Evaluating student centred teaching and learning strategies for Aviation students using a quality framework for online learning environments

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Abstract

This paper reports on the online teaching and learning strategies used in an undergraduate course in Aviation Biology and Medicine at Griffith University and their evaluation. The strategies described here are based on a conceptual framework that outlines essential components of effective online learning environments (social presence, interaction, cognitive strategies, collaborative learning, and learner-centeredness). The study demonstrates the application of this framework in an online course delivered to 49 undergraduate students and intends to model a framework for other online teaching and learning contexts. After an introduction to the framework and a description of the course in question, the authors will report on the evaluation design, the data collection methods, and the results, followed by reflections on future continuous improvement of the course.

Introduction

This paper describes an approach to teaching in an Aviation course offered by Griffith University's School of Aviation that embraces new technologies and emphasises collaboration, interaction, and students' responsibility for their own learning. The teaching strategies discussed and evaluated here are based on a theoretical framework of online teaching, which brings together a variety of theories (mainly Gunawardena, 1996, Palloff & Pratt, 1999, Salmon, 2000, and Jonassen, 1998) and centres around the five principles of social presence, interaction, cognitive strategies, collaborative learning, and learner-centeredness.

The course, "Aviation Biology and Medicine", is an undergraduate course within the Bachelor of Aviation Program. It is delivered fully online via the university's learning environment Blackboard™, and has been offered for 7 years. The course familiarises students with the physiology and anatomy of the human body and explores ways in which the working environment of flight crew can have effects on the body. It also looks at the ways lifestyle and diseases can impact on the health of flight crew, gives a brief introduction to first aid, and contains discussions on current topics of interest in Aviation Medicine. The aim of this course is to provide students with an understanding of the way in which the human body works with reference to the flight environment and the diseases, hazards and health pitfalls associated with professional flight crew. In terms of generic skills, the course aims to develop collaboration skills, presentation skills, and academic writing skills. It also puts emphasis on making students aware of their own learning process on a meta-cognitive level.

The student body consisted of 49 students, 9 of whom were experienced pilots, 30 were ab initio, and 10 from New Zealand. The experienced pilots and New Zealand students had little or no prior tertiary education exposure. Within the 30 ab initio students 1 was an international student. There were 42 males and 7 females, and while 27 students worked externally 22 enrolled as internal participants. This was an interesting mix of experiences and backgrounds, and a challenging group to work with for the lecturer as students needs were fairly varied.

A quality framework for the evaluation of online learning environments

The framework used in this study is based on five dimensions defined by Gunawardena and Zittle (1996) that are seen as central to effective online learning. The following overview defines these dimensions and explains their importance in the learning process.

Social presence

Social presence in an online learning community is the intellectual and emotional presence of learners and instructor(s). According to Stacey (2000), "the social dimension of online interaction provides the basis of establishing an environment of trust and motivation for effective learning." In most current online courses this becomes apparent mainly in textual contributions to the dialogue/discussion. The quality of social presence determines the climate in the course, and its effect on student learning cannot be underestimated. According to constructivist theory (e.g. Jonasson, 1998), learning is a social, dialogic process, which includes social negotiation of meaning as a central part of knowledge construction. The learning process in an online course can only be successful if the "social climate" in the course is such that learners feel safe to take risks, to voice opinions and to make mistakes in their meaning-making process. In order to make online learning environments a comfortable and safe setting for learners, protocols and social rituals as we know them from face-to-face situations have to be redefined and made explicit in order to foster trust and bonding between the instructor and the students, and among learners.

Interaction

Interaction in an online learning context refers to the engagement of the learner with the content, the other learners, the instructor, and the technical interface (cf. Hillman, Willis, & Gunawardena, 1994). Interaction can be interpreted as a two- or more-way exchange of information that facilitates the knowledge building process in terms of conceptualisation, internal negotiation, and social negotiation. Interaction is essential in order to deal explicitly with the conceptions formed by learners.

