Flipping the (COVID-19) Classroom: Redesigning a First-Year Information Literacy Program during a Pandemic

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abstract: The literature on information literacy identifies several significant challenges inherent in designing and providing comprehensive first-year programs, including reach, sustainability, instructional design, the flipped classroom, and assessment. In summer 2020, in response to the requirements of the COVID-19 pandemic, the User Experience and Student Success (UESS) Department at Tisch Library of Tufts University developed an innovative approach to instruction that addressed these challenges. The new concept optimized online learning in both asynchronous and synchronous modes and created a sustainable program for the future. This article outlines the process used to develop this program, its learning outcomes, and the results of both student learning and programmatic assessment.

Introduction

Tisch Library in Medford, Massachusetts, is the largest library in the Tufts University system and the main undergraduate library at Tufts. Tisch librarians are responsible for providing orientation and instruction for first-year students. Until the fall semester of 2020, Tisch Library’s first-year information literacy instruction followed a highly traditional face-to-face model. Instruction librarians partnered with individual instructors in the Tufts University English Department to reach students via the First-Year Writing Program. This program consists of English 1, English 2, English 3, and English 4, with the latter two courses aimed specifically at English-language learners. First-year students may or may not take English 1 or English 2, depending on
such factors as their incoming test scores and their enrollment in alternate or equivalent courses that satisfy the first-year writing requirement. Students may take English 2 after testing out of English 1, and English 1 students may be required to take English 2 depending on the grade they receive in English 1.

Participation in library instruction has also been completely voluntary on the part of the course instructor. This mixture of instructional situations has made it, and continues to make it, impossible to provide all incoming first-year students with a common foundation of information literacy instruction. Given that challenge, Tisch librarians have worked diligently to rethink the first-year instruction program. They have kept two major goals in mind: (1) reach more students enrolled in the First-Year Writing Program to provide a more consistent instructional baseline; and (2) provide more instruction with a declining number of participating librarians. In summer 2020, the User Experience and Student Success (UESS) Department at Tisch Library, which is responsible for the library’s first-year instruction program, developed an innovative approach that accomplished the two original goals and addressed the additional requirements of the COVID-19 classroom. The new concept not only optimized online learning in both asynchronous and synchronous modes but also created a sustainable program for the future.

The newly developed first-year instruction program became mandatory for all sections of English 1 in fall 2020. It combines a flipped asynchronous course created in the Canvas learning management system with 75-minute synchronous workshops, doubling the amount of instruction provided to each student. The provision of both asynchronous and synchronous content is timed to coincide with major writing assignments to meet students at their point of need. In addition, First-Year Writing sections are combined during the synchronous portion of the program, allowing library instructors to reduce the total number of instruction sessions they provide each semester. This redesigned program allows Tisch Library to offer more instructional content to more students with fewer participating librarians.

**Literature Review**

The library literature includes a wealth of research on information literacy programs for all student levels and academic library types. Rather than provide a complete accounting of the literature on this topic, this section will highlight some research that helped to inform the development of this program and that addresses both the short-term and long-term problems outlined earlier. Instruction librarians may find this prior research useful as they adapt to changes in delivery modes and methods going forward.

A major issue facing instruction librarians is the ubiquity of the “one-shot” model, which shortchanges students while creating an increasingly unsustainable workload for librarians. To address sustainability, Glenn Koelling and Lori Townsend outlined a model for providing instruction to a large number of first-year students. The
model specifically focused on Koelling and Townsend’s “ongoing attempt to provide deep and meaningful learning experiences as well as personal support to our students while enjoying a satisfying and sustainable working life.”

Their model entailed what they call a “faux” flipped classroom, which combined asynchronous and face-to-face instruction and gave students the option of completing a tutorial during the first part of a face-to-face workshop. The asynchronous content was integrated with the workshop, allowing students to finish the tutorial before taking part in a hands-on session. The face-to-face workshop took place outside class time, which allowed students from multiple sections to attend the same workshop. This technique addressed two major challenges with first-year information literacy instruction—limitations on the use of class time and instructional sustainability. Gerardo Gómez-García, Francisco-Javier Hinojo-Lucena, María-Pilar Cáceres-Reche, and Magdalena Ramos Navas-Parejo provide a timely re-assessment of the flipped-classroom model, in which students learn new content outside class and use class time for discussion and activities. Gómez-García and his coauthors note the nearly universal effectiveness of this model for information literacy instruction. It shows, they say, “how the integration of technology in the teaching-learning processes is promoting the improvement of educational quality, and therefore, the promotion of sustainable generations at an educational, digital and informational level.”

