Graduate Student Searching Proficiencies in the Selection of Qualitative and Quantitative Journal References

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Introduction

Observations on Graduate Students in Current Academic and Library Environments

Teaching faculty, librarians, and students are riding the waves of technological advances in the current academic environment. Rapid changes and enhancements are providing users with innovative and powerful search and discovery tools and are granting greater access to library collections. Adoption of developments in library technology impacts all users, and they certainly affect graduate students. This is apparent as they search for journal articles necessary for completion of class assignments. Regardless of admittance date into a post bachelor's graduate program, each student may have difficulties with some aspect of information literacy, but particularly with current information searching skills. The student returning to a higher education program after years of absence encounters a new learning curve, both in terms of scholarly rigor and technological mastery. "For the new graduate student with little knowledge of the demands of academic research in graduate education this online global environment can be daunting, for nontraditional students it is overwhelming."[1]

To make the re-entry transition operational for students of widely varying competencies, it is important that they be introduced to and supported in their acquisition of fundamental technological, searching and evaluative skills. These will be needed, particularly when assigned literature searches throughout their programs and coursework. It has been noted that ". . . many students find the research process difficult and often choose Google or Google Scholar as their first research port of call."[2] While it is true that Google indexes top quality journal content from vendors such as JSTOR, users will need to authenticate into their library sites to retrieve full text. Academic library resources, containing authoritative information inclusive of research studies, are provided through electronic journal subscriptions and subscription packages. Students, past/currently specifically in the social sciences, must have some acquaintance with electronic library access and navigation if they hope to find the most relevant and up-to-date research findings in the journal literature.

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Boyd-Byrnes and Rosenthal remind readers that "technological advancements have created a misperception that the research process is a simple delivery transaction rather than a complex cognitive activity."[3] Many graduate students are unaware of the most effective searching strategies to find what they need. Acquisition of more sophisticated search and evaluative skills, resulting from library and faculty guidance, enables successful outcomes resulting in increased competence and self-confidence. The accelerated rate at which library resource providers merge and re-package journal content and update interface displays creates a condition where many graduate students approach library databases as novices to the search process semester to semester. Open access journals found both in library collections and directly from the internet only serve to complicate the situation. Consequently, it is not surprising that students may prefer to start searches with a favorite search engine and avoid using the library altogether. However, librarians play a special role by assuring students that the library is a worthwhile starting point for literature searching, despite apprehensions or perceptions of instability. This was highlighted in Dillon's (2002) article, when he stated: "Innovative electronic products are seldom accepted by all library customers as soon as the new products are introduced. New solutions and new products generate a high level of uncertainty and it is important for customers to develop their faith in these products over time."[4]

As students gain more confidence using library resources remotely, and as access to information becomes more of an intentional task, the next step is the evaluation and selection of the right type of material to fulfill course requirements. In the context of the present study of graduate students, evaluation means distinguishing peer-reviewed *research studies* for use in their papers. More specifically, students needed to identify the differences between well-researched opinion articles and evidence-based research prior to selection and use of these materials. Confidence building, then, becomes an additional instructional goal for librarians as they work with faculty to create conditions favorable to student success.

The Need For a Study on Student Selection of Resources

With these points in mind, acquisition of skills needed to develop a literature review or to write a technical paper remains an imperative for success in graduate school. The issue of concern in this pilot study was to identify a list of journals compiled by graduate students as they investigated current topics in education, having searched the vast array of library databases and electronic journal holdings. In support of this selection process, Paul and Elder's[5] critical thinking framework

has been the preferred model for student determination of the value of studies selected for inclusion.

Throughout the initial phase of the resource evaluation process each term, students were under the direction of the Education professor and librarian with each class having convenient access to the librarian throughout the semester. Students were given instructions to find qualitative and quantitative research studies based upon an educational topic of choice in using peer-reviewed journal articles of no more than ten years old. Additionally, this study was undertaken to:

a) categorize which resources are being selected to meet course requirements;
b) differentiate journals that cover research studies from those which do not; and
c) identify whether there is a need to develop library sessions or instructional units focusing on effective searching and journal evaluation methods in support of academic requirements with a best practices outcome.