Constructivist theorists consider the learner as being proactive rather than reactive. In the knowledge building process the learner interacts with the environment in order to learn instead of being dominated by instruction. Through interaction with content, peers, experts/instructors, and the technical interface, new information is acquired, interpreted and made meaningful. The individual components of interaction in an online course are of equal importance. Interaction with content and resources is essential in order to analyse the scope and nature of a problem, and to provide the basis for negotiation of meaning.

Interaction with peers and instructor is necessary to compare viewpoints and test knowledge against other perspectives.

Cognitive strategies

Cognitive strategies are internal cognitive activities which learners use to construct personal knowledge within a domain (Taylor, 1994). These processes include selection, interpretation, classification, modification, reflection and re-construction (remembering) of information and knowledge. In the process of knowledge construction, cognitive strategies are complimented by the results of social negotiation of knowledge through articulation and dialog with peers, mentors and experts. Development of cognitive strategies can be aided by the use of cognitive tools (Jonassen, 1992), the observation of experts' cognitive activities and processes, and by modeling (especially cognitive) by the instructor.

If learning is a process aimed at personal and social meaning making and knowledge construction, then the strategies employed to achieve these goals must play an essential part in the learning community (both for learners and instructors). Reflection, exploration and meta-cognition as well as the learners' sharing and comparing of these experiences is therefore an essential component of constructivist learning environments.

Collaborative learning

Collaborative learning is the process of learners working together in order to generate deeper levels of understanding and to achieve a common learning goal. An essential component of collaborative learning is interaction with peers as described above. Collaborative learning fosters sharing and exchanging knowledge and understanding. It can provide a safe model of a community of practitioners and experts, in which shared striving for knowledge and meaning making is the common vision. Jonassen et al. (1995) claim that "collaboration aids in developing, testing, and evaluating different beliefs and hypotheses within learning contexts." Similarly, Paloff and Pratt (1999) maintain that "the collaborative effort among the learners helps them achieve a deeper level of knowledge generation while moving from independence to interdependence." Collaborative learning can increase learner motivation, and by working on a common problem or projects, learners can generate, link and structure ideas with peers in a non-threatening environment. Conversation/discourse is an essential part of the learning process, and the knowledge generated is a joint achievement that learners can defend confidently as it has been developed, 'tested,' and evaluated in the group.

Learner centeredness

Learner-centeredness is an approach to teaching that moves away from the concept of the teacher as the centre of instruction and pays much more attention to what the *learner* is *doing*, ie on the active role of the student in the learning process (Jonassen et al., 1995). Teaching is not seen as transferring knowledge or the teachers' interpretation of meaning to the learner, but engaging the learner in interaction and collaboration as described above and thus facilitating individual and social knowledge construction, with a focus on "learner initiated inquiry and exploration" (Gunawardena & Zittle 1996).

Again, if we consider learning as individual meaning making, the emphasis of instruction has to be on the process of learning rather than on the presentation and transfer of content. Jonasson (1998) suggests that the aim of teaching is to create situations in which student learning is possible. Similarly, Beaudoin (1999) sees the role of the teacher as one of "mentor, facilitator, and guide through the transformative process of learning". If this is true, the features of an educational setting (eg. learning objectives, resources, assessment, activities, etc.) must be consistently and clearly aimed at achieving the instructional purposes defined, which have to be transparent and agreed upon by learners and instructor.

Teaching and learning strategies

The principles described above were used as the theoretical framework for the teaching and learning strategies used in the course, which are varied and aim to involve the students and make them responsible for their own learning, attempting to cater for the needs of a variety of learners. They range from the students' independent interaction with a variety of resources (both online and print) to learning activities that foster collaboration and reflection, to the assessment activities.

The content covered in the course is available in six modules on the course website. Each module contains a short introduction, a statement of purpose, and the learning objectives, and is then structured into a number of topics. Many topics contain interactive multimedia elements and graphic elements to illustrate difficult concepts. Whereas some topics cover most of the content, some contain a brief introduction to the subject matter and references to further resources to help students structure their learning. Throughout the online modules, students also find Internet links to additional information on the topic covered. In addition to that, two textbooks, one of which is available online, round off the suite of learning resources available for this course. The online course also contains a so called "study chart", outlining a study plan to help students determine when they need to study which topic in order to stay on track with their learning.

