, 2015). As "great believers that [Information Literacy] is a transformative and elemental experience required for all citizens" (Stonebraker, 2016, p.229), librarians tend to invest a lot of effort into this teaching.

Despite this general agreement around the importance of library instruction and information literacy, as well as the efforts invested by business schools and librarians, it is unclear what are the most effective strategies for post-secondary business programs. Although instructional context matters and accounts for the difference one can observe (Gunn & Miree, 2012), there are inconsistencies when it comes to the approach in how librarians teach business students (Baxter et al., 2016). Significant differences can be

observed when it comes to frameworks used in the classroom, caused perhaps by the fact that “AACSB requirements (AACSB International, 2012) make no direct reference to the need to develop information literacy type skills” (Cullen, 2013, p.211). There are some frameworks that figure more heavily in this domain such as the ACRL Framework for Information Literacy for Higher Education, but there is no one unifying framework, overarching theory, standard, or conceptual model. Though it should be noted that in an earlier business library instruction review conducted by Fiegen (2011), of “the 45 evidence-based articles most but not all referred to a theory, standard, or model as basis for their study” (p. 271), with 16 of these specifically using an educational theory.

In an effort to provide an overarching perspective of library instruction provided to business students, this study will investigate the effectiveness of library instruction, with a focus on pedagogy, in business undergraduate and graduate programs. Cullen (2013) notes that many librarians have strategically examined how to improve their own practice and the practices of others. Indeed, a noteworthy review was conducted by Fiegen in 2011 where she identified “six components from evidence-based literature of business information research instruction to synthesize best practices and so to serve as a guide when planning and delivering information literacy instruction to business students” (p. 268). This current study differs from many of the existing literature reviews since they were completed a considerable amount of time ago and they did not apply a systematic review methodology to examine the pedagogy of library instruction.

A systematic review can be defined as “a carefully organized and structured assessment of all completed research on a specific topic. The term refers to both the process of conducting the review and the final document produced from the review process” (Ungvarsky, 2020, np). The rigorous and transparent nature of the systematic review was ideal for this project as it allows a study to be “reproducible and updateable”

(Zawacki-Richter et al., 2020, p.vi), which could be beneficial for future research in this field. Although systematic reviews were initially born in the health fields (Ungvarsky, 2020, np), they are being embraced by educational professionals since systematic reviews “have much to offer the educational community in terms of providing unbiased evidence from a wide range of studies of educational policy and practice” (Davies 2000, p.375). Systematic reviews become more important in educational disciplines, as such when these fields turn to the “use of research evidence to inform policy and practice decision-making” (Newman & Gough, 2020, p.4). Dowd and Johnson (2020) also note that there is a rising number of systematic reviews being published in the top cited educational journals such as *Review of Educational Research*.

Generally systematic reviews are viewed positively because “they tend to be less time-consuming and less expensive than conducting new studies. In addition, systematic reviews are generally more accurate than any individual study and the results can be more widely applied” (Ungvarsky, 2020, np). However, there are some areas of caution that the authors hope to avoid during their work on the systematic review. The first being that the “quality of systematic reviews and meta-analyses depends upon the quality of the primary studies on which they are based, and on the rigour, transparency and reporting of the inclusion and exclusion criteria used by reviewers when doing a systematic review” (Davies 2000, p.375). As such, the authors have been selective in including primary studies and have outlined their inclusion and exclusion criteria in great detail in the methods section. Dowd and Johnson (2020) also emphasize the importance of the author’s ability to “story and inhabit systematic review articles with the variety of compelling people and place” (p.71) and reduce bias. These are suggestions that the authors have taken to heart in their methods and reporting of the results.

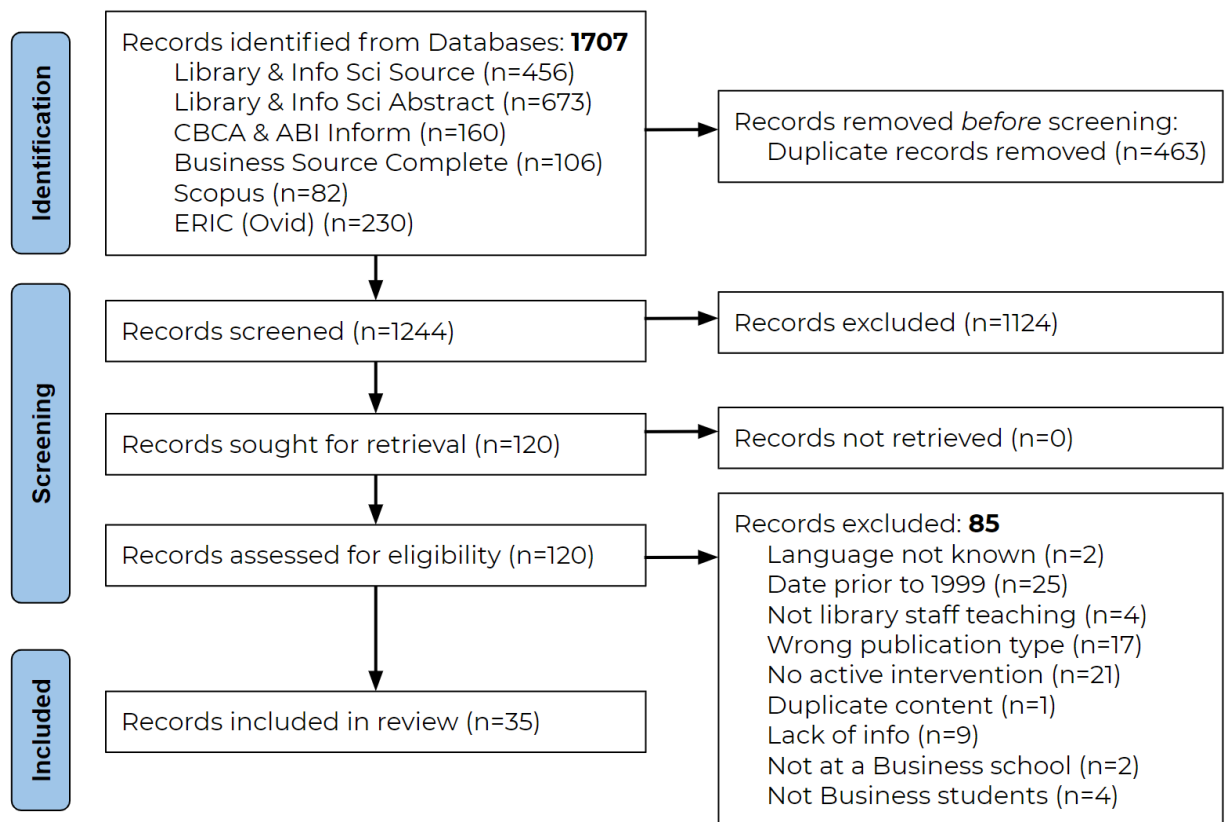
## Objective

This systematic review explores the effectiveness of library instruction, with a focus on pedagogy, in Business postsecondary programs, including undergraduate and graduate studies. In doing so, this review hopes to answer the following question: What is the effectiveness of library instruction (with a focus on pedagogy) in business programs?

