Similarly different: Finding the nuances in first year students' library perceptions

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ABSTRACT

Information literacy efforts in academic libraries commonly target first-year students as a way to ensure that students learn foundational research skills at the beginning of their college experience. However, little has been written about different populations within the category of first-year students. First-year students may come to college with a variety of different experiences, concerns, and backgrounds. In this study, the researchers explored how students from several different first-year learning communities described their previous experience with libraries, research, and their perceived preparation for college-level research. The researchers found that different groups of first-year students did express varying perceptions about their level of preparedness for college research, research anxiety, and perception of librarians at the beginning of their college experience. An end of year survey after a library intervention showed a reduction in research anxiety and increased confidence for some groups of students. These findings support library efforts to tailor instruction to the needs of a particular student group.

Introduction

Providing information literacy instruction to first-year students is a foundational element of many libraries' information literacy programs. Library instruction programs often target their information literacy efforts at first-year students through freshman orientation sessions, outreach activities, and embedded library content in freshman composition classes. In support of these efforts, the library profession has seen an increase in dedicated first-year experience (FYE) librarian positions and programs (Kim & Shumaker, 2015). Additionally, many campuses have created common first-year programs that can serve as an early entry point for library instruction. While it can be helpful to think of first-year students as their own group, librarians need to remember that they are not a monolith. First-year students are a diverse group and come into this initial year of college with a wide variety of experiences, needs, and strengths.

The researchers for this study were enmeshed in just such conversations, as Texas A&M had several first-year experience programs belonging to different units across campus but was beginning conversations about unified campus-wide initiatives. The library had a history of providing library instruction to some of the first-year programs, each

of which had particular characteristics that governed student participation such as first-generation status or scholarship requirements. The researchers wondered to what degree students' unique past experiences with libraries might impact their perceptions of libraries and their level of research confidence coming into their first year. In addition, the researchers wondered if a library instruction session would alter these perceptions by the end of students' first year.

This study was designed to better understand the unique library perceptions and experiences of students participating in different first-year experience courses in order to discover areas of commonality and degrees of difference. The research questions for this study are as follows:

- Do students enrolled in different first-year learning communities perceive the library differently?
- Do students enrolled in different first-year learning communities have different levels of prior experience with library research?
- What is the change, if any, in first-year students' perception of libraries and their research confidence after library instruction sessions and are there differences amongst students in different learning communities??

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By studying both the commonalities and differences between different student groups, the researchers could better inform future instructional programs as the university works to scale first-year programming for all incoming students.

Literature review

A first-year experience program is intended to "support the academic performance, social development, persistence, and degree completion of college students" (What Works Clearinghouse, 2016, p.1). The inclusion of information literacy instruction in a FYE program is present in literature going back decades. Researchers note a marked increase in these programs since the early 1980s, when institutions' interest in providing FYE programs (Kim & Shumaker, 2015) began to take off. A nationwide survey of first year experience courses by Boff and Johnson (2002) found that 86% of surveyed institutions had a required or optional library component in their FYE. This literature review will explore how different institutions have approached their implementation of FYE library programs, examine other library/learning community partnerships, and explore instances of first-year students' library anxiety and self-perceptions of information literacy knowledge. There is prolific literature regarding the existence of information literacy in FYE, with the majority focusing on case studies of institution-specific programs. However, this paper is unique in its application of information literacy interventions to groups based on several different learning community characteristics (socioeconomic, achievement, etc.).

Library involvement in FYE programs

Literature on library involvement in FYE programs shows these programs to be as numerous and varied as first-year students themselves. Jacobson and Mark (2000) identified the most common delivery models of information literacy instruction: course-related, web-based, general education credit courses, models connected with general education programs, and first-year experience or first-year seminar classes. In the majority of college and university libraries, information literacy is delivered through one, two, or all of these methods to first year students. One resource, *The First-Year Experience Cookbook*, offers several examples of programming and events geared toward communicating information literacy concepts to first-year students and FYE programs, including one-shot sessions, orientation activities, embedded instruction, and discipline-based instruction (Pun & Houlihan, 2017). At York College, an FYE program was centered around a 'common reader', in which freshmen were given a book of the university's choice and invited to participate in discussions and activities centered around the text. The library was considered essential to this program and focused on "nurturing the practice of critical reading; integrating information literacy skills into the curricula; and building a learning community" (Megwalu et al., 2017, p. 444), providing instruction through reference interviews, consultations, and multiple modes of instruction delivery.

Examples of online-based library instruction can be found in Marineo and Shi (2019) and Parang, Raine, and Stevenson (2000), and examples of embedded librarians in FYE courses in Karshmer and Bryan (2011). Course-related library instruction often involves the first-year writing course. Although many such programs exist, examples in the literature can be found at Virginia Tech (Harrington Becker, 2018) and Oregon State University (McMillen et al., 2002).

Overall, the literature shows a marked increase in the popularity of library involvement in FYE programs. These FYE programs vary between institutions, as does the level of librarian intervention. However, it is clear that information literacy is an important component of FYE.

Libraries & learning communities

Learning communities are a high-impact education practice that the Association of American Colleges & Universities (AAC&U) describe as "encourag[ing] integration of learning across courses and to involve students with 'big questions' that matter beyond the classroom" (Kuh, 2008). Another source defines 'learning community' as "a distinct program within a higher education institution that develops an interrelated common curriculum enabling students and faculty to build connections between disciplines and it enrolls a cohort of students that go through the program together" (Lippincott, 2002, p. 190). How these learning communities are structured can vary greatly by institution. Frank, Beasley, and Kroll (2001) identified five types of learning communities that librarians could become involved in "including linked courses, learning clusters, interest groups for first-year students, federated learning communities, and coordinated studies" (p. 1009). Some learning community programs group students based on shared student characteristics or a common set of courses. Other universities may allow students to self-select into learning communities based on mutual interests, an academic theme, or even shared living environments.

