Annotated bibliographies can help maximise benefit of literature research skills exercises

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Abstract: This study evaluates annotated bibliographies as a way to 'value-add' to written assignments, to guide students towards strong literature research skills. While the annotated bibliography is an accepted research tool in social sciences, it is rare in most sciences disciplines. This study followed two small cohorts of biology students as they encountered annotated bibliographies. Students submitted their annotated bibliographies four weeks into a 10 week assignment. All students found the experience valuable, and felt that it increased their preparation for the final essay. Virtually all students said receiving written feedback on their bibliography was helpful. However, many students were ambivalent about whether the annotated bibliography exercise improved their literature research skills. When asked the question, 'What do you think would most improve your literature research skills?', the most common response was 'more practice'. Annotated bibliographies allow more practice indirectly, by facilitating greater effort and completion in existing essay-type assignments. Other advantages of annotated bibliographies identified in this study include timely identification of students headed down the wrong track and the ability to provide timely feedback to students. Possibly the major direct benefit perceived and appreciated by students is in facilitating early commencement and thus effective time management. The annotated bibliography is concluded to be a useful pedagogical tool to enhance the outcomes of any assessment requiring literature research skills.

Introduction

The University of Adelaide, as with virtually all Australian universities, explicitly includes communication skills and information research skills in its Graduate Attributes (The University of Adelaide, 2002; Faculty of Sciences, The University of Adelaide, 2007). Although many courses have assessment pieces that require these skills, they are not always explicitly taught. 'Teaching' writing and information research is problematic in itself, for example, dedicated writing courses can achieve good results within the course but skills are not necessarily transferred to other courses (Sommers and Saltz, 2004). Students entering university are faced with the whole new world of academic writing; many students report anxiety and confusion when first faced with a major writing assignment (Sommers and Saltz, 2004). There are many interrelated reasons for this, including that different disciplines have their own conventions and appropriate styles (McCune and Hounsell, 2005). The 'fish out of water' feeling is compounded when the students are faced with researching the literature to find their own information sources. The current study evaluates the small scale introduction of annotated bibliographies as a way of guiding students towards stronger literature research skills as part of existing written assignments.

The literature research exercise and annotated bibliography

The study involved two cohorts (24 students in total) of a subset of students in a second year biology subject. In Week 1 the major literature research project was announced and defined, to be assessed by an oral presentation in Week 7 and a written report due three weeks later. Students were required to submit an annotated bibliography in Week 3. The idea of annotated bibliographies was introduced to students in Week 1 through discussion with the tutor (author). Written information on annotated bibliographies was included with the handbook to this section of the course. Note that to better suit the conventions of scientific writing, the term 'draft annotated reference list' was used with the students throughout. However, for convenience 'annotated bibliography' will be used here.

The annotated bibliography was presented as a preliminary exercise to support the major literature research project. It had two stated objectives: to provide a vehicle for feedback as to the

appropriateness of the information resources included, and to provide a framework for critical reflection of the reading and research. Students were required to submit annotations for at least five references (each annotation was limited to 300 words). Each annotation required three parts: (1) summary of the findings of the reference (this is the standard annotation), (2) a reflection about how that reference was useful to the topic (to encourage students to read in the context of the specific topic and connect to the specific objectives of their assignment), and (3) a reflection about how that reference helped with researching the topic (to encourage students to research strategically). Students were also required to write each reference in the appropriate style, for early practice at this aspect of scientific writing.

Feedback by the tutor was anticipated to be the key learning feature of the annotated bibliography exercise. To be effective, feedback must be timely and relevant. Bibliographies were returned to students one week after submission, meaning that students received feedback, three weeks before the oral presentation and six weeks before the written report. Bibliographies were returned with written feedback on seven criteria: demonstrated effort, breadth of reading/researching, relevance of content for your topic, reputability of the resource, correctness of citation format, clarity of annotations, and usefulness of annotations. Bibliographies were given a mark out of 10 based on these criteria, and this mark contributed up to five marks of the 70 marks available for the major literature research exercise. Thus the exercise was considered formative but included a small number of marks to encourage engagement.