It was not within the scope of this initial investigation to assess use of the library's collections, though data collected would suggest the range of materials and specific journal titles used by this student population.

Research Questions

The following research questions were addressed:

1. What are the most commonly selected journals referenced by graduate students when conducting a literature search on educational topics?
2. In addition to journals, what are the most commonly selected types of material referenced by graduate students when conducting literature searches on educational topics?
3. What percentage of journals containing qualitative or quantitative studies are referenced by graduate students when conducting literature searches on educational topics?

Review of Literature

The work of Kulthau[6] has been devoted to the classification of the six stages in the literature searching process. Spanning the last two decades, her work is foundational regardless of the access and/or delivery mode for the selection of specific topic information. Kulthau's model for the Information Search Process (ISP)[7] is well known by academics and informs the research that is undertaken in any aspect of literature searching. Success can be attained when students come to an understanding of what they need, how to find it efficiently, how to evaluate, assimilate, and use it both legally and ethically, while at the same time developing information technology skills.[8] When students are required to conduct literature searches, it makes sense for faculty and librarians to collaborate on library interventions for students, whether re-entry beginners or seasoned researchers.

Studies in Graduate Education

Previous studies to produce a listing of journals and additional resource materials are small in number, especially when graduate education is the center of the investigation. Others that focus on the behavior of literature searching while engaged in the critical thinking process are very limited and varied, including topics in three broad areas, with nine subsidiaries similar to those found in the undergraduate study literature:

- *Student focus* on: (a) evaluation of the competence of learners, (b) identification of barriers in the process, and (c) needs of doctoral students
- *Instructional focus* on: (d) faculty-librarian collaboration, (e) developing intervention strategies, (f) assessment of quality of selected materials and (g) classification of journal status
- *Library collection organization* for: (h) retention or cancelation of materials and (i) providing library services.

According to Collins and Veal[9] adult learners, particularly off-campus graduate students (attending classes at a distance of 50 or more miles from their home institution's libraries), are prone to experience a heightened sense of anxiety with respect to use of online library resources. Returning to the university after years away from campus library facilities and the information technology changes that have occurred over time, they also enter into the world of demanding graduate education requirements. Only minor change has been noted, since the 1998 study undertaken by Jiao and Onwuegbuzie,[10] to identify graduate students' perceived level of library anxiety and the barriers encountered in the different phases of the search process as classified by Kulthau.[11] Green and Bowser followed up in 2002 with a study addressing off-campus graduate students' anxiety with respect to use of the library and the quality of thesis literature reviews.[12] An additional qualitative study by Green focused on the perceptions of doctoral students' competencies in using the library and found that students described themselves as being competent learners rather than information illiterates even without information literacy interventions.[13]

Fleming-May and Yuro looked at PhD students' information-seeking behaviors as library users and the connection between marketing the services of libraries and the efforts of information literacy instruction and research assistance.[14] This study was conducted to ascertain the needs of doctoral students and develop intervention strategies for librarians that would improve communication and services for this population. Boote and Beile in a discussion of doctoral student preparedness to tackle advanced educational research looked optimistically to productive collaborations between professors and librarians: "The new focus of libraries on teaching students to critically engage with information offers the possibility of successful faculty-librarian collaboration, especially in the realm of graduate literature reviewing and writing."[15] To better understand the needs of graduate students, Rempel engaged in a longitudinal study to identify the impact of workshops provided by librarians, with the revelation that workshops do have long-term benefits for the student but there is no one best practice.[16] Haycock's research examined dissertation citations specifically to provide library staff with data to support the process of deselection and retention of journal subscriptions and other library materials when making budgetary decisions.[17]

These studies identified both masters and doctoral specific conditions and concerns. Regardless of the educational level, the importance of gaining some form of mastery remains a constant in the literature. The speed at which electronic and multimedia innovations are being accepted by academic institutions is changing the interface between learner and librarian and between professor and librarian. This is a positive dynamic that will impact both graduate and undergraduate education profoundly.

