How does assessment affect learning: an example from a chemistry PhD-course in scholarly communication

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Abstract

Assessment of students in the learning process may have several reasons (knowledge assessment, ranking etc.). One reason presented in this article would be to use the assessment as a way to enhance learning. At Stockholm University Library, PhD-students in Chemistry annually partake in a library course, where they have to write a mandatory essay and, from 2012, review a fellow student's essay. Comparing and discussing the former and the new ways of assessing, this article aims to discuss assessment as a way to enhance learning.

Introduction

My experience as a student in a MOOC (Massive Online Open Course) course got me thinking about assessment as part of the learning process. As this course had almost 100 000 students enrolled, there was no way a teacher could assess your weekly essays. The solution was assessing each other, peer review. This was presented as an opportunity to learn more. Heavy discussions followed, where students demanded being assessed by qualified teachers instead of fellow students with uncertain skills. The teachers insisted on peer review. With that decided the discussion finally focused on the possibility of reviewing reviewers, since it was perceived that you could also learn from feedback on your reviews. This got me thinking about the ways we assess our students in the library instruction of Stockholm University Library. The result was a new form of assignment, with a peer review part included.

Literature review

Assessment in libraries

There are multiple sources to be found on academic and research library assessment, for a recent review see Hufford (2013). In this review, a section about Information Literacy (IL) assessment can be found. IL assessment can be divided in several parts; we can evaluate ourselves as teachers of IL, our lesson content compared to national and international guidelines and we can also assess if students learn from our lessons, which is the focus of this article. More specifically, this article will treat assignments as part of the learning process (Ramsden, 2003, p. 176).

Assignment for learning/formative assessment

What kind of learning do we wish to achieve with our teaching? Different forms of assessment encourage different forms of learning (Gipps, 2013). "Knowledge must be assessed in terms of its constructive use for further action" (Gipps, 2013, p. 9).

Assessment practices focused for a long time on final evaluation of student knowledge in order to compare and grade students. This was based on a behaviorist approach where learning is seen as bits and pieces transferred from teacher to student. Toward the end of the 1980s new perspectives on how assessment could enhance learning started to spread (Balan, 2012, p. 24). These perspectives were based on constructivist and socio-cultural approaches to learning, approaches that see learning as a process of creating meaning, and thus more actively involving the student in this process (Säljö, 2000, p. 235). "Learning occurs in the space between what the individual can accomplish independently and what he or she can do with assistance" (Vygotsky's zone of proximal development, taken from Brookhart, 2013, p. 394). To see assessment as part of the learning process became known as formative assessment. Since then, formative assessment has been studied extensively, and statistically significant improvements in student learning have been shown in several cases, although the results have to be interpreted with caution (Balan, 2012, p. 27).

Assessment is not only about assignments and tests. Given the new theories described above, assessment of students often takes place in the classroom. Student perceptions of assessment is dependent of this environment, "and ultimately the meaning and use of information it affords." (Brookhart, 2013, p. 393). Student access to teacher and peer feedback emphasizes the importance of the work performed, not only the final product. Making an assessment more performance-based tends to blur the line between assessment and instruction (Brookhart, 2013). Performance-based assessment aims to model the real learning activities, such as written communication skills, that we wish students to engage with (Gipps, 2013).

Peer assessment

Practice in peer assessment is a central component of formative assessment, as this gives students further possibilities to learn. Students take active part in their learning as opposed to a teacher serving feedback and suggestions for improvement (Balan, 2012, p. 27). It is also an important form of co-operative teaching, as students need to interact, giving and receiving reviews from fellow peers (Ramsden, 2003, p. 189). "..[C]ombined with effective instruction in classrooms, feedback can be very powerful in enhancing learning" (Hattie &Timperley, 2013, p. 191).

Library assessment and assignments

Library instruction typically concerns IL, and aspects relating to this field. The instruction is usually performed by librarians, more or less specialized in teaching IL. Karen Sobel and Kenneth Wolf (2011) list several particular circumstances for library instruction including many teachers involved, completely different majors, unconventional library research assignments, and often only seventy-five minutes per semester with students. Further, librarians usually work more or less independently of the universities' institutions. This gives freedom to use own methods, but may also cause librarians to feel the need for being more embedded within the teaching of the institutions (Sobel & Wolf, 2011).

The assessment of learning takes place within this library instruction environment. However, learning assessment is not always included in library instruction. This may be due to assessment not seen as the library's responsibility or depending on individual teachers. However, libraries have seen an increasing demand for assessment (Sobel & Sugimoto, 2012). When assessment is performed, it is affected by the common one-shot sessions. Assessment techniques used in libraries include quizzes (sometimes as pre and post-tests), free response questions, assignments in the forms of reports or journals, and viewing student's final

essays/portfolios. Peer assessment is sometimes used (Warner, 2003; Sobel & Sugimoto, 2012; Sobel & Wolf, 2011).