Sara Arnold-Garza also provides a useful overview of the flipped classroom in higher education and its uses for information literacy instruction, grappling with both its advantages and disadvantages. A primary question for library instruction that she addresses is “logistical: how do you assign pre-work to a class you haven’t visited yet?” She explains that “students may not actually do the pre-assignment if no grade is given.” This grading challenge has long been acute within higher education in general and for librarians in every context. Librarians who teach traditional “one-shot” instruction sessions find it difficult to assess students’ exposure to the “flipped” information literacy concepts before the scheduled class time. This uncertainty often increases the need for differentiated instruction within the class session. Ladislava Khailova suggests that librarians need “to secure enough buy-in from the teaching faculty to have them require their students to view the e-materials and/or complete the e-activities before the information literacy session, while helping select the most feasible method of the e-material delivery.” Thus, generating faculty buy-in and assessing students’ exposure to, and ability to navigate, asynchronous content before a face-to-face or synchronous online session are key problems to solve when developing a flipped-classroom approach to information literacy instruction.

Combining the flipped classroom with asynchronous instruction requires engaging with multiple instructional design issues. Ashley Lierman and Ariana Santiago provide a review of the literature that concentrates on the design of asynchronous tutorials, focusing “solely on the development of online learning objects.” Their review offers a nuanced look at some pros and cons of several sets of practices. Defining such terms as active learning, self-guided learning, and assessment is a key challenge in developing best practices around both the technical construction of online learning objects and the pedagogical procedures they embody. Lierman and Santiago note that “the majority of best practices in the literature for online IL learning objects are focused more on the technological than the pedagogical.” They go on to say that, even as late as 2019, “the
relative newness of the field” means that there “is still something of a knowledge gap” about how to combine technological and pedagogical best practices. Lierman and Santiago describe the design and implementation of a fully asynchronous learning experience for students at the University of Houston in Texas. Such teaching makes the challenges in combining technology and pedagogy especially acute, since the asynchronous modules may be the only library instruction students receive for a given course. Kara Van Abel also discusses the creation of a fully asynchronous business information literacy course. For that course, learning objects such as tutorials and instructional videos were created in Springshare’s LibWizard tool and embedded into a Canvas shell. The course incorporated many best practices in tutorial design, such as paring back content to make it approachable by “multiple levels of learners,” providing students with immediate feedback, and offering learners opportunities to engage with the content at their own pace. Although Van Abel’s case study was not consulted in the development of the program described here, both efforts used many of the same design principles. These ideas can be employed in different types of information literacy programs, whether providing foundational instruction to first-year students or more advanced teaching in upper-level, subject-specific courses.

A 2018 book by Jennifer Ferguson, the author of the present article, provides a comprehensive overview of authentic assessment in information literacy instruction. Such assessment evaluates how students use skills gained in the classroom to perform real-world tasks. She identifies key elements of instruction that include developing authentic learning activities, in which students apply knowledge in real-life situations; providing timely feedback; and integrating assessment with instructional design.

The challenges involved in designing meaningful instruction continue to increase as the social and institutional environments evolve, including the growing need to provide instruction in multiple modalities to students in different time zones. The challenges are especially pronounced within first-year instruction, considering its role in providing a foundation for scaffolded learning, which uses progressive steps to move students toward greater understanding throughout their time at the university. Additional factors include faculty perceptions around students’ lack of readiness, which lament the “inadequate preparation” that most students receive in high school. Twenty years later, Chase Dane suggested that “most important . . . is the meaningfulness of the instruction given. Library instruction must be properly motivated; and it must be
put to use as soon as it is given. Library instruction must be taken out of the vacuum in which it is now too often taught."^13 Those recommendations will sound familiar to contemporary librarians working with first-year information literacy. The library literature still emphasizes the need to “meet students where they are”^14 and laments that a “generation of teaching students to rely on checklist approaches to information literacy has left citizens ill equipped to navigate a universe of misinformation.”^15

Numerous challenges must be addressed when designing an information literacy program that encompasses complex elements, such as designing for sustainability, employing a flipped classroom, providing both asynchronous and synchronous online instruction, and developing a first-year program that includes best practices in authentic assessment and instructional design. The next section will describe Tisch Library’s approach to creating a sustainable foundation for its first-year instruction program during an especially challenging time.

**Redesign Process**

As the COVID-19 emergency progressed into summer 2020, Tisch Library’s instruction librarians, including those responsible for first-year instruction, were asked to work remotely for the fall semester. The UESS Department discussed the options that might be provided to the First-Year Writing Program to meet the needs of incoming students. The team identified and acknowledged some key problems with the library’s traditional approach to first-year instruction, including issues with sustainability, reach, and scaffolding. The team also conducted a literature review and a needs assessment that included meetings with the administrators of the First-Year Writing Program. This multitiered approach provided a foundation for planning and prompted us to ask a series of questions: What are we currently doing that we should continue? What are other libraries doing that we should adopt? How can we provide multimodal instruction that meets the needs of the First-Year Writing Program and addresses the Framework for Information Literacy for Higher Education of the Association of College and Research Libraries (ACRL)?^16