A review of library collaborations with learning communities confirmed that most partnerships involved varying types of community structures, but all involved a shared learning experience. Riehle and Weiner (2013) argue that the social experience of learning from one another in a learning community is ripe for information literacy instruction, as most research is learned through experience and in community. During the 2002–2003 academic year, Kent State University's main library worked with an arts and science learning community and initiated a library related focus group (Voelker, 2006). A joint program between Drexel University and the Community College of Philadelphia created a collaborative 'micro-environment' geared toward increasing participation of underrepresented minority groups in STEM fields. This program emphasized embedded librarianship, aiming to help students "succeed in searching, obtaining and applying relevant information to conduct independent research projects and disseminate that knowledge through effective written and verbal communication" (Christe et al., 2015, p. 9). Still other universities are able to teach information literacy through credit hour courses that are linked to other courses using a linked-course learning community model. Pate, Wagers, Owen, and Simpkins (2020) explored the effects of a linked-course freshman learning community of criminal justice majors at Radford University, concluding that the learning community positively influenced writing composition content. The University of Hawaii at Manoa conducted focus group interviews to explore the impact of information literacy in a linked course model. They found that students who took the information literacy course as a part of their learning community cluster saw the transferability of the library skills to their other courses (Lebbin, 2005). Rapchak and Cipri (2015) found that students enrolled in a paired set of courses, one information literacy and one writing course, showed marked improvement and retention of information literacy skills. Rapchak, Brungard, and Bergfelt (2016) used the VALUE rubrics to assess information literacy skills in a linked course model in which one course was an information literacy course. They found that transfer of information literacy skills to other courses in the learning community increased (Rapchak et al., 2016).

Self-perception

The authors also delved into literature surrounding student self-perception in order to gain a better understanding of how first-year students may be affected by library anxiety. Many investigations have been made into how first-year students perceive their preparation in regard to university-level research. The term 'library anxiety' was coined by Constance Mellon (1986). Since then, research has noted that library anxiety can result in negative library experiences (Fliotsos, 1992) and a reluctance to ask for help (Keefer, 1993). Both of these results are potentially damaging to students, as higher use of library resources has been tied to increased retention and academic success (Parks, 2019). First-year students in particular are more likely to experience library anxiety than their upperclassmen peers (Jiao et al., 1996). Parks also

noted that "understanding the emotional impact of library instruction for first-year students is a necessary component of assessment, to ensure that library instruction resources are being used effectively" and to reduce the chances that library anxiety will diminish students' experience (2019, pp. 71–72). Recently, Lund and Walston (2020) proposed that this anxiety can also result from unrealistic expectations, "rather than solely from negative past experiences," and encouraged libraries to decrease anxiety by "considering many factors (e.g., the university system, cultural background) rather than just the library, or 'students' as a homogenous group" (p. 6). It is important to note that students' feelings of preparation do not necessarily correspond to their actual levels of preparation; research has found that students' perceptions of their information literacy skills do not correlate with their actual skill level (Gross & Latham, 2012; Molteni & Chan, 2015). However, their perceptions are important as they demonstrate how they feel about their experiences, which can affect their willingness to use the library.

Background

Texas A&M University is a large public land, sea, and space grant university with a student population of over 69,000. The freshman class alone has numbered over 10,000 students for the past several years. With such a large freshman class, Texas A&M has developed a number of strategies to help orient students to campus, including new student conferences, an extended orientation called Fish Camp, and learning communities formed around shared interests, experiences, or goals.

Over the past several years, university leadership has begun to develop programs that address the student experience at our large university. In particular, the university has been in a multi-year project to increase first-year student retention, expressly addressing underserved populations. First-generation college students have been a particular interest to our campus; first-generation students experienced disparities in retention and graduation rates that the university has been striving to eliminate (Webb, 2019). At the time of this study, Fall 2018, 25.15% of our undergraduate population was first generation (Texas A&M University, n.d.). Learning communities were under consideration as one strategy to address student learning and community building. Librarians were involved in the continuing discussion on campus about campus-wide first-year programs.

The concept for this study arose when the Libraries began to receive requests for library instruction from several learning communities on campus. These instruction sessions were one-shots delivered in the learning communities' weekly class meetings. While some universities have learning communities with a linked set of courses, this was not always the case at our university. Instead, our university had several learning communities using a zero-credit hour course as a standalone course based on the shared student characteristics of that learning community. Each learning community had a zero-credit course that focused on student success skills that met weekly with a facilitator. Depending on the size of the learning community, some learning communities had multiple sections of this zero-credit course. The learning communities identified for this study included those composed of students with particular academic scholarships, students from underrepresented high schools, first-generation students, honors students, or students at a remote satellite campus. The Honors learning community also had a shared residential dormitory. While these learning communities are defined by the university using the characteristics above, it is unclear how students who qualify for more than one learning community select the one in which they will participate.

With the exception of Honors, these learning communities received instructional interventions in the form of one-shot library instruction sessions during the fall semester that focused on resource awareness and introductory research skills. The interventions for the Honors learning community have been described in-depth elsewhere (LeMire et al., 2019), but essentially involved an information literacy instruction session tied to an assignment focused on topic selection, search strategies,

information evaluation, and citation, along with a citation tutorial available to the students through their learning management system. This study was designed to better understand the unique library perceptions and experiences of students participating in different first-year experience courses in order to better craft instructional interventions that meet student needs.

Methods

The researchers opted to use surveys as a methodology. After seeking IRB approval, the researchers disseminated surveys via Qualtrics to students participating in different learning communities.

Although the surveys were sent separately to each learning community, the researchers conceptualized the learning communities as five distinct groups, combining groups where the learning community characteristics were similar:

1. Underrepresented High Schools (URHS): This is a learning community that includes students from underrepresented high schools across the state
2. Honors: This learning community includes honors students
3. Satellite: This is a learning community of students enrolled at a satellite campus several hours away from the main campus
4. First Gen: This group is composed of the three learning communities that serve first-generation students whose family incomes are below a specific institution-determined threshold
5. Specific Academic Scholarships (SAS): This group is composed of two learning communities that include students who receive specific academic scholarships

A pre-assessment was sent to members of all five groups ahead of library instruction during the Fall 2018 semester. Each group received library instruction during the Fall 2018 semester, though lesson plans varied based upon the content requested by group leadership. At the end of the Spring 2019 semester, an end-of-year survey was sent to the same five groups. Because participation was voluntary, some students may have chosen to participate in the pre-class survey but not the end of year survey, and vice versa.