Studies in Undergraduate Education

Research studies addressing undergraduate reference list collection in the late 1990s and early 2000 have a slightly larger presence, with a goal of identifying the importance of faculty-librarian collaboration to improve reference quality according to Davis and Cohen,[18] Davis,[19,20] and Hurst and Leonard.[21] Research conducted in 2007 by Hurst and Leonard and in 2009 by Barratt and others,[22] looked at the level of quality of the selection of the resource materials with instruction as part of the construct of the studies. A follow-up study by Robinson and Schlegl[23] corroborated Davis's[24] claim that library instruction alone produced negligible results with respect to student use of scholarly material.

Various methodologies have been used to determine the influence of library instruction on reference lists and invariably these studies employ bibliometric or citation analysis as the basis for measuring the effectiveness of instruction. Davis and Cohen[25] and Davis[26,27] took a longitudinal approach in reviewing scholarly and non-scholarly content. The 2001 study by Davis and Cohen concluded that library instruction does not ensure student selection of scholarly materials and that faculty need to both communicate expectations and enforce guidelines in the use of research materials.[28] The final study in this sequence (Davis, 2003), provided evidence of a return to the initial 1996 level of scholarly resources selected by students and inferred that adjustments made to course requirements together with library instruction are generalizable strategies for improving reference lists.[29]

There is one remarkable study at the undergraduate level which is more emphatic on the application of resource guidelines for student use of resource materials. Robinson and Schlegl sought to test the generalizability claim by Davis (2003) through internationalizing the population under study and expanding it to another academic discipline.[30] Further, they wanted to test the hypotheses that scholarly electronic citations will be fewer than their print counterparts and that use of scholarly sources correlates with higher grades. A control group consisting of two classes receiving no library instruction served for baseline measures. A third class was given library instruction with faculty guidelines to include scholarly sources in the bibliography and a fourth class received library instruction, scholarly resource requirements and a quantified penalty for non-compliance with the scholarly source requirement. The researchers' findings corroborated Davis's (2003) claim that library instruction alone produced negligible result with respect to student use of scholarly material. The statistical analysis of the second hypothesis inferred that the penalty threat positively impacted student selection of sources. Statistical significance was also demonstrated when comparing grades to the control and instruction-only groups.

Attaining skills and knowledge in the literature searching process for graduate students shows no major distinction from the undergraduate populations to date. The goal of the ISP for all students is to prepare them well to use the necessary tools as they explore the literature to meet their individual needs. Collaboration among professor, librarian, and student is imperative to support the search process and to provide students with a positive and confident disposition throughout the progression toward mastery.

Methodology

This study analyzed the reference lists from seventy-seven masters and doctoral students' Literature Review submissions which fulfilled the requirements in two graduate Education courses that were randomly selected by the professor of record. The students were enrolled in various disciplines which had graduate programs at a Florida public university, with a large percentage of them coming from its College of Education programs, particularly Curriculum and Instruction. In preparation for the study, the Institutional Review Board office at the University was contacted to ascertain approval to conduct the research. It was agreed that the need for a Human Subjects Research review and approval was not required to advance the study. Only archived data collected between 2005 and 2010 were used with no reference to any students.

Reference list data were coded to designate the level of the course offering, masters or doctoral, and the semester and year collected. During the period from which the data were collected, a campus librarian provided one or two sessions of database and resource instruction for each class in the anticipation that the collaboration would provide students guidance for recognizing and accessing peer reviewed qualitative and quantitative research studies. All courses required the completion of a literature searching assignment that would be used in a final submission of a Literature Review or a final paper submission that included a Review of Literature section. Written directions for the Literature Searching assignment were provided in the syllabus (see Fig. 1), in BlackBoard announcements, in email messages, and frequently, in verbal communications. Literature searching directions were identical for each course regardless of the course title or section.