## Methods

The reporting of this systematic review was guided by the standards of the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) Statement (Page, 2021). The methods described below are also outlined in the following PRISMA 2020 Flow Chart.

FIGURE 1. PRISMA Flow Chart



The authors developed a set of inclusion and exclusion criteria to review the studies that is summarized in the Inclusion and Exclusion Criteria Table (Figure 2).

FIGURE 2. Inclusion and Exclusion Criteria Table

Study Characteristic	Inclusion Criteria	Exclusion Criteria	Rationale
Population and Setting	Business students at a post-secondary business school	Anyone who was not a business student at a post-secondary business school	Business programs have specific or specialized resources that they use, which is the rationale in this review to restrict to business programs rather than exploring all library instruction in different disciplines.
Intervention	Library instruction conducted by library staff  Active educational interventions	Non-Library Instruction  Instruction by non-library staff  Passive educational interventions	Only library instruction that was conducted by library staff was included, making this review more relevant to the profession of librarianship.  Due to the authors' objective of focusing on pedagogy when it comes to library instruction, only active educational interventions were included. For the purpose of this review, an active educational intervention was an action or method implemented during the instruction. Active intervention might include an in-person instruction session or a recorded session but would not include, for example, libguides, handouts, or static content included on a learning management system. Other publications were also excluded due to lack of content, or duplicated content, such as the same author or authors writing about the same study in multiple publications.
Publications	Published after 1999  Published in English or French  Primary studies with enough detail to meet the research objectives	Published before 1999  Published in language other than English or French  Conference proceedings, book chapters, publications considered synthesis, reviews, or assessment of studies	Publications published before 1999 were excluded since this was the time frame that aligned with the emergence of Web 2.0, which dramatically changed the way in which information became readily available through the internet.  In order for the reviewers to fully understand the included studies, only papers in English or French were included.  To promote the homogeneity of how studies were reviewed, it was important to include certain publication types and not others. This was accomplished by finding primary studies with enough detail to meet the research objectives.

Once the eligibility criteria was established, the authors selected the following databases for the search because they had comprehensive coverage of library education for business students: Library & Information Science Source, Library & Information Science Abstracts, Business Source Complete, Scopus, ERIC (via Ovid), as well as Canadian Business and Current Affairs (CBCA) and ABI Inform. CBCA and ABI Inform were grouped together as they both used the same ProQuest platform and controlled vocabularies. The authors also developed search strategies using keywords and controlled vocabulary for each of these databases that can be seen fully in Appendix 1 - *Search strategies*. Using these databases, the authors ran the searches and extracted 1244 unique references for further study. All of the references were uploaded to Covidence (<https://www.covidence.org/>), a web-based tool to facilitate the initial title/abstract screening as well as full-text screening phases. Then, both authors independently screened the titles and abstracts and made a decision as to whether they should be included in the full text screening phase using the eligibility criteria elaborated previously. Conflicts were resolved through consensus. A total of 120 publications were selected for full text review. For the full text review, the authors independently read each of the articles, and made decisions based on the eligibility criteria as to whether they should be included in the data extraction phase. A total of 39 publications were selected for data extraction. However, upon closer examination during the data extraction phase, one additional publication was excluded to prevent an overrepresentation of the same studies in the analysis since they were deemed duplicate publications of the same study published in different journals. Therefore, a total of 35 publications (listed in Appendix 2) were included in the synthesis of the systematic review.



The publications selected for data extraction were then added to a spreadsheet that included all the elements for data extraction. The data extraction consisted of general information about the intervention, as well as a specific series of questions to enable the authors to evaluate the educational intervention. A full list of the elements for data extraction can be viewed in Appendix 3 - *Elements in the data extraction table*. Some of the questions were based on an instrument developed to critically appraise educational interventions developed by Morrison et al. (1999), and adapted by the authors to better suit the objective of this review. The modified instrument includes the following questions:

- Are there learning outcomes?
- Are the learning outcomes clear and explicit?
- Is there a method to assess the intervention? (the teaching)
- What is the impact of the intervention on students?

Having completed the data extraction, the authors then analyzed the data extraction form, identified themes, and evaluated results using a narrative synthesis approach. Narrative synthesis is a method used to identify themes and summarize findings of all included studies by primarily focusing on words and text used in publications (Popay et al., 2006).

