



**Improving a library workshop service: Implementing change and enhancing the service based on data analysis**

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## Improving a library workshop service: Implementing change and enhancing the service based on data analysis

### Abstract

**Purpose:** This paper describes how one medical library implemented a new scheduling system, initiated data analysis, and modified its regularly scheduled workshop program because of evidence-based decision-making. Academic libraries that struggle with workshop attendance may use this process as a model.

**Design/methodology/approach:** Workshop registration data analysis focused on registrants' affiliation, role, and location, and how registrants learned of workshops. Workshop attendance data analysis focused on which workshops, days, times of the day, and months had the highest attendance. The analysis led to changes in marketing and targeted scheduling of future workshops by the time of day, day of the week, and month of the year.

**Findings:** Data collected for four years, fall 2018 – summer 2022 (12 semesters), shows a steady increase in the number of people attending library workshops. The increase in attendance and ROI experienced after the changes implemented at Ruth Lilly Medical Library (RLML) is significant as libraries often struggle with attendance, marketing, and return on investment when offering ongoing educational workshops.

**Originality/value:** Many libraries offer ongoing workshops with low attendance. This article provides an example of how one library changed software and registration and implemented evidence-based decision-making related to scheduling which may have contributed to an increase in workshop attendance. Other academic libraries might consider adopting similar software and evidence-based decision-making to improve their library workshop service.

### Introduction/Background

Indiana University School of Medicine (IUSM) is the largest medical school in the United States with nine campuses and nine residency sites located throughout the state of Indiana (Association of American Medical Colleges, 2022). Ruth Lilly

Medical Library (RLML) serves all nine campuses and nine sites and is physically located in Indianapolis. In the IUSM

1 organizational hierarchy, the medical library is funded by and falls under the School of Medicine's Office of Educational  
2 Affairs. The population served by the library is primarily students, staff, and faculty of the medical school, and there is an  
3 emphasis on educational programming and services in the library.  
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9 Before 2019, RLML offered a few regularly scheduled workshops. Librarians were hesitant to offer recurring library  
10 workshops because attendance was historically low, the scheduling system for the workshops was cumbersome, and  
11 there was no consistent analysis of registration or attendance. As a result, it was impossible to make evidence-based  
12 decisions to improve the situation. Between fall 2018 and fall 2021, the number of library workshops increased by  
13 118%, and attendance at those workshops increased by 352%.  
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21 The authors begin with a literature review focusing on library workshop promotion and attendance. The review  
22 concentrates on graduate students and faculty as library workshop data shows that these populations register for  
23 workshop offerings most frequently at RLML. The authors then explore how they implemented changes to the medical  
24 library's workshop service and provide an analysis of workshop data collected between fall 2018 and fall 2021.  
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### 31 32 *Literature review* 33

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35 As long as libraries have supported patron access to tools such as library catalogs and databases, librarians have  
36 provided workshops to teach people how to use these tools (Steffen, 1986). In academic libraries, workshops often  
37 focus on the best ways to search the literature for research projects, and in medical libraries, specifically, workshops can  
38 range from how to promote your research, to how to code qualitative data using specific tools, to learning the basics of  
39 a systematic review. As libraries provide workshops, librarians have studied who needs those workshops, what they  
40 need, and best practices for providing and marketing them. In academic library research, the needs, attendance patterns  
41 and best practices of individual patron populations are often analyzed separately.  
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### 51 52 *Graduate student population* 53 54 55 56 57 58 59 60

There is a substantial amount of library literature demonstrating that graduate students need workshops offered by academic libraries, and this need is not novel (Bussell *et al.*, 2017, Critz *et al.*, 2012, Hoffmann *et al.*, 2008, O'Malley and Delwiche, 2012, Peacemaker and Roseberry, 2017, Rempel, 2010, Roszkowski and Reynolds, 2013, Saetnan, 2020). While graduate and post-graduate students need library workshops, academic libraries struggle with workshop attendance (Alvarez *et al.*, 2014, Bussell *et al.*, 2017, Critz *et al.*, 2012, Fong *et al.*, 2016, O'Malley and Delwiche, 2012, Peacemaker and Roseberry, 2017, Saetnan, 2020, Witherspoon and Taber, 2021). To change this phenomenon, one study looked at what specifically motivates graduate students to attend workshops (Saetnan, 2020), and another study looked at workshop factors that might contribute to higher attendance (Witherspoon and Taber, 2021). Saetnan (2020) surveyed and then held focus groups to identify what motivates post-graduate students to register for workshops. She found that post-graduate students were most influenced by the workshop's relevance (Saetnan, 2020). Witherspoon and Taber (2021) sought to determine the "workshop characteristics. . . [that result] in higher student attendance rates. . ." (p. 15). By using two separate surveys, Witherspoon and Taber (2021) found three significant factors of workshops with high attendance: topic, location (outside of the library), and push advertising. As Saetnan (2020) discovered, Witherspoon and Taber (2021) also found that most important to students were specific workshops aimed at their needs.

### *Faculty population:*

There is also literature discussing faculty needs for library workshops which dates to when faculty began to get access to databases through the fee-based DIALOG Online Search System (Bandi and Ramakrishnegowda, 2016, Hall *et al.*, 2019, Steffen, 1986, Storie and Campbell, 2014). In the early days, faculty wanted to take workshops focusing on database searching to be able to independently research topics (Steffen, 1986). Later, as faculty gained more access to databases, librarians realized that even though faculty had received initial training in database searching, they lacked expertise and needed additional workshops (Hall, 1999). When conducting multiple surveys with faculty, Storie and Campbell (2014) found that sixty-five Medicine and Dentistry faculty members were interested in training on "database search skills (73%), how to do a systematic review search (56%), keeping up to date with the literature (38%), and reference tracking (36%)" (p. 52). However, even when faculty needed library workshops and were aware of their existence, they didn't

always attend the programs (Bandi and Ramakrishnegowda, 2016). These studies show that there is a great need by faculty for library-related workshops, but workshop attendance does not always reflect that need.

### *Marketing:*

When examining literature focusing on what libraries might do to help increase attendance at workshops, one finds a range of approaches from strategically timing the workshops to targeted promotion of the workshops (O'Malley and Delwiche, 2012, Rempel and Davidson, 2008, Saetnan, 2020). Timing is discussed in a couple of articles such as in one when O'Malley and Delwiche (2012) worked with faculty to choose the best time and day to hold workshops while successfully overhauling an existing library workshop program (2012). Saetnan found that due to post-graduate students' unpredictable schedules, a need for various forms of delivery (online and in-person) and repeated workshops was apparent (2020). Promotion and advertising as part of marketing also figured into far more articles about helping prospective attendees learn about and engage with library services, including workshops. Three studies suggest that the promotion of workshops through outside departments and channels other than social media might make the most sense for advertising and for generating attendance at library workshops (Cheng *et al.*, 2020, Jones and Harvey, 2019, Liu *et al.*, 2016).

Social media doesn't seem to be an effective medium for advertising library programming. A recent study found that student use of the academic library's Facebook page was low (Cheng *et al.*, 2020). Another study examined if social media was an effective tool for marketing and promotion of the academic library and whether it was valued by its users (Jones and Harvey, 2019). The study concluded that students might not always want to communicate with or receive communication from the library via social media. Therefore, social media "should not be the library's sole marketing tool" (Jones and Harvey, 2019, p. 13). Much like the studies examining library promotion, in general, Jones and Harvey (2019) found that students may prefer to connect with departments and the college feeds as compared to connecting with the library feeds. When surveying students at two different universities, both sets of students "indicated that involving their professors to 'encourage' them to attend the library user education programs could be one of the most effective ways for promoting/marketing their library user education services" (Liu *et al.*, 2016, p. 647). A finding in another study backed up promotion via non-library channels and "found that the best way to promote library events to

graduate students on their campus [was] . . . to have the information come from the student's graduate advisors"

(Rempel and Davidson, 2008, p. 9). This suggests that indirect marketing, through departmental contacts, advisors, faculty, and department heads, might be the most effective way to advertise library workshops.

## Setting and method

In 2018, the Ruth Lilly Medical Library (RLML) created a new position, Instructional Design Librarian, and one of the responsibilities of this position was to focus on the library workshop program. This librarian worked with a second librarian at RLML (article authors) to perform an environmental scan of current practices around scheduling and promoting workshops. At that time, workshop offerings were scheduled through a system that only one staff member had access to. Registration confirmations and reminder emails were not sent to registrants unless a teaching librarian reached out to staff for a list of registrants and then personally emailed reminders. Attendance was not tracked, and workshops were advertised using paper signage in the library, through a School of Medicine newsletter, and on the School of Medicine online calendar. Workshops were not advertised on the front page of the library website.