The course encourages students to participate in a variety of interactions with their peers and the instructor. The most important tool in this is the discussion forum. It is the basis of the online community established in the learning environment, and it provides flexibility in terms of when students choose to do their forum work. In line with the modules of content studied each week, there are questions for each module which student answer by a certain deadline. Forum posts were assessed.

For student so benefit from other posts and not only their own, the instructor trialed a strategy in this course where students had to negotiate their forum marks with the instructor, based on exemplars, but also based on comparing their own contributions with those of their peers. In addition to that, a group assignment, requiring students to work together in the preparation of an oral assignment delivered by the internal students and a written report provided a stimulus for interaction and group learning.

The fourth interactive learning experience were occasional "lectures", offered for anyone who wanted to or could attend. These lectures were not intended to deliver content, but to define the operation of the course and to manage the course, develop relationships between the internal students and create a relationship between the internal students and the lecturer. They were also used to encourage the internal students to be active online to encourage and interact with the external students. Information from these sessions was then shared with the entire student body via the discussion board. The face-to-face time also included the group presentations for assessment and occasionally a "real" lecture to assuage internal students concerns about the lack of "real" lectures.

The assessment of the course consisted of three components, online asynchronous forum answers (30%), a group project (30%) and an end of semester exam (40%). To achieve a pass in the course students had to achieve a passing grade in the end of semester examination.

The forum questions were a weekly activity where a question was set and all students were encouraged to answer. All answers were available for the entire student body to see. The first two questions were to introduce themselves and describe what they wanted to achieve from the course. This was intended to be a non-threatening activity and the genesis of an online community. The first two assessable questions were

marked and feedback provided directly to each student via their own individual site. Overall feedback was then provided to the group as a whole via the message board and exemplars of good responses were named. After the first two weeks of forum questions the assessment process changed to a negotiated mark between the teaching staff and the individual student. To this end, general feedback about expectations and exemplars were provided on the message board. Students were then given several days to digest that general feedback, compare it with their own work and make a judgement of their own work relative to the feedback and exemplars. To achieve this the student was required to nominate a mark and justify it based on the general feedback. Teaching staff either accepted that mark or provided reasons why that mark was not appropriate and suggested a more appropriate mark. Students were then free to contest the staff member's suggestion, although this rarely happened.

The group project consisted of two activities, a formal written assignment and a less formal presentation. The internal group negotiated the terms of assessment of the presentation and this was provided to the entire student body via the message board. Each attending student provided written identifiable marks on each of the group presentations. These marks along with the teaching staff marks were collated to provide the overall mark for each group's presentation. Group sites were provided and included email, asynchronous as well as recorded synchronous communication tools. The formal written assignment was also a product of the entire group. An assignment marking key was provided to all students on the web site to ensure that they each understood what was required and sought in the formal written assignment. The end of semester examination consisted of a one hour multiple-choice exam.

From teaching to evaluation — reusing the theoretical framework

An important step in any evaluation project is the definition of indicators against which can be measured. This study, with teaching and learning strategies based on the framework of five principles, develops these standards out of the underlying theory, linking the design and intention of the course directly to its evaluation. The evaluation questions are constructed to hone in on these five areas.

Table 1: Evaluation framework

Aspect	Indicators	Measurement
Social presence	Extent of social interaction Evidence of students feeling as part of a community Presence of instructor	No of "social" posts Student perception No of posts from instructor
Interaction	Extent of academic interaction Suitability of learning activities Feedback given and received	No of posts Student perception Student perception
Cognitive strategies	Presence of cognitive tools Encouragement of reflection and metacognition Challenge of previously existing mental models	Content and learning activities analysis Analysis of posts
Collaborative learning	Collaborative instances as central learning activities Feedback student – student Common problem solving Room for collaborative activities	Analysis of collaborative instances Student perception Number of posts
Learner-centeredness	Negotiation of assessment Encouragement of reflection Promotion of student ownership of problems / processes Modelling / coaching / scaffolding	Analysis of posts in marking "groups" Student perception

Evaluation design

In order to evaluate the effectiveness of above mentioned teaching & learning strategies, an eclectic-mixed-method approach (Reeves, 1996) was taken, combining both qualitative and quantitative evaluation methods.