Student results and feedback by marker

Students generally received very high marks for their annotated bibliographies. The mean for the combined cohorts was 8.75 out of 10 (SD=1.79). The high marks were encouraging for the tutor, as they were thought to indicate that the exercise was well within the capabilities of the students, and thus had the potential to work as a positive learning tool, focussing existing skills to maximise outcomes of the assignment. The high marks also reflected students' willingness to engage with the greater assignment at this early stage of the semester (see below).

Written feedback was in the form of brief notes written on the bibliography (e.g., correcting citation formats, comments on specific references) and under each of the seven criteria (see above). It was very quick to mark the annotated bibliographies – annotations for each reference were limited to 300 words, and students were encouraged to use dot points, making reading of the annotations very rapid. Furthermore, because grammar was not assessed and content was not assessed in detail, the annotations did not need to be read in detail. Rather, the marker looked for concise summary and sensible comments on how the reference was useful to the topic and helped the student's research. The best bibliographies included references that clearly addressed specific requirements of the assignment and this was explicitly acknowledged by the student. Average bibliographies used appropriate references but were limited to those of a general nature (e.g., relevant for the Introduction section of the final assignment only), and the student failed to link information gained from these references to the specific requirements of the final assignment. Only a few poor bibliographies were received – these relied heavily on websites rather than peer review journals (against instruction) and again failed to link to the specific requirements of the final assignment. For the average bibliographies, feedback included comments indicating that the specific use of these references in the final assignment might be limited, and thus that further research was required. The marker found feedback at this level useful for distinguishing between primary sources and review articles, the concept of which had been discussed as a group but was now more relevant. For student who submitted poor bibliographies, the feedback was especially timely and valuable – all of the few students in this category discussed the issue with the tutor and rectified the main problems. The tutor felt that the most valuable qualitative aspect to the annotated bibliography exercise was as an 'early

indicator' of students who were heading down the wrong path – effective feedback was appreciated by the students (see below) and facilitated greater relevant effort.

Survey of student perceptions

The main evaluation of the annotated bibliography exercise was a survey that used Likert scale questions and open ended question. The survey was given to students the week their marked bibliographies were returned. Questions addressing the workload, timing, weighting and information provided of the annotated bibliography demonstrated that students were happy with the exercise in itself (not shown). All students reported that they 'strongly agreed' or 'agreed' that the bibliography exercise will be valuable for their final assignment and increased their degree of preparation (Figure 1, A and C). However, unexpectedly there was greater ambivalence as to whether the bibliography exercise improved their confidence in the final assignment or was expected to improve the quality of it (Figure 1, D and E). The apparent reason for this difference is revealed in the comments provided to the open ended question 'what was the most valuable aspect of the (annotated bibliography) assignment?' – students most valued the exercise as a way of 'forcing' them to get started early. There was strong agreement or agreement, with one dissenter, that the feedback received was helpful (Figure 1, J). This result was especially important, as eight students received full marks, and the tutor was concerned that feedback for these students was not valuable. The annotated bibliography exercise was introduced with the idea that it would help students improve their literature research skills. However, it was on this point that students were most ambivalent (Figure 1, B). Students were asked open ended questions about the feedback, the exercise generally, and what they thought would most improve their literature research skills. Selected comments are presented in Table 1. The most striking observation was that 10 out of 24 students commented that 'forcing me to start early' was the most valuable aspect of the annotated bibliography) exercise. Note that this comment was unprompted by a specific question on the survey.
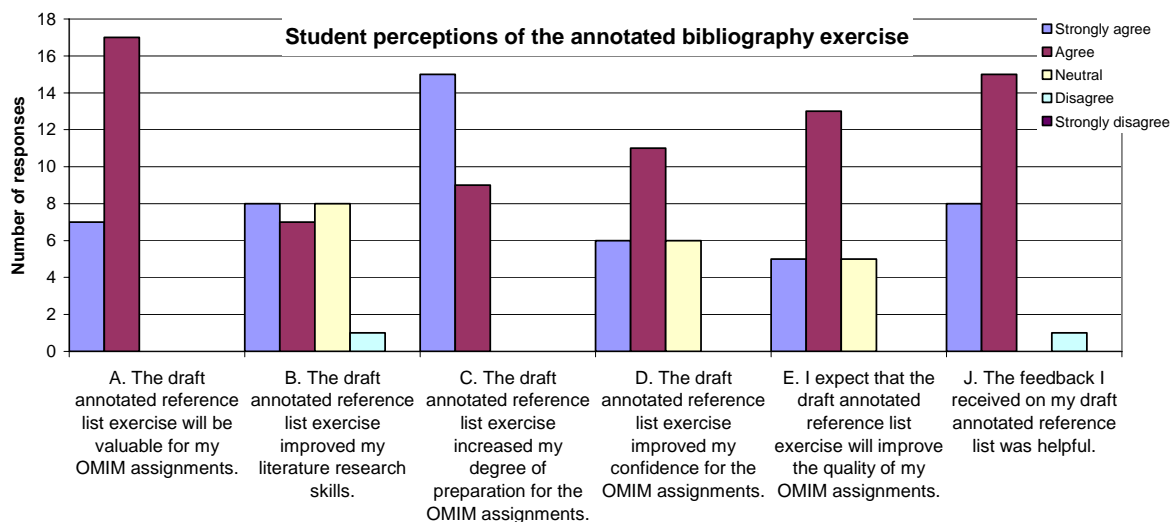