After discovering that the library had access to an unused scheduling program (LibCal), the authors and a staff member trained themselves on the program and began using it to schedule library workshops. They then worked with other staff to link the scheduling program to the library website. Using this new system, demographic registration data was captured, and real-time attendance was documented. The new scheduling program also helped minimize duplicative work in the library, saving administrative staff and librarians' time. The librarians utilized event templates with reusable workshop descriptions, customizable registration forms that gather demographics and information about what attendees want to learn, automatic registration confirmation emails containing calendar files that are sent to registrants, email reminders automatically sent one day before the workshop, automatic post-workshop emails populated with a link to a workshop evaluation, and attendance tracking.

## Data Analysis

After each semester, registration and attendance data was downloaded from LibCal into spreadsheets. Registration data was analyzed by registrants' affiliation, role, and location, and by how registrants learned of workshops. Attendance data analysis focused on which workshops, days of the week, times of the day, and months of the year had the highest total and average attendance. Attendance and attrition in each workshop, on each day of the week, at each time of the day, and each month of the year was calculated. Return on investment (ROI) was calculated by dividing total attendance by total workshops each semester. Four years of data was also analyzed cumulatively from Fall, 2018 through Summer, 2022.

### *Marketing and Scheduling*

Before changes were implemented, the advertising of library workshops consisted of monthly workshop flyers and individual workshop flyers placed around the physical library, announcements placed in a medical schoolwide newsletter, and events added to the online medical school calendar. In 2019, the authors joined the library marketing team to promote workshops internally and across campuses. After analyzing registration data and learning how registrants learned about workshops, front-page advertisements were added to the library website using rotating banners. Paper advertisements in the library were phased out. Social media also supplemented library workshop advertising. In 2020, website banners advertising workshops were standardized, and in 2021, one-sentence descriptions of the workshops were added to those banners. Currently, one month before each semester begins, upcoming workshop schedules are now posted on the website, sent to the school's faculty development department for assistance with promotion, and placed on the school-wide calendar. It is in the job description for the Instructional Design Librarian to coordinate this effort and to analyze data after each semester.

The new scheduling software (LibCal) allowed the Instructional Design Librarian to study registration, timing of workshops, registrant roles, and desired learning outcomes. At the end of each semester, registration and attendance data was downloaded and analyzed to detect patterns related to who registers for the workshops, how they learn about those workshops, and which days, times of the day, and months have the highest workshop attendance. When looking at data after the first semester of implementation, it was clear that it would be helpful to gather more information during the registration process. Additional questions were added to the registration form during the first three semesters in 2019 resulting in the current registration form that collects the following information: Name, Email,

Affiliation, Role, School of Medicine campus/site, “How did you learn about this class?”, and “What do you want to learn

from this class?”. The last question was used to help workshop instructors get a sense of the goals workshop attendees have before the workshop begins.

## Results

### *Workshop, Attendance, and ROI Data*

Since 2019, the number of workshops offered, the number of attendees in workshops, and the average number of attendees per workshop increased (Tables 1 and 2 and Figure 1). In the 2018 fall semester the library offered only 11 workshops. Three years later, the library offered 24 workshops during the fall semester, an increase of 118% (Table 1). Likewise, the number of spring workshops increased from 20 in spring 2019 to 26 in spring 2022 (up 30%). Summer workshops saw the largest increase, up 280%, going from 5 workshops in summer 2019 to 19 in summer 2022 (Table 1)

Table 1 – Number of workshops offered each semester (4 years)  
Fall = August-December; Spring = January-May; Summer = June-July

Not only did the number of workshops increase beginning in 2019, but workshop attendance also increased. During the fall 2018 semester, only 29 total people attended library workshops. By the fall of 2021, three years later, 131 people attended workshops (up 352%). This means we were reaching and engaging with far more people each semester in our workshops. Spring semester workshop attendees also increased, going from 87 in 2019 to 131 in spring 2022 (up 51%). Again, summer semester attendance had the largest increase from 55 during the summer of 2019 to 105 during the summer of 2022 (up 91%). (Table 2)

Table 2 – Number of attendees each semester (4 years)

Perhaps most importantly, as it relates to return on investment in library staff time spent per workshop (ROI), the average number of attendees per workshop also continued to rise from the baseline of 3 attendees in the fall of 2018. Certainly, the high of 11 attendees per workshop in the summer of 2019 was an indication to us that we needed to offer more workshops during the summer. In twelve semesters, fall 2018 – summer 2022, the library offered 227 workshops with 1341 people attending. Cumulatively, the average attendance per workshop was 6. (Figure 1)



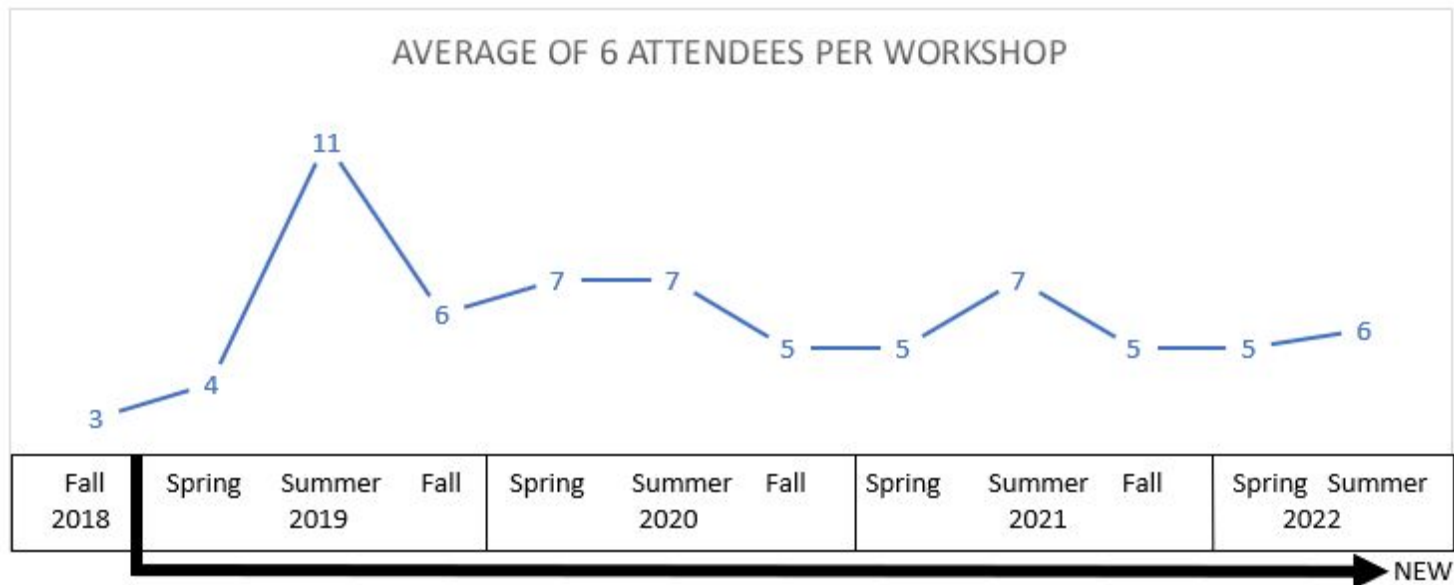


Figure 1 – Average attendees/workshop each semester (4 years)

### Workshop Popularity

Data collected on the most popular workshops were also analyzed. For a list of workshop descriptions, see Appendix 1.

The authors found that EndNote workshops were the most frequently offered workshops (Figure 2). Nearly half of library workshop attendance (42%) was either in a *Basics of EndNote* or in an *Advanced EndNote* workshop (Figure 3).

Collecting and analyzing library workshop data also enabled the authors to identify the workshops with the highest average attendance which helped identify which workshops (*5-day research impact challenge*, *Introduction to systematic reviews*, and *Maximize your literature search in PubMed*) had the biggest ROI (Figure 4).