Answering these questions helped provide a basis for examining not only how the program might be redesigned to address the short-term COVID-19 emergency but also how we might enact long-term changes that addressed our major goals. These goals included sustainability, the flipped classroom, asynchronous and synchronous instruction, and best practices in authentic assessment and instructional design. In discussing practices that should be continued, we identified several strong components of our individual approaches to first-year instruction, including teaching threshold concepts, ideas that lead to new levels of understanding; active learning, in which students actively assimilate the material instead of passively absorbing it; and problem-based learning, in which students employ problem-solving techniques and team participation skills. In each case, the current practice exemplified at least one of our program’s goals. Teaching broad information literacy concepts rather than focusing instruction on a specific assignment meant that we could develop a program that addressed the ACRL Framework, applied across sections, met significant learning goals, and promised to be more sustainable. Although active learning can take a variety of forms,^17 some techniques—such as breaking students into small groups and using problem-based learning—are known to be effective^18 and could readily be adapted to the Zoom environment.
The literature review helped identify approaches to first-year instruction that we could adopt to a greater or lesser degree. For example, Koelling and Townsend’s workshop approach helped to clarify some sustainability issues that our program faced and provided an alternative model that we could adapt to our needs. In addition, we evaluated many of the pros and cons associated with a flipped classroom model and benefited from discussions around ensuring participation and assessing online learning modules. The library literature on instructional design for asynchronous learning modules is still relatively scant. There is, however, considerable research on authentic teaching and learning across modalities and instructional settings, from K–12 through postgraduate education, that can be adapted to asynchronous learning experiences.

In addition to assessing our current program and determining whether it had achieved the goals we set for it, we met with the First-Year Writing Program administrators. These meetings helped us understand how the program would be run in the upcoming academic year, how it differed from prior years, and the administrators’ expectations for library participation. During the initial meeting, it became clear that, while the Writing Program had grappled with the altered modalities, it had not made a clear break with past practice. It sought to adapt current techniques to the online or hybrid classroom rather than rethinking or redesigning the program itself. As the discussions progressed, a desire for new ideas and new thinking became apparent, along with a willingness to adopt new ways of providing instruction in partnership with the library. Indeed, as the revamped library instruction program began to take shape, the First-Year Writing administrators expressed their gratitude for the focus and direction the library provided. The library’s program helped instructors to better time assignments and scaffold the students’ research skills in a way that was not possible within the prior program.

The new program included parts of our former practice that we chose to continue as well as examples from the library literature that we decided to adopt. It involved the creation of asynchronous learning objects and synchronous sessions that enacted best practices in authentic teaching and learning. The shape of the program we designed and our initial assessment of the fall 2020 semester are discussed in the next sections.

**First-Year Program Redesign**

Tisch Library’s redesigned first-year instruction program uses a flipped classroom model in which students complete a set of six interactive asynchronous tutorials prior to attending a synchronous online or face-to-face session with an instruction librarian. Created using the open source ActivePresenter platform, these tutorials cover all six ACRL frames for information literacy: Authority Is Constructed and Contextual; Information Creation as a Process; Information Has Value; Research as Inquiry; Scholarship as Conversation; and Searching as Strategic Exploration. Each tutorial addresses at least one of the frames, which are also mapped to the library’s six first-year learning outcomes (see Table 1).

The tutorials are designed to be accessed in sequence, so that students are introduced to gradually more sophisticated methods for finding, evaluating, and using information. Table 2 lists the tutorials’ six modules (see Table 2). Modules 2 through 6 include embedded interactive quizzes that provide immediate feedback on students’ answers (see Table 3).
Table 1.
Learning outcomes for Tisch Library’s first-year instruction mapped to the ACRL Framework for Information Literacy for Higher Education

<table>
<thead>
<tr>
<th>Library learning outcome</th>
<th>ACRL frame</th>
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<tbody>
<tr>
<td>At the end of the session, students will be able to identify differences between materials found in JumboSearch and materials found on the open Web in order to strategically use search tools to identify a variety of appropriate sources for their research papers.*</td>
<td>Information Creation as Process</td>
</tr>
<tr>
<td>At the end of the session, students will be able to identify relevant keywords in order to develop their topic and construct effective searches in any search context.</td>
<td>Research as Inquiry</td>
</tr>
<tr>
<td>At the end of the session, students will be able to differentiate between formats and types of information in order to choose appropriate resources for their assignments.</td>
<td>Scholarship as Conversation</td>
</tr>
<tr>
<td>At the end of the session, students will be able to apply a facet/limiter in JumboSearch in order to refine their search results and choose sources appropriate for their assignments.†</td>
<td>Searching as Strategic Exploration</td>
</tr>
<tr>
<td>At the end of the session, students will be able to evaluate information sources for concepts such as authority, reliability, credibility, and bias in order to use information more effectively.</td>
<td>Authority Is Constructed and Contextual</td>
</tr>
<tr>
<td>At the end of the session, students will understand why proper citation is important and will be able to locate citation help in order to use information ethically.</td>
<td>Information Has Value</td>
</tr>
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</table>

*JumboSearch is the discovery tool for Tufts University Libraries, including books, journals, audio and video recordings, and other items held across the seven different Tufts Libraries locations.

