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What Do High School Students Know About Information Literacy?

A Case Study of One University's Feeder Schools

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This article describes a local study that seeks to illuminate first-year college students' prior experiences with research and information literacy (IL) during high school. A small, suburban university surveyed and conducted interviews with librarians at the university's feeder schools. The high school librarians rated students' levels of proficiency in IL skills and described their school's IL programs. Overall, librarians rated students' IL levels as less than proficient and described several challenges to helping students improve these competencies, including teacher resistance, assignment design, and students' habits around information. Opportunities exist for academic and school librarians to collaborate to improve IL instruction as well as to emphasize IL in teacher education programs.

Introduction

Students begin college with a wide range of experiences, competencies, and attitudes around information. Academic librarians often do not know what students have learned about research and information literacy (IL) in high school, which can be a challenge for those who teach first-year students. This localized study contributes to the body of literature on the topic of IL and the transition from high school by serving as a case study of one small, private, suburban university's students' experiences with libraries, librarians, research, and IL instruction prior to enrollment. Having a sense of incoming students' baseline IL skills and level of exposure to IL concepts can help librarians who work with first-year college students to tailor instruction to more effectively help students build on existing knowledge, develop skills, and think about information and research in more sophisticated ways.

Literature Review

Studies show that many students enter college with low levels of IL (Foster, 2006; Gross & Latham, 2009; Saunders, Severyn, & Caron, 2017; Smith, Given, Julien, Oullette, & DeLong, 2013). One factor contributing to this low level may be students' experiences with libraries and IL instruction in K-12, which tends to be inconsistent both between and within school districts. In their survey of more than 375 first-year students at a small honors college, Douglas and Rabinowitz (2016) found that, while in high school, 79% of students borrowed library materials, 67% had used a library database, and 64% reported receiving a lesson from a librarian. However, students often receive IL lessons in a fragmented way, and these lessons may not be reinforced throughout their academic careers (Crawford & Irving, 2007). Many schools do not have a library, and others may have a library but no librarian, relying instead on teachers, staff, or volunteers to run the library. Even in schools that do have a library and a librarian, some students may not receive IL lessons, and those that do may not value those lessons or retain what they learned. In their survey of incoming first-year students, Gross and Latham (2007) found that, regardless of GPA, respondents said they taught themselves information skills and were just as likely to say they learned IL skills from a friend or classmate as from a school librarian.

Even in high schools where a librarian provides IL instruction, there may be a gap between skills taught in high school and skills needed for a student to successfully perform college-level research, and students may have difficulty transferring these skills as they transition to college (Saunders, Severyn, & Caron, 2017; Varlejs & Stec, 2014). Moreover, students with low levels of IL proficiency tend to overestimate their abilities as researchers (Gross & Latham, 2007; Gross & Latham, 2009; Gross & Latham, 2011; Latham & Gross, 2008; Saunders, Severyn, & Caron, 2017), and faculty tend to assume that students are better prepared for college-level research than they actually are (Smith et al., 2013). Both faculty and students find that the level of research and IL instruction provided in high school is insufficient to prepare students for their college research projects (Gross & Latham, 2007; Head, 2013; Saunders, Severyn, & Caron, 2017; Taylor, 2012). Understanding where students tend to need the most remediation can help academic librarians provide effective instruction early in a student's college career.

Some librarians have worked to address this gap by hosting visits to academic libraries for high school students, usually in the context of a class; one such program is the Informed Transitions (n.d.) program at Kent State University. Others have studied high school students directly, such as Julien and Barker (2009), who asked 11th and 12th graders to complete skills-based tasks and followed up with interviews to gather information about their affect and mindset. Additional work seeks to study the research and IL skills students will be expected to have when they begin their first year of college, either by interviewing or surveying faculty who teach first-year students (Dawes, 2017; Jackson, MacMillan, & Sinotte, 2014; Raven, 2012) or by reviewing syllabi or assignments (Donham, 2014; Oakleaf & Owen, 2013). Others, such as Rollins, Fonseca, Fontenot, and Seidel (2013), have facilitated conversations between academic librarians and school librarians to help each group better understand what students learn and what they are expected to do at each level. This study seeks to add to the body of literature around the IL gap between the last year of high school and the first year of college by examining the local context for students entering one university.

