

Assessing the Enduring Impact of Research Workshops for Biological Sciences Undergraduates

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Abstract

This paper describes a review of a regular library instruction seminar at Nanyang Technological University utilising a delayed survey approach in order to assess its usefulness, both in terms of student perception and actual use of resources taught during the workshops. Results of the survey revealed actual use patterns that can be used to further improve the workshops and ensure that they continue to meet the needs of participants.

Keywords

Library instruction assessment, impact studies, user perception, user behaviour, delayed surveys

Introduction

Nanyang Technological University's Science Library offers the Advanced Research Seminar workshops to undergraduate students in the School of Biological Sciences, Nanyang Technological University (NTU) before they undertake their final year project (FYP) or industrial attachment (IA). Two workshops are held in December and January each year and one in May to cater to students in different programmes. Conducting a review of the workshops was an initiative to improve them, as they had been run for a number of years. The results showed the timeliness of the survey, as despite many years of positive feedback from users when asked to assess their learning experience immediately after a workshop, this review revealed that the resources that librarians thought were very important were actually not well used by attendees when preparing their reports.

The selected approach for the review of the workshops was to use a delayed survey technique to determine if the resources and skills taught in the workshop were actually used. Wong et al (Wong, Chan, & Chu, 2006) from the Hong Kong University of Science and Technology (HKUST) pointed out that library instruction assessment has been prevalent in colleges and universities but relatively few institutions conduct assessments on a programmatic level and even fewer on the enduring impact of library instruction. They endeavoured to assess their library instruction at a programmatic level as well as the

enduring effect, i.e. do the classes exert any lasting impact on the attendees? This was achieved at HKUST by administering a survey some time after the classes were conducted, to allow the attendees to apply the library skills learned to their projects or assignments. The survey findings affirmed the value of library classes and provided some useful suggestions for programme improvement.

Others have used this delayed approach for assessing library instruction as well. Orme (Orme, 2004) conducted an assessment one semester behind the library instruction with an aim to assess the residual impact of a Web-based tutorial. There were some positive outcomes and Orme concluded that “this study provides impetus to conduct further research into the utility of technological approaches to information research instruction”. King and Ory (King & Ory, 1981) and Colborn and Cordell (Colborn & Cordell, 1998) are other examples of “delayed” surveys in the library instruction arena. MacMillan’s (MacMillan, 2009) longitudinal study of the information skills of journalism students enabled her to watch learning happen in response to classes, work, and the changing information environment.

Method

A questionnaire (Appendix 1) was designed for attendees of the workshops in the academic year 2014/15. The questionnaire consisted of 4 questions with the intent to take no more than five minutes to complete. The questions would hopefully provide information about:

- Usefulness and retention of the various skills taught during the workshops
- Use of resources taught
- Other aspects of the workshops via open comments.

The questionnaires were sent to the attendees about 8 weeks after the workshops. This approach was similar to that used by Wong et al. (Wong, Chan, & Chu, 2006). The reason for the delay was to observe if the workshop had any enduring impact on the attendees’ behaviour or strategies. The delayed survey would allow attendees to have a chance to apply what they learned during the workshops to their project work. If they actually used the skills and resources taught by applying them when doing their project work, then we could conclude that the workshops had an enduring impact.

The questionnaire was sent to attendees via email. The initial response rate was low, and so a reminder had to be sent two weeks later to encourage attendees to respond. Phone survey was also deployed to solicit more responses. An interesting observation was that students whom the author had to contact via phone all became very willing participants who gladly answered the questionnaire via phone. Overall, the survey had a response rate of 32.4%.

Results

Although the number of completed questionnaires was not high in terms of actual numbers, there was encouraging feedback on the workshops. Attendees found the skills and resources taught during the workshops to be very useful or useful.

Usefulness of skills taught

In Question 1 of the questionnaire, participants were asked to rate the usefulness of various skills taught during the workshops. The reason for asking the question was to find out if the librarian was choosing the right skills to teach. Attendees were asked to rate if the following skills were Very Useful, Useful, Somewhat Useful, Not Very Useful or Not Useful At All.

- Choose the best databases for my information need
- Form better search strategies
- Use Fulltext@NTU to obtain articles I need
- Use EndNote to manage my reference list
- Use Cite While You Write in EndNote to write my FYP/IA report.

Figure 1 shows the responses from this question. Overall there was positive feedback with regards to the usefulness of various skills and resources taught during the workshops.

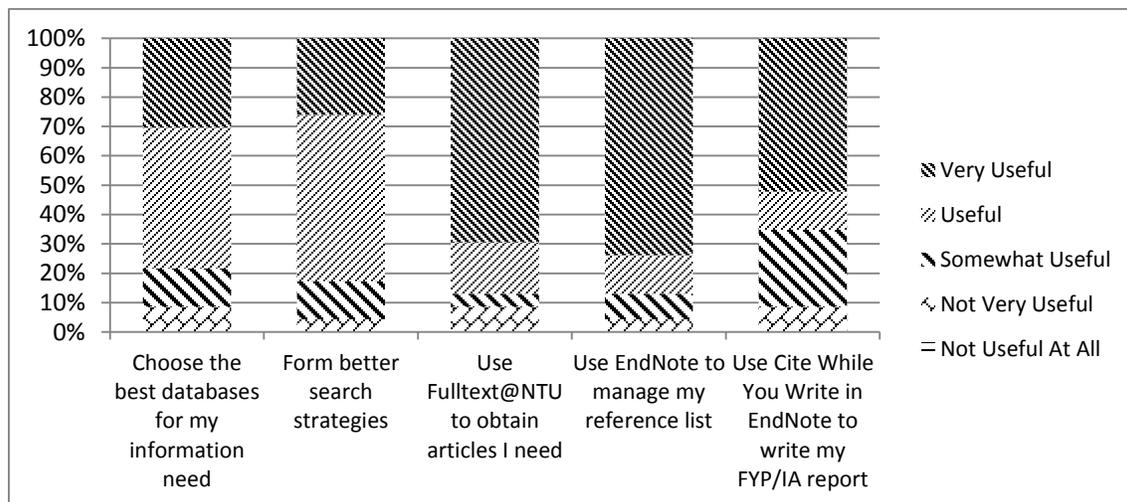


Figure 1: Usefulness of the various skills taught in the workshops.

The percentage of users who found “Choose the best databases for my information need” and “Form better search strategies” to be very useful or useful was 78.2% and 82.6% respectively.

The percentage of participants who found Fulltext@NTU (which is a bookmarklet that allows NTU staff and students to seamlessly retrieve full text articles or e-books subscribed by NTU Library from the Internet or email) to be very useful or useful was 87%. 86.9% of participants found “Use EndNote to manage my reference list” to be very useful or useful, while 65.2% found “Use Cite While You Write in EndNote to write my FYP/IA report” very useful or useful.

Use of resources

In Question 2, attendees were asked to rate how often the resources taught in class were used when they were preparing their report. As the workshop content was deemed useful, if the resources taught during the workshops were actually used, it can be concluded that enduring impact had been achieved. Attendees were asked to rate if the following resources were used Very Frequently, Frequently, Occasionally, Rarely or Never.

- Web of Science
- Scopus
- OneSearch
- PubMed
- Fulltext@NTU
- EndNote.

From Figure 2, it can be seen that at least three resources were never used by some attendees when they were preparing their reports while another three were used frequently.

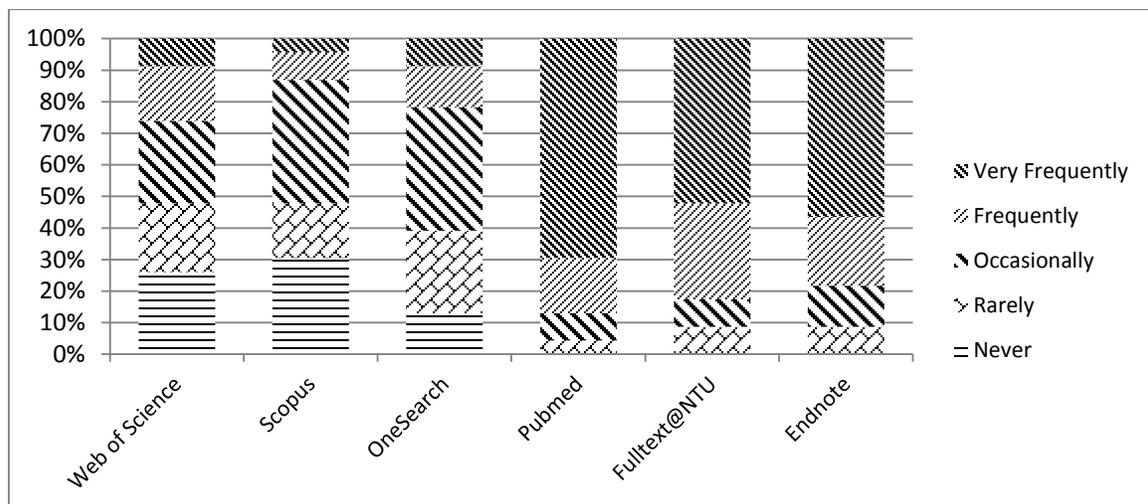


Figure 2: How frequently resources taught during the workshops were used when attendees write their report.