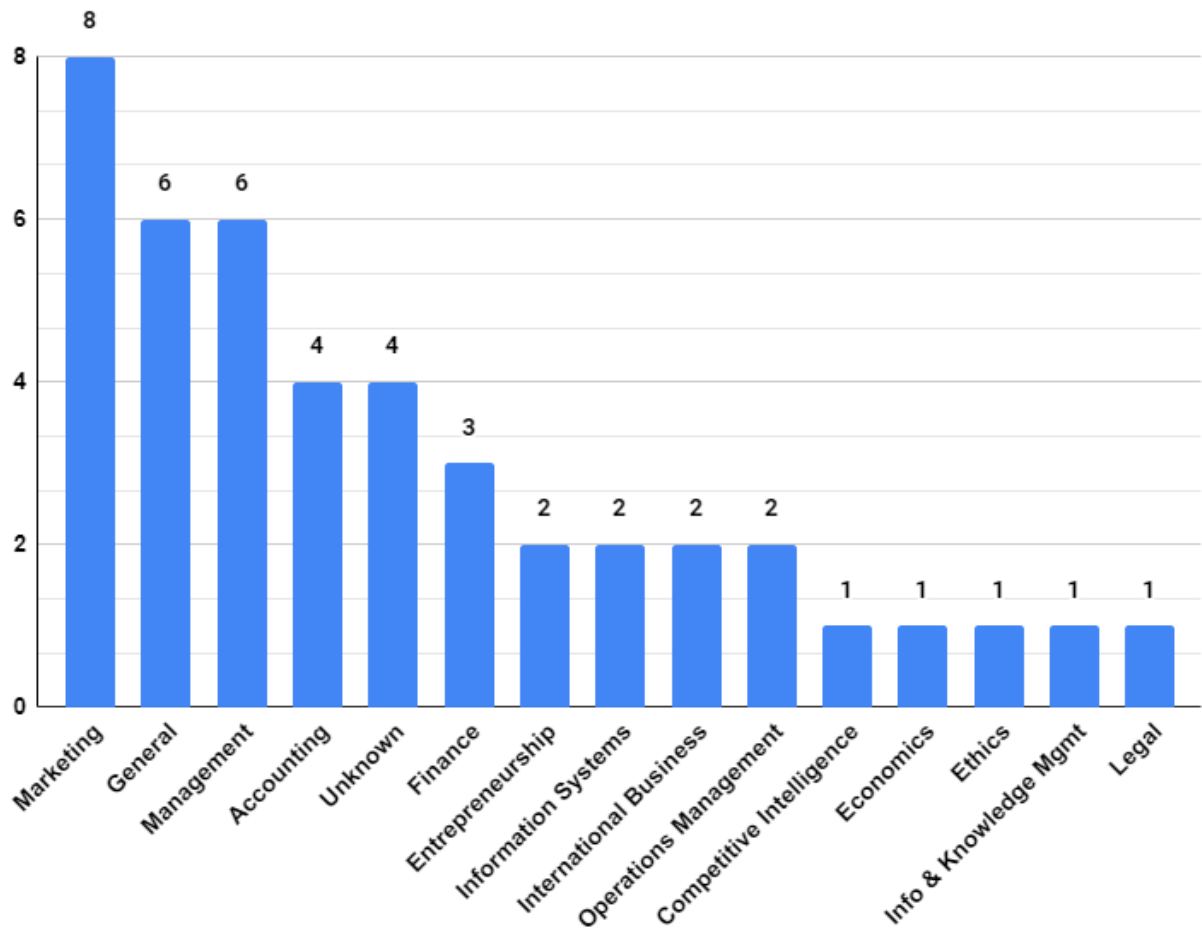
## **Results**

Thirty-five articles met the inclusion criteria of the review. The researchers extracted the following variables: country of origin, collaboration, mode of instruction, audience, specialty or subject area, frequency of sessions, length of sessions, intervention, content (such as tools or topics covered), student deliverables, learning outcomes, assessment, and recommendations provided by authors. Approximately the same number of articles

were published between 2000-2009 (n=17) compared with those published between 2010-2019 (n=18). Based on the country of origin of the first author, an overwhelming majority of the studies originated from the United States (n=30) and there was one study from each of the following countries: Australia, Canada, Ireland, Singapore, and the United Kingdom. Educational systems vary across different regions and countries, which may result in different approaches to library instruction. However, this was not an issue that required consideration for this review since most of the articles came from a North American context. Collaborating with faculty members was integral in many of the sessions (n=27). There were collaborative efforts with other groups as well. They included university centres/other university offices (n=6), vendors (n=1), and local business leaders (n=1). Authors from four studies did not collaborate with anyone outside of the library and three studies did not indicate whether collaboration was a consideration during the design and implementation of their sessions.

Most of the studies used in-person as their mode of instruction (n=30), four studies were online, and one study had a combination of both in-person and online components. Library sessions were targeted primarily to undergraduate students (n=25), six studies focused on graduate students, two studies targeted both undergraduate and graduate students, and two studies did not specify the audience. Library instruction spanned across several specialties or subject areas in business (Figure 3). Most of the classes centered around marketing (n=8), general business (n=6), management (n=6), and accounting (n=4). The total frequency displayed in Figure 3 is greater than 35 since some sessions reached more than one subject area (e.g. multiple library sessions that reached accounting, economics, and marketing classes). Four studies did not indicate a specialty, subject area, or course for the library sessions.

FIGURE 3. Specialty/Subject Areas in Business where Library Instruction Occurred



The frequency of sessions varied. More interventions involved multiple sessions (n=16; 46%) and twelve studies (34%) provided one-shot sessions only. Five studies (14%) did not indicate the frequency of library sessions, and two studies (6%) included a combination of multiple and one-shot library instruction. Figure 4 summarizes the length of library sessions across the 35 included studies. Surprisingly, a significant percentage of papers did not indicate the length of their sessions (n=17; 49%) and there was a fairly even distribution of studies that had sessions running between 1-60 minutes, 61-120 minutes, and sessions longer than 180 minutes. One study was marked as unclear because there was confusion on the precise length of each session since there were multiple sessions.

FIGURE 4. Length of Library Sessions

<b>Length (min)</b>	<b>Count</b>
1 - 60	6
61 - 120	5
121 - 180	1
More than 180	5
Unclear	1
Unknown	17

Instructors used a wide variety of interventions when teaching their library sessions. The 5 most frequently used interventions included hands-on activities, live demonstrations, active learning, group work, and lectures (Figure 5). Some studies may have integrated more than one intervention in their sessions.

FIGURE 5. Most Common Educational Interventions Applied

<b>Intervention</b>	<b>Count</b>
Hands-on	14
Live demonstrations	14
Active learning	8
Group work	8
Lectures	8
Interactive discussion	7
Case study	6

Flipped classroom	5
Gamification	3
Handout	3
Instructor help	3

Librarians covered a wide range of topics for their sessions including, but not limited to, tools, databases, resources, websites, and specialized business topics or vocabulary. The majority of the content covered involved specified resources or databases and the frequently mentioned databases included Lexis-Nexis (n=10), ABI/Inform (n=7), Hoover's (n=6), Business Source Complete (n=4), Mergent (n=4), Business Source Premier (n=3), and Standard and Poor's (n=3). There were also thirteen studies that did not specify the resources taught or information sources. Other common topics covered were citations (n=9), business vocabulary including NAICS codes, SWOT, Porter's Five-Forces assessment, and competitor cash flow analysis (n=8), library orientation/libguides (n=8), research skills (n=8), evaluating sources (n=6), literature searches (n=4), search strategies (n=4), and web searching (n=4). Many other topics were covered by one or two studies including critical thinking, case based learning, copyright, and plagiarism. With the variety of topics covered in the sessions, it was not surprising to see that there was also a fair amount of variety in terms of what students were required to deliver in those classes. Student deliverables ranged from completing graded assignments, group projects, to writing exams (Figure 6). Some courses required more than one deliverable to be completed by students.