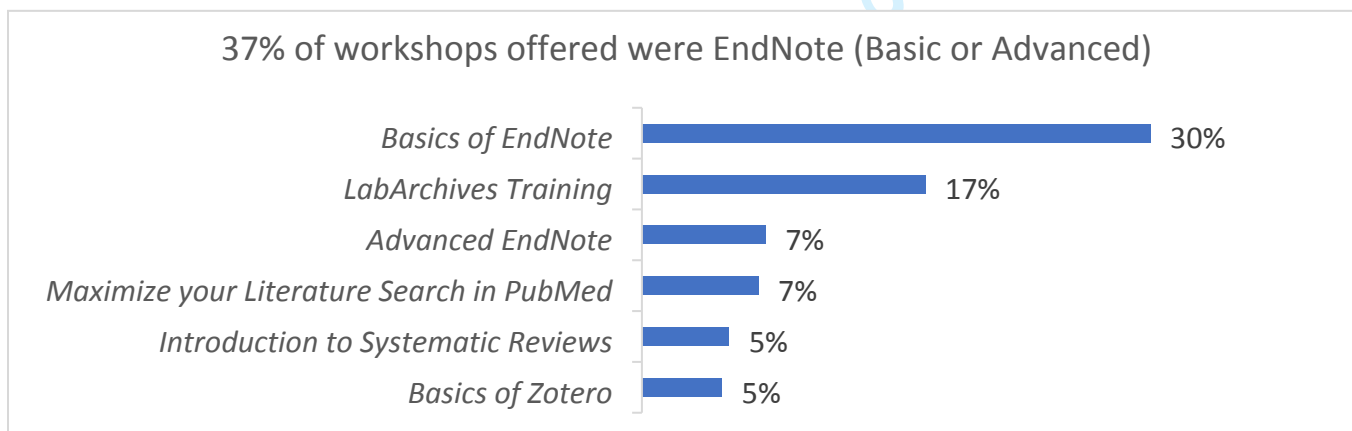


Figure 2 – Top 6 workshops (% of total workshops offered – 4 years, fall 2018 – summer 2022)

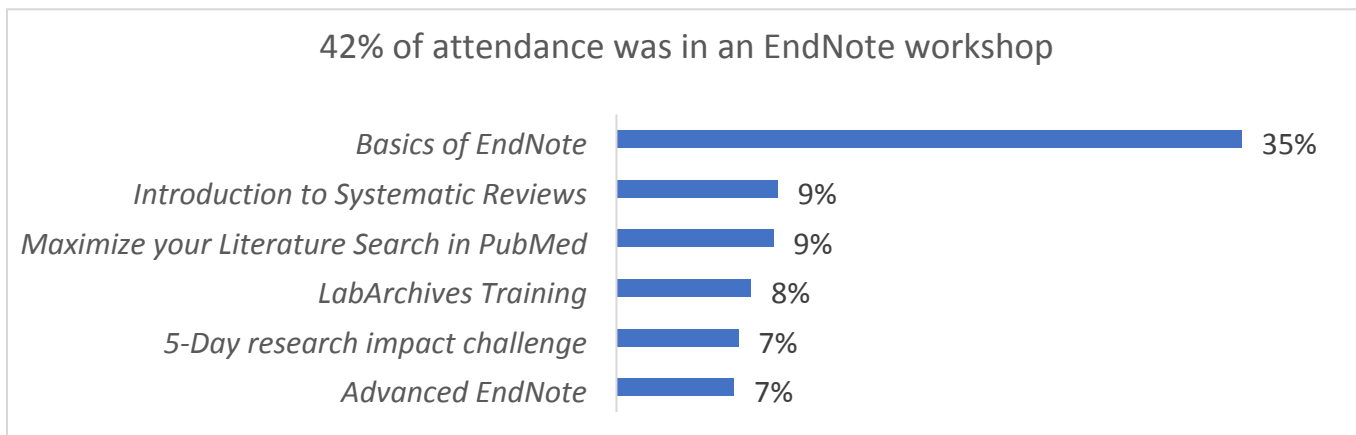


Figure 3 – Top 6 workshops (% of total attendees – 4 years, fall 2018 – summer 2022)

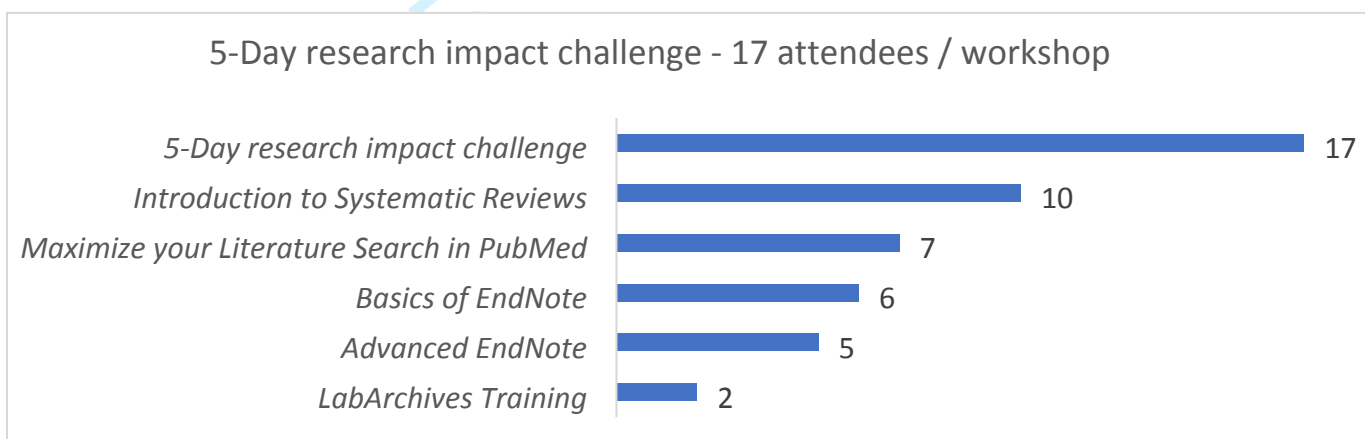
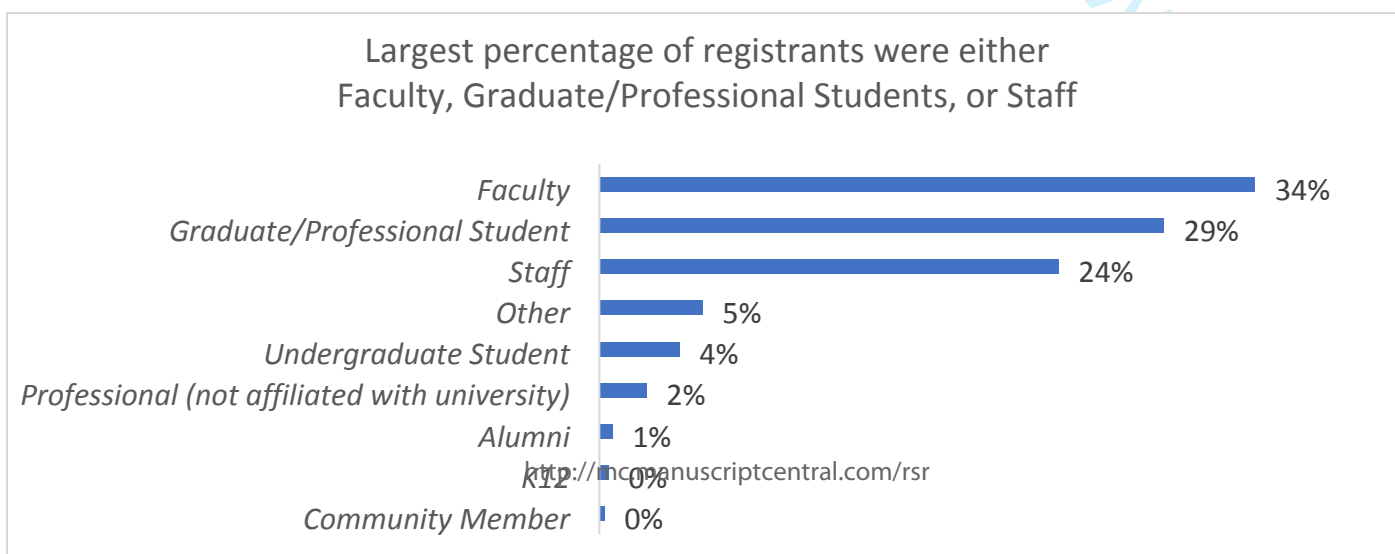


Figure 4 – Top 6 workshops (Average attendance per workshop – 4 years, fall 2018 – summer 2022)

### Registration Data

Additionally, the authors analyzed workshop registration data. As data needs were discovered, the authors added questions to the workshop registration form. Registration data supplied more information about who registered for workshops (affiliation, role, and location), and this information guided future workshop planning. It is important to note



that the information gathered on the registration form changed a few times during the first year of implementation,

therefore, the authors do not have four years of all registration data. However, the following was clear. In 11 semesters, more faculty registered for library workshops than in any other category, and eighty-seven percent of workshop registrants were either faculty, graduate/professional students, or staff (Figure 5).

Figure 5 – Percentage of registrants' roles (11 semesters, spring 2019 – summer 2022)

NOTE: Not all registrants indicated their role

When analyzing 11 semesters of data, the authors also saw that the library website was an important source for people to learn about library workshops. Like previous authors who found that library users did not interact with library social media often (Cheng *et al.*, 2020), even though RLML increased its efforts to advertise via social media, registrants did not learn about library workshops via social media often (Figure 6).