The data collection methods included student surveys, observation by the evaluator, and reflections by the lecturer (instructor). Students were asked to fill in a short questionnaire in Week 9 and a longer end of semester survey in Week 14. The results of this data collection method are to be seen in terms of student perceptions of the course and the teaching and learning strategies. All 49 students were encouraged via the course website Announcements to complete the two surveys. 12 students (24.5%) replied to the end semester survey, whereas 14 students (28.6%) replied to the mid-semester evaluation. Whilst an average of 26.55 % of respondents does not yield statistically valid results overall, the information obtained can be used as strong indicators of student perceptions in this course.

The evaluator observed the following components of the course: learning design, announcements, discussion forum, group discussion areas, chat archives, negotiation of marks, course statistics

The evaluator and the lecturer were in contact throughout the course, discussing aspects of the course and potential areas for change and improvement. The lecturer's reflections are included below.

The combination of these evaluation angles was designed to achieve a triangulation of data to increase validity and reliability of the evaluation outcomes.

Data analysis and interpretation in relation to the framework

The data gathered via these three channels were interpreted on the basis of the quality framework described above. The following section discusses the outcomes of the evaluation components for each of the five aspects.

Social presence

Course observation

The course had many elements that helped create a social presence in the online environment. The instructor used the discussion forum and the announcements actively to make students feel welcome and to help them get started in the course.

The announcements were used consistently to alert students to new features of the course, or to prompt them to do things in a timely fashion. In sum, there were 49 announcements, 36 of which were posted by the instructor, whereas 8 were posted by school admin staff, 3 by the tutor and 1 by the evaluator and the system administrator respectively. All announcements were written in colloquial and friendly language.

The discussion forum was another tool that helped create social presence in the course. The instructor posted guidelines on how to use the forum and also some Netiquette guidelines to help students get started. In addition to that, an "Introduce yourselves" forum was set up to give students the opportunity to post a message about themselves. They were encouraged to introduce themselves and talk about their motivation to take this course as the set course activity for Week 1. Forty-six messages posted in the introductory forum indicate that all students but three have taken the opportunity to introduce themselves to their peers in this forum.

Student perceptions

When asked about the atmosphere in the course, 75% (41.7 % strongly agreed, 33.3% agreed) of respondents indicated they found the atmosphere friendly and collegial. 25% were not sure, and 0% disagreed or strongly disagreed with this statement.

Responding to a similar question, 58.4% (16.7% strongly agreed; 41.7% agreed) of respondents agreed or strongly agreed to the statement "I felt I was part of a learning community", whereas 41.6 % disagreed (25% disagreed, 16.7% strongly disagreed).

Student comments from the end of semester evaluation indicated that the course was "fun" and enjoyable, e.g. "Thanks for a fun course. Probably the most fun course I have done in my degree so far. Thanks […] for making it so enjoyable."

Instructor reflections

The intention is to make the atmosphere friendly and to encourage the students to regularly check the announcements to ensure they take full advantage of the communication opportunities provided to them. I expect that some of the students don't actually know what a learning community is and thus possibly the reason that some didn't feel they belonged to one. It is also possible that as we tried the introduction of a "tutor" as well as the lecturer this year some communication strategies used did not meet expectations, as the tutor did not communicate as often or as effectively as might have been expected.

Overall, however, I believe that the staff provide a strong social presence and encourage the students to be as active online as possible.

Interaction

Course observation

The course had a variety of interaction strategies to help student learning.