Methods

In order for the librarians at Arcadia University to have a better understanding of our first-year students' experiences with research and IL, I surveyed librarians at our top 50 feeder high schools and followed up with semi-structured phone interviews. To identify the university's top 50 feeder high schools, I reached out to the enrollment management office, who shared a College Board document that identifies those schools. In 12 instances, the school's website did not help me identify the librarian or media specialist to contact at that school, so I called the school's main office. While two of these calls yielded librarians' names and contact information, 10 schools did not employ a librarian

or media specialist. Three of these schools had no library at all; the others had a space containing books and computers, staffed by volunteers or operating on the honor system.

To gather context about the schools that did have a library and a librarian, I adapted a survey from Nix, Hageman, and Kragness (2011) to ask respondents about what they teach and their perceptions of students' research and IL skill levels after four years of high school. The original survey gathered the IL experiences of students who attend parochial high schools. For my study, I shortened it, focused it on IL, and tailored it to my own institutional context (Appendix A). I omitted questions about libraries' equipment, where high school graduates enrolled in college, and librarians' estimate of the percentage of time spent on different responsibilities. I also added questions that asked librarians about teaching, assessment, and collaboration with classroom teachers, and one question that asked if librarians teach search strategies for Google. I created the survey using the Qualtrics platform and distributed it by email, following up with a reminder to those who did not complete the survey after two weeks. Of the 40 librarians I was able to identify at our top 50 feeder schools, 21 responded (52.5% response rate). The survey invited participants to indicate if they would like to be contacted for a follow-up phone interview. These semi-structured interviews used a common set of questions while allowing for conversation to develop organically (Appendix B).

Limitations

The local and highly qualitative nature of this study, combined with the very small sample size, mean that the results of this study are not generalizable. Additionally, taking interview notes by hand rather than recording phone interviews could have introduced researcher bias. However, this study could provide a model that could be useful for other universities who wish to study incoming students' experiences.

Findings

All survey respondents were full-time school library employees, and all but one were state-certified, degree-holding school librarians or media specialists. The respondent who was not a librarian was a teacher, and explained:

> All librarians were laid off four years ago and our library went unused for one year. I moved my office into the library so that the space and computers could be used. There is no budget, no official library staff. It is a meeting area and a place with computers only. We do not even have a working printer. There are no databases. (Survey comment)

More than three quarters of the respondents were the only librarian employed by their high school, though most had one or two support staff in their library. All but two of the respondents reported that IL instruction is in their job description. However, of the 21 survey respondents, only eight reported that their school had a formal IL curriculum or formal IL learning outcomes, while 10 reported that their school had none, and three reported informal outcomes or integration of IL in the English Language Arts curriculum. All but one of the respondents reported that they instruct students how to use their library's subscription databases, while only 11 reported that they teach students search strategies for Google. None of the respondents use a standardized assessment tool to measure students' performance on IL tasks, but three reported using an informal assessment they developed to gauge student learning. Several noted they rely on observations of students and feedback from teachers to get a sense of both student learning and their own performance as IL instructors.

The survey asked librarians to use a five-point Likert scale to rate students' skill level in several aspects of research and IL. A score of 1 indicated "not well at all," 3 was labeled "proficient," and 5 was labeled "expert." Results indicated that, on average, these high school librarians rated their students' overall IL levels as slightly less than

proficient (2.85) by the time they graduate. Interestingly, librarians gave students higher ratings in all but two of the individual skill areas. Students received the highest ratings in distinguishing between online search engines and subscription databases (3.66) and avoiding plagiarism and documenting sources using an appropriate citation style (3.57). Librarians were more critical of students' abilities to use advanced search techniques such as Boolean (2.38) and truncation and wildcard characters (1.76). In fact, 85% of respondents said that students used truncation and wildcards "slightly well" or "not well at all."