Survey questions included a mixture of Likert scale questions and open-ended responses. Results were downloaded into Excel for review. In addition, textual survey data was coded using a thematic analysis. Survey data was then loaded into SPSS for analysis. Descriptive statistics were run to indicate means and frequencies for each survey question. Welch's ANOVA, a one-way analysis of variance, was used to determine if there were statistically significant differences between the way in which students enrolled in the different learning communities answered the survey questions. Welch's ANOVA was chosen as it allows for analysis when there are unequal sample sizes. Additionally, Welch's ANOVA is designed to analyze data with unequal variance so a test of homogeneity is not needed. A Games-Howell post hoc test was used to determine differences between two specific learning communities. It was chosen as the post hoc test because it allowed for unequal variance and sample sizes amongst the learning communities. Finally, a paired samples *t*-test was used to compare the results from the pre-class survey and the end of year survey to analyze changes in students' answers over time. A *p*-value of $p < 0.05$ was used to determine significance for all surveys.

Results

Response rates

There were 641 unique students in the learning communities who completed at least one of the surveys, a pre-class or end of year survey. The total number of pre-class surveys ($n = 641$) is the largest data group, followed by the end of year survey ($n = 160$). Far fewer students

completed the follow-up end-of-year survey, likely because the survey was disseminated months after the library session. Table 1 indicates how many unique students in each of the five distinct groups took each survey.

Pre-class survey: meeting students where they are

The pre-class survey was primarily implemented as a way to help library instructors better understand each learning community in order to prepare for library instruction sessions. Library instructors designed lesson plans for each learning community based upon their understanding of that learning community's needs and in collaboration with the leadership for each learning community. In addition to this primary purpose, the pre-class survey also gave the researchers an opportunity to better understand differences in the library experiences of students in these variant learning communities. Because the same pre-class survey was used for all of the learning communities, the researchers could see whether there were differences in the responses of students in each group.

The pre-class survey was not designed to measure the information literacy skills of students in the learning communities. The University Libraries' instructional efforts with first-year learning communities aim to reduce library anxiety, raise awareness of library resources, and build relationships with students. In alignment with those goals, the pre-class survey was intended to help librarians understand students' feelings of preparedness for college-level research and their past experiences with libraries and librarians.

Past experience with libraries

First, students were asked to describe their experiences using libraries in high school using a free-text box. Their answers were coded using thematic analysis. Eleven distinct categories emerged. A single response could be coded into more than one category. Student responses revealed a range of interpretations of the question, so categories range from the affective (e.g., good experience) to frequency of use (e.g., rarely used) to descriptive or functional use (e.g., used facilities/spaces). Since the group sizes vary, a stacked bar chart allows for visualization of the relative experiences between groups as seen in Fig. 1.

Students who described some sort of affective experience gave responses like, "I love going to the library," "it was amazing," "bad," "ok," and "the libraries in high school were very helpful." Students also included a glimpse of their frequency of use with responses that were on a spectrum from "never had to use them" to "I barely ever used them" to "I used them a fair amount" to "I was there every day during lunch." Most students gave answers that dealt with the functional use of the library, including facilities, spaces, resources, equipment, or some indication of a lack of one or all of these. More positive responses ranged from "I mainly used libraries as a place to get work done when I wasn't in class. They had all the resources I needed to complete my classwork" to "The libraries in high school [were] a great place to study, meet up with groups, and to use the computers" to "Good place to study during lunch and off periods and a nice quiet place to sit." Meanwhile, more negative responses included "It was confusing and no one really taught us how to properly look for a book we wanted or needed," and "My high school library was very small; it only included textbooks for middle

school and high school, so there were next to no resources to assist us in research, meaning we had to do all of our research on our own online."

In addition, a small but noticeable number of students indicated that they used the library in high school, but not in a way that they perceived as "correct" library use. Some students did not perceive themselves as true library users because they didn't use the library to check out books. For example, one student noted "Used the computers rather than go and check out books, most of the time" while another noted, "During high school I used the library as a study space mostly. I rarely used it as a resource for books." Other students did check out books but seemed to perceive that they checked out the wrong types of books. For example, one student said that they would "Go to check out books for pleasure reading, never research" and another that they "Used occasionally for reading for fun, but never used for research." Still others felt their library use was transgressive because their usage was required for classes. For example, a student wrote "I only checked out books a few times. The times I checked out books were because it was required but I never took action to visit the library and check out books for my own reading pleasure." Another mentioned that "I would only go to the Libraries for meetings or class work on projects. I don't think I ever checked out a book just to read on my own."

Next, students were asked a series of Likert-scale questions. Descriptive statistics are found in Table 2. A Welch's one-way ANOVA can be found in Table 3, which determined if there were statistically significant differences in the way in which the different groups answered each question. The one-way ANOVA is an omnibus test and doesn't indicate which specific groups were statistically different in their responses. Therefore, the researchers performed a post hoc comparison, using a Games-Howell post hoc test, to determine which pairs of the groups differed significantly, as shown in Table 4. Only those results which are statistically significant are represented in Table 4, as the data set is rather large.

First, students were asked if they felt like high school prepared them for college level research. While student perception of preparation does not necessarily correspond with actual preparation, as noted in the literature review, it could be a potential indicator for research anxiety. Students in the different groups reported varying levels of confidence in their preparation for college level research. On a 5-point Likert-style scale, with 5 being most prepared, students in all five groups indicated that they felt only moderately prepared for college-level research. The results indicate a statistically significant difference amongst the groups, Welch's $F(4, 212.881) = 16.269$, $p < 0.000$. Students in the Satellite and Honors learning communities felt most prepared, while students in the URHS and First Gen groups felt least prepared.

The post hoc analysis revealed several interesting patterns, as seen in Table 4. The students who felt most prepared for college-level research, the Satellite students and the Honors students, were different from the other groups to a statistically significant degree. Satellite students showed the most marked differences; there were statistically significant differences between Satellite students and all of the other groups other than Honors. Honors students showed statistically significant differences with all groups other than Satellite and the SAS group.

Other groups showed more similarities. The groups that felt less prepared for college-level research, including the URHS and First Gen learning communities, did not have statistically significant differences in their responses to this question when compared to each other. The SAS group was in the middle of the range of responses and showed statistically significant differences only with the Satellite group.

Students were also asked to respond to two additional questions related to past experiences with libraries in the pre-class survey. First, they were asked to express their level of agreement with the statement, "I find the idea of doing college-level research intimidating." Mean scores indicated ($M = 3.71$, $SD = 1.104$) the majority of students either somewhat or strongly agreed. There were no statistically significant differences amongst student learning communities.

Next, the students were asked to express their level of agreement

Table 1
Total unique students completing surveys by category.