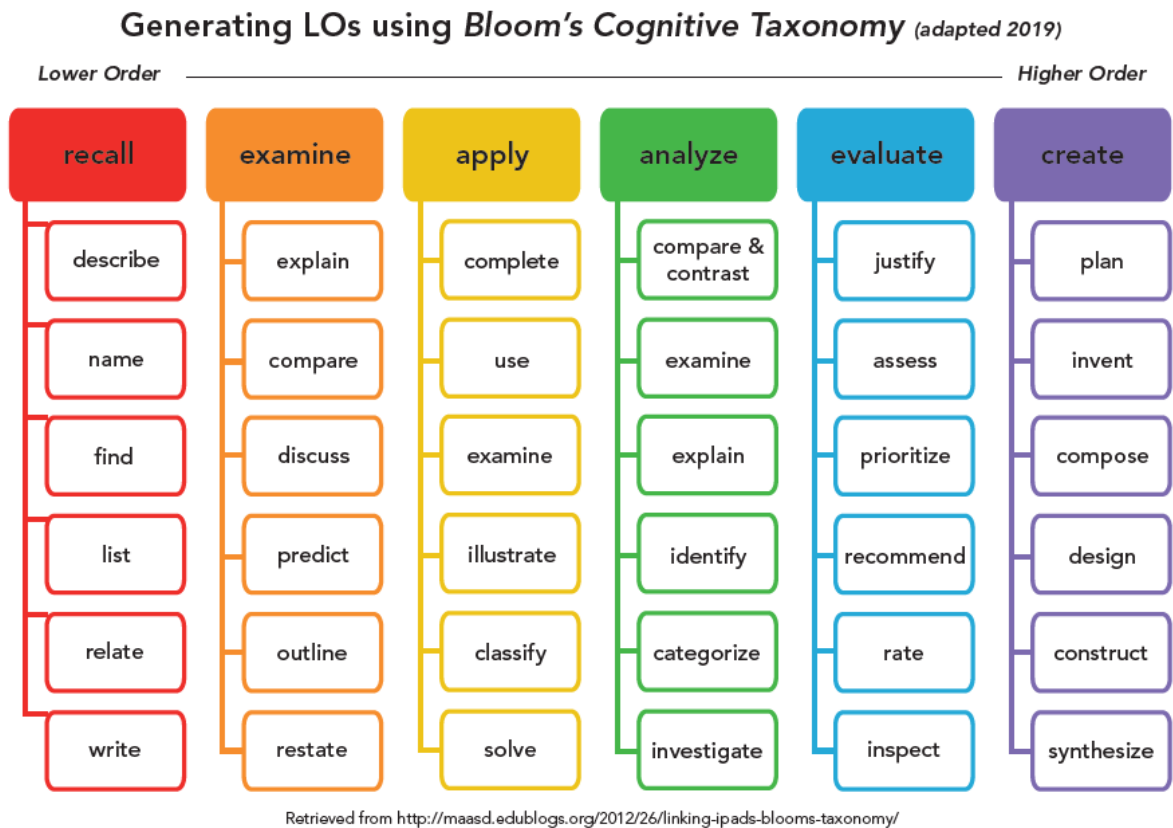
FIGURE 6. Student Deliverables

<b>Deliverables</b>	<b>Count</b>
Research report	9
Assignment	9
Project	6
Exercises	4
Term paper	2
Case study	2
Certification examination	1
Group discussion	1
Group presentation	1
Oral presentation	1
Unclear	1
Unknown	7

In order to critically appraise the included studies, a modified instrument based on a study by Morrison and colleagues (1999) was applied to determine the use and extent of learning outcomes such as identifying whether or not the learning outcomes were clear and explicit. Of the 35 papers reviewed, 18 studies (51%) included learning outcomes, five studies did not, and it was unclear whether the remaining twelve studies used learning outcomes in their educational interventions. Learning outcomes were subsequently categorized as clear and explicit if they used action verbs (see Figure 7) that are based on a revised version of Bloom’s Taxonomy of learning objectives

(Anderson et al., 2001). In other words, learning outcomes needed to be specific and measurable. Based on the aforementioned criteria, only nine studies (26%) had clear and explicit learning outcomes.

FIGURE 7. Action Verbs to Facilitate the Evaluation of Learning Outcomes (Mohawk College)



The majority of included studies had at least one method to assess the educational intervention, particularly with teaching (n=28; 80%). On the other hand, six studies (17%) did not mention the use of assessing their teaching, and one study was ambiguous so it was coded as unclear. Figure 8 lists the most common methods used for assessing their teaching, which included pre- and post-tests or questionnaires, graded assignments, surveys, student feedback, and assessment tools. Due to the lack of detail in several papers, it was unclear whether the librarian and/or faculty member was involved in grading students' assignments.

FIGURE 8. Assessment Strategies

Assessment	Count
Pre and post-tests	11
Assignment	9
Survey	8
Student feedback	6
Assessment tool	3
Faculty feedback	2
Class work	2
Exam	2
Student peer assessment	1
Unknown	4

Student feedback came from a number of formats including course evaluations, feedback forms, formative assessment, and informal feedback. Some authors used established assessment tools such as the Information Literacy Inventory and Learning Outcomes Checklist (Cooney & Hiris, 2005), or their own version of an assessment instrument to help students reflect on their learning (Reilly, 2017). Narrative synthesis was used to synthesize the literature concerning a) the impact of the interventions on students and b) author recommendations. In addition to identifying themes, textual descriptions were grouped and clustered based on similarities, differences, and results that may be used to inform practice.

***Impact of the interventions on students:***



The themes were consolidated into six categories; there were 18 studies that found the students gained knowledge, 13 studies where their instructors received positive feedback, 8 studies demonstrated that the educational intervention improved the quality of students' work; students experienced high level of comfort with the material in two studies; there was no change in the students' performance in two other studies; and finally, one study found the students worked more efficiently. Three articles did not specify how the educational intervention impacted their students.

***Recommendations:***

The included studies mentioned a number of recommendations, which have been grouped into five overarching themes: general commentary, collaborations, teaching recommendations, improving assessment, and future directions. The general commentary theme consolidated ideas that authors shared in terms of what worked and what did not work in their library sessions. Based on these comments, it may be inferred which strategies to implement and which should be avoided. For instance, hands-on exercises should be encouraged since students found them to be credible and valuable (Cunningham & Anderson, 2005). On the other hand, giving treats or prizes did not increase student satisfaction (Spackman & Camacho, 2009). In order to show instructors and faculty members that librarians are dedicated to being more involved, more willing to learn and participate, librarians could attend nontraditional library events such as attending classroom events that showcase students' work (Pietraszewski, 2016). Collaboration and building relationships with key stakeholders, including faculty and administrators, was a recurring theme that emerged throughout the literature (n=11). One notable example is where the flipped classroom strategy can be used as a "catalyst for collaboration" (Cohen, 2016, p. 20). Teaching recommendations varied from developing or enhancing support materials (e.g. video tutorials, libguides, provide

search templates, and multimedia), reducing content, and requiring assignments (e.g. compare and contrast sources, reflective assignments). Sessions can be improved by providing self-directed learning opportunities so that students can understand the relevance of the content (Reilly, 2017). Holler (2008) stressed that in order to facilitate more structure to the course, integrating ACRL standards would be a step in the right direction. Several authors made suggestions to improve assessment in their teaching such as expanding assessment to other areas (e.g. modules, tutorials), combining both quantitative and qualitative data analyses, and constructing formal evaluation forms. Some authors offered future directions such as expanding services to off-campus students and developing the session as an online course. They also proposed future areas for research including establishing student satisfaction in a controlled environment and considering longitudinal studies of student learning and improvement.

## **Discussion**

There is a wide range of studies exploring business library instruction in different contexts. This systematic review provides a comprehensive way of synthesizing all related literature by identifying common themes and pedagogical strategies for improving library sessions.

In order to discuss the results as to how they relate to the research question, it helps to refer to the ACRL Framework, a primary source for standards, guidelines, and frameworks on academic libraries. The ACRL Framework for Information Literacy for Higher Education covers six frames for enhancing information literacy skills among post-secondary students (American Library Association, 2015); listed in alphabetical order they include *Authority is Constructed and Contextual*, *Information Creation as a Process*, *Information Has Value*, *Research as Inquiry*, *Scholarship as Conversation*, and *Searching as Strategic Exploration*. Not all frames were covered in the included

studies but there was strong alignment with three frames, *Information Has Value*, *Research as Inquiry*, and *Searching as Strategic Exploration*.