Description of course and assignment

The course in scholarly communication that is being taught at Stockholm University Library is about ten years old now. The current course consists of a two hour lecture, followed by an assignment in the form of an essay (mandatory but not graded). The lecture introduces the recent history of scholarly communication, information searching, bibliometrics and reference management. The teacher actively encourages discussions with questions to the PhD-students, about their experiences and views. The purpose of the course is to let the students reflect on these issues, particularly from their point of view as gatherers of scientific information, but also in their role of disseminating their own scientific findings.

The 2012 year assignment differed from the previous year both in form and content. This year, PhD-students had to write an essay in the form of a review-article with abstract, conclusion and scientific references. In order to pass, each PhD-student also had to review a fellow students' essay, stating at least two aspects that were good, and two aspects that would improve the essay. In 2011 the essay didn't need to have a particular form, but recommendations were 1-2 pages and to include references. No peer reviewing occurred, the essays were commented on by the librarians giving the course.

Results

The results of the two different essay assignments will be presented and analysed in this section. The first part consists of overview statistics whereas the second part focus on the content and peer review.

The completion rate (number of students finishing the course) dropped from 66 % to 47 % from 2011 to 2012. This quite big difference between the years could reflect the increasing demand from us on the students in terms of workload (writing and reviewing) but may also be due to several other factors such as their other workload at the time, the possibility for them to re-enrol later etc.

Word count raised from a mean value of 678 words to 1374 words between the years (In 2011 we asked for 1-2 pages, in 2012 no such restrictions were implemented). The number of references also raised, from mean 2 to mean 11. These numbers probably reflects the demand for the review form, you need a certain number of words to fit abstract, literature review and discussion into the essay, as well as some references (11 references is still a very low number of references considering review-articles).

The change in form from a free essay to an essay mimicking a scientific review-article made the overall form stricter. The students were not supplied with an example review-article, nor were they told how many pages/words they were supposed to write. Apart from abstract and conclusion that was explicitly demanded, almost all essays contained introduction and discussion as well. Compared to earlier years, the language also became more formalized as the subjective form (I search...) and small comments were excluded.

When it came to peer reviewing, the students commented on form and content (usually both). Form comments included disposition, citations and layout. Typical comments on content included missing parts and subjectivity.

Mangelsdorf and Schlumberger (1992) present different stances to be found in reviewers' suggestions. They identify the Interpretive, Prescriptive and Collaborative stance. The Interpretive reviewer focuses on rewriting the essay according to their own interpretation of the task at hand. The Prescriptive reviewer focus on the form of the essay whereas the Collaborative reviewer tries to see the text through the eyes of the author, and suggesting

improvements from this stance. Usually, there is no strict line between stances, a single reviewer can show two or all three of the stances in the same review.

Evidence for the different stances could be found in my material, see the following citations:

Interpretive: "E.g. quality dilemma. PLOS ONE seems to be more or less a cash cow to pay the expenses of the their other journals. Just by looking how many papers they accept, it is not hard to argue that the quality threshold of PLOS ONE is quite low…"

Prescriptive: "Overall I believe the paper is good. Apart of the mistakes is well structured, has a sensible paragraphs and interesting content. I saw you have read a lot of paper to write the review."

Collaborative: "Discussion and conclusion focus on different points (open access and young scientists); it would be better to address both points under discussion and conclude shortly afterwards"

Conclusion

The literature review showed different aspects of how assessment affects learning. One way of making an assessment more valid is to use a form that is close to what the students are likely to encounter in the future (Ramsden, 2003, p. 194). Two major changes were introduced in the 2012 essay assignment for the PhD-students in Chemistry. The mimicking of a review article gives the students a more defined task, compared to an undefined essay. Furthermore, a review-article is more closely connected to their scientific endeavour, they are supposed to write scientific articles as a way of presenting their findings, thus placing the assignment in their PhD context. The peer assessment is also something that they are expected to do, especially further on in their careers as researchers.

The peer assessment part revealed to some extent the three stances presented by Mangelsdorf and Schlumberger (1992). A deeper analysis of this would preferably include student views as well as a second examiner, to reduce subjectivity. The three stances can help teachers and students focus on the most important learning outcomes of a specific task, and it ensures that students become actively involved in making meaning (Mangelsdorf & Schlumberger, 1992).

Future studies could include self-assessment among the students about their own learning experience, as well as a follow up among their supervisors. Finally: the methods used are not what determine learning, it is how the students experience the learning that matters. Rarely, one method will satisfy all learning objectives (Ramsden, 2003, p.184).

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