Groups	Total unique students	# of Pre class surveys	# of End of year surveys
URHS	126	126	57
Honors	235	235	56
Satellite	71	71	15
First Gen	155	155	20
SAS	54	54	12
Total	641	641	160

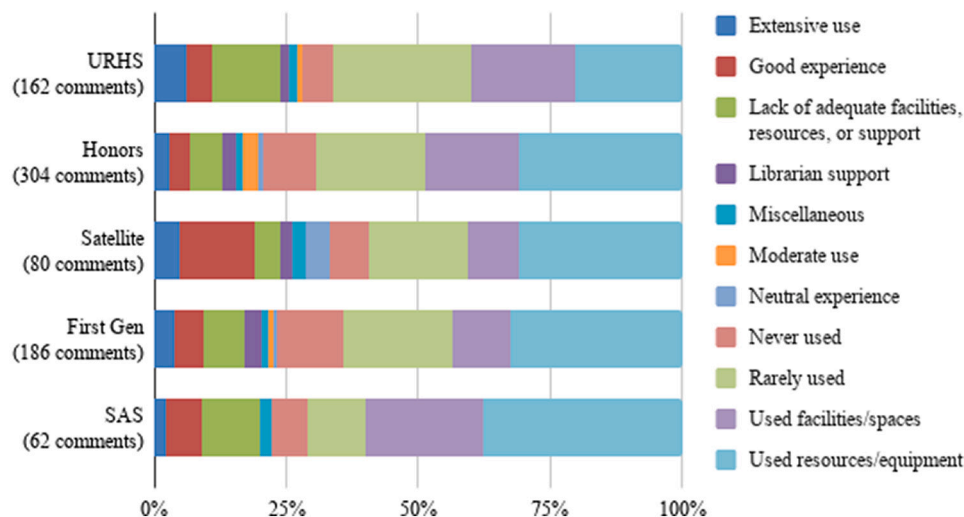## Please describe your experience using libraries in high school

Fig. 1. High school experience using libraries.

with the statement, "My past interactions with librarians have been positive." The mean scores (M = 4.04, SD = 1.022) were overwhelmingly positive, with the vast majority of students reporting that they somewhat agreed or strongly agreed that that their past interactions with librarians were positive. There was a statistically significant difference amongst the groups, Welch's F(4, 213.693) =3.975, $p = 0.004$. First Gen students showed the most differences, with statistically significant lower levels of satisfaction than URHS, Honors, and Satellite students. While the mean is still high (M = 3.77), First Gen students reported the lowest mean score of all groups, indicating they may perceive librarians less positively than their counterparts.

Confidence in research

The next set of questions in the pre-class survey was designed to help the researchers understand students' experience and confidence with research.

First, students were asked to quantify the number of research papers that they had written in the past. The Welch's ANOVA indicates that the differences were statistically significant between groups, Welch's F(4, 209.175) =3.832, $p = 0.005$. A further Games-Howell post hoc analysis showed that the statistically significant differences appeared when comparing the Honors students and the First Gen students, as seen in Table 4.

Students were then asked how often they used the library to find research for the papers they completed in high school. While there were no statistically significant differences amongst the students in the different learning communities, it is noteworthy that the majority of students reported never using the library (M = 2.42, SD = 1.213) or only using it for a few sources for their papers, compared to the minority of students who reported trying to use the library and finding it helpful and those that used the library for most of their research needs.

Students were also asked if they "didn't want to ask questions at the library because I feel like I should know this stuff already." Mean scores for all students (M = 2.73, SD = 1.151) seemed to indicate that students did not feel strongly about the question, as seen in Table 2. However, the ANOVA indicated that there were statistically significant differences between the way in which students in the different learning communities answered this question, Welch's F(4, 213.170) =2.788, $p = 0.027$. A Games-Howell post hoc analysis indicated that the two groups that differed significantly in their responses were Honors and First Gen, as shown in Table 4.

Next, students were asked if they were worried that their professors

would assign a research project and they wouldn't know where to start. There was general agreement amongst all students that this was a concern (M = 3.92, SD = 1.130). However, the ANOVA for this question did not uncover any statistically significant differences in the students enrolled in the various learning communities.

Finally, students were asked to rate their confidence in their ability to do research for upcoming papers and projects. The responses to this question produced a wide difference between groups. The one-way ANOVA indicated that the differences were statistically significant Welch's F(4, 213.390) =4.661, $p = 0.001$. The corresponding post hoc analysis showed statistically significant differences between URHS and Honors, URHS and Satellite, and Satellite and First Gen.

Changes in student responses over time

In order to measure how student responses changed over the course of the academic year, the researchers conducted a paired samples *t*-test to compare the results of those students who completed both the pre-class survey and end of year survey (*n* = 160). Because the dataset was smaller, an analysis of the distinct learning communities was not possible. Instead, the results of the pre-class survey indicated statistically significant differences between Honors students and some of the other learning communities. As such, the researchers grouped the students into two categories, Honors students and non-Honors students, for analysis. The data is represented in Tables 5 and 6.

Non-Honors students

Non-Honors students demonstrated an overall increase in confidence and reduction in anxiety from the beginning to the end of the academic year. Non-Honors students showed strong statistically significant differences in their concern that professors would assign a research project and they wouldn't know where to start ($p = 0.000$). Non-Honors students reported a high mean for this question at the beginning of the academic year (M = 4.05) during the pre-class survey and it dropped substantially at the end of year (M = 2.88).

Non-Honors students also reported an increase in their research confidence for upcoming projects across two of the three comparisons. The change was statistically significant ($p = 0.00$) from the pre-class survey to the end of year survey. Additionally, students were asked to respond to the question about "I don't want to ask questions at the library because I feel like I should know this stuff already." The pre-class survey to end of year analysis indicates a decline in the overall mean and

Table 2
Pre-survey descriptive statistics.

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
I feel like high school prepared me for college-level research	URHS	126	2.30	1.208	0.108	2.09	2.51
	Honors	235	3.13	1.221	0.080	2.97	3.29
	Satellite	71	3.38	1.200	0.142	3.10	3.66
	First Gen	155	2.48	1.306	0.105	2.27	2.68
	SAS	54	2.65	1.216	0.165	2.32	2.98
	Total	641	2.80	1.294	0.051	2.70	2.90
I find the idea of doing college-level research intimidating	URHS	126	3.77	1.118	0.100	3.57	3.97
	Honors	235	3.65	1.124	0.073	3.50	3.79
	Satellite	71	3.45	1.228	0.146	3.16	3.74
	First Gen	155	3.85	0.968	0.078	3.69	4.00
	SAS	54	3.78	1.144	0.156	3.47	4.09
	Total	641	3.71	1.104	0.044	3.62	3.79
My past interactions with librarians have been positive	URHS	126	4.13	1.068	0.095	3.95	4.32
	Honors	235	4.08	0.967	0.063	3.95	4.20
	Satellite	71	4.28	0.913	0.108	4.07	4.50
	First Gen	155	3.77	1.086	0.087	3.60	3.94
	SAS	54	4.07	0.968	0.132	3.81	4.34
	Total	641	4.04	1.022	0.040	3.96	4.12
I don't want to ask questions at the library because I feel like I should know this stuff already	URHS	126	2.91	1.345	0.120	2.68	3.15
	Honors	235	2.57	1.219	0.080	2.41	2.73
	Satellite	71	2.62	1.223	0.145	2.33	2.91
	First Gen	155	2.92	1.235	0.099	2.73	3.12
	SAS	54	2.61	1.156	0.157	2.30	2.93
	Total	641	2.73	1.251	0.049	2.63	2.83
I'm worried that my professors will assign a research project and I won't know where to start	URHS	126	4.02	1.149	0.102	3.82	4.23
	Honors	235	3.80	1.186	0.077	3.65	3.96
	Satellite	71	3.77	1.198	0.142	3.49	4.06
	First Gen	155	4.10	0.972	0.078	3.94	4.25
	SAS	54	3.91	1.120	0.152	3.60	4.21
	Total	641	3.92	1.130	0.045	3.84	4.01
I am confident in my ability to do research for my upcoming research papers and projects	URHS	126	2.73	1.113	0.099	2.53	2.93
	Honors	235	3.09	1.121	0.073	2.94	3.23
	Satellite	71	3.38	1.047	0.124	3.13	3.63
	First Gen	155	2.94	1.064	0.085	2.77	3.11
	SAS	54	3.09	1.086	0.148	2.80	3.39
	Total	641	3.01	1.107	0.044	2.93	3.10
How many research papers have you written in the past?	URHS	126	2.55	0.891	0.079	2.39	2.70
	Honors	235	2.81	0.828	0.054	2.70	2.91
	Satellite	71	2.62	0.834	0.099	2.42	2.82
	First Gen	155	2.50	0.856	0.069	2.36	2.63
	SAS	54	2.70	0.964	0.131	2.44	2.97
	Total	641	2.65	0.867	0.034	2.58	2.72
How often did you use the library to find research for those papers?	URHS	126	2.48	1.263	0.113	2.25	2.70
	Honors	235	2.30	1.150	0.075	2.15	2.45
	Satellite	71	2.59	1.050	0.125	2.34	2.84
	First Gen	155	2.46	1.321	0.106	2.25	2.67
	SAS	54	2.44	1.239	0.169	2.11	2.78
	Total	641	2.42	1.213	0.048	2.33	2.51

therefore an increase in students' willingness to ask ($p = 0.023$).

Honors students

Similar to non-Honors students, Honors students generally showed a reduction in anxiety and an increase in confidence over the course of the academic year. Of the Honors students who completed both surveys ($n = 56$), the data indicates statistically significant differences in students' concern that professors would assign a research project and they wouldn't know where to start ($p = 0.000$). The mean dropped significantly over the course of the year. They started the academic year with a fairly high mean (M = 3.82) that suggested high anxiety for meeting research expectations. By the end of the year, the mean had decreased substantially (M = 2.66).

Another positive outcome was an increase in Honors students' confidence in their ability to do research for upcoming projects. The mean increased from the pre-class survey to the end of year survey (M = 3.11 to M = 3.75 respectively), a change that was statistically significant ($p = 0.000$). Though Honors students reported higher confidence levels than most other students in the pre-class survey, their confidence still showed significant growth over the course of the year.

The one category in which Honors students' results did not show a change over time was their willingness to ask questions due to a perception that their research skills should already be fully developed ($p = 0.414$). The mean response remained fairly neutral on the pre-class survey (M = 2.52) and end of year survey (M = 2.66).

Library instructional interventions

Three questions were included in the end of year survey, but not in the pre-class survey. These questions focused on measuring students' perceptions regarding the instruction interventions that the librarians offered during the course of the year. In order to see if librarian interventions had an impact on students' willingness to seek assistance, students were asked if they were more likely to seek help at the Libraries after they had participated in a library instruction session (Fig. 2). The question was a five-point Likert scale, with a 5 corresponding with

Table 3
Welch's ANOVA equality of means between learning communities.

	Statistic[a]	df1	df2	Sig.
I feel like high school prepared me for college-level research	16.269	4	212.881	0.000
I find the idea of doing college-level research intimidating	1.828	4	209.080	0.125
My past interactions with librarians have been positive	3.975	4	213.693	0.004
I don't want to ask questions at the library because I feel like I should know this stuff already	2.788	4	213.170	0.027
I'm worried that my professors will assign a research project and I won't know where to start	2.273	4	211.119	0.063
I am confident in my ability to do research for my upcoming research papers and projects	4.661	4	213.390	0.001
How many research papers have you written in the past?	3.832	4	209.175	0.005
How often did you use the library to find research for those papers?	1.191	4	212.948	0.316

[a] Asymptotically F distributed.

strongly agree and a 1 corresponding with strongly disagree. Approximately 64% of students either strongly agreed or agreed, indicating that the majority of students were more likely to seek help. There were no statistically significant differences between the way in which Honors and non-Honors answered this question.

Reflecting on their learning experience during the library instruction session, students responded yes or no when asked if the library instruction changed their perception of what the libraries had to offer. An overwhelming majority of students responded yes ($n = 118$, 73% on the end of year survey). There were no statistically significant differences between Honors and non-Honors students.