The framework *Information Has Value* expresses the diversity of how value can be assigned to information such as “a commodity, as a means of education, as a means to influence, and as a means of negotiating and understanding the world” (American Library Association, 2015, p. 16). For example in her case study, Tingle wanted students to understand that “proprietary business databases vary in focus and content” (2018, p. 189), which directly relates to how information is perceived as a commodity. The value of information also comes in the form of assigning proper credit to original ideas through citations and attribution to original content creators. The proper use of citations was a common topic covered across nine studies. *Research as Inquiry* presents the concept of research as an iterative process where answers to original questions may lead to more questions, thus expanding the set of research questions within a field (American Library Association, 2015). Several studies had learning outcomes that related to evaluating and synthesizing information from multiple sources for a specific purpose (Roldan & Wu, 2004; Spackman & Camacho, 2009; Stonebraker, 2015). Instructors also promoted critical thinking in their sessions (Detmering & Johnson, 2011; McInnis et al., 2009; Taylor, 2008), such as understanding the economic, legal, and social issues with regards to using information (Leavitt, 2016), and identifying bias in websites (Strittmatter, 2012). Critical thinking skills are particularly important for business graduates since a study found that eighty-one percent of employers placed heavy emphasis on critical thinking and analytical reasoning skills in business learning outcomes (Hart Research Associates, 2015). The *Searching as Strategic Exploration* framework outlines the complexity of searching multiple information sources and how it is a nonlinear and iterative process (American Library Association, 2015). With an

abundance of free and licensed resources available, students needed to know where to find and effectively use relevant information (Roldan & Wu, 2004). Students also learned how to optimise search strategies such as including appropriate subject headings and knowing how to re-execute searches (Pietraszewski, 2016). Although authors did not explicitly mention using or adopting the ACRL framework in their instruction sessions, they incorporated many guidelines into their teaching practices with a heavy emphasis on the frames related to research. Alternatively, in a recent study by Click and colleagues (2021), they found that the three most useful frames for business information literacy instruction include *Authority Is Constructed and Contextual*, *Information Has Value*, and *Searching as Strategic Exploration*.

Many key points expressed in the included studies of this systematic review reinforce the findings and conclusions of existing literature, for promoting effective library instruction. They include topics concerning active learning, providing engaging sessions, and faculty collaboration. Positive course evaluations from one study demonstrated the successful approach of integrating a mixture of content delivery methods, including short lectures, small group discussions, and games (Leavitt, 2016). Strategies for engaging students in sessions are as diverse as the number of business resources available. Hands-on exercises were common such as implementing interactive activities for identifying business sources (Lahlafi et al., 2012), optimising classroom discussion by using evaluative prompts in search activities (Tingle, 2018), and group exercises (Taylor, 2008). Student feedback demonstrated that these interventions were effective. Impressively, more than 90% of students agreed or strongly agreed that their library research skills improved after the session (Strittmatter, 2012). Cohen found that the flipped information literacy instruction helped students develop “substantial skills and confidence in conducting research and in compiling data into a report” (2016, p. 19)

and the business professor was so impressed with the students' quality of work that she hoped to continue the collaboration with the librarian in the future. In this study, faculty collaboration was fundamental to the success of library sessions, which has been affirmed by other studies (e.g. Cooney & Hiris, 2003; Fiegen et al., 2002). Not only did librarian/faculty relationships improve the course work for students but they also better contextualized the library sessions into the course as a whole.

Authors used a variety of methods to assess their teaching such as surveys/questionnaires, graded assignments, and exams. However, 75% of studies did not clearly identify learning outcomes, which is problematic since assessment activities are used "to evaluate learning outcomes in the general education component of programs" (Murphy & Harrold, 1997, p. 1). As a result, it is unclear how effective the assessments really were if they were not aligned with learning objectives set out in their sessions. Despite the general acceptance expressed in the literature on the importance of having student learning outcomes (e.g. Lightner & Benander, 2010), there is a notable absence of documenting this information in publications on library instruction. In addition to the missing learning objectives, some studies did not provide enough detail concerning their sessions in order to provide more context. Many studies did not indicate the length of sessions, content or resources covered, and what impact, if any, did educational interventions have on students.

Based on the themes identified concerning the impact of interventions on students (e.g. gained knowledge, positive feedback from instructors, improved quality of students' work, and students' level of comfort), there is a degree of ambiguity and uncertainty with this information since the true impact on students' learning appeared to be unmeasurable. Additionally, there are significant challenges that librarians face when conducting one-shot sessions given the time restrictions of interacting with learners and

the limitations of pursuing long term assessment to see if students have met session or course learning objectives.

The limitations to this systematic review should be considered. With the English/French language limit applied to this study, papers published in other languages may have been missed in the analysis. Grey literature was also excluded from this review to minimize the heterogeneity of the study by focusing on peer-reviewed literature. Due to the subjective nature of how data was extracted, it is possible for other themes to emerge if this review were to be repeated by other researchers. For instance, the ACRL Board adopted and published the ACRL Framework in 2016 but the majority of the included papers for this study was published prior to 2016 (n=26), which required some interpretation on how the interventions aligned with the six frames. Integrating the ACRL Framework into future instructional studies would be worth considering as there are still many factors left unexplored such as investigating how librarians are using the framework to redesign their information literacy programs and sessions.

## **Conclusion**

To the authors' knowledge, this is the first systematic review to explore the effectiveness of library instruction in business undergraduate and graduate programs. This type of review methodology is comprehensive and may be applicable to other library topics of interest. While the common instructional strategies identified are not new, they helped reinforce the importance of active learning, applying the flipped classroom approach, and collaborating with faculty and other key stakeholders to develop library instructional sessions. Since there were many papers without learning outcomes or details about assessment, instructors are strongly encouraged to consider including learning outcomes in library sessions as best practice and to provide ample

detail in publications so that others may be able to adopt strategies into their own teaching practices.

### **No Acknowledgements**

### **Declaration of Interest Statement**

The authors have no conflicts of interest to declare.

## References

- American Library Association, (February 9, 2015), *Framework for Information Literacy for Higher Education*. <http://www.ala.org/acrl/standards/ilframework>
- Anderson, L.W., Krathwohl, D.R., Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., Wittrock, M.C. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A revision of Bloom's Taxonomy of Educational Objectives*. New York: Pearson, Allyn & Bacon.
- Baxter, K., Johnson, B., & Chisholm, K. (2016). Evaluating and Developing an Information Literacy Programme for MBA Students. *New Zealand Library & Information Management Journal*, 56(1), 30–45.
- Click, A. B., Wiley, C. W., & Houlihan, M. A. (2021). “We’re a Little Different:” Business Information Literacy Perspectives on the ACRL Framework. *Communications in Information Literacy*, 15(1), 24–56. *Communications in Information Literacy*, 15 (1), 24–56. <https://doi.org/10.15760/comminfolit.2021.15.1.2>
- Cooney, M., & Hiris, L. (2003). Integrating information literacy and its assessment into a graduate business course: A collaborative framework. *Research Strategies*, 19(3), 213–232. <https://doi.org/10.1016/j.resstr.2004.11.002>
- Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. Available at [www.covidence.org](http://www.covidence.org)
- Cullen, A. (2013). Using the Case Method to Introduce Information Skill Development in the MBA Curriculum. *Journal of Business & Finance Librarianship*, 18(3), 208–232. <https://doi-org/10.1080/08963568.2013.795740>