Individual evaluations were given to journal resources for both their coverage of research study content and indicators of prestige. To determine whether journals referenced carried any amount of research study content, the investigator and a graduate assistant divided a list of 265 journal titles and used the library's Electronic Journal Portal to sample journal content. Volume indexes were searched for article titles that pointed to research content, but the investigators relied more upon article abstracts to make individual determinations. If an abstract was unclear, the sample article was downloaded and examined for standard structural elements found in most research studies. In many cases, multiple samples from a single journal title were reviewed in order to make the fairest determination possible. Separately, prestige annotations were associated with journals indexed by JSTOR, ISI Web of Knowledge, Cabell's Directories, and assigned Eigenfactor scores for the year 2008 (http://eigenfactor.org).

Journal titles were also documented individually for each of the two courses in the sample and entered into separate spreadsheets. For each set, journal titles and other resources referenced were sorted in the same manner as the full aggregated list above. Sorting in this manner allowed the present researchers to view and quantify journal usage in a manner revealing usage patterns for each course. A separate summary sheet displaying most-used journals for literature searches per course provided an overview from which observations could be made.

Findings

At present, the electronic journal holdings at the Florida institution where this study was conducted, number approximately 117,000 unique titles. According to Bray and Major, there are roughly 700 education journals in existence today.[31] In the present sample, 77 students, distributed over a 6-year period, referenced a total of 265 journals. In addition to educational journals, students referenced articles from discipline-specific journals outside the field of education. Table 1 represents the top ten journals selected by students, number of times referenced, and whether the journal carries replicable research study content.

Non-journal materials appearing in reference lists totaled 120 unique resources. Table 2 groups them by type and number of instances.

Figure 1
Excerpt from EDG6224 course syllabus.

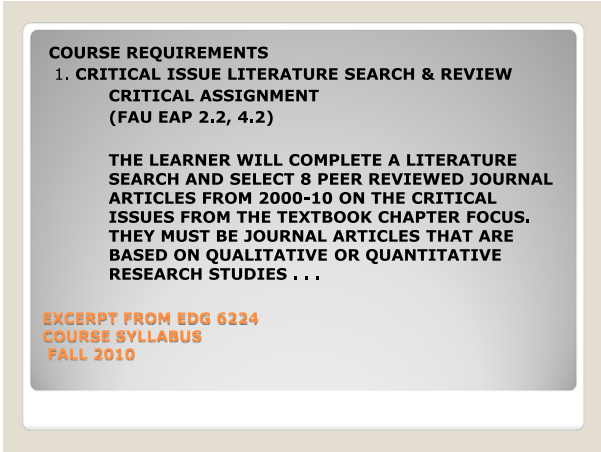

Table 1

Top ten journals selected by students, number of times referenced and presence of replicable research studies

Most commonly selected journals	Times referenced	Research study content
Educational leadership	32	No
Phi delta kappan	24	No
Educational policy	20	Yes
The clearing house	15	Yes
Educational researcher	12	Yes
The social studies	11	Yes
The elementary school journal	10	Yes
Teacher education quarterly	10	Yes
American educational research journal	9	Yes
Kappa delta pi record	9	No

Part of the assignment required that the course textbook be referenced, but the count has been omitted from the book category.

The authors examined referenced selections from two perspectives. First, the journals which were referenced the most were identified and evaluated as to whether they contained research studies (cf. Table 1). Secondly, the *total number* of journals referenced was evaluated in the same manner. Viewing data from the first perspective, on average 56.2% of top-referenced journals contained research studies. From the second perspective, on average 67.4% of all journals referenced contained research studies.

The majority of journals referenced in student literature searches were available by way of electronic library subscriptions. A subset of open access journals (n = 23) was available through both the library's electronic collection or freely available through internet searching. Only two journals could not be located within the library's holdings. Of the 265 journals referenced, print formats for 150 journal titles were available at three campus locations, but only 8 are currently held as print plus online subscriptions.