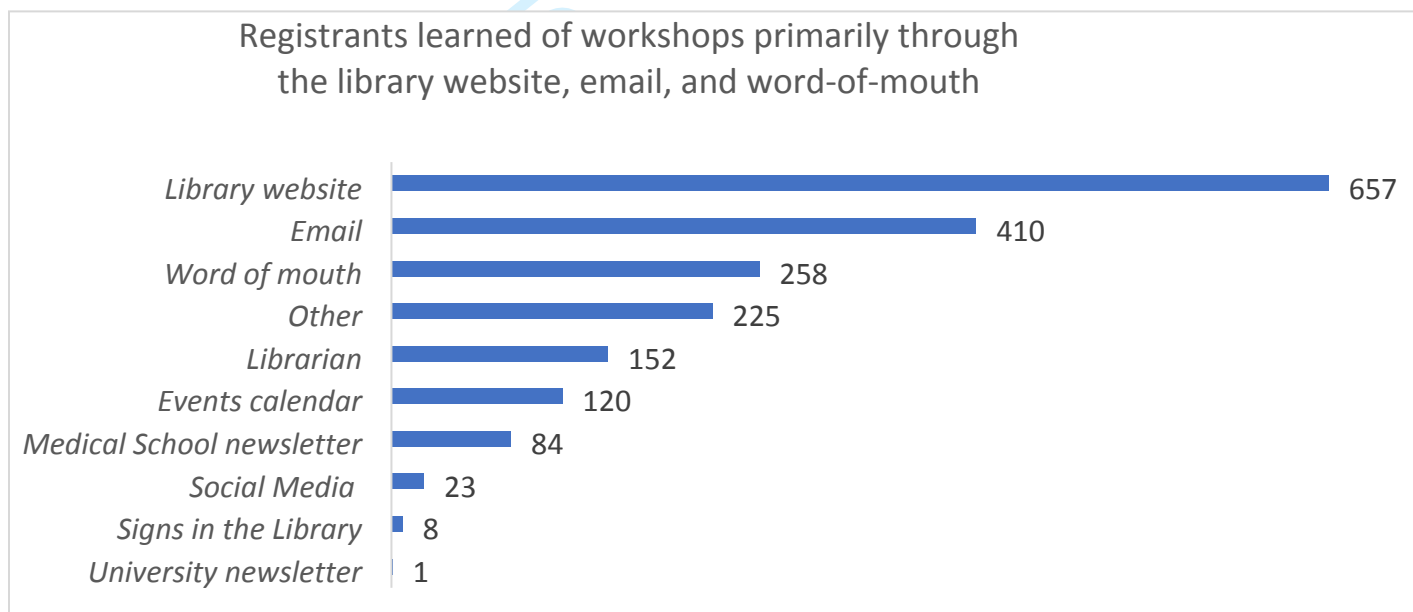


Figure 6 – Number of registrants per mode of learning about workshops (11 semesters, spring 2019 – summer 2022)

NOTE: Registrants could choose none or more than one option.

### *Evidence-based decision-making*

Workshop attendance was analyzed using data captured in the registration and attendance system. Based on that evidence, the authors drew conclusions about the most popular month, day, and time for workshops, and they made suggestions for the same semester the following year. During the first summer, it quickly became evident that demand for library workshops was higher than initially thought. The average attendance per workshop during summer 2019, 11,

was much higher than in the previous fall and spring semesters (Figure 1). It was hypothesized that there was a higher demand for workshops during the summer months. During the following three summer semesters, the library offered more workshops in June and July. In the summer of 2020, the number of workshops more than doubled; the next summer, 2021, the number increased again by 30%, and in the summer of 2022 an additional workshop was added. To understand summer demand, consider that in spring 2022 (5 months), there was an average of 26 each month. Compare this to summer 2022 (2 months), when there was an average of 53 attendees each month.

The authors also learned the best days and times to offer workshops for the highest librarian ROI by analyzing attendance each semester. Due to a prior, unfounded belief that Fridays and Mondays were not the best days to offer workshops, it was only recently that workshops were offered on those days at the library. On average, Friday workshops had the highest attendance/workshop, 8, after offering 16 workshops. Monday had the second highest of attendees/workshops, 7, after offering 28 workshops. Wednesday had the third-highest average attendance/workshop, 6, after offering 81 workshops on that day. (Figure 7)

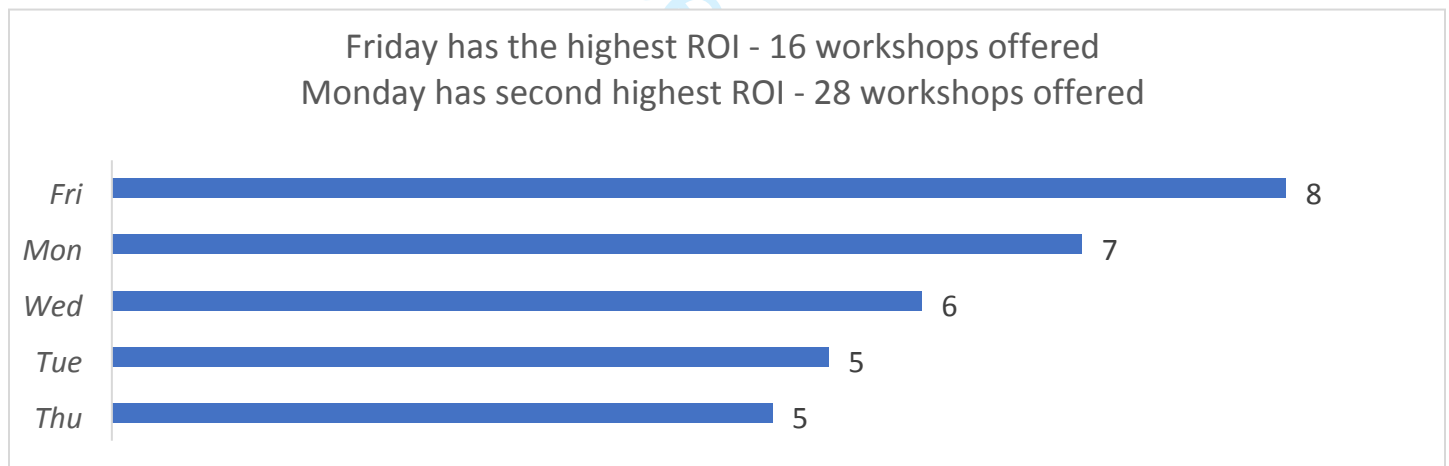


Figure 7 – Attendance/workshop by day of week (11 semesters)

Attendance and time of day were also analyzed. Two o'clock pm had the highest attendance/workshop average, 7, but only 7 workshops were offered at 2 pm during 11 semesters. During those same 11 semesters, 110 workshops were offered at noon with a 6 attendee/workshop average, the second highest average (Figure 8). As a result of this finding, more workshops will be offered at 2 pm while continuing to offer many workshops at noon.