- Davies, P. (2000). The Relevance of Systematic Reviews to Educational Policy and Practice. *Oxford Review of Education*, 26(3/4), 365-378.  
<http://www.jstor.org/stable/1050764>
- Dowd A.C., Johnson R.M. (2020) Why Publish a Systematic Review: An Editor's and Reader's Perspective. In: Zawacki-Richter O., Kerres M., Bedenlier S., Bond M., Buntins K. (eds) *Systematic Reviews in Educational Research*. Springer VS, Wiesbaden. [https://doi.org/10.1007/978-3-658-27602-7\\_5](https://doi.org/10.1007/978-3-658-27602-7_5)
- Fiegen, A. M., Cherry, B., & Watson, K. (2002). Reflections on collaboration: learning outcomes and information literacy assessment in the business curriculum : Expended conversations: collaboration for student learning. *Reference Services Review*, 30(4), 307–318.
- Fiegen, A. (2011). Business Information Literacy: A Synthesis for Best Practices. *Journal of Business & Finance Librarianship*, 16(4), 267–288.  
<https://doi.org/10.1080/08963568.2011.606095>
- Gunn, M., & Miree, C. E. (2012). Business information literacy teaching at different academic levels: an exploration of skills and implications for instructional design. *Journal of Information Literacy*, 6(1), 17–34. <https://doi-org/10.11645/6.1.1671>
- Hart Research Associates. (2015). *Falling short? College learning and career success*. Washington, DC.: Association of American Colleges and Universities.  
<https://www.utc.edu/sites/default/files/2020-10/2015employerstudentsurvey.pdf>

- Lightner, R., & Benander, R. (2010). Student Learning Outcomes: Barriers and Solutions for Faculty Development. *Journal of Faculty Development*, 24(2), 34–39.
- Makani-Lim, B., Agee, A., Wu, D., & Easter, M. (2015). Applying the Model of Information Literacy Skills Assessment in Business Education to Support Accreditation. *Proceedings of the American Society of Business & Behavioral Sciences*, 22(1), 308–322.
- Mohawk College. (n.d.). *How to Write Course Learning Outcomes*.  
<https://www.mohawkcollege.ca/employees/centre-for-teaching-learning/curriculum-development/how-to-write-course-learning-outcomes>
- Morrison, J. M., Sullivan, F., Murray, E., & Jolly, B. (1999). Evidence-based education: development of an instrument to critically appraise reports of educational interventions. *Medical education*, 33(12), 890–893.  
<https://doi.org/10.1046/j.1365-2923.1999.00479.x>
- Murphy, P. D., & Harrold, R. L. (1997) Assessment: A moving target with rising expectations. In A Collection of Papers on Self-Study and Institutional Improvement 1997. Chicago, IL: Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools.  
<https://files.eric.ed.gov/fulltext/ED416732.pdf>
- Natt, A. (2013). What Is Business Information Literacy and Can the Corporate Librarian Contribute Anything to the Discourse? *Journal of Business & Finance Librarianship*, 18(2), 146–174. <https://doi-org/10.1080/08963568.2013.769290>

- Newman M., Gough D. (2020) Systematic Reviews in Educational Research: Methodology, Perspectives and Application. In: Zawacki-Richter O., Kerres M., Bedenlier S., Bond M., Buntins K. (eds) *Systematic Reviews in Educational Research*. Springer VS, Wiesbaden. [https://doi.org/10.1007/978-3-658-27602-7\\_1](https://doi.org/10.1007/978-3-658-27602-7_1)
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Journal of Clinical Epidemiology*, 134, 178–189. <https://doi.org/10.1136/bmj.n71>
- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., Duffy, S. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews*. ESRC Methods Programme. <https://www.lancaster.ac.uk/media/lancaster-university/content-assets/documents/fhm/dhr/chir/NSsynthesisguidanceVersion1-April2006.pdf>
- Rodríguez, K., Cádiz, L., & Penkova, S. (2018). Integration of information literacy skills into the core business curriculum at the University of Puerto Rico Río Piedras. *Journal of Business & Finance Librarianship*, 23(2), 117–130. <https://doi-org/10.1080/08963568.2018.1467168>
- Stonebraker, I. (2016). Toward informed leadership: Teaching students to make better decisions using information. *Journal of Business & Finance Librarianship*, 21(3/4), 229–238. <https://doi-org/10.1080/08963568.2016.1226614>
- Ungvarsky, J. (2020). Systematic review. *Salem Press Encyclopedia*.

Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M., & Buntins, K. (2020).

*Systematic Reviews in Educational Research : Methodology, Perspectives and Application.* Springer VS.

## Appendices

### *Appendix 1 - Search strategies*

Database	Search Strategy
Library & Info. Science Source	<p>S1 DE "Libraries &amp; business" OR DE "Business information services" OR DE "Business librarians" OR DE "Business libraries"</p> <p>S2 "business school*" OR "business program*" OR "school of business" OR "business education" OR "business student*" OR "business librar*" OR "business facult*" OR "business department*"</p> <p>S3 DE "Information literacy" OR DE "Information literacy education" OR DE "information literacy digital resources" OR DE "Study &amp; teaching of information retrieval" OR DE "Study &amp; teaching of internet searching" OR DE "Literacy education" OR DE "Library education"</p> <p>S4 (librar* or literacy) N4 (instruction* or education* or teach* or curricul* or pedagog*)</p> <p>S5 S1 OR S2</p> <p>S6 S3 OR S4</p> <p>S7 S5 AND S6</p>
Library & Info. Science Abstracts	<p>( MAINSUBJECT.EXACT("business libraries") OR MAINSUBJECT.EXACT("Business schools") OR MAINSUBJECT.EXACT("MBA programs &amp; graduates") OR</p>

(LISA)	<p>noft(("business school" OR "business schools") OR ("business program" OR "business programme" OR "business programmes" OR "business programming" OR "business programs" OR MBA OR "Master of Business Administration") OR "school of business" OR "business education" OR ("business student" OR "business students") OR ("business library") OR "business faculty" OR ("business department" OR "business departments"))) ) AND ( MAINSUBJECT.EXACT("Team teaching") OR MAINSUBJECT.EXACT("Instructional design") OR MAINSUBJECT.EXACT("Teaching") OR MAINSUBJECT.EXACT("Pedagogy") OR MAINSUBJECT.EXACT("Training") OR MAINSUBJECT.EXACT("Library users") OR MAINSUBJECT.EXACT("Online information services") OR MAINSUBJECT.EXACT("Online instruction") OR MAINSUBJECT.EXACT("Information literacy") OR MAINSUBJECT.EXACT("User training") OR noft((library OR literacy) NEAR/4 (instruction* OR literacy OR education* OR teach* OR curricul* OR pedagog*))) )</p>
Business Source Complete	<p>S1 DE "BUSINESS libraries" OR DE "BUSINESS education" OR DE "MANAGEMENT education" OR DE "MASTER of business administration degree" OR DE "BUSINESS school graduates" OR DE "BUSINESS schools" OR DE "BUSINESS students"</p>