Students were also asked to comment on the most useful thing they learned during the library instruction session using a free-text comment box. The student responses were coded using a qualitative thematic analysis approach (Fig. 3). Although a small number (7%) indicated that

there was nothing they found helpful (N/A), most students were able to identify at least one useful takeaway from the library session. Across the five study populations, the most popular response students provided was that they learned how to research. For example, one student indicated that the most helpful thing they learned was "The ability to sort search results and the ability to combine them with AND/OR keywords," while another said it was "How to find different articles and information using the Library database." Students also commonly indicated that they became aware of library resources (e.g., "I learned all of the different things the library has to offer"), that they learned about collections and how to access them (e.g., "Being able to borrow electronic equipment"), and that they learned about library spaces and facilities (e.g., "The fact that there are individual study rooms to reserve in Evans Library"). Although less common, students also mentioned that they found it useful to learn about librarian help (e.g., "there are specific librarians for each major"), the Get It For Me interlibrary loan service, strategic campus partners like the Writing Center, the library website, and the library's multimedia Studio.

Discussion

Pre-class survey

The pre-class survey explored the library experiences of students from several groups of first-year learning communities that had requested library instruction. This pre-assessment resulted in several interesting findings that informed the design of library instruction. First, it found that students, regardless of learning community, seemed to perceive that only a particular type of library use is the correct type of library use. For example, their comments suggested that they may perceive common activities such as checking out books for pleasure reading, using the computers or printers, or just meeting up with friends as transgressive or inappropriate use of libraries. This finding led librarians to use the library sessions to challenge this perception of correct library usage by specifically discussing the myriad of acceptable ways of using the library.

The researchers also found that there were some notable differences

Table 4
Games-Howell post hoc analysis of groups.

	(I) Groups	(J) Groups	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval Lower bound	95% Confidence interval Upper bound
I feel like high school prepared me for college-level research	URHS	Honors	−0.830	0.134	0.000	−1.20	−0.46
		Satellite	−1.079	0.178	0.000	−1.57	−0.59
	Honors	URHS	−0.830	0.134	0.000	−1.20	−0.46
		First Gen	0.654	0.132	0.000	0.29	1.02
	Satellite	URHS	1.079	0.178	0.000	0.59	1.57
		First Gen	0.903	0.177	0.000	0.41	1.39
		SAS	0.732	0.218	0.009	0.13	1.34
	First Gen	Honors	−0.654	0.132	0.000	−1.02	−0.29
		Satellite	−0.903	0.177	0.000	−1.39	−0.41
	SAS	Satellite	−0.732	0.218	0.009	−1.34	−0.13
My past interactions with librarians have been positive	URHS	First Gen	0.367	0.129	0.038	0.01	0.72
	Honors	First Gen	0.309	0.108	0.035	0.01	0.60
	Satellite	First Gen	0.514	0.139	0.003	0.13	0.90
	First Gen	URHS	−0.367	0.129	0.038	−0.72	−0.01
		Honors	−0.309	0.108	0.035	−0.60	−0.01
		Satellite	−0.514*	0.139	0.003	−0.90	−0.13
I don't want to ask questions at the library because I feel like I should know this stuff already	Honors	First Gen	−0.352	0.127	0.046	−0.70	0.00
	First Gen	Honors	0.352	0.127	0.046	0.00	0.70
I am confident in my ability to do research for my upcoming research papers and projects	URHS	Honors	−0.355	0.123	0.035	−0.69	−0.02
		Satellite	−0.650	0.159	0.001	−1.09	−0.21
	Honors	URHS	0.355	0.123	0.035	0.02	0.69
	Satellite	URHS	0.650	0.159	0.001	0.21	1.09
		First Gen	0.438	0.151	0.034	0.02	0.86
	First Gen	Satellite	−0.438	0.151	0.034	−0.86	−0.02
How many research papers have you written in the past?	Honors	First Gen	0.312	0.087	0.004	0.07	0.55
	First Gen	Honors	−0.312	0.087	0.004	−0.55	−0.07

Table 5
Descriptive statistics for end of year and pre-survey results.

		Mean	N	Std. deviation	Std. error mean
Honors students					
I don't want to ask questions at the library because I feel like I should know this stuff already	Pre-survey	2.52	56	1.265	0.169
	End of year	2.66	56	1.133	0.151
I'm worried that my professors will assign a research project and I won't know where to start	Pre-survey	3.82	56	1.208	0.161
	End of Year	2.66	56	1.297	0.173
I am confident in my ability to do research for my upcoming research papers and projects	Pre-survey	3.11	56	1.123	0.150
	End of year	3.75	56	0.958	0.128
Non-Honors students					
I don't want to ask questions at the library because I feel like I should know this stuff already	Pre-survey	2.97	104	1.303	0.128
	End of year	2.62	104	1.143	0.112
I'm worried that my professors will assign a research project and I won't know where to start	Pre-survey	4.05	104	1.169	0.115
	End of year	2.88	104	1.267	0.124
I am confident in my ability to do research for my upcoming research papers and projects	Pre-survey	2.77	104	1.125	0.110
	End of year	3.46	104	1.097	0.108

in the library experiences of students from different learning community groups. One surprising difference was in the self-perceptions of Satellite students. Satellite students are different from the other studied populations because they are situated on a satellite campus several hours away from the main campus and do not have a library on their campus. The researchers were surprised to find that students at the Satellite campus reported some of the highest levels of confidence and preparedness. However, Satellite students did not report statistically significant differences in their levels of experience writing research papers. This may suggest that Satellite students' feelings of preparedness comes from another source, such as a different type of previous research experience or a different recruitment and orientation experience. Further research is necessary to understand why students at the Satellite campus were more confident about their preparation for college-level research, but the researchers were able to use this information to help them determine the appropriate tone and content level for the library session for Satellite students.

Another group that demonstrated some interesting differences were the Honors students. Honors students reported high levels of experience with writing research papers, which likely contributed to their strong feelings of preparedness for college-level research. Although the Honors students reported more experience writing research papers than many of the other populations in the pre-class survey, the Honors students were less likely to report feeling reluctant to ask questions because they felt they should already know the answers. Librarians should consider that their more experienced students may be more confident about asking for help. It is important to note that while Honors students reported more experience with writing research papers, there were students in the Honors program and all of the other learning communities who reported never having completed a research paper in the past. Librarians designing lesson plans, even for student groups with high levels of experience with research papers, should not assume that all students share similar levels of experience. Librarians should think critically about pedagogical choices and scaffolding strategies to ensure that all students feel supported and prepared for research during and following library instruction. Strategies could include ideas such as acknowledging student research anxiety, creating tutorials prior to library sessions, allowing students to move at their own pace, and offering individual support services such as consultation appointments.