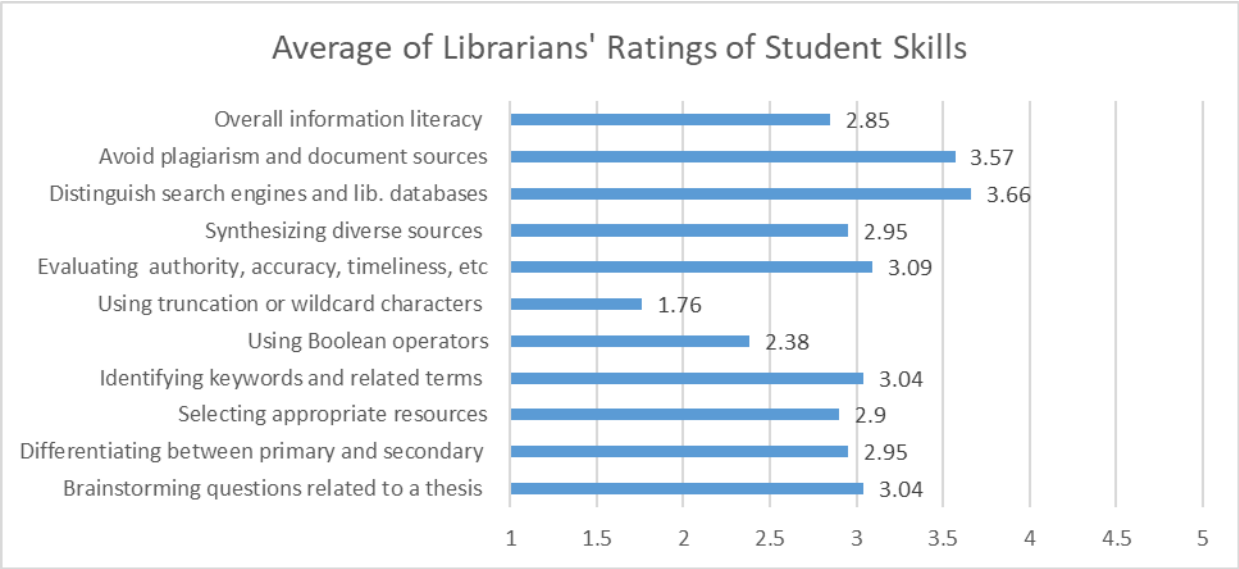

Figure 1

Librarians' Ratings of Students' Skills

After the survey, I conducted semi-structured interviews with seven participants, taking notes by hand and capturing direct quotes whenever possible. All of the participants were librarians or media specialists from schools in Pennsylvania or New Jersey, representing six public schools and one private Catholic high school. All but one worked as a solo librarian, and the schools ranged in size from approximately 1,200 to 3,100 students. The interview questions focused on the types of assignments for which teachers request research and IL instruction, librarians' experiences collaborating with teachers, what the librarians typically teach, and their overall assessment of their library's instruction program. Taken together, the survey responses and the interviews revealed common themes that characterize issues in high school IL instruction at the local level, which are listed here and discussed in more depth below:

- Instruction is not universal
- Instruction is uneven for students on different academic tracks
- Lack of collaboration and teacher resistance
- Concern that teachers themselves lack IL skills
- Prescriptive assignment design or a lack of research assignments
- Students' unsophisticated approach to searching and uncritical, transactional approach to selecting and using information resources
- Lack of skills transfer between assignments and between grade levels

Discussion

Instruction is not universal

All of the librarians surveyed and interviewed said that they see students most often in the context of their English Language Arts (ELA) courses. This is unsurprising as Pennsylvania has adopted the Common Core State Standards, which, while not using the term "information literacy," includes research and IL skills in the ELA standards (Pennsylvania Department of Education, 2014). Only two of the librarians reported that their school requires research and IL instruction with the librarian in ELA. One additional librarian noted that a lesson in the library is required in the Freshman Seminar course; however, this lesson is focused on how to physically get to the library, a tour of the space, and a brief introduction to the library catalog. Generally, it does not cover IL concepts. The remaining four librarians interviewed all reported that teachers arrange for lessons for their students at will, and one librarian described the instruction at her school as "haphazard." Another librarian mentioned that she collaborates with some teachers and never sees others. As such, some students are completing high school without ever receiving a lesson in research and IL from their school librarian.

Instruction is uneven for students on different academic tracks

The interviews revealed that freshmen and sophomores are more likely to receive IL instruction than juniors and seniors. Furthermore, interviews echoed research that finds that instruction is provided differently, depending on students' academic track, with students in more advanced classes receiving more instruction centered on higher-order thinking skills (Fabbi, 2015). Students in honors and advanced placement (AP) courses are more likely to receive instruction than students in general education or remedial courses. IL expectations differ for students on different academic tracks as well. One librarian explained that for a particular assignment, AP students are asked to select a website to use as a source and have it vetted by a teacher, while in the same course at the college preparatory (CP) level, students are allowed to use "any source" and the assignment does not include an evaluation component. While college-bound students need to practice research and IL skills, these skills are important for all students to prepare not just for academia but also for their personal and professional lives.