	<p>S2 "business school*" OR "business program*" OR mba OR  "Master of Business Administration" OR "school of business" OR  "business education"</p> <p>S3 S1 OR S2</p> <p>S4 DE "LIBRARIANS" OR DE "LIBRARIES"</p> <p>S5 DE "LIBRARIES &amp; business"</p> <p>S6 librar*</p> <p>S7 S4 OR S5 OR S6</p> <p>S8 (librar* or literacy) N4 (instruction* or education* or teach* or  curricul* or pedagog*)</p> <p>S9 S3 AND S7 AND S8</p>
<p>ABI/Inform  AND CBCA</p>	<p>(MAINSUBJECT.EXACT("business libraries") OR  MAINSUBJECT.EXACT("Business schools") OR  MAINSUBJECT.EXACT("MBA programs &amp; graduates") OR  noft(("business school" OR "business schools") OR ("business program"  OR "business programme" OR "business programmes" OR "business  programming" OR "business programs" OR MBA OR "Master of  Business Administration") OR "school of business" OR "business  education" OR ("business student" OR "business students") OR  ("business library") OR "business faculty" OR ("business department"  OR "business departments"))) AND</p> <p>(MAINSUBJECT.EXACT("Academic Libraries") OR  MAINSUBJECT.EXACT("Librarians") OR noft(Librar*)) AND  (MAINSUBJECT.EXACT("Team teaching") OR</p>

	<p>MAINSUBJECT.EXACT("Instructional design") OR</p> <p>MAINSUBJECT.EXACT("Teaching") OR</p> <p>MAINSUBJECT.EXACT("Pedagogy") OR</p> <p>MAINSUBJECT.EXACT("Training") OR</p> <p>MAINSUBJECT.EXACT("Library users") OR</p> <p>MAINSUBJECT.EXACT("Online information services") OR</p> <p>MAINSUBJECT.EXACT("Online instruction") OR</p> <p>MAINSUBJECT.EXACT("Information literacy") OR</p> <p>MAINSUBJECT.EXACT("User training") OR noft((library OR literacy)</p> <p>NEAR/4 (instruction* OR literacy OR education* OR teach* OR</p> <p>curricul* OR pedagog*))</p>
Scopus	<p>(( TITLE-ABS-KEY (( library W/4 ( instruction* OR education*</p> <p>OR teach* OR curricul* OR pedagog* )) OR ( literacy W/4 (</p> <p>instruction* OR education* OR teach* OR curricul* OR pedagog*</p> <p>)))) AND ( TITLE-ABS-KEY ( "business school*" OR "business</p> <p>program*" OR mba OR "Master of Business Administration" OR</p> <p>"school of business" OR "business education" )))</p>
ERIC (OVID)	<ol style="list-style-type: none"> <li>1. exp Business Education/</li> <li>2. exp Business Schools/</li> <li>3. master of business administration.mp.</li> <li>4. mba.mp.</li> <li>5. business program*.mp.</li> <li>6. business student*.mp.</li> </ol>



- |  |   |
|--|---|
|  | <p>7. business faculty.mp.</p> <p>8. business librar*.mp.</p> <p>9. school of business.mp.</p> <p>10. business education.mp.</p> <p>11. business department*.mp.</p> <p>12. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11</p> <p>13. exp Libraries/</p> <p>14. exp Librarians/</p> <p>15. exp Library Services/</p> <p>16. librar*.mp.</p> <p>17. 13 or 14 or 15 or 16</p> <p>18. exp Information Literacy/</p> <p>19. exp Library Instruction/</p> <p>20. exp "users (information)"/</p> <p>21. ((librar* or literacy) adj5 (instruction* or literacy or education* or teach* or curricul* or pedagog*)).mp.</p> <p>22. 18 or 19 or 20 or 21</p> <p>23. 12 and 17 and 22</p> |
|--|---|

## ***Appendix 2 - Reference list of the 35 included studies***

- Atwong, C., & Heichman Taylor, L. (2008). Integrating Information Literacy into Business Education: A Successful Case of Faculty-Librarian Collaboration. *Journal of Business & Finance Librarianship*, 13(4), 433–448.  
<https://doi.org/10.1080/08963560802202227>
- Boudreau, S., & Bicknell-Holmes, T. (2003). A model for strategic business instruction. *Research Strategies*, 19(2), 148–162.  
<https://doi.org/10.1016/j.resstr.2004.03.001>
- Campbell, D., & Cook, R. (2010). An Experiential Market Research Analysis: A Partnership between Teaching and Library Faculty. *Journal of Business & Finance Librarianship*, 15(3/4), 171–178.  
<https://doi.org/10.1080/08963568.2010.487433>
- Clayton, S. (2004). Your class meets where? Library instruction for business and education graduate students at off-campus centers. *Reference Services Review*, 32(4), 388–393. <https://doi.org/10.1108/00907320410569743>
- Cohen, M. E. (2016). The Flipped Classroom as a Tool for Engaging Discipline Faculty in Collaboration: A Case Study in Library-Business Collaboration. *New Review of Academic Librarianship*, 22(1), 5–23.  
<https://doi.org/10.1080/13614533.2015.1073162>
- Cooney, M., & Hiris, L. (2003). Integrating information literacy and its assessment into a graduate business course: A collaborative framework. *Research Strategies*, 19(3/4), 213–232. <https://doi.org/10.1016/j.resstr.2004.11.002>
- Cunningham, N. A., & Anderson, S. C. (2005). A Bridge to FARS and Information Literacy for Accounting Undergraduates. *Journal of Business & Finance Librarianship*, 10(3), 3–16. [https://doi.org/10.1300/J109v10n03\\_02](https://doi.org/10.1300/J109v10n03_02)