A third population with some interesting differences was the First Gen population. As a population identified by campus as underserved, librarians were particularly interested in understanding how they could better support first generation students. Students from the First Gen learning communities were some of the students most likely to report little experience with research papers on the pre-class survey and also were one of the groups that expressed the lowest confidence levels for research. However, it is important to note that the First Gen learning communities included students who had considerable experience writing research papers and who expressed high levels of confidence in their research. Rather than assume that all First Gen students have low experience or confidence levels, librarians should consider implementing pre-assessments in order to target library instruction to meet the specific needs of the students in the session.

The First Gen students also demonstrated differences in their past interactions with librarians. While all of the groups reported fairly positive interactions with librarians in the past, first-generation students had significantly less positive responses than the other groups. This finding may indicate that librarians working with first-generation students may want to consider the relational and affective aspects of the instruction session. Helping students feel comfortable and supported by the librarians may be a key learning outcome for this population. For example, librarians can design a session that is playful in tone, incorporating games and other activities designed to reduce library anxiety
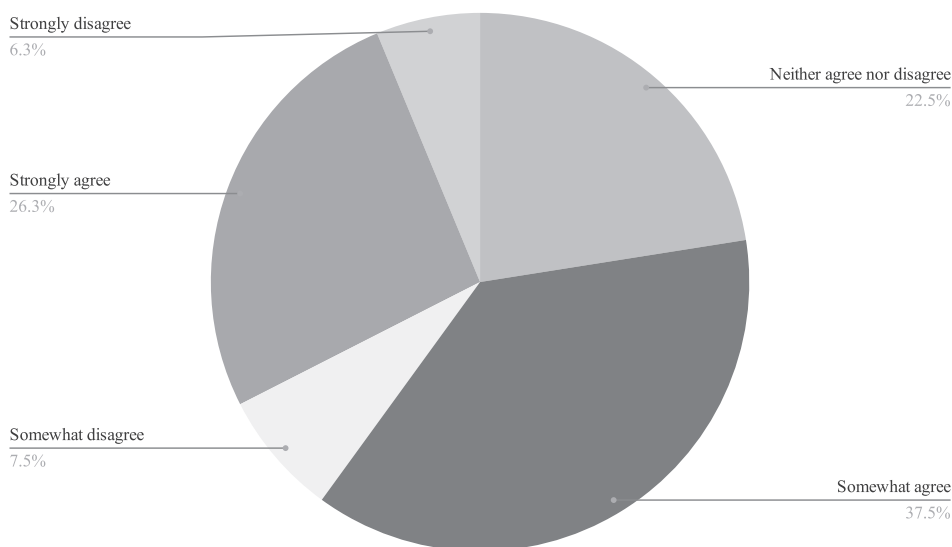
Table 6
Paired samples T-test: end of year compared to pre-survey results.

	Mean diff.	Std. deviation	Std. error mean	95% confidence interval of the difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Honors students								
I don't want to ask questions at the library because I feel like I should know this stuff already	0.143	1.299	0.174	−0.205	0.491	0.823	55	0.414
I'm worried that my professors will assign a research project and I won't know where to start	−1.161	1.218	0.163	−1.487	−0.835	−7.133	55	0.000
I am confident in my ability to do research for my upcoming research papers and projects	0.643	1.182	0.158	0.326	0.959	4.070	55	0.000
Non-Honors students								
I don't want to ask questions at the library because I feel like I should know this stuff already	−0.356	1.570	0.154	−0.661	−0.050	−2.311	103	0.023
I'm worried that my professors will assign a research project and I won't know where to start	−1.173	1.354	0.133	−1.436	−0.910	−8.834	103	0.000
I am confident in my ability to do research for my upcoming research papers and projects	0.692	1.428	0.140	0.415	0.970	4.943	103	0.000

Fig. 2. Willingness to seek help at the libraries after library instruction.
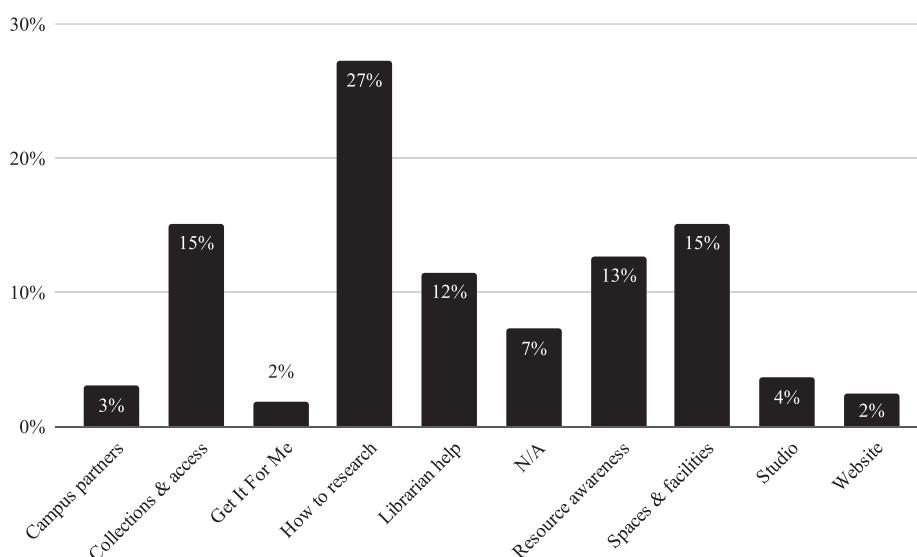

Fig. 3. Coded comments: most useful thing learned during library instruction.

and encourage perceptions of librarians as accessible and supportive.

Changes in student responses over time

In addition to understanding where students were at the beginning of the semester, this assessment was intended to help librarians understand whether students felt differently about the library later in the school year (after the library session). Notably, both Honors and non-Honors students demonstrated a decrease in anxiety about meeting their professors' research expectations. While this is exactly the kind of outcome the researchers were hoping to see, this survey didn't elucidate the cause for their reduction in anxiety. Students have a wide variety of experiences with professors throughout their first year, of which library instruction may only be one component. Regardless, the decline in research anxiety is a positive outcome.

Findings also indicated that students demonstrated an increase in their confidence over the course of the academic year. Notably, this was true for Honors students as well as non-Honors students, even though Honors students demonstrated high confidence levels at the beginning of the year. It is unclear whether this growth in confidence was related to

the library instruction session, but it suggests that it is possible that even students with high levels of confidence in their research skills may benefit from library instruction.

