It takes more than breadcrumbs to learn generic skills: Collaborating to improve information literacy

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Abstract: The effective teaching and learning of generic skills is becoming an important component of undergraduate education with the introduction of graduate attribute programmes in some Australian universities. Research shows that contextualised learning of these skills is important, but is a discipline-specific context sufficient to ensure student success in acquiring these skills? This paper studies the effectiveness of information skills learning by a group of undergraduates using Brookfield’s concept of critical reflection and Critical Incident Questionnaire (CIQ). Most students reported positive experiences where the learning environment encouraged a deep approach to learning and negative experiences where that environment encouraged a surface approach. To ensure that students’ approach to learning is appropriate for achieving the level of information literacy required of graduates, the study recommends the integration of information skills learning into course curricula through the close collaboration of academic and library staff.

Keywords: graduate attributes; integration; information skills

Introduction

The adoption of mandatory graduate attributes adds a new dimension to the Australian higher education agenda (Scoufis, 2000). This new challenge in student learning requires effective ways of teaching generic skills. I am a librarian, working in a university. One of my primary tasks is to increase the level of information literacy amongst library users, many of which are undergraduate students. Research has shown that learning is most effective where generic skills are taught in a discipline-specific context (de la Harpe, 2000). The ‘best’ librarians teach information skills this way. They introduce students to information structures within their discipline and focus on discipline-specific tools. Library class content and outcomes reflect students’ academic course content.

Despite this commitment to discipline-specific teaching, some students have difficulty applying new information skills to their current work. Many fail to transfer these skills to future assignments or future courses. Such low skill levels suggest that while a discipline—or course-specific context may be a very important condition for developing generic skills, such context is not a sufficient condition for effective learning to take place. What is missing? Why is the teaching ineffective?

Information literacy is a complex quality. Since the American Library Association’s 1989 report on information literacy, librarians have debated their role in developing users’ information literacy skills (Candy 1998). Recently, Lupton (2002, p. 78) suggested that “[I]nformation literacy is so broad that the responsibility for it does not start and end with the
library. In the context of higher education, the academic, (the) librarian and (the) academic skills/study skills advisor have joint responsibility”. Herein lies a clue. The task is said to need a joint effort. But is this true?

In the first part of this paper, I outline teaching practice in libraries and describe some relevant student and adult learning research. In the second part, I report on a small study involving Psychology students whose experience of library learning is revealing and suggests a form of collaboration between academic and library staff that could boost levels of information literacy.

**Library teaching practice**

Traditional didactic methods reflecting a behaviourist orientation to learning (Merriam & Caffarella, 1999) were once common practice in libraries. Teaching sought to change library users’ behaviour so that it mimicked the information seeking behaviour of librarians. Face-to-face time was lecture style with few class activities and limited librarian-student interaction.

More recently, librarians have introduced elements of active learning, running interactive demonstration sessions in computer laboratories with hands-on activities for students and group discussion of results and discoveries. Current practice reflects a cognitive approach to learning. The learner is seen as a thinking person whose individual mental processes, such as perception and insight, are involved in learning (Merriam & Caffarella, 1999). In these library sessions, students are encouraged to relate new concepts to their existing knowledge and to find meaning through association with their past learning and experiences.

Many librarians customise every session, consulting course co-ordinators, course outlines, faculty websites and library reserve readings so that library classes are not merely discipline-specific but course-specific. However, students are not challenged by information skills workshops (Brookfield, 1991). Library activities and exercises ‘don’t count’. What’s more, students appear to have negative expectations of what they might learn. Without the incentive of marks, it seems very unlikely that students will realise the benefit of library learning and engage a deep learning approach. So what can be done?

**Increasing learning effectiveness**

The adult and student learning literature provides insight into improving learning outcomes.

**Using reflection for learning**

Schön (1991) first described reflection as a process to evaluate and improve professional practice. Reflection *in* action involves a professional in changing a course of action while that action is happening. However, as “[t]here are indeed times when it is dangerous to stop and think” (Schön, 1991, p. 278) he also proposed reflection *on* action, where the reflection happens after the event and may influence future practice. Using the concept of critical reflection, Brookfield (1995) further developed reflection on action as a process of looking critically at our assumptions. He acknowledged that critical analysis is difficult as we look at our assumptions within the framework of those assumptions. Brookfield identified four lenses to aid critical reflection. One lens is our own standpoint, “our autobiographies as learners and teachers” (p. 29). The other three lenses are colleagues; the teaching and learning literature; and students.
Self and colleagues

The first lens—my own experience—is what prompts this study. Despite my efforts to actively engage students and to teach in a discipline-specific context, my teaching practice is sometimes ineffective. I have also observed that attendance and involvement in library classes is far higher where graded course assessment requires the demonstration of library skills. Not surprisingly, students value learning that they perceive will bring tangible benefits, particularly learning that could improve assessment results.

Feedback from the second lens—both library and academic colleagues—supports my observation of students’ skill levels. Librarians report ongoing student requests for help with assignments, especially finding journal articles. Informal discussions with academic staff indicate that many students have poor referencing skills, use irrelevant sources and depend heavily on Internet sites.

Student approaches to learning

Brookfield’s third lens is the teaching and learning literature. Research into student approaches to learning is particularly relevant (e.g., Biggs 1999a; Gibbs 1992; Marton & Säljö 1997).

Marton and Saljo (1997) sought to explain marked differences between students’ learning outcomes. Their 1976 research involved students completing a reading task, answering questions and reporting on their learning experience. They concluded that differences in the learning process related to the approach that students took to a learning situation. These strategies were later named surface and deep approaches to learning and have been studied in many areas of higher education (e.g., Biggs 1999b, Gibbs 1992). The ‘approaches to learning’ model is useful for analysing library learning.

A student adopting a surface approach to learning “reduces what is to be learnt to the status of unconnected facts to be memorized. The learning task is (simply) to reproduce the subject matter at a later date” (Gibbs, 1992, p. 2). Some students reduce information skills to a series of search steps that they try to memorize. Questions they ask include: “Which database covers all this?” “How can I limit my search to full-text articles?” “Is it OK to cite an abstract?” These students seem to just want the search ‘recipe’, download an article and go! Students who adopt such an approach ignore the structure of scholarly information, what constitutes a researchable topic, techniques to rescue failed searches or ways to critically evaluate results. In taking a surface approach, students focus on isolated search steps—what comes after what—without reference to the overall journey required to find the information that they need. The strategy of a student who takes this approach is to utilise little markers or signs along the way—similar to the breadcrumbs dropped by Hansel and Gretel. The markers or signs are their only means of re-tracing their search steps at a later time without the need to recognise where they are now, where they’re going, or why they’re on this path at all! And like breadcrumbs, the markers for the steps lack sustainability. When students return and find a new interface or software update, their breadcrumb markers have vanished.

Not all students take such approach. Some students ask about functions to increase search relevance; what to do if the library doesn’t hold a journal; where to learn more about referencing, evaluating and organizing their sources. These students try to make sense of the library class with respect to their university learning as a whole. They mirror elements of a deep approach, “looking for relations” (Marton & Saljo, 1997, p. 43) and seek to find meaning in the resource discovery process.
A third approach to learning—an achiever approach—has been observed at the University of New South Wales amongst undergraduates who are trying to convert to high-demand degrees. Taking an achieving approach, students seek every possible mark in the hope of transferring to a more prestigious course.

Expecting students to deeply engage in all learning is unrealistic and inappropriate. Many students need paid employment; are accumulating a large education debt; or need to achieve high grades to maximise their professional futures. In order to improve the effectiveness of library teaching and learning, the literature encourages us to use strategies that will encourage students to adopt the most appropriate approach.

Utilising library resources could be seen as merely a process. So is flying a plane and brain surgery. The complexity of these processes differs, and yet they all share the need for expertise when unexpected events complicate a situation or when brand new problems need to be solved. Developing high-level expertise in information literacy requires thoughtful application and conceptual understanding. It requires students to find meaning rather than rote learn—to transfer the information skills they learn to other assignments, to other courses and ideally, to their later life. And to achieve that level of skill, a deep approach to learning is required.

**Students’ own experience**

To gain access to the fourth lens—students’ uncensored, unfiltered accounts of their learning and our teaching—Brookfield (1995) developed an anonymous tool, which he named the classroom Critical Incident Questionnaire (CIQ). Using the CIQ, I invited ten Psychology students to give anonymous feedback to five questions following a two-hour library workshop. The questions encouraged students to reflect on their experience of learning and to identify instances during the class where they felt most: engaged or involved; distanced; affirmed or helped; puzzled or confused; and surprised.

The situation for these students was special. While most library classes are not linked with course assessment, it was compulsory for these students to attend the library session in place of their usual tutorial and to complete a graded course assignment that assessed their information skills. The lecturer prepared the assignment by collaborating closely with library staff. She ensured that students had reason to engage deeply by setting demanding questions—scenarios reflecting the information problems that practicing psychologists need to solve. The questions were motivating—it’s very likely that, on first reading the assignment, every student “experience(d) a need to know something” (Gibbs, 1992, p. 10). Most students found the problems were challenging. To tackle them successfully, students needed to learn a lot about library resources—they were inadvertently drawn to take a deeper approach to their learning.
Results

A sample of student responses to the CIQ is given in Table 1. The items are included in the right hand column. Students’ experiences are included in the left hand column.

Table 1: Responses to critical incident questionnaire

<table>
<thead>
<tr>
<th>When students felt most:</th>
<th>Critical incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>... engaged, most involved?</td>
<td>- doing the assignment and practices (5)</td>
</tr>
<tr>
<td></td>
<td>- when able to follow the search while also looking at the big screen demonstration (1)</td>
</tr>
<tr>
<td></td>
<td>- during the PsycINFO section because it’s the most important (1)</td>
</tr>
<tr>
<td></td>
<td>- in PsycINFO—learning different methods (1)</td>
</tr>
<tr>
<td></td>
<td>- in explaining Web of Science – very complicated (for a first time user) (1)</td>
</tr>
<tr>
<td>... distanced from what was happening?</td>
<td>- when I couldn’t find something, even though I’d listened to the instructions in class (3)</td>
</tr>
<tr>
<td></td>
<td>- when I missed a step and couldn’t work out how I was meant to get to where the class was (1)</td>
</tr>
<tr>
<td></td>
<td>- trying to figure out what the assignment question wants us to do (1)</td>
</tr>
<tr>
<td></td>
<td>- no access to database and had to look on (3)</td>
</tr>
<tr>
<td></td>
<td>- towards the end because it felt long (1)</td>
</tr>
<tr>
<td>... affirmed or helped?</td>
<td>- teacher’s willingness to help and answer students’ questions/ when the issues I had were immediately addressed (6)</td>
</tr>
<tr>
<td></td>
<td>- overhead presentations to follow along – very useful (2)</td>
</tr>
<tr>
<td></td>
<td>- the librarian showed the steps slowly and explained why we can do it that particular way (1)</td>
</tr>
<tr>
<td>... puzzled or confused?</td>
<td>- ...finding cited articles, many steps involved /understanding explanations of Cited Ref and Times Cited (4)</td>
</tr>
<tr>
<td></td>
<td>- the librarian showing us steps too quickly (1)</td>
</tr>
<tr>
<td></td>
<td>- restricting a search using NOT (1)</td>
</tr>
<tr>
<td></td>
<td>- can’t think of any / none (4)</td>
</tr>
<tr>
<td>... surprised?</td>
<td>- hearing great new things/methods in PsycINFO”/ “so many ways to use PsycINFO – functions I didn’t know about (4)</td>
</tr>
<tr>
<td></td>
<td>- the extent to which you can limit a search” /“how much more there was to finding an article (2)</td>
</tr>
<tr>
<td></td>
<td>- I liked Web of Science – I didn’t know about it before” / “the class was very productive – I learnt many things I didn’t know. How to delete dissertations from searches will probably change my research forever! (2)</td>
</tr>
<tr>
<td></td>
<td>- difficulty of the assignment questions”/ “I’ve been using PsycINFO for 3 years now, but I still can’t do the tutorial exercise (2)</td>
</tr>
</tbody>
</table>

Students’ responses clustered around certain themes. Half the students felt most engaged when applying the new skills to their assignment—when actively learning and completing a meaningful task. One-third of students felt most distanced when they were unable to apply their new learning and another third when they had to ‘look on’ rather than have ‘hands on’ during demonstrations. Two-thirds of students found that individual attention and prompt answers to questions were the most helpful aspect. Half found the new concepts introduced in unfamiliar databases most puzzling. Eight students – all but two—were most surprised (perhaps pleased) by the new skills and features that augmented their current skills, and which they perceived as useful. The other two students were surprised (perhaps annoyed) that they couldn’t apply skills to information problems.
Discussion

To find meaning in these responses, I considered whether the emotions being reported were positive (applauded) or negative (unwelcome) and then reflected on Biggs’s proposal (1999a) regarding the influence we have on students’ approaches to learning.

Biggs (1999a) proposed that teaching is improved when we avoid factors that encourage students to adopt a surface approach. These include providing insufficient time; breadth not depth of coverage; presenting discrete parts without the intrinsic structure of a topic; creating anxiety or low expectations of success; and assessing for facts. He also argues that learning is improved where teachers actively encourage students to engage in deep learning. Table 2 summarises students’ own learning experiences against the approach to learning most likely to be induced by the learning environment.

Table 2: Relation between students’ experience of learning and factors in the library teaching and learning environment

<table>
<thead>
<tr>
<th>Emotion recalled by student in CIQ (State conveyed by that emotion)</th>
<th>Most reported perception when that emotion was experienced</th>
<th>Approach encouraged by the teaching/learning ‘environment’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaged/involved (positive)</td>
<td>Active learning</td>
<td>Deep approach</td>
</tr>
<tr>
<td>Distanced (negative)</td>
<td>No active learning</td>
<td>Surface approach</td>
</tr>
<tr>
<td>Helpful (positive)</td>
<td>Self-directed, interdependent learning</td>
<td>Deep approach</td>
</tr>
<tr>
<td>Puzzling/confusing (negative)</td>
<td>Lacking readiness to learn</td>
<td>Surface approach</td>
</tr>
<tr>
<td>Surprising (positive)</td>
<td>Seeing connections, attaching meaning, perceiving value</td>
<td>Deep approach</td>
</tr>
<tr>
<td>Surprising (negative)</td>
<td>Inability to complete assignment</td>
<td>Surface approach</td>
</tr>
</tbody>
</table>

Positive experiences in learning

This particular library session had many elements that Biggs (1999a) suggests would encourage a deep approach to learning. The structure of information was described; new material was linked to what students know; misconceptions were addressed; the assessment task required thorough understanding, not independent facts; the learning environment was positive with questions encouraged; and library teaching methods supported the course lecturers’ aims.

There is evidence of these factors in students’ responses to the three CIQ questions that related to positive learning experiences. Students felt most engaged by things that improved their ability to learn and thereby their ability to complete their assignment. What was most affirming or helpful to students related to having their individual learning needs met. Over half felt most affirmed by having their questions answered, explanations given slowly and learning material presented through several media. Although many students had attended library database sessions and used PsycINFO in previous years, they were very surprised by all that they did not know. This library session covered a wide range of PsycINFO functions, however the level of student ‘surprise’ was unexpected. Perhaps it could be explained by students’ previous approaches to library learning.
Students who had taken a surface approach, merely memorizing and replicating demonstrated search steps would be very surprised by all that they did not know. If they had taken a deep approach, they might have explored the database in their own time or used it to search for information for other assignments and discovered more sophisticated functions themselves.

The course assignment based on this library workshop counted for 10% of the course assessment and challenged students to demonstrate their understanding of information organization and their ability to source required information for varied scenarios. With this task in hand, students’ conception of learning was more sophisticated. Rather than being at the reproducing level of memorising or learning procedures, students’ conception was more at the level of making sense—of abstracting meaning and trying to understand (Gibbs, 1992).

With an intention to find meaning, students now saw new connections—they constructed a network of links between what had previously been isolated facts or steps. They began to see the whole of PsycINFO, not just a few discrete parts. They began to see the place PsycINFO filled in a highly complex information network and to make sense of how they could use it. They were acquiring a valued skill.

**Negative experiences in learning**
Despite their deep engagement, some students expressed negative feelings of distance/annoyance when they could not use resources independently that they had just seen demonstrated. Emotions and tensions in learning identified by Brookfield (1991) are evident here. Students also experienced distance when they felt out of control—when they missed a step and could not catch up, and when hands-on access was not available to them during one demonstration.

One student was surprised at not being able to complete the tutorial despite three years of using PsycINFO. This student was possibly still taking a surface approach—pre-occupied with search steps, isolated facts and assessment anxiety. Appropriate application of different databases may have eluded her. The order and complexity of assignment questions did not follow the order of topics and resources presented in the library session. The first two assessment questions required use of Web of Science, not PsycINFO. Was this the cause of her difficulty? Negative emotions expressed by the students may partly be due to them taking a surface approach to learning.

The CIQ responses point to a key message. Students’ experiences of learning appear to be more positive where the learning environment encourages a deep approach to learning. Their negative experiences occur in the type of learning environment that fosters a surface approach.

**Conclusion**

We return to our challenge—the effective teaching and learning of information skills by graduation. In this paper I have reflected on student learning through four lenses. I have analysed my own observations and those of my library and academic colleagues, sought meaning and insight from the literature and from CIQ responses.

Students’ personal reports of their learning experience, especially what surprises them and makes them feel engaged and involved, illustrate that the approach they take to their learning has an enormous influence on their experience. Where students’ involvement in library classes has been at a surface level, it is not surprising that their information skills seem to
develop very, very slowly. What the librarian does to engage and motivate students may be important, but it’s not sufficient to ensure effective learning. Candy (1990, p.57) acknowledges that it is the “(p)erspective of the learner that determines what is learned and what is not”. If students are to fully develop their information literacy skills, they need to perceive that mastery of these skills is valuable. Presenting meaningful real-life contexts for problems gives them credibility. An assignment that counts to final assessment further strengthens students’ commitment to learning information skills.

Collaboration between library and academic staff needs to embrace content and context—relevant questions in an assignment that counts. This study is preliminary. More rigorous longitudinal controlled trial research is needed before conclusions can be drawn. However, the results of this pilot are illuminating. They suggest that full integration of the teaching, learning and assessment of information skills into course curricula would assist students to value these skills and to approach their learning with greater enthusiasm, higher expectations and an increased likelihood of learning success. Close collaboration between academic and library staff can make this integration a reality and bring the achievement of graduate attributes a step closer.

References

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