Recalling the results from Figure 1, it can be seen that participants were encouraging in their responses on the usefulness of the workshops. When those responses were compared with responses on their use of the resources, we see a different picture. Attendees may find learning something useful, but they do not necessarily apply their learning when writing their reports. This is clearly seen in the cases of three resources where some attendees responded that they never used them while preparing their FYP/IA report:

- Web of Science (26.1%)
- Scopus (30.4%)
- OneSearch (NTU Library’s discovery tool) (13%).

The three resources that were found to be used very frequently or frequently were PubMed (87%), Fulltext@NTU (82.6%) and EndNote (78.2%). Attendees who used a resource frequently may indicate that the participants had learned something in the workshops and applied that learning in their actual work. From the frequency of use of these three resources when the attendees started some form of writing of their report, we concluded that enduring impact had been observed. It should be noted that the proficiency of usage is not being measured here; as long as a tool was being used, even if badly used, we would conclude that enduring impact had been observed.

Question 3 of the questionnaire asked attendees to indicate the most important thing they learned in the workshops. The two most mentioned resources were EndNote and Fulltext@NTU. The responses from Question 3 were similar to the results from Question 2; resources that attendees said they used frequently were considered to be the most important resource they learned in the workshops.

Question 4 asked the attendees to indicate what else would have been useful for them to learn in this workshop. The items or concepts that were mentioned most frequently in this question were EndNote-related. There were requests to show the use of REFScan (note: REFScan was no longer supported by Thomson Reuters from 1 June 2015), how to handle articles that have no DOI, to go through some frequent pitfalls and to provide more hands-on exercises. The number of nil responses was similar to those who commented that the workshops were comprehensive and covered everything that was needed.

Discussion

The findings in Question 1 where participants provided positive feedback on the usefulness of the various tools and resources taught during the workshops were expected. This was because the workshops had been running for a number of years, and assessments were conducted after each workshop. Changes or improvements to the workshops had taken place over the years. Some of these changes included incorporating outcome-based teaching and learning approaches, activity-based instruction, and generally incorporating feedback from attendees.

An example of such feedback was the structure and duration of the workshops. In the early years, each workshop lasted three hours and there was more focus on library resources. EndNote was only introduced to the students as a tool they could use in their report writing and the students could sign up for a full EndNote class if they wanted to later.

After feedback from attendees that they would like to combine the workshop on library resources and a full EndNote workshop together, the duration of the workshop was extended from three hours to five hours as seen in the outline in the table below.

	Content	Duration
Part 1	Library resources: citation databases including	1 hour

	Web of Science and Scopus	
	Break	15 minutes
Part 2	Library resources: tools and resources, including OneSearch, Fulltext@NTU and PubMed	1 hour
	Lunch	30-45 minutes
Part 3	EndNote	2 hours

The high rating on the usefulness of the resources taught during the workshops is an indication of the effectiveness of the assessment made after workshops and the willingness to put into action feedback provided by attendees.

In Question 2, 26.1% of participants indicated they never used Web of Science and 30.4% indicated so for Scopus. The question that comes to mind is why were citation databases not being used by students to find seminal works or highly cited articles to kick-start their research? Was it ineffective teaching that left the students with some vague concepts about finding good papers but not exactly sure how to do it?

There are a few possible reasons why citation databases were not used. For many of the attendees, this was the first time that citation databases were introduced in library instruction for the school. The attendees were expected to process many new concepts about citation count within an hour and also to learn to use the tools to obtain such information. For students with no prior knowledge about citation counting, it may indeed be a case of information overload. Many probably know it is possible to find good papers but are not exactly sure how it can be done. The possibility of the students' inability to apply the knowledge about citation databases to their research work tied back to the responses from Question 1 where they find choosing the best databases for my information needs to be useful; unfortunately, there may not have been enough deep understanding to apply the learning to authentic situations.

One possible way to overcome this information overload might be to provide closer guidance during the workshop to help participants identify seminal works for their individual topic of research. As the attendees already had a research topic when they attended the workshops, this is certainly a way to help participants make effective use of available resources.

Another possible reason for the low usage could be the close supervision the attendees receive from their project supervisor, who are active researchers. As such, we postulate (and anecdotal evidence suggests) that the supervisors are acting as effective guides and filters in terms of recommending key articles for their supervisees. In such a context, there is little need or incentive to explore further.

PubMed is a comprehensive database that provides rich biomedical resources. Given that 87% of them used PubMed very frequently or frequently, they would have been able to retrieve many of the key articles that were indexed in Web of Science or Scopus as well. This further reduced the incentive or need to explore other databases.

The result of low usage of OneSearch did not come as a surprise. Library search portals or discovery layers are not commonly the first point of search for users in need of resources. When viewed against the high usage of Fulltext@NTU Library, we can conclude that much access to Library's subscribed resources is done directly through PubMed using Fulltext@NTU, which is needed to access the full text of articles found in PubMed.

When the responses from Questions 1 and 2 are examined together, they seem contradictory. Since the rating for usefulness of the workshop was high, one would expect almost all the resources covered during the workshops to be well-used or at least occasionally used by the attendees. How do we reconcile the high rating of the usefulness of the workshops with the low usage or even no usage of some of the resources taught? This led to more self-assessment questions being asked. Had teaching been ineffective? Or had assessment (both current and past) been focusing on the cognitive and affective domains-- on what students know at a given time, and their perceptions of what and how well they had learned from the workshops instead of concrete ability to apply information literacy skills in authentic situations? (Cmor, Chan, & Kong, 2010)? In short, did we get it wrong all along?

Recommendations

The aim of the survey was an attempt to solicit feedback and actual use behaviours from students that would help us further improve library workshops. After reviewing and analysing the survey findings, some of the broad changes that will be made include:

1. Reviewing how citation databases are being taught. Should the amount of time spent be reduced given that the majority of the students attending the workshops are not pursuing higher degrees immediately? Is it more practical to consider the immediate needs of the students and provide training for areas that they need most for their immediate project? Should the focus be on one citation database only? Should we have more librarians available during the workshops to provide personalised guidance on searching for seminal works in the area of research that the students are working on?
2. Provide more hands-on activities for EndNote and going through some frequently encountered problems instead of waiting for attendees to encounter the problems and then seek assistance from librarians after the workshop.
3. Review the content for PubMed and consider introducing more advanced searching such as using MeSH subject headings instead of only keyword searching.
4. Explore the use of alternative teaching methods such as flipped classroom approaches to enhance the learning experience of students.

At the time of this writing, the process of revising the workshop had only started. The survey and analysis of responses provides decision-supporting data that is important in ensuring that libraries are providing instructional classes that are meaningful and relevant to students.

Conclusion

Wong et al. said that “assessment of a library instruction programme is a daunting task” (Wong, Chan, & Chu, 2006). Colborn and Cordell’s also assert that “there is relatively little reward for undertaking such an enormous task” (Colborn & Cordell, 1998). Despite the amount of work required, assessment of library instruction is critical in enabling instruction librarians to identify gaps or problem areas in instruction and to address them.

Through the survey, it was found that some resources such as PubMed, Fulltext@NTU and EndNote had enduring impact on attendees while others such as the citation databases needed further investigation on how they could be better taught and utilised. Without such assessment, we would not know the needs and patterns of our users and would not be able to continuously respond to changing needs.

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Appendix 1

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Purpose of survey: This survey is designed to help us understand how useful Library workshops are to students' project work. Your participation will help us to plan and modify our workshops to better serve our users.

1. In preparing for your FYP/IA report, how useful were the following skills:

	Very Useful	Useful	Somewhat Useful	Not Very Useful	Not Useful At All
-Choose the best databases for my information need	<input type="radio"/>				
-Form better search strategies	<input type="radio"/>				
-Use Fulltext@NTU to obtain articles I need	<input type="radio"/>				
-Use EndNote to manage my reference list	<input type="radio"/>				
-Use Cite While You Write in EndNote to write my FYP/IA report	<input type="radio"/>				

2. In preparing for FYP/IA report, how often have you used the following resources:

	Very Frequently	Frequently	Occasionally	Rarely	Never
Web of Science	<input type="radio"/>				
Scopus	<input type="radio"/>				
OneSearch	<input type="radio"/>				
Pubmed	<input type="radio"/>				
Fulltext@NTU	<input type="radio"/>				
EndNote	<input type="radio"/>				

3. What is the most important thing you learned in this workshop?

4. What else would have been useful for you to learn in this workshop?