†Facets, also known as limiters or filters, allow users to limit their search results by such criteria as date of publication, type of material, or peer-reviewed sources only.
Table 2.
The asynchronous tutorial modules and learning outcomes for Tisch Library’s first-year instruction program

<table>
<thead>
<tr>
<th>Module</th>
<th>Library learning outcome</th>
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<tbody>
<tr>
<td>Module 1: Introducing Tisch Library</td>
<td>—</td>
</tr>
<tr>
<td>Module 2: The Google Algorithm</td>
<td>At the end of the session, students will be able to identify differences between materials found in JumboSearch and materials found on the open Web in order to strategically use search tools to identify a variety of appropriate sources for their research papers.</td>
</tr>
<tr>
<td>Module 3: Interpreting Google Search Results</td>
<td>At the end of the session students will be able to evaluate information sources for concepts such as authority, reliability, credibility, and bias in order to use information more effectively.</td>
</tr>
<tr>
<td>Module 4: What if You Can’t Use Wikipedia?</td>
<td>At the end of the session, students will be able to identify relevant keywords in order to develop their topic and construct effective searches in any search context.</td>
</tr>
<tr>
<td>Using Library Resources to Develop Keywords and Construct a Topic</td>
<td></td>
</tr>
<tr>
<td>Module 5: Using JumboSearch to find Books and Peer-Reviewed Articles</td>
<td>At the end of the session, students will be able to differentiate between formats and types of information in order to choose appropriate resources for their assignments. At the end of the session, students will be able to apply a facet/limiter in JumboSearch in order to refine their search results and choose sources appropriate for their assignments.†</td>
</tr>
<tr>
<td>Module 6: Information Ethics</td>
<td>At the end of the session, students will understand why proper citation is important and will be able to locate citation help in order to use information ethically.</td>
</tr>
</tbody>
</table>

*JumboSearch is the discovery tool for Tufts University Libraries, including books, journals, audio and video recordings, and other items held across the seven different Tufts Libraries locations.†Facets, also known as limiters or filters, allow users to limit their search results by such criteria as date of publication, type of material, or peer-reviewed sources only.
### Table 3.
Sample questions from quizzes embedded within Tisch Library’s asynchronous tutorial modules

<table>
<thead>
<tr>
<th>Quiz question</th>
<th>Potential answers*</th>
</tr>
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<tbody>
<tr>
<td>Module 2: How can Google personalization bias your search results?</td>
<td>Google’s suggested search terms can be prejudiced.</td>
</tr>
<tr>
<td></td>
<td>Google personalization doesn’t change my search results.</td>
</tr>
<tr>
<td></td>
<td>Google personalization returns only the best results for my research project.</td>
</tr>
<tr>
<td></td>
<td><strong>Google personalization returns results based on my own personal bias.</strong></td>
</tr>
<tr>
<td>Module 3: What two key criteria will help you to better evaluate your Google search results?</td>
<td>popularity AND personal interest</td>
</tr>
<tr>
<td></td>
<td><strong>author affiliations AND website domain</strong></td>
</tr>
<tr>
<td></td>
<td>confirms my beliefs AND sounds good location in the results list AND a frequently asked question</td>
</tr>
<tr>
<td>Module 4: It’s important to identify some of the key concepts related to your topic because they:</td>
<td>Provide you with alternate points of view.</td>
</tr>
<tr>
<td></td>
<td>Offer evidence to support your argument.</td>
</tr>
<tr>
<td></td>
<td>Help you to evaluate the quality of your information source.</td>
</tr>
<tr>
<td></td>
<td><strong>Help to focus your paper on what you find interesting and important about it.</strong></td>
</tr>
<tr>
<td>Module 5: Adding additional keywords to a database search will:</td>
<td>Have no effect on my search results.</td>
</tr>
<tr>
<td></td>
<td><strong>Narrow and focus my search results.</strong></td>
</tr>
<tr>
<td></td>
<td>Limit my results to online resources.</td>
</tr>
<tr>
<td></td>
<td>Expand and broaden my search results.</td>
</tr>
<tr>
<td>Module 6: To use information ethically I need to:</td>
<td>Cite only some of my sources.</td>
</tr>
<tr>
<td></td>
<td><strong>Cite all the sources that I use.</strong></td>
</tr>
<tr>
<td></td>
<td>Cite only ethical sources.</td>
</tr>
<tr>
<td></td>
<td>Cite only sources that I agree with. *Correct answers appear in bold type. 1</td>
</tr>
</tbody>
</table>
The tutorial sequence is embedded in a first-year library instruction course on Canvas in which First-Year Writing students enroll at the start of the semester. Additional quizzes are provided in each Canvas course module to take advantage of the robust analytics and reporting functionality of the Canvas learning management system. The Canvas quizzes replicate the interactive quizzes in modules 2 through 6, since our goal for the asynchronous part of the instruction program is to introduce key concepts and reinforce student learning, rather than to test a broader range of knowledge. The instructional design emphasizes inclusivity by employing methods meant to reinforce learning rather than to punish a lack of knowledge. First-year students enter Tufts University with a wide array of high school experiences (from both the United States and abroad) and a huge variation in prior exposure to library research tools and methods. This instructional design allows us to engage with their common prior knowledge and research skills, such as experience with Google and Wikipedia, while establishing a new and shared baseline for understanding those tools and applying that knowledge to library research. The approach offers students multiple opportunities to engage with the material and reinforce their learning, rather than penalizing them for missing a question. This technique is informed by the pedagogy of inclusion, in which we “identify what skills must be developed in order to achieve mastery without excluding students on the basis of nonessential skills.” In addition to inclusivity, we also concentrate on the accessibility of the online tutorial modules. Each Canvas module includes a short video (less than 10 minutes in length) with voice-over narration and closed captioning as well as a complete written transcript, allowing students to engage with the content in multiple ways. For example, they could read the transcript and take the quiz in Canvas without viewing the videos. Students generally spend from 40 to 60 minutes in the Canvas course engaging with the content in any format.