Willingness to ask questions was the one area where Honors and non-Honors students seemed to differ. Non-Honors students seemed to become increasingly willing to ask questions at the library from the pre-class survey to the end of year survey. Honors students reported that they did not have substantial anxiety about asking questions and their attitude did not experience a significant change over the course of the study. Increasing student willingness to ask questions is one of the intents and goals of library instruction, but seemed to be unnecessary for Honors students. Librarians may want to consider leveraging Honors students' willingness to ask questions as a way to address their anxiety about meeting professors' expectations, about which they reported a fairly high degree of anxiety on the pre-class survey.

Library instructional interventions

In addition to understanding differences in student populations and gains over time, the researchers wanted to gather student feedback on

the library instruction sessions themselves. This type of feedback can help librarians determine whether the approach they took was successful or whether they should discard a particular approach for future semesters. The success of the sessions is based on the goals and outcomes of the sessions themselves, which were generally focused on two primary areas: resource awareness and reduction of library anxiety.

Increasing student awareness of available library resources is one of the primary goals of the library's first-year program. First-year library instruction dedicates significant time to educating students about the availability of these resources and these survey results suggest that these efforts are producing results. Not only did the majority of students indicate that they found the library session changed their perceptions of what the library had to offer, but students were able to identify a wide variety of library services and resources ranging from interlibrary loan to specific databases to the library recording studio.

Another primary goal is reducing library anxiety. Students who feel anxious or uncomfortable using the library are unlikely to use library resources to their full potential, so helping students feel comfortable and at home in the library is a specific goal. Student responses indicated that, regardless of learning community affiliation, students were positively influenced by library instruction to seek assistance from librarians. This finding suggests that the library instruction sessions may be helping students feel more comfortable with the librarians and contributing toward that larger goal of reducing library anxiety.

Value of assessment

Since student populations are subject to local context, the data about specific student groups cannot be generalized to other universities. Each university will have different criteria for how they define and assign students to learning communities, and every library will work with classes that include students grouped in ways that the library has no control over. Although the findings in this study cannot be generalized to other institutions, the assessment strategy can. Assessing those student groups to uncover differences and better tailor library instruction is a strategy that can lead to new ideas and approaches to library instruction, including clear recognition of the affective aspect of library instruction.

The utility of this study for other institutions lies in the methodology and the overall finding of the research; not all students have similar experiences with research or similar levels of confidence. The type of assessment implemented in this study can provide valuable insights to librarians designing instruction for different groups on campus. Librarians working with groups of first-year students need to understand the dynamics of those groups so that they can offer services accordingly. Rather than creating a single first-year experience intervention, like a tutorial or standard lesson plan, librarians may want to consider conducting their own assessments to better understand differences in the first-year groups on their own campuses.

Librarians who focus solely on the acquisition of research skills are missing a vital part of the learning experience. As librarians explore the differences in student groups, they need to take into account students' affective perception of themselves as research-capable. The information garnered in such an assessment can not only help librarians determine the appropriate content level for a library session, but it can also help librarians consider and select the best tone or affect in order to ensure a positive experience for students.

Limitations and future research

There were some limitations to the design of this particular study. First, the data collected represents the perceptions of students enrolled in first-year learning communities at one large public university. The researchers were not privy to the specific criteria used for participation in each learning community, and some students may have been eligible for multiple learning communities, but were enrolled in only one. For example, students could have been eligible for the Honors program but also have qualified for one of the scholarship or first-generation learning communities. This underscores the difficulty of demographic research, as they often fail to recognize the intersectionality of the student experience. Certainly, a future study could explore individual demographics by asking students to respond to survey questions about their perceived identity groups. This might help the library community understand how first-generation students or honors students view libraries differently. However, care should be taken when applying any general assumptions to student groups defined by a single demographic characteristic.

In addition, the survey was designed to gather students' self-perceptions about their experiences with libraries and research, both in high school and during specific points in time during their first year of college. The survey does not uncover why students feel the way that they do, nor does it corroborate the self-perception data with empirical evidence on students' actual use of libraries. Future research could improve upon this study by using a mixed-methods approach to ask students why they hold their particular perceptions and then collect data on actual student behavior to draw conclusions. Additionally, when students described their past use of libraries, there was a tendency toward hedging or qualifying language that suggested a belief in a "correct" way to use a library. Future research could explore this idea of transgressive use. Finally, some of the learning communities used for this study no longer exist and/or the enrollment of students in these learning communities has changed over time. These changes to learning communities are not surprising given the universities' emphasis on making campus-wide first year programs available to all students. Despite these changes, the overarching idea that librarians should account for the wide variety of library experiences still holds true.

Conclusion

First-year students in this study exhibited differences in their high school library experiences and their perceptions of libraries, particularly at the beginning of their college career. Students also reported anxiety about the expectations for research and their own research competence. This anxiety seems to be universal across the different learning communities, including high-achieving students in the Honors program. The results indicate that librarians should not assume that just because students are participating in academic excellence programs such as honors, they do not experience anxiety about their research skills. Library instruction programs can and should aim to acknowledge and assuage research anxiety as an intentional part of their pedagogy. Similarly, librarians should not make assumptions about students' past experience with research. For example, there may be an assumption that students in Honors have written more research papers in high school. However, this research suggests that many students in non-Honors learning communities wrote a similar number of research papers in high school.

At the Texas A&M University campus, the first-year learning communities have recently been gathered together under the umbrella of a new first-year experience course. This course is intended to give all incoming first-year students a common experience, while still affording these learning communities the flexibility to retain their original character and focus. As the Libraries develops programming for this course, we are continuing to explore the specific needs of each group of students. As seen across the surveys conducted in this study, first-year students come to college with a wide range of experiences, needs, and perceptions about libraries. Additionally, the way in which first-year students experience the library over the course of that first year also varies. For this reason, we strive to tailor our instruction to meet the unique needs of each group of students, depending on their academic focus, level of library experience, interests, and needs. We encourage other libraries to explore the unique characteristics of the first-year students at their institutions, creating tools and programming that meet their specific needs. Libraries can operationalize this research by thinking critically about affective domains when designing instructional

interventions, acknowledging previous experiences, and scaffolding activities to support different levels of experience and comfort with research.

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