- Detmering, R., & Johnson, A. M. (2011). Focusing on the Thinking, Not the Tools: Incorporating Critical Thinking Into an Information Literacy Module for an Introduction to Business Course. *Journal of Business & Finance Librarianship*, 16(2), 101–107. <https://doi.org/10.1080/08963568.2011.554771>
- Donaldson, K. A. (2000). Library Research Success: Designing an Online Tutorial To Teach Information Literacy Skills to First-Year Students. *Internet and Higher Education*, 2(4), 237–251. [https://doi.org/10.1016/S1096-7516\(00\)00025-7](https://doi.org/10.1016/S1096-7516(00)00025-7)
- Finley, W., & Waymire, T. (2012). Information Literacy in the Accounting Classroom: A Collaborative Effort. *Journal of Business & Finance Librarianship*, 17(1), 34–50. <https://doi.org/10.1080/08963568.2012.629566>
- Friebs, C. G., & Craig, C. L. (2008). Assessing the Effectiveness of Online Library Instruction with Finance Students. *Journal of Web Librarianship*, 2(4), 493–509. <https://doi.org/10.1080/19322900802484438>
- Gil, E. L. (2017). Maximizing and assessing a one-shot information literacy session: A case study. *Journal of Business & Finance Librarianship*, 22(2), 97–110. <https://doi.org/10.1080/08963568.2017.1285748>
- Gong, X., & Loomis, M. K. (2009). An Empirical Study of Follow-up Library Instruction Sessions in the Classroom. *Electronic Journal of Academic & Special Librarianship*, 10(1). [https://southernlibrarianship.icaap.org/content/v10n01/gong\\_x01.html](https://southernlibrarianship.icaap.org/content/v10n01/gong_x01.html)
- Gunasekara, C. (2008). Fostering independent learning and critical thinking in management higher education using an information literacy framework. *Journal of Information Literacy*, 2(2), 74–85. <http://dx.doi.org/10.11645/2.2.159>

- Helms, M. M., & Whitesell, M. (2013). Transitioning to the Embedded Librarian Model and Improving the Senior Capstone Business Strategy Course. *Journal of Academic Librarianship*, 39(5), 401–413.  
<https://doi.org/10.1016/j.acalib.2013.03.015>
- Holler, C. M. (2008). Incorporating Vendor-Created Training into Information Literacy Instruction: A Case Study. *Communications in Information Literacy*, 2(2), 99–108. <https://doi.org/10.15760/comminfolit.2009.2.2.61>
- Kelly, A. S., Williams, T. D., Matthies, B., & Orris, J. B. (2011). Course-Integrated Information Literacy Instruction in Introduction to Accounting. *Journal of Business & Finance Librarianship*, 16(4), 326–347.  
<https://doi.org/10.1080/08963568.2011.605651>
- Kirkwood, H. M. (2016). Teaching Competitive Intelligence to Business Students. *Information Outlook (Online)*, 20(6), 12–13.
- Lahlafi, A. E., Rushton, D., & Stretton, E. (2012). Active and reflective learning initiatives to improve web searching skills of business students. *Journal of Information Literacy*, 6(1), 34–49. <https://doi.org/10.11645/6.1.1680>
- Leavitt, L. (2016). Taking the plunge! A case study in teaching a credit-bearing information literacy course to business undergraduate students. *Journal of Business & Finance Librarianship*, 21(3/4), 274–287.  
<https://doi.org/10.1080/08963568.2016.1226617>
- Lieberthal, S. (2009). Teaching Undergraduate Business Students to Access Public Company Information: Assessing Students' Use of Library Resources. *Journal of Business & Finance Librarianship*, 14(3), 230–247.  
<https://doi.org/10.1080/08963560802362849>

- Lombardo, S. V, & Miree, C. E. (2003). Caught in the Web: The Impact of Library Instruction on Business Students' Perceptions and Use of Print and Online Resources. *College & Research Libraries*, 64(1), 6–22.  
<https://doi.org/10.5860/crl.64.1.6>
- McInnis Bowers, C., Chew, B., Bowers, M., Ford, C., Smith, C., & Herrington, C. (2009). Interdisciplinary Synergy: A Partnership Between Business and Library Faculty and Its Effects on Students' Information Literacy. *Journal of Business & Finance Librarianship*, 14(2), 110–127.  
<https://doi.org/10.1080/08963560802362179>
- O'Neill, T. W. (2015). The business model canvas as a platform for business information literacy instruction. *Reference Services Review*, 43(3), 450–460.  
<https://doi.org/10.1108/RSR-02-2015-0013>
- Pietraszewski, B. A. (2016). Developing future scenarios: Business students and librarians employing foresight techniques in tandem during course support. *Journal of Business & Finance Librarianship*, 21(3-4), 239–257.  
<https://doi.org/http://dx.doi.org/10.1080/08963568.2016.1226615>
- Reilly, P. (2017). Creative Approaches to Teaching Graduate Research Methods Workshops. *Nordic Journal of Information Literacy in Higher Education*, 9(1), 21–36. <https://doi.org/10.15845/noril.v9i1.232>
- Renirie, R. H., & Harper, S. (2019). Flipped Library Instruction and Scholarly Resources: A Citation Analysis. *Journal of Library & Information Services in Distance Learning*, 13(4), 339–352.  
<https://doi.org/10.1080/1533290X.2020.1713277>

- Roldan, M., & Wu, Y. D. (2004). Building Context-Based Library Instruction. *Journal of Education for Business*, 79(6), 323–327.  
<https://doi.org/10.3200/JOEB.79.6.323-327>
- Ru, L. X. (2018). Flipping Library Instruction: Singapore Polytechnic Library's Experience. *Singapore Journal of Library & Information Management*, 47(1), 66–72. <https://www.las.org.sg/wp/sjlim/flipping-library-instruction-singapore-polytechnic-library-experience/>
- Rutledge, D. P., & Maehler, A. (2003). An Assessment of Library Education Contributions to Business Student Learning: A Case Study. *Journal of Business & Finance Librarianship*, 9(1), 3–19. [https://doi.org/10.1300/J109v09n01\\_02](https://doi.org/10.1300/J109v09n01_02)
- Spackman, A., & Camacho, L. (2009). Rendering Information Literacy Relevant: A Case-Based Pedagogy. *Journal of Academic Librarianship*, 35(6), 548–554.  
<https://doi.org/10.1016/j.acalib.2009.08.005>
- Stonebraker, I. (2015). Flipping the Business Information Literacy Classroom: Redesign, Implementation, and Assessment of a Case Study. *Journal of Business & Finance Librarianship*, 20(4), 283–301.  
<https://doi.org/10.1080/08963568.2015.1072893>
- Strittmatter, C. (2012). Developing and Assessing a Library Instruction Module for a Core Business Class. *Journal of Business & Finance Librarianship*, 17(1), 95–105. <https://doi.org/10.1080/08963568.2012.630645>
- Taylor, L. H. (2008). Information Literacy in Subject-Specific Vocabularies: A Path to Critical Thinking. *College & Undergraduate Libraries*, 15(1/2), 141–158.  
<https://doi.org/10.1080/10691310802177127>

Tingle, N. (2018). Taking care of business (before class): Information literacy in a flipped classroom. *Journal of Business & Finance Librarianship*, 23(2), 183–198. <https://doi.org/10.1080/08963568.2018.1510254>

### *Appendix 3 - Elements in the data extraction table*

Authors

Title

Journal Year

Country Origin

Institution Name

Mode of Instruction

Audience

Specialty Area

Frequency of Sessions

Length (min)

Intervention

Content (Tools, Topics covered)

Learning Outcomes

Student Deliverables

Collaboration

Educational Intervention Modified Instrument:

Are there learning outcomes?

Are the learning outcomes clear and explicit?

Is there a method to assess the intervention? (the teaching)

What is the impact of the intervention on students?

Assessment

Recommendations

Notes