Figure 1. Results of Likert questions surveying students' perceptions of the annotated bibliography exercise

Table 1. Selected responses to open-ended questions

'What was the most valuable aspect of the feedback you received?'	'What was the most valuable aspect of the (annotated bibliography)?'	'What do *you* think would most help you improve your research skills?'
• Commendation of the original research article made me feel very confident using it	• It forced me to get started, which would have been hard to do otherwise	• Instruction in using search engines
• Indication of how suitable articles are and aspects missing from research	• Forced me to get organised sooner (when I had the time) rather than later (when I didn't)	• Workshop on using keywords to search

Discussion

The key finding coming from the survey results was the emphasis students placed on how the annotated bibliography exercise in 'forcing' them to start the assignment early. Academic procrastination can be defined as 'intentionally deferring or delaying work that must be completed' (Schraw, Wadkins and Olafson 2007; p.12) and is common amongst university students. Although some students frame procrastination in a positive sense (for example, facilitating more efficient use of study time), procrastination is reported to be positively correlated with undesirable academic outcomes such as failure to complete assignments (Steel 2007; Schraw et al. 2007). The annotated bibliography exercise is valued by students because it requires an early start on their major literature research project.

A limitation of this study is that the class sizes were small, enabling the tutor to build a relationship with the students. It is thus not surprising that they valued the annotated bibliography and the literature research project overall. It is thus unclear if the positive attitude towards the annotated bibliography exercise would be maintained in a larger class. However, the survey data clearly indicate that no students were 'harmed' by the exercise, and some were greatly helped. Thus, annotated bibliographies are recommended for any class that includes an exercise with a significant literature research component.

In conclusion, this study shows that including an annotated bibliography as a preliminary stage of any assessment that includes a literature research component would be valued by students. The survey results clearly showed that two aspects of the annotated bibliography exercise were valued in particular: the feedback received from the tutor, and the incentive to get started on the greater assignment. In itself the annotated bibliography is not likely to enhance significantly students' literature research skills. However, students reported that 'more practice' would help their literature research skills – the annotated bibliography increases the amount of 'practice' gained from one literature research skills assessment by increasing student preparation. Furthermore, the annotated bibliography appears an ideal way of guiding students early in an assignment about the expectations of writing in the particular discipline.

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