Lack of collaboration and teacher resistance

Finding time to teach IL skills seems to be a challenge universally familiar to instruction librarians, and the high school librarians participating in this study shared the same sentiment. Some mentioned that being the only librarian in a school of thousands of students made seeing each student impossible and explained their efforts to make instructional videos available. A few librarians also stated that teachers can be reluctant to collaborate with librarians and/or devote class time to IL instruction. In response to the survey, one librarian wrote "I have teachers who tell their students to just go to Google and find appropriate sources but push back when I ask to show their students the databases. It seems like I have to fight every year to meet with the students." In a follow-up interview, this same librarian explained that there is an assumption that the teachers are providing IL instruction to their students in their own classrooms. However, this librarian suspected "…that's what they say, but in truth, they're not." Other librarians also explained they think teachers are providing IL instruction in their own classrooms, but they do not know what the content of such lessons might be. Recognizing this, one librarian said "My involvement with students is rather hit or miss. I work to train the teachers to in turn train the students." Another librarian worried that teachers would be unlikely to provide instruction in the same way that a librarian would, relaying instead what they learned as a student, which may be outdated or less relevant to the school library's resources.

Concern that teachers themselves lack IL skills

Compounding the problem of not knowing what, if anything, teachers are teaching their students about research and IL, three of the librarians interviewed expressed some concern that the teachers themselves may not be information literate. One mentioned that the teachers were unfamiliar with the library's databases, so she provided in-service training for all teachers in her district. Another was concerned that teachers were not proficient in their abilities to evaluate information found on the open web and would not be able to guide their students in source evaluation. The same librarian reported that she provided training for teachers in her district on how to create citations for non-print sources after she found out that some teachers had been telling students that they didn't need to cite images. A third expressed some doubt that the teachers at her school knew how to research and write a traditional research paper. Research seems to support the notion that teachers may themselves have low IL, such as a recent study at one university that found that fewer than half of teacher education students who participated in a standardized IL assessment met or exceeded the cut score (Godbey & Dema, 2017). As these authors point out, part of the challenge in helping preservice teachers develop IL skills is the fact that the latter years of teacher education programs put much more emphasis on practice and student teaching than on writing research papers, and students tend to associate IL only with finding sources (Godbey & Dema, 2017). It is possible that developing techniques to make IL more visible to preservice teachers throughout the course of their studies might help them to be more aware of their role in teaching, or at least reinforcing, IL concepts in their own classrooms.

Prescriptive assignment design or a lack of research assignments

A few interviewees mentioned their schools seem to be moving away from assigning the traditional research paper, opting more toward deliverables that involve technology, such as presentations, infographics, and podcasts. When research is required for an assignment, the guidelines are sometimes problematic. For example, when students are told they cannot use sources from the open web, they miss an opportunity to practice source evaluation skills to select an appropriate resource. The same is true when they are provided with a list of vetted websites to use, or if, conversely, students are told they are allowed to use any source and do not receive feedback or grades based on the quality of the sources they cite. As many studies show, students tend to deemphasize source evaluation (Gross & Latham, 2009; Gross & Latham, 2011; Taylor, 2012) and value convenience over quality (Connaway, Lanclos, & Hood, 2013; Gross & Latham, 2011; Parker-Gibson, 2001). This habit likely leads to students choosing inferior sources, simply because they found them quickly.

Students' unsophisticated approach to searching and uncritical, transactional approach to selecting and using information resources

The Pew Internet and American Life Project found that students have a transactional view of research as a task requiring them to find just enough information to complete an assignment (Purcell et al., 2012). In fact, as Thomas Mann (1993) pointed out with his Principle of Least Effort:

> Most researchers (even 'serious' scholars) will tend to choose easily available information sources, even when they are objectively of low quality, and, further, will tend to be satisfied with whatever can be found easily in preference to pursuing higher-quality sources whose use would require a greater expenditure of effort. (p. 91)

Valentine (1993) confirmed this tendency to sacrifice quality for convenience in her study of undergraduates who, although they had jobs in the library, struggled with using the library, did not want to ask librarians for help, and stuck to sources or methods they thought of as easy or familiar with the goal of getting their research done as quickly

as possible. This issue is longstanding, and contemporary students' preference for convenience can only have been exacerbated by their lifelong reliance on Google.