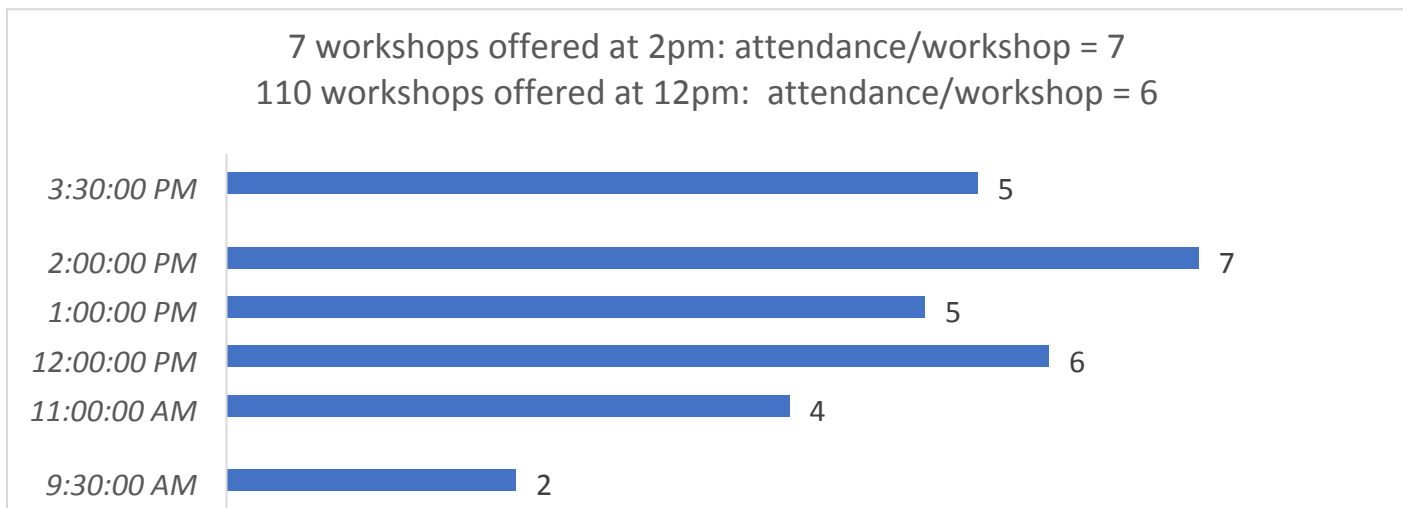


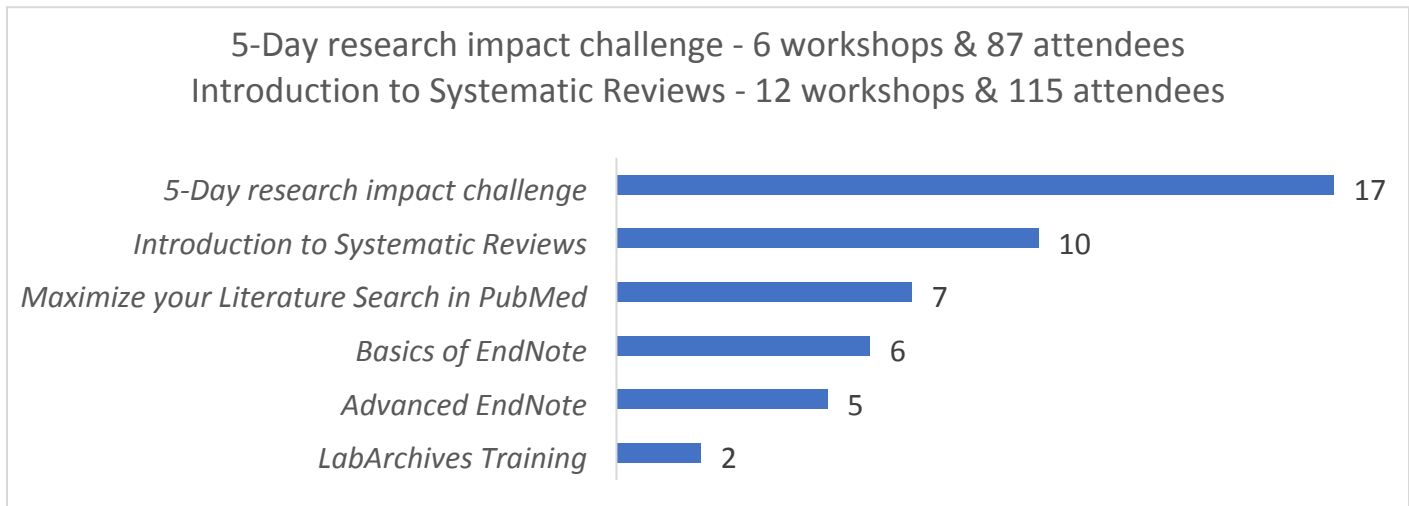
Figure 8 – Attendance/workshop by time of day (11 semesters) rounded to the nearest whole number; bar represents fraction.

As far as the best months for high relative attendance, in 11 semesters, June, July, and October were the best months to schedule workshops based on ROI. Clearly, summer semester workshops were popular and consistently had the library's highest average attendees/workshop compared to the fall and spring semesters. However, there was no clear pattern that June or July was better than the other month for attendance (Figure 9).



Figure 9 – Attendance/workshop by month (11 semesters)

The average attendance/workshop of *Basics of EndNote* workshops was 6, but the highest ROI workshop is the week-long once/semester, asynchronous 5-day *Research Impact Challenge* which had an average of 17 attendees/workshop (Figure 4). After 6 workshops, there were 87 attendees. After 12 workshops of *Introduction to Systematic Reviews*, there were 115 attendees.



16 Figure 10 – Attendance/workshop (12 semesters) See appendix 1 for a short description of each workshop

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19 Lastly, attendance data was used when deciding how many instances of a workshop should be delivered each semester  
20 and whether to continue offering a workshop. With the average ROI being 5-6 attendees/workshop, that attendance  
21 range was used as a cut-off if a workshop fell below that level for multiple semesters. When attendance was  
22 consistently lower than 5-6, a workshop was re-evaluated, and a decision was made on whether to continue offering it  
23 each semester. Some workshops have a compelling reason to be offered, such as an agreement with the research arm of  
24 the medical school to offer the *LabArchives* electronic lab notebook training. In this scenario, a low ROI indicated it  
25 would likely not be offered as many times per semester. Likewise, if a workshop consistently had a higher-than-average  
26 ROI, offering the workshop an additional time during the semester (compared to previous semesters) was considered.

### 37 *Outlier – Pandemic*

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40 The closure of campuses during the beginning of the COVID-19 pandemic in March 2020 impacted workshop registration  
41 and attendance. It was presumed that one of the initial ways employees met job expectations while working remotely  
42 was by taking online library workshops. After the shutdown, registrations skyrocketed with 106% more registrations in  
43 12 fewer workshops compared to registrations and workshops offered before the shutdown. Attendance was also 23%  
44 higher in fewer workshops. Moreover, the average attendance/workshop went from 5 to 9 after mid-March 2020. (Table  
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52 1).

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55 Table 3: Workshop numbers before/after shutdown, spring 2020

The pandemic may have influenced a permanent change from in-person attendance to online attendance. Due to the shutdown in the spring of 2020, the library's workshops switched from a hybrid format (in-person and online simultaneously) to an online-only format. In 2019, when workshops were offered in the hybrid format, online attendance ranged from 15% to 51% of the total attendance per workshop. However, even though workshops were offered in the hybrid format again in the fall of 2021, attendees chose the online option only. To help make an evidence-based decision about the workshop format, a question about online vs. in-person preferences for workshops was added to the post-workshop survey fall of 2021. A large majority of respondents either preferred taking workshops online or had no preference between online and hybrid workshops. Because no one attended in-person during that semester and because post-workshop survey data did not show a strong preference for an in-person option, the authors permanently moved workshops to online-only beginning in spring 2022. Since the shift back to fully online offerings, registration and attendance data hasn't decreased. Attendance numbers continue to increase, and ROI numbers are consistent. Further, offering online-only workshops has also meant librarian instructors have more scheduling freedom as they are not limited to reserving open time slots in busy computer classrooms.

## Discussion

The following changes made at the end of 2018 may have contributed to increased attendance in library workshops, but no direct correlation can be drawn:

- One librarian's job description included management of the program.
- Two librarians and a staff member moved the program to a new scheduling system.
- The library offered more and varied workshops.
- The library increased library website and stakeholder advertising.
- Future semester schedules were made based on evidence from previous semesters' data.

Because the temporary spike in workshop registrations and attendance during the second half of the spring 2020 semester did not continue past that semester, it was assumed that the spike was due to the pandemic shutdown that occurred worldwide. After finding that faculty and graduate students comprised almost two-thirds of workshop

registrants, the library should now consider making decisions about workshop topics and how/when to offer workshops

1 primarily based on the needs of those populations.  
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4 When making decisions, it is important to keep in mind that the ranking of the most popular workshops, as determined  
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6 by the average number of attendees per workshop (ROI), may be a bit misleading because:  
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9 1) The asynchronous workshop is delivered via daily instructional emails and is not housed in a learning  
10 management system therefore, engagement (or attendance) cannot be measured. Hence, attendance in the  
11 most popular workshop, the workshop with the highest ROI, can only be quantified as the number of registrants,  
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13 whereas attendance in all other workshops is quantified as the number of attendees. This may lead to an  
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15 overcount of attendance in the asynchronous workshops.  
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19 2) The *Basics of EndNote* workshop was offered far more times, 70, than the top three workshops by average  
20 attendance (Figure 4) which could account for a lower average attendance per workshop number than the top  
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22 three workshop titles.  
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28 Liu *et al.* (2018) encouraged marketing library workshops by understanding the biggest training needs and then meeting  
29 those needs. By analyzing attendance patterns and the ROI of library workshops, the authors gained a sense of which  
30 workshops met the highest needs of attendees. Perhaps this analysis and resulting changes to workshop offerings  
31 contributed to higher attendance in workshops. Attendance data also shows that attendance is usually quite high for  
32 the *5-day Research Impact Challenge* workshops which are heavily promoted through departments. This agrees with  
33 literature discussing the most effective ways of promoting library education and services (Liu *et al.*, 2016, Rempel and  
34 Davidson, 2008). Learning how to increase scholarly impact, the basics of systematic reviews, how to efficiently search  
35 PubMed, and how to use EndNote are popular skills-based workshops. These workshops' popularity at IUSM seems to  
36 align with faculty desires for skills training which were important types of workshops to faculty identified by Blummer  
37 (2009). O'Malley and Delwiche (2012) and Saetnan (2020) found that offering workshops at various times and in  
38 different formats was helpful due to the unpredictable schedules of attendees. In a school that encompasses a large city  
39 and regional campuses throughout the state, workshops offered online and during varied times and days are likely  
40 easier to attend than workshops offered only when the few computer classrooms are available in the library. Hence, the  
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online-only format where workshops can be scheduled at many different times of the day and on many different days