First-Year Writing instructors ask students to complete the online tutorials before they begin their first research-based writing assignment to time this introductory material to the students’ first point of need. This timing also allows instructors some flexibility, so that they can include tutorial completion in their syllabus at a point that makes sense for their assignments. The only time-based obligation is that the instructors require students to complete the tutorials prior to the synchronous library session, which is generally scheduled during the middle or later part of the semester, before the students begin research for their final assignments. Because students have access to the online tutorial modules when their classes begin, they have time to explore the content as they work through preliminary writing assignments. In addition, they can refer to the tutorials at any point as a refresher, which allows them to continue to practice their skills and reinforce their learning throughout the semester.

Based on Tisch Library’s prior history of first-year library instruction, the librarians expected that most First-Year Writing instructors would request their “library sessions” to take place on many of the same dates and times. In the past, this situation posed a scheduling problem when individual librarians were asked to work with two classes
simultaneously. In fall 2020, what had previously been thought of as a problem became a tool to help solve a growing sustainability issue. In fall 2018, 12 librarians participated in the first-year instruction program. That number dropped to seven librarians in fall 2019 and three in fall 2020 because of temporary vacancies and a library reorganization in which first-year instruction became the sole purview of the UESS Department (see Figure 1). The department was understaffed due to a university hiring freeze at the beginning of the COVID-19 emergency. Zoom allowed us to host more students than we could traditionally handle given the space (and double-booking) limitations of both the library classroom and section classrooms. If an instructor requested the same date and time as another instructor, their sections were combined, allowing fewer teaching librarians to reach more students. At Tufts, sections of English 1 are capped at 15 students for lecturers and at 10 or 12 students for graduate teaching assistants. Thus, a combined section could never exceed 30 students. Once the main schedule was compiled, the three first-year instruction librarians divided up the 32 scheduled sessions, averaging a manageable 10 sessions per librarian in fall 2020.

An additional challenge for sustainability using our old approach resulted from the need to develop individual lesson plans for each First-Year Writing instructor that focused on their specific assignments. This requirement meant that much lesson preparation time had to be devoted to individual sections, in which assignments varied widely. Working with the ACRL frames prompted us to switch our focus from specific assignments to larger conceptual learning outcomes that could be replicated across sections. As the asynchronous tutorials began to take shape, it became clear that the synchronous sessions could, and should, take the same approach, exposing students in every library session to the same conceptual framework and learning outcomes. This common approach created a more equitable learning experience and provided a more consistent foundation.

Working with the ACRL frames prompted us to switch our focus from specific assignments to larger conceptual learning outcomes that could be replicated across sections.

![Figure 1. Librarians participating in Tisch Library’s first-year instruction program in fall 2019 and in fall 2020.](image-url)
for all students enrolled in the course. In addition, moving away from specific assignments and toward teaching larger ideas provided further opportunities for students to transfer their knowledge and apply it to other domains. Engaging with prior knowledge allows students to connect their personal experience to library research. Connecting to larger concepts enables students to transfer their knowledge beyond the specific course context, both during their time at the university and in their personal life.

We developed a common lesson plan for English 1 that each librarian used as an outline for each session. The lesson plan significantly reduced the time devoted to lesson prep. Teaching librarians could engage with the outline in ways that suited their individual teaching styles, but students in each section were exposed to the same concepts and learning outcomes.

To address the English 1 library learning outcomes, the lesson plan includes three components. The first part focuses on commonly missed quiz questions as a basis for a content review and to correct any misinformation students might have. Focusing on commonly missed questions allows teaching librarians not only to correct misperceptions but also to reinforce learning in areas of need. The second part of the plan focuses on a problem-based learning activity in which Zoom breakout rooms are used to divide students into randomly assigned groups to solve an information problem together. The students receive a link to the problem statement and discussion prompts, along with a handout to help guide them through solving the problem. They have approximately 15 minutes to work on the problem together, after which the groups return to the main room to report on their solutions. The group reports prompt a larger discussion around the nature of information, how that information gets to us, and the construction of authority. The final part of the class is devoted to individual topics, treating each topic as an information problem that the student needs to solve. During fall 2020, combining sections and randomly assigning breakout groups also had the bonus of connecting students to others whom they may not have met as a result of COVID-19 restrictions, helping to ease their feelings of disconnection and isolation.

This combined asynchronous and synchronous instruction program focuses on specific learning outcomes, reinforces key concepts, incorporates inclusive pedagogy, and reduces both prep time and the total number of sessions each teaching librarian needs to provide. At the same time, it increases the amount of instruction offered to a larger number of students. In that regard, it achieved the two major goals outlined at the beginning of the development process: (1) reach more students enrolled in the First-Year Writing Program to provide a more consistent instructional baseline; and (2) provide more instruction with a declining number of participating librarians. In addition, it offers a model for a more sustainable program going forward. The next section outlines the fall 2020 results, including student learning and program assessment as well as levels of participation and engagement.
Results

Participation

In fall 2020, even as the number of first-year teaching librarians declined dramatically, the number of sections for which they provided instruction increased by 13 percent and the total number of students who received instruction grew by 16 percent (see Figures 2, 3, 4, and 5). Given the large number of incoming students, additional sections of English 1 were offered in spring 2021. While the number of individual instruction sessions decreased by almost 19 percent in fall 2020, the number of students reached by the program increased by 5 percent.

Figure 2. Students in Tisch Library’s first-year instruction program in fall 2019 and in fall 2020.

Figure 3. Number of sections for which Tisch Library provided instruction in fall 2019 and in fall 2020.
Engagement

In fall 2020, 598 students participated in synchronous instruction sessions, but the number of quizzes they completed varied by module. No single module achieved full participation, though module 3, with 488 finished quizzes, had the largest number of completions (see Figure 6). Based on quiz completions and synchronous attendance, as of December 31, 2020, at least 82 percent of students enrolled in First-Year Writing in fall 2020 received two instruction sessions, one asynchronous and one synchronous. It should be noted that students who did not complete the quizzes within Canvas may have engaged with the tutorial content and taken the quizzes embedded within the tutorials. In almost every case, students participating in synchronous sessions indicated that they had completed the tutorials prior to the session, but if they did not submit the Canvas quiz, a completion would not have been recorded.
Given the inclusive pedagogical approach embedded in the design of our asynchronous modules, it is no surprise that a majority of students answered most questions correctly (see Figure 7). Some students struggled with a question asked in module 4, which focused on identifying keywords and related concepts, and 16 percent answered it incorrectly. This result remained constant throughout the semester, which provided us with crucial data around what topics needed to be reviewed and reinforced during the session.

Figure 6. Number of students completing the quizzes for each module of Tisch Library’s first-year instruction program in fall 2020.

Figure 7. Percentage of correct answers for the quizzes with each module of Tisch Library’s first-year instruction program in fall 2020.
While, as noted earlier, 598 students attended synchronous sessions in fall 2020 and as many as 488 students submitted quizzes through the Canvas course, there were significantly more participations and page views in the Canvas course than the total number of students recorded in either modality. In this case, participations indicate that students interacted with the course content, such as when they viewed a tutorial or submitted a quiz. Students actively engaged with the first-year instruction Canvas course 2,315 times from September to December 2020 (see Figure 8). Canvas course analytics breaks down active participations and page views by individual student. Engagement with course content ranges from a high of 490 page views to a low of 1, which indicates that while some students were highly engaged with the content, others signed on just once. Students with the highest number of page views also had the highest number of participations, which was seven, with an average of approximately five participations per student.

Program Evaluation

At the end of the spring 2021 semester, the UESS Department designed and implemented a short six-question survey using the Qualtrics platform to send to instructors who had participated in the first-year instruction program during the prior academic year. Fall and spring instruction for English 1 used the same instructional model and lesson plan, making their experiences across semesters comparable. The survey, which included both fixed- and open-response questions, was sent to 27 instructors. We received 10 responses to most of our six questions, resulting in a 37 percent response rate. The potential for both self-selection and nonresponse bias, as well as the small sample size, indicates that these results should be considered as suggestive and not necessarily conclusive.

A majority of responding instructors recommended no additional foundational skills to add to the asynchronous tutorials (see Figure 9). A second question asked for specific suggestions if the respondent indicated that they had additional skills to propose. One respondent answered yes, urging more information about using the physical library.
space and more on citation (given a lack of prior exposure to this topic for incoming first-year students). We had not considered including orientation to the physical space in the asynchronous modules for several reasons, including the ongoing pandemic, which limited access to library spaces. That said, we are currently creating online library tours that will be included in the Canvas modules going forward. In addition, since module 6 focuses on information ethics, particularly on citation, we will take this suggestion under advisement.

The three respondents who made suggestions regarding the structure of the synchronous session all mentioned that the review period at the beginning of the session should be shortened, since most students had already engaged with the material in the asynchronous tutorials (see Figure 10). This comment was not unexpected, since all the participating teaching librarians indicated that they struggled with balancing the activities and content review, especially during the fall semester. This situation was especially acute in combined sections, where some students had more preparation than others. As a result, the spring 2021 lesson plan for English 2 included an additional hands-on activity, and the fall 2021 plan for English 1 was also revised accordingly.

The six respondents who indicated what they thought went well in the instructor-led synchronous sessions mentioned the problem-based learning activity. Two other comments focused on the break-out rooms and discussion period provided in the activity (see Figure 11). Regarding what did not go well, two respondents...
repeated their earlier comments about shortening the review period at the beginning of the session.

Most respondents somewhat or strongly agreed that their students were better equipped to do college-level research after participating in the first-year instruction program (see Figure 12). Of the 10 respondents, no one disagreed, while 2 respondents did not answer.

Our final question was open response and asked if there was “anything else related to the library’s approach to first-year instruction during the past year that you would like to tell us?” This question generated six responses. Some respondents reiterated
earlier comments, such as suggesting more in-person orientation to the library space and increased instruction around proper citation. Two respondents expressed general thanks and compliments to the librarians and the program itself, and two reported some technical frustration with Canvas and Qualtrics. The most common suggestion received (from three respondents) was to reduce the portion of the synchronous sessions devoted to review. That said, all three respondents also somewhat or strongly agreed that their students were better prepared after participating in the program, and two also thought that the asynchronous modules were “great.”

**Conclusions**

This redesigned approach to first-year library instruction appears to have accomplished the major goals that the UESS Department had for the program, including reaching more students, creating a common instructional baseline for students in First-Year Writing classes, developing a sustainable approach to first-year instruction, and optimizing online learning. UESS librarians reached 16 percent more students in fall 2020 compared to fall 2019, and the asynchronous tutorials offer a consistent introduction to important threshold concepts and the library’s first-year learning outcomes. Combining sections and creating a common lesson plan helped to provide for sustainability going forward, while the inclusive pedagogy embodied in the asynchronous tutorials helped to optimize online library learning for both consistency and equity. Most instructors who responded to the survey spoke highly of the tutorials, and many expressed their desire to retain this approach even after the library returned to face-to-face learning.

Along with the department’s goals, this program also overcame many of the challenges outlined in the library literature around sustainability, the flipped classroom,
online instructional design, and authentic assessment. As noted earlier, we developed a two-pronged approach to sustainability that includes combining sections and developing a common lesson plan, which reduces the number of sessions each librarian needs to lead as well as lesson prep time. As the university continues to increase the number of incoming first-year and transfer students, combining sections may be more difficult—especially as we return to more face-to-face instruction in a library classroom with limited availability and capacity. We may need to increase the number of librarians who teach in the first-year instruction program to provide more synchronous or follow-up sessions where combined sections are not possible. That said, the standardized lesson plan still allows us to reduce the prep time for everyone teaching in the program, and the feedback from instructors helped us to improve the sessions in fall 2021, especially around balancing review and hands-on practice. We anticipate another round of program assessment after we revise the lesson plan and implement it in a face-to-face setting.

Regarding the flipped classroom approach, the main challenges outlined in the library literature involve generating faculty buy-in and developing a method for assessing students’ exposure to, and ability to navigate, asynchronous content before a face-to-face or synchronous online instruction session. In summer 2020, we secured faculty buy-in for our revised approach in response to the extraordinary circumstances imposed by the COVID-19 pandemic. While we had discussed implementing the flipped classroom model in our pre-pandemic planning, we might not have been able to generate as much participation and general buy-in as we did without the emergency. It likely would have taken far longer to develop and pilot a new first-year library instruction model without the need to rethink and redesign our program as we moved to fully online instruction. The urgency of the moment necessitated an innovative approach. Students could navigate the asynchronous content easily because we used Canvas to host our tutorials—the same learning management system that they use for all their other courses. In addition, we provided numerous accessible ways to engage with the content via discrete modules within the larger course, enabling students to move through the material in multiple ways. However, the challenge of ensuring that all students enrolled in the course submit Canvas quizzes remains.

Instructional design for online learning objects also continues to be a challenge, and most of the library literature on this topic focuses on the technology rather than design. In this case, we had developed a set of first-year library learning outcomes long before we redesigned our first-year instruction program, and those learning outcomes provided a framework around which to design the asynchronous tutorials. As we mapped the learning outcomes to the ACRL Framework, we also employed more inclusive pedagogy to ensure that students were rewarded for what they know rather than punished for what they do not know. In the end, the asynchronous tutorials have been popular with both the students and the instructors, and we intend to continue revising, updating, and employing them in first-year library instruction for the foreseeable future. As we continue to improve the asynchronous portion of our flipped classroom, we may rely on tutorials for most of the instructional content and concentrate more on problem-solving and practice in our synchronous and face-to-face sessions.

To address assessment, we combined the Canvas quizzes with the problem-based learning exercises to generate both quantitative and qualitative assessment instruments.
While the quizzes used a multiple-choice format to reinforce learning, the problem-based exercises asked students to solve an information problem together, which required them to engage their skills in searching for and evaluating information. Both the discussion and the submitted worksheets provided teaching librarians with a better sense for how well the students understood and could practice the skills that we try to teach. As expected, the students demonstrated a wide range of competencies in their initial solutions. The group reports and follow-up discussions enabled peer learning to take place, so groups with more basic skills could learn from those with more advanced abilities. It proved difficult, however, to collect the problem-based worksheets in the online environment since we had to rely on students to e-mail them to the instructors. As a result, the actual artifacts from this exercise were more limited than when we physically collect them at the end of a face-to-face class. As we move toward a flipped classroom in which the follow-up sessions are conducted face-to-face, we expect that this problem will be solved and that we will be able gather more assessment data in real time.