However, the popular assumption, which the students themselves also share, that students are good at using Google simply by virtue of being born in a world in which it has always existed, is simply untrue. One librarian said in her interview that she is "not so confident they really know how to search on the internet." She described students' "natural behavior to type in the search bar exactly what they are thinking," often a complete sentence or question. She provided an example of a student who typed the question "Why did John F. Kennedy win the Nixon-Kennedy debates in 1960?" into Google's search bar, and became frustrated when an answer was not instantly apparent on the results page. Project Information Literacy found that first-year college students struggled with developing keywords when searching for information in library databases (Head, 2013). Providing high school students instruction on how to parse out the main concepts of a topic and use Google to generate keywords could help students improve their search habits and results using any search platform.

After struggling with what to type into a search bar, students often struggle with selecting which sources to use. Two of the librarians interviewed mentioned that students have difficulty separating legitimate sources from sensational, fanatical, or conspiratorial sources, with one librarian giving the example of a student struggling to determine the accuracy of health information and another relating an example of a student who believed the earth is flat because NBA star Kyrie Irving says so. While this surprised me, it aligns with Dawes's (2017) finding that faculty who teach first-year college students report they have a tendency to equate celebrity with authority. A third interviewee explained she uses a survey after lessons that is "revealing that [students are] not worried about quality. They're worried about just getting the information and being done." In a survey response, one librarian reported that "secondary level students in general are very lazy when it comes to the research process. They don't take the time to really think about what needs to be accomplished to be successful. They are prone to choosing the first thing that comes up." While students may be naturally inclined to expend the least amount of effort possible, their overreliance on Google likely reinforces this uncritical, consumeristic approach to information.

Lack of skills transfer between assignments and between grade levels

Occasional IL instruction may not be enough to ensure that students have a proficient level of IL when they graduate high school. In their survey comparing high school and college librarians' perceptions of students' IL skills, Saunders, Severyn, and Caron (2017) found that high school librarians consistently rated students more proficient in individual skills than college librarians did. The authors explain that one possible reason for this incongruence could be that, if students are learning these skills in high school, they are "simply not remembering or transferring" them once they reach college (Saunders, Severyn, & Caron 2017, p. 282). The high school librarians in this study would add that students have trouble transferring skills between grades and even between assignments. In both the survey responses and the interviews, librarians expressed frustration that even after receiving instruction and successfully using the library's databases, students revert back to using Google in an uncritical manner when searching independently. One librarian wrote in response to the survey, "Continually I am amazed at students' lack of ability to transfer knowledge from one task to another in the future." Another said in an interview, "It's amazing how many 10th graders act like they've never seen a catalog before." Students need support and guidance to understand how research and IL skills they learn from librarians both build on what they already know and can be used in different contexts, in school, the workplace, and their personal lives.

Conclusion

The findings in this small, local study confirm the general conclusion represented in the literature that students often graduate high school and enroll in college with less-than-proficient IL levels. A variety of factors conspire to thwart the efforts of high school librarians' IL instruction efforts, including a lack of collaboration with or outright resistance from teachers; the assumption that teachers, who may not themselves be information literate, are teaching IL in their own classrooms; and the sheer number of students enrolled in schools that often employ no more than one librarian – to say nothing of the schools that have no librarian, or no library at all. However, it remains important for librarians to continue to advocate for opportunities to help students develop their IL skills. Additionally, students need repeated practice using research and metacognitive skills in all four years of high school, not only freshman and sophomore years. High school librarians may find it useful to articulate an IL curriculum or IL learning goals for their school, which can be used as a tool to advocate for IL instruction time. Several states, including Pennsylvania, have model school library curricula which can serve as inspiration or a starting point.

Students tend to be weak in developing a search strategy and generating keywords, and the assumption that they naturally know how to do this because they have grown up in a highly connected world does not help them improve in these areas; perhaps focusing more direct instruction around those topics would better prepare students for searching both academic databases and internet search engines. Students need more practice with selecting high-quality resources and need to be able to transfer source evaluation skills between assignments as well as between academic, work, and personal contexts. In light of this, both high school and college librarians should provide more direct instruction, not only in using library databases but also in using search engines like Google to find quality sources. Students need guidance to understand that Google is a business and not a neutral platform serving up truth; librarians have an opportunity to help students understand that the search engine works on a proprietary algorithm that privileges some information and obscures others in a personalized manner. Likewise, students need guidance in understanding the contextualized nature of authority and to distinguish celebrity from expertise.