1 may contribute to increased workshop attendance.  
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6 As Manuel (2003) discovered, libraries should use many avenues to publicize workshops. (Jones and Harvey, 2019, Liu *et*  
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8 *al.*, 2016) The workshop registration form asks registrants to choose the multiple ways they hear about library  
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10 workshops. Since the highest-selected answer was “library website”, and the library began advertising its workshops  
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12 prominently on the website’s front page in 2019, this may be another contributing factor to increased workshop  
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14 attendance, but there is no way to know this for sure. Like previous library literature that found users don’t choose to  
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16 engage with the library via library social media (Cheng *et al.*, 2020, Jones and Harvey, 2019, Liu *et al.*, 2016), most RLML  
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18 workshop registrants did not learn about library workshops through social media. Though not mentioned in any library  
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20 literature thus far, it is also possible that the new scheduling system which included confirmation emails with calendar  
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22 attachments and automatic reminders also contributed to increased attendance. Lastly, a collaboration with other  
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24 campus libraries that began during the pandemic to advertise and open workshops to all affiliates of the institution may  
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26 also contribute to the rise in registrations and attendance in the medical library’s workshops.  
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33 There have been a few unexpected occurrences since implementing changes to the library’s workshop program. The  
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35 spike in registrations, attendance, and average attendance/workshop during the pandemic was unexpected, and after  
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37 just one semester, registrations, attendance, and average attendance/workshop went back to pre-pandemic levels. Also  
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39 unexpected was how once attendees were forced to take workshops online during the pandemic, they showed a strong  
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41 preference for continuing to take workshops online. Finally, it was originally thought that summer semesters would have  
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43 the lowest workshop attendance. However, the authors were surprised to learn after evaluating data that the summer  
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45 semester was a popular time to take workshops. After analyzing four years of data, summer consistently has the highest  
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47 average attendance per workshop of all semesters even as the authors continually increase workshop offerings during  
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49 that semester. This may be because this is a time when faculty and graduate students have more free time to sign up for  
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51 workshops during summer semesters and to work on research projects requiring skills learned in the workshops.  
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There are some limitations to the data analysis. This article reports on changes made in one academic medical library's workshop program and how the changes might be associated with increased attendance at library workshops. Because the changes occurred in only one library, results can't be generalized to other academic libraries. Also, currently, the authors only analyze selected attributes of registrants. Since not all registrants attend workshops, it would be more precise to analyze workshop attendees, specifically, to get a better sense of their demographics, marketing preferences, etc. If other libraries want to implement the exact changes made at RLML, it will require paying for a subscription service like the one used at RLML and assigning one librarian to coordinate and analyze workshops each semester. This may be costly and time-prohibitive for other libraries. Lastly, the data in this article contain outliers stemming from spring 2020, at the beginning of the pandemic, when there were spikes in registration and attendance. Attendance and registration are now back to pre-pandemic growth, but these outliers should be considered when evaluating the data.

There are a few items to analyze in the future, and it will be interesting to see if there is a threshold for the number of workshops offered each semester. Will there ever be too many workshops offered that the workshop offerings will become unsustainable for library instructors? What is that number, and what does unsustainable look like? Also, except for one chart, the data presented currently combine attendees from both the IUSM, which is the population RLML serves, with the population from the greater Indiana University Purdue University Indianapolis (IUPUI) campus. Since RLML's budget comes from the IUSM, the authors should focus future data analysis on the needs of IUSM registrants and attendees. Lastly, now that a workflow has been established for the workshop program, the next step is to administer a workshop needs analysis to determine what topics are most important to faculty and graduate students in the IUSM.

## Conclusion

The purpose of this article was to explain changes implemented in a library workshop program that may have contributed to a library going from offering minimal workshops with low attendance to offering many workshops with high attendance. The increase in attendance and ROI experienced after the changes implemented at RLML is significant as libraries often struggle with attendance, marketing, and return on investment when offering ongoing educational

workshops. While it is not possible to pinpoint precisely if changes made led to the transformation of the RLML

workshops program, the path used by RLML may provide ideas for other libraries that serve faculty, medical schools, and/or graduate students and want to expand their ongoing educational programming. Since RLML's workflow is content agnostic, strategies outlined in this article can be applied or replicated in any academic library with the appropriate amount of support. Key areas a library may consider focusing on are:

- Assignment of workshop responsibility to one librarian
- Adoption of scheduling software, such as LibCal
- Customized registration forms that gather registrant demographics and opinions
- Regular analysis of registration and attendance after each semester
- Responsive marketing and scheduling based on semester-by-semester data analysis

## Acknowledgment

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## Keywords

Library classes, Library workshops; Library instruction; Scheduling; Library service; Software

## References

Alvarez, B., Bonnet, J. L. & Kahn, M. (2014), "*Publish, not perish: supporting graduate students as aspiring authors*", *Journal of Librarianship & Scholarly Communication*, Vol. 2, No. 3, pp. 1-10, doi: 10.7710/2162-3309.1141.

Association of American Medical Colleges 2022. Table b-2.2: Total enrollment by u.S. Medical school and sex, 2018-2019 through 2022-2023. *Adobe Acrobat*. Washington, DC: Association of American Medical Colleges.

Bandi, I. & Ramakrishnegowda, K. C. (2016), "*User education programs in university libraries: feedback from faculty*", *SRELS Journal of Information Management*, Vol. 53, No. 4, pp. 313-316, doi: 10.17821/srels/2016/v53i4/96981.

Blummer, B. (2009), "*Providing library instruction to graduate students: a review of the literature*", *Public Services Quarterly*, Vol. 5, No. 1, pp. 15-39, doi: 10.1080/15228950802507525.

1 Bussell, H., Hagman, J. & Guder, C. S. (2017), "*Research needs and learning format preferences of graduate students at a*  
2 *large public university: an exploratory study*", *College & Research Libraries*, Vol. 78, No. 7, pp. 978-998, doi:  
3 10.5860/crl.78.7.978.

4 Cheng, W. W. H., Lam, E. T. H. & Chiu, D. K. W. (2020), "*Social media as a platform in academic library marketing: a*  
5 *comparative study*", *Journal of Academic Librarianship*, Vol. 46, No. 5, pp. 8, doi: 10.1016/j.acalib.2020.102188.

6  
7  
8 Critz, L., Axford, M., Baer, W. M., Doty, C., Lowe, H. & Renfro, C. (2012), "*Development of the graduate library user education*  
9 *series*", *Reference Services Review*, Vol. 40, No. 4, pp. 530-542, doi: 10.1108/00907321211277341.

10  
11  
12 Fong, B. L., Wang, M., White, K. & Tipton, R. (2016), "*Assessing and serving the workshop needs of graduate students*",  
13 *Journal of Academic Librarianship*, Vol. 42, No. 5, pp. 569-580, doi: 10.1016/j.acalib.2016.06.003.

14  
15  
16 Hall, H., Cruickshank, P. & Ryan, B. (2019), "*Closing the researcher-practitioner gap: an exploration of the impact of an ahrc*  
17 *networking grant*", *Journal of Documentation*, Vol. 75, No. 5, pp. 1056-1081, doi: 10.1108/JD-12-2018-0212.

18  
19  
20 Hall, L. (1999), "*A home-grown program for raising faculty information competence. (cover story)*", *Computers in Libraries*,  
21 Vol. 19, No. 8, pp. 28.

22  
23  
24 Hoffmann, K., Antwi-Nsiah, F., Feng, V. & Stanley, M. (2008), "*Library research skills: a needs assessment for graduate*  
25 *student workshops*", *Issues in Science and Technology Librarianship*, Vol. 53, No. 1, pp. 1-15, doi: 10.5062/F48P5XFC.

26  
27  
28 Jones, M. J. & Harvey, M. (2019), "*Library 2.0: the effectiveness of social media as a marketing tool for libraries in*  
29 *educational institutions*", *Journal of Librarianship and Information Science*, Vol. 51, No. 1, pp. 3-19, doi:  
30 10.1177/0961000616668959.

31  
32  
33 Liu, Q., Lo, P. & Itsumura, H. (2016), "*Measuring the importance of library user education: a comparative study between*  
34 *fudan university and the national taiwan normal university*", *Journal of Academic Librarianship*, Vol. 42, No. 6, pp. 644-654,  
35 doi: 10.1016/j.acalib.2016.08.009.

36  
37  
38 Manuel, K. (2003), "*Marketing 'drop-in' workshops for lifelong learning*", *Public Services Quarterly*, Vol. 1, No. 4, pp. 43-65,  
39 doi: 10.1300/J295v01n04\_04.

40  
41  
42 O'Malley, D. & Delwiche, F. A. (2012), "*Aligning library instruction with the needs of basic sciences graduate students: a case*  
43 *study*", *J Med Libr Assoc*, Vol. 100, No. 4, pp. 284-290, doi: 10.3163/1536-5050.100.4.010.

44  
45  
46 Pastva, J., Shank, J., Gutzman, K. E., Kaul, M. & Kubilius, R. K. (2018), "*Capturing and analyzing publication, citation, and*  
47 *usage data for contextual collection development*", *Serials Librarian*, Vol. 74, No. 1-4, pp. 102-110, doi:  
48 10.1080/0361526X.2018.1427996.

49  
50  
51 Peacemaker, B. & Roseberry, M. (2017), "*Creating a sustainable graduate student workshop series*", *Reference Services*  
52 *Review*, Vol. 45, No. 4, pp. 562-574, doi: 10.1108/RSR-04-2017-0010.

1  
2  
3 Rempel, H. G. (2010), "*A longitudinal assessment of graduate student research behavior and the impact of attending a*  
4 *library literature review workshop*", *College & Research Libraries*, Vol. 71, No. 6, pp. 532-547, doi: 10.5860/crl-79.

5  
6  
7 Rempel, H. G. & Davidson, J. R. (2008), "*Providing information literacy instruction to graduate students through literature*  
8 *review workshops*", *Issues in Science and Technology Librarianship*, doi: 10.5062/F44X55RG.

9  
10 Roszkowski, B. & Reynolds, G. (2013), "*Assessing, analyzing, and adapting: improving a graduate student instruction*  
11 *program through needs assessment*", *Behavioral & Social Sciences Librarian*, Vol. 32, No. 4, pp. 224-239, doi:  
12 10.1080/01639269.2013.837798.

13  
14 Saetnan, E. R. (2020), "*Graduate students' motivations for participating in development workshops*", *Practice and Evidence*  
15 *of the Scholarship of Teaching and Learning in Higher Education*, Vol. 14, No. 1, pp. 117-136.

16  
17 Steffen, S. S. (1986), "*College faculty goes online: training faculty end users*", *Journal of Academic Librarianship*, Vol. 12, No.  
18 3, pp. 147.

19  
20 Storie, D. & Campbell, S. (2014), "*Determining the information literacy needs of a medical and dental faculty*", *Journal of the*  
21 *Canadian Health Libraries Association / Journal de l'Association des bibliothèques de la santé du Canada*, Vol. 33, No. 2, pp.  
22 48-59, doi: 10.5596/c2012-011.

23  
24  
25 Witherspoon, R. L. & Taber, P. O. L. (2021), "*Increasing student attendance at library workshops: what the data tells us*",  
26 *College & Research Libraries*, Vol. 82, No. 1, pp. 113-128, doi: 10.5860/crl.82.1.113.  
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**# of workshops offered increased over four years**

	Fall semester	Spring semester	Summer semester
2018	11		
2019	17	20	5
2020	27	28	12
2021	24	24	18
2022		26	19

Table: Julia Stumpff · Created with Datawrapper

Table 1 – Number of workshops offered each semester (4 years)  
Fall = August-December; Spring = January-May; Summer = June-July

213x91mm (96 x 96 DPI)

**# of people attending increased over four years**

	Fall semester	Spring semester	Summer semester
2018	29		
2019	109	87	5
2020	129	185	88
2021	131	117	118
2022		131	105

Table: Julia Stumpff • Created with Datawrapper

Table 2 – Number of attendees each semester (4 years)

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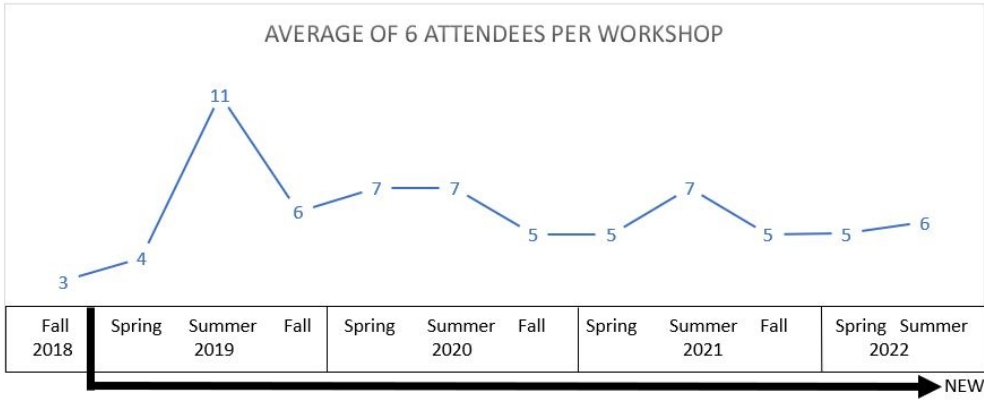


Figure 1 – Average attendees/workshop each semester (4 years)

233x95mm (96 x 96 DPI)



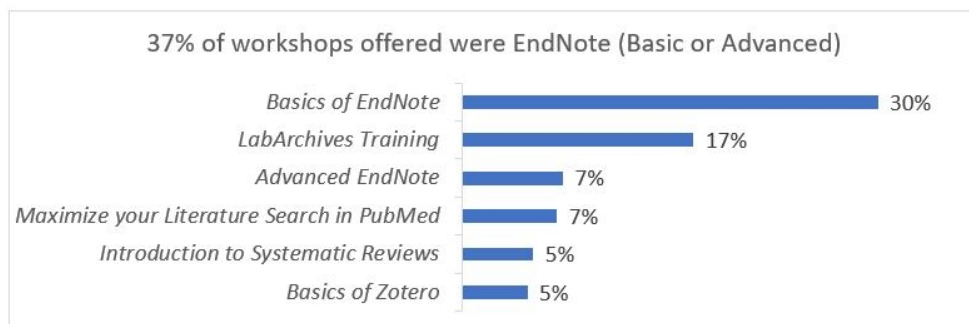


Figure 2 – Top 6 workshops (% of total workshops offered, 4 years, fall 2018 – summer 2022)

211x73mm (96 x 96 DPI)

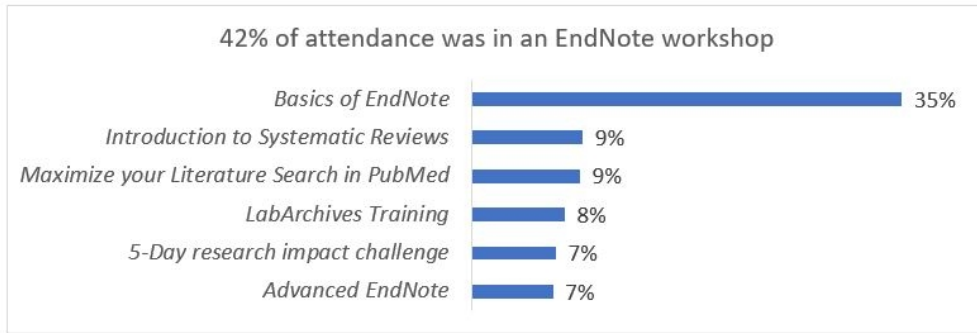
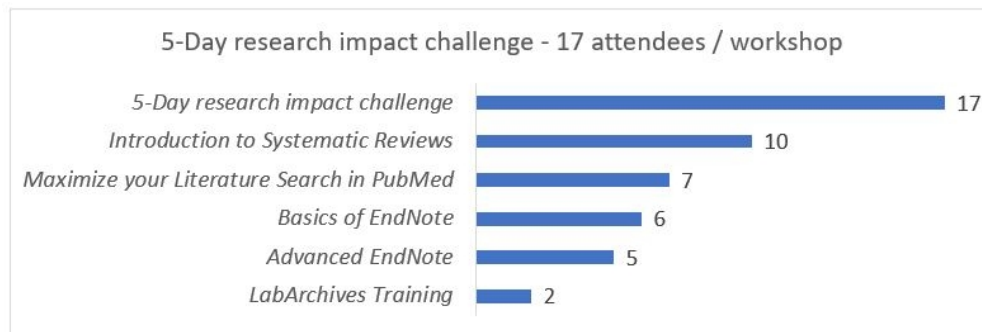


Figure 3 – Top 6 workshops (% of total attendees – 4 years, fall 2018 – summer 2022)

209x72mm (96 x 96 DPI)



18 Figure 4 – Top 6 workshops (Average attendance per workshop – 4 years, fall 2018 – summer 2022)

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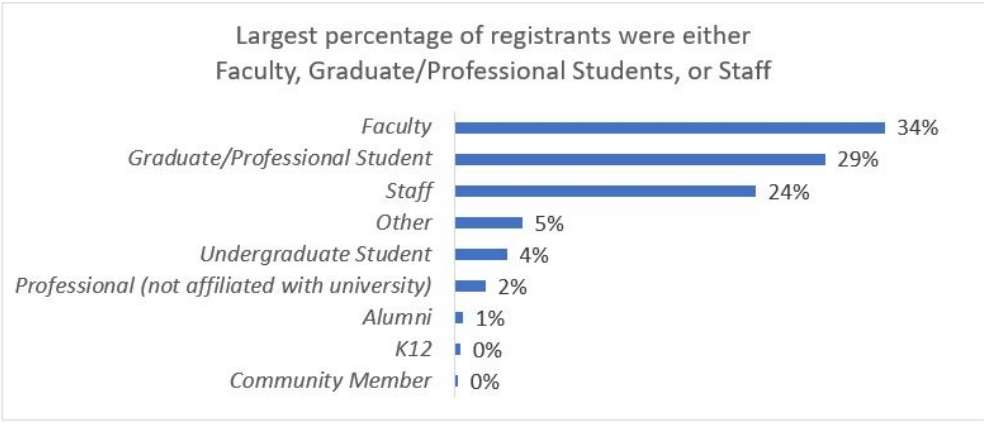
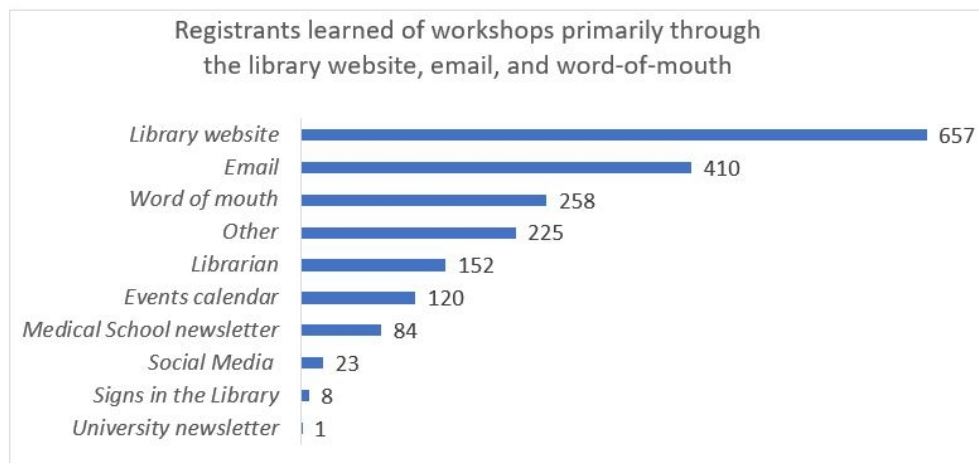


Figure 5 – Workshop registrants’ roles (11 semesters, spring 2019 – summer 2022)  
NOTE: Not all registrants indicated their role

208x91mm (96 x 96 DPI)



22 Figure 6 – How did you hear about the workshop? (11 semesters, spring 2019 – summer 2022)  
23 NOTE: Registrants could choose more than one option.

24 209x98mm (96 x 96 DPI)

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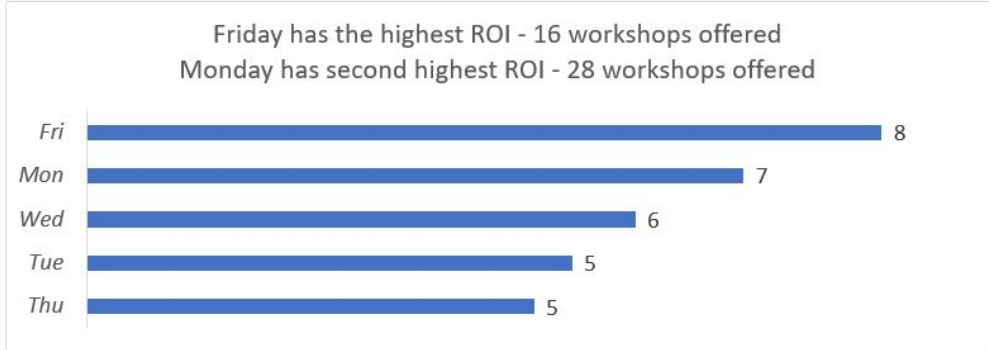


Figure 7 – Attendance/workshop by day of week (11 semesters)

209x76mm (96 x 96 DPI)

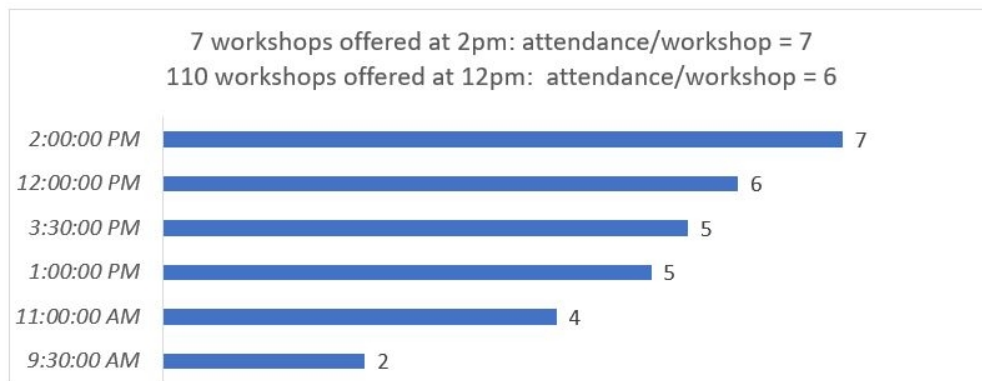


Figure 8 – Attendance/workshop by time of day (11 semesters); bar represents fraction; number is rounded to the nearest whole number.

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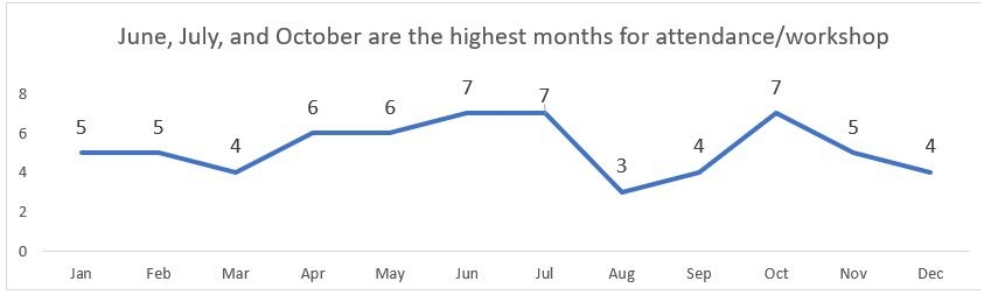


Figure 9 – Attendance/workshop by month (11 semesters)

226x68mm (96 x 96 DPI)





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Figure 10 – Attendance/workshop (12 semesters)

213x82mm (96 x 96 DPI)

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### 23% higher attendance after shutdown

	Pre-Covid shutdown	Post-Covid shutdown	Percent difference
Total workshops	16	12	-25
Registrations	90	185	106
Actual attendance	83	102	23
Avg. attendance/workshop	5	9	80

Table: Julia Stumpff · Created with Datawrapper

Table 3 – Workshop numbers before/after shutdown, spring 2020  
190x91mm (96 x 96 DPI)

## Appendix 1

### Descriptions of classes offered during the timeframe of the case study

- *Basics of Endnote*  
EndNote is a citation management software program allowing users to import citations from numerous literature databases into one location. Attendees will be able to add and edit citations, add notes, import full text documents, and use the program to format citations using their word processor.
- *Advanced Endnote*  
This class will focus on using EndNote in collaborations where multiple people need to access the same EndNote library and edit the same Word document with EndNote references. Some useful EndNote customizations will also be demonstrated.
- *Basics of Zotero*  
Zotero is an open-source citation management tool. This workshop will cover: Installation and set-up, adding references, creating shared collections, importing citations from an EndNote library, adding new citation styles, and backing-up and setting up online Sync with Zotero server.
- *LabArchives Training*  
This training provides an overview of LabArchives, an electronic lab notebook, and how it might be used in a research laboratory. The session will be a mix of demonstration and hands-on practice.
- *Maximize Your Literature Search in PubMed*  
This hands-on class will provide tips and tricks on using advanced search skills to find systematic reviews and randomized controlled trials in PubMed. Participants will learn how to use keywords and Medical Subject Headings (MeSH) to get the most out of their searches and will also learn to save their searches and create search alerts.
- *Introduction to Systematic Reviews*  
Systematic reviews are considered the highest level of evidence in terms of publication types. This class will introduce systematic reviews of the literature. Topics will include: standards and criteria to consider, establishing a plan, registering a protocol, developing a research question, determining where to search, identifying search terms, reporting search strategies, and managing references.
- *5 day impact challenge*  
In this online asynchronous workshop, you will get hands-on practice on tools and platforms to enhance the impact and visibility of your research. For this 5-day challenge, instructions and tasks to complete each day will be provided through email, to allow you to work at your own pace. There will be live virtual office hours to provide guidance and answer questions. Topics include learning to use: altmetrics, our institutional repository, and scholarly profiles.