**Next Steps**

Tisch Library’s UESS Department will continue to refine and develop our flipped-classroom approach to first-year library instruction. We will continue to revise the asynchronous tutorials to reflect changes in our website and other interfaces. We have already added content to the Canvas courses that introduce physical library spaces, but we anticipate that this type of introduction to the library will be less urgent, since in fall 2021 the library was fully open and once again participated in the university’s orientation program.

Along with continuing to improve the asynchronous portion of the flipped classroom, first-year instruction librarians have also worked to improve the synchronous and face-to-face sessions, offering more hands-on practice and group activities. The problem-based learning exercise employed in fall 2020 was engaging for the students and well received by the instructors, and ensuring a balance of time in each session is a high priority going forward. That said, our top priority has been, and will remain, student learning, and we will continue to examine and reexamine the effectiveness of our instructional approach, especially as we continue to develop our fluency with the pedagogy of inclusion.

In the spirit of continuous improvement, we understand that the development of this program will never be fully complete. Instead, each year’s iteration will be assessed and revised to meet the needs of a changing information environment, changing technology, changing higher education, and, especially, a changing student body. As Tufts moves toward more fully online and hybrid programs and partners with international universities, the mix of students that we need to reach worldwide will become more complex and challenging. The first-year instruction program implemented in fall 2020 provides a solid foundation on which to build our programming for years to come.

Finally, our experience with the flipped classroom model can be applied beyond the COVID-19 period and to classrooms outside the library. In response to the difficulties we experienced with the review portion of the synchronous lesson, in fall 2021 we developed a more interactive lesson plan, which includes online audience response tools such as
Poll Everywhere\textsuperscript{28} and Google Jamboard\textsuperscript{29} to reinforce the asynchronous content. The tools allow students to answer anonymously, so rather than spending time reviewing the tutorial content, we spend time in conversation with students about the material. These discussions allow both for more interactivity and more peer learning. This type of review can be instituted in any discipline in which a flipped classroom approach is employed. For example, instructors could prepare a set of discussion questions based on course readings or other assignments for students to complete outside class. They could then pose those questions during class using online audience response tools, which can provide “systematic and explicit opportunities for interaction between the teacher and the students and can act as a catalyst for peer discussion.”\textsuperscript{30}

Along with this method’s applicability across pedagogies, our library will continue to employ the flipped classroom model for first-year instruction. It offers librarians the opportunity to double their instructional content without taking additional class time. In addition, it provides a way to supply meaningful information literacy instruction in classes that do not traditionally ask for such instruction or do not allow teaching librarians more than 15 to 30 minutes of class time. Given the prevalence of one-shot instruction sessions and librarians’ ongoing struggle to teach important concepts within that model, fully asynchronous information literacy courses that target specific learning outcomes provide a way not only to flip the classroom but also to offer more in-depth instruction in large lecture classes and other contexts where the opportunities for face-to-face instruction can be limited. Faculty enthusiasm for the asynchronous course, along with its potential for providing library instruction across our institution, will bring continuing development of our expertise in online learning. Indeed, this model not only gives teaching librarians more openings to provide flipped instruction in face-to-face classes but also enhances our ability to embed content and to flip the classroom in fully online courses. The tools that we now have, from learning management systems to free tutorial authoring software and audience response platforms, and the experience in online teaching that we have developed present librarians with expanded opportunities to become strong campus partners and even leaders in teaching and learning within higher education.

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Notes


10. See Ferguson, *Using Authentic Assessment in Information Literacy Programs*.


21. This section describes the program adopted for library instruction in English 1 in fall 2020. Additional modules and a separate lesson plan were designed for use in spring 2021 with sections of English 2, which has slightly different needs than English 1. Development of a similar program for English 3 is ongoing, while English 4 does not generally participate in library instruction.
22. Atomi Systems, “ActivePresenter 8,” https://atomisystems.com/download/. ActivePresenter functions similarly to Adobe Captivate and Camtasia, and the open-source free version of this software includes significant functionality, such as interactive quizzes, embedded multimedia content, and closed captioning.


25. For a more complete discussion of the importance of engaging with students’ prior knowledge, see “How Does Students’ Prior Knowledge Affect Their Learning?” chap. 1 in Susan A. Ambrose, Michael W. Bridges, Marsha Lovett, Michele DiPietro, and Marie K. Norman, How Learning Works: Seven Research-Based Principles for Smart Teaching (San Francisco: Jossey-Bass, 2010), 10–39.


27. A typical information problem that students were asked to solve during the session was to “Find credible, reliable, and academic/scholarly information about the rights of the Inuit people, including a detailed description of the main issues, historical background information, and the current context in which it is being discussed. Then answer the questions below.” The questions that the students were asked were: “What information did you find, where did you find it, and how do you know it’s reliable?” and “What strategies did you use to find that information, and why did you choose that approach?” This discussion also prompts questions about what students did not find and why.