From the 265 journals referenced, 173 were determined as carrying, at minimum, some research study content. Further, the researchers wanted to know which of these were considered prestigious or at least given heightened exposure by their presence in recognized indexes. It was discovered that 98 titles (57%) were indexed in Cabell's Directories; 25 titles (14%) were indexed in ISI Web of Knowledge; 24 titles (14%) were indexed in JSTOR and 32 (18%) received an Eigenfactor score. One title alone, *Higher Education*, was indexed and scored in all latter categories.

Table 2

Non-journal content referenced with number of references per category

Non-journal resources referenced	Times referenced
Government and school district web sites	13
ERIC documents/digests	20
Books	34
Online newspapers	12
Non-governmental web sites	38
Recorded broadcast	1
Dissertations	2

Discussion

These findings would suggest that journals which were being referenced the most by students were not necessarily the best sources for research studies. Use of research journals varied widely from student to student, term to term, and year to year. This preliminary investigation of 265 journal titles garnered a list of the ten most often referenced journals with current educational content. A subset of the complete list of titles, that is to say, those identified as journals which carry research content, may serve as a guide to graduate students in the future as they focus their search efforts.

Detailed directions for the literature search required only that journal articles be selected, but 120 non-journal sources were referenced, indicating either students' inability to distinguish between journal and non-journal submissions or their inability to locate suitable sources. It could also suggest that no current research studies have been conducted in those topic areas or that results have not been published in the professional literature. Yet another possibility is that students have been locating materials outside the journal literature which support their own opinions and thus desire to use them. Another factor which may be influencing student selection is the amount of time it takes to fulfill the requirement. The process of searching, evaluating, and selecting research studies can be a tedious and time-consuming process, even for those with advanced skills and availability of cutting edge library discovery tools. Students pressed for time may not be able or willing to invest the many hours needed to master literature search competencies.

The method of analysis provides a model to identify journals that both carry research studies and are supported with evidence-based results, rather than opinion or an expert's analysis of a topic. The findings indicate that students are either unfamiliar with research methodology or believed they had followed the assignment directions, and used whatever resource they could find that featured their selected educational topic. This would suggest that student knowledge of research methodology be surveyed prior to the literature searching assignment. Faculty and librarians should be prepared to help students recognize differences between research and non-research literatures.

Recognition of a journal's prestigious classification as determined by the presence of specific indicators could enhance the quality of references selected by graduate students. If students are knowledgeable of quality differences, and the topic of choice is covered within those prestigious sources, students may be more apt to select them. This pilot study provided the researchers an exercise which evaluated and categorized journal content, which may have applications for future library instruction and student knowledge of the research study literature.

This initial pilot has provided the researchers a template for moving to the next phase of exploration. A larger data sample collected over six years will allow for a more substantial analysis of the selected journal and non-journal resources and an opportunity to test whether the model proposed for assessing journal prestige can be brought to bear when guiding student selections. The results of a larger study may lead to better collaboration between professor and librarian to develop stand-alone podcasts that may be used to meet student needs based upon criteria deemed necessary for literature searching assignments. Further, graduate students who are addressing current topics in education will have a more defined list of pre-vetted journals which contain evidence-based studies acceptable for assignment submission.

These findings may provide a futuristic look at library instruction and intervention needed to meet the new standards for distance learning and face-to-face teaching environments. The data from this

pilot study would suggest to faculty and librarians an opportunity to break new ground in the advance of information literacy. Orienting graduate students to the value and benefit of evidence-based literature carries the potential to raise the bar in academic environments. Medicine, nursing, psychology, and a number of social disciplines regularly use research evidence for argument and action. The inclusion of underused research studies in instruction with graduate education students adds an element of balance to existing student competencies. The challenge for those working with time-strapped and library-apprehensive graduate students will be to offer these opportunities, and at the same time, support them on their way to success.

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