One impetus for this project was my own ignorance of, and desire to understand, the range of research and IL instruction experiences our first-year students have before they arrive at Arcadia University. This desire is reflected in the common theme in the literature that calls for high school and college librarians to communicate more about what students need to know and be able to do, and plan ways to reach those goals (Gerrity, 2018; Saunders, Severyn, & Caron, 2017; Varlejs & Stec, 2014). Surveying and interviewing librarians who work in schools from which this university routinely draws students has revealed that, even at the local level, students' experiences vary widely.

In pursuit of a more thorough understanding of our students' backgrounds, Arcadia University's library administered the Higher Education Data Sharing Consortium's Research Practices Survey to incoming first-year students in the fall 2018 semester. The data gleaned from this survey will form a useful complement to what we have learned from high school librarians and allow us to begin to tailor our first-year instruction program to build on students' current knowledge and encourage the meaningful application and transfer of new skills. Opportunities for further research could include interviewing our first-year students and their instructors, which could provide a rich portrait of what our incoming students know and how they think about research and information when they begin college.

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Appendix A: Survey of Research and Information Literacy Instruction in High Schools

Adapted from Nix, Hageman, & Kragness, 2011

1. Consent Form for Participation in a Research Study Survey of Research and Information Literacy Instruction in High Schools
2. Are you a state-certified school librarian or school library media specialist (SLMS)?
3. How long have you been working as a school librarian or SLMS?
4. How long have you been a librarian or SLMS at your current school?
5. Are you employed full time or part time? If part time, how many hours per week?
6. How many certified school librarians or SMLSs work in your school library?
7. How many other paid employees work in your school library?
8. Does your library provide electronic databases for your students?
9. Do students have access to the library's electronic databases from home or outside school?
10. How many computers are available for student use in your school library or media center?
11. Please comment on how your library's budget has changed over the last three fiscal years.
12. Does your school have an information literacy curriculum and/or articulated information literacy learning outcomes?
13. Is instruction in your job description?
14. Do you provide formal research and information literacy instruction for students?
15. Do you collaborate with teachers to design information literacy lessons?
16. Do you teach students search strategies for Google?
17. Do you teach students search strategies for library databases?
18. Do you teach students how to evaluate sources?
19. Do you administer a standardized information literacy assessment instrument to students in your school?
20. What strategies do you use to assess how well your students have met your information literacy learning goals?
21. What subjects are most represented among classes brought to the library for formal instruction? Rank the top two.
22. What subjects are least represented among classes brought to the library for formal instruction? Rank the top two.
23. Tell us about your graduating seniors' level of preparation for college-level research. On a scale of 1 - 5, with 5 being expert and 1 being not at all prepared, how well prepared do you think most of the seniors at your school are to do each of these research tasks at the college level?
    a. Brainstorming both broad and specific questions related to a thesis statement
    b. Differentiating between primary and secondary resources
    c. Identifying keywords, synonyms, and related terms describing an information need
    d. Constructing a search query using Boolean operators (AND, OR, NOT, +, -) in a variety of online information systems
    e. Constructing a search query using truncation or wildcard characters (*, ?, $) in a variety of online information systems
    f. Evaluating the authority, accuracy, timeliness, and point of view or bias of a wide variety of sources
    g. Synthesizing sources representing a wide variety of viewpoints
    h. Distinguishing between online search engines and the library's subscription databases
    i. Avoiding plagiarism and documenting sources using an appropriate citation style

j. Overall, how information literate would you say that most your school's seniors at are at the time of their graduation?

24. You can use this space to share any additional comments or thoughts.

Would you like to participate in a phone interview to follow up on this survey?

Appendix B: Standard Phone Interview Questions

- You mentioned that your library has information literacy curriculum or goals. Can you tell me a bit more about that?
- Over the course of your time at your school, what trends have you observed regarding the kinds of assignments students are asked to do that involve research?
- What about trends in the types of resources they use to complete those assignments?
- What are the information literacy learning outcomes of a typical lesson with students, or that you generally try to teach?
- Can you describe an example of a time that you and a classroom teacher collaborated successfully to design and implement an information literacy lesson for their students?
- Overall, how would you characterize your level of collaboration with classroom teachers? Has that changed at all over the years?
- In what ways do you think your graduating seniors are best prepared for college-level research? In what ways are they unprepared?
- What do you wish you could improve about your school's information literacy and instruction program?