In terms of the course design, the deliberate use of tools to help scaffold student learning included a study chart, which is used as an advanced organiser to guide student interaction with the content and resources. As described in the section "teaching and learning strategies," the marks negotiation, the use of the forum, and the face-to-face sessions were all designed to stimulate interaction between the students and also between students and lecturers. The alignment of the assessment with the learning activities (especially the forum activity with the marks negotiation, and the group assignment) was a strong motivator to encourage students to interact with each other.

The number of messages posted to the discussion forum as an indication of the level of interaction reveals that a majority of students posted their messages regularly. With 511 posts overall, the mean per week is 42.6 messages. This indicates that the forum activity has encouraged students to constantly interact with the content, other students, and the instructor.

Student perceptions

The survey questions about this aspect revolved around interaction strategies, feedback from the lecturer, and use of communication tools.

Overall, students were relatively happy with the interaction components in this course. About 60% of respondents indicated that the communication and interaction strategies were explained clearly and that the interaction with peers stimulated their learning. The responses to the questions about lecturer feedback were mixed. 58.3% of the respondents indicated that they though the quality and helpfulness of the lecturer was adequate. 50% thought that the feedback received was helpful, with 33.3% disagreeing with this statement. Only 33.3% of respondents found that the feedback received was timely, with 50% disagreeing with this proposition. In terms of the effectiveness of the online forum as a learning tool, 75% of the respondents indicated that they thought the forum was useful for their learning, with 33.3% strongly agreeing with this statement.

Student answers to the open questions in both mid-term and end-term semester evaluations confirm the tendency apparent from the Likert Scale questions. The majority of students commented on the usefulness of the discussion forum as a learning tool. They stated that it stimulates independent and creative though, encourages reading and research, keeps students on track, forces continuous study and review, and proves the opportunity to compare their own work with that of others.

Similarly, comments about the feedback received from the lecturer reflected the students' opinions mentioned above. The "marks negotiation" exercise was seen by some students as unfair. They could not see the real value of it for their learning, and they did not regard it as 'real' feedback.

Whilst the variance in responses was very high, individual students named interaction related components as the most valuable aspects of the course. These included content related comments (i.e. practical, authentic, well structured, and comprehensive web content), interaction with peers and lecturer, instant feedback, and constant communication.

Instructor reflections

I agree with many of the students in this case. As the class was large we decided to include a tutor for the first time and the management of the feedback between the tutor and myself was far from perfect. We need to further develop strategies for using tutors in relatively large classes. The marks negotiation is a good tool; we just did not manage the process well this year with the tutor. I think in other years the students would have been and will be much more comfortable with the process. Some students this year did not receive feedback for some considerable time. The feedback needs to be completed every week in time for the next weeks' work; I feel this is vital for this strategy to work.

Cognitive strategies

Course observation

The course very consciously seeks to facilitate the development of cognitive skills, notably in its content design and its learning activities and assessment. The course content is designed to help students scaffold their learning and focus on the relevant aspects of each module. To that effect, each module has a short introduction, which describes the purpose, the objectives, and the outcomes to help student focus on the important aspects. In addition to that, each topic (as subsets of the module) again has an overview of learning objectives at the beginning so students can read this before they delve into the content itself. In addition to that, many modules contain a number of interactives and animated graphics illustrating difficult concepts, and links to web sites where students can find further information. This part of the course contributes to students developing selection, interpretation, classification and evaluation skills by exposing them to information in a variety of formats and media. The course aims to cater for different learner styles by providing a mixture of text- based information, visual information, web links, and interactives.

The main learning activities are closely aligned with two of the assessment items (forum work and group assessment), contributing to the development of cognitive strategies. At the end of each topic, there is a self-assessment quiz to help students review, reflect on and evaluate their own understanding of the content they have just worked through before they start working on the follow-up activity, which is a submission to the forum about the relevant module.

The contribution to the forum and the marks negotiation exercise both contribute to the social negotiation of meaning and cognitive modelling and observation. When formulating their answer to the question raised in the forum for each module, students interpret and evaluate the information gained from the course content, applying it to a real life scenario. By comparing their own answer with others as part of the marks negotiation, students validate their response, but they also observe other — better and not so good — submissions and therefore construct meaning by comparison and negotiation.

The group assignment provides a fruitful venue for social negotiation of meaning, especially when — as is the case in this course — students are required to work on one common assignment. Students bring a variety of individual knowledge and experience to group work. On the common basis of the course content, they need to align their understanding and interpretation of both the assignment requirements and the actual content with that of their peers, thus discussing and negotiating understanding and constructing new knowledge through and with their peers. A scan of the group discussions in this course shows that this was mainly done by discussing the content and structure of the assignment, contributing to a draft version, and reviewing and critiquing draft versions that others had more input in.

Student perceptions

With regard to this aspect, students were asked a number of questions in their end of term course evaluation survey. Students seemed to be reasonably happy with the learning activities and the course content. 75% declared that they thought the learning activities stimulated their learning, 67% and 58.3% respectively said that the course content was relevant and that the level of the course was adequate. 66% thought that the concepts were explained clearly, whereas 58.3% indicated that all resources were easily accessible.

When asked about the assessment items, however, students were more critical. Only 50% thought that the learning activities were relevant to the module goals and the assessment, with 33.3% not sure about that. 58.3% agreed that the assessment items and due dates were explained well, but only 33.3% agreed that the assessment items used were clear, with 58.3% disagreeing. 58.3% indicated that they thought the assignments were useful for their learning, and the same number of students indicated that the degree of difficulty in the course was adequate.

Student comments indicate that they found the course content authentic, up to date and practical as well as well structured and cohesive. There was no special mention of the interactives embedded in the course content (e.g. simulation of night flight, etc.), but students found the textbooks helpful. As mentioned above, the forum activities were highly valued by students, with 8 students naming it as the most valuable aspect of the course. Students indicated that it stimulates independent and creative though, encourages reading and research, keeps students on track, forces continuous study and review, and allows for comparison with others: all aspects contributing to the development of cognitive strategies. Overall, students asked for more "guidance" on learning activities.

Instructor reflections

It is very interesting to note that students were seeking more "guidance". The process and expectations are explained in several areas, i.e. the course outline, the study chart and in several ways and at different times in the announcements section. Clearly however for some students this was not enough, and understanding why this was not enough will be a useful task. The other interesting item to consider is that these students are not at all used to group work and this is a big challenge for them. I think that sometimes those who struggle a little with this type of course have been "hand fed" for a long time and having to work independently and with others rather than be exposed to the clear intentions of a didactic lecture is a challenge for some.

Collaborative learning

Course observation

The main collaborative activity in the course was the group assignment, where all students were assigned by the lecturer to 6 groups, each consisting of a mix of internal and external students. The face-to-face lectures were mainly designed to inform internal students of the group assignment requirements and encourage them to communicate with the external students, informing them of the issues discussed in the lectures. The assignment required students to work together to prepare both a presentation and a written report about a topic relevant to the course. Each group was set up with a discussion forum, a file upload area, an online chat, and an e-mail functionality as a common work space. These groups were used with differing intensity. Some groups used the discussion forum regularly, with close to 150 messages in the forum. Others hardly touched the forum, but made more use of the online chat. The file upload area was used by two group intensively to store drafts of the report, whereas others e-mailed drafts to each other.

Whilst no detailed discourse analysis was conducted for the group discussion, some general observations can be made:

- Most groups took several weeks before they started to work productively.

- In all groups one or two students took on the role of team leader, without any formal decision process. They were driving the group work, and presumably doing a lot of the work.

- In all groups there were students who did not contribute regularly. There was, however, a general sense of goodwill and partnership.

- The group discussions and chats generally centred around who does what, the structure of the assignment and where to get content from. The communication tools in the group areas were therefore mainly used for organisational issues rather than for knowledge construction and negotiation of meaning, especially in the earlier weeks of the collaborative activity. Later on, knowledge construction and discussion can be observed, especially when it comes to critiquing drafts and making suggestions for change.

- Observation of the group discussion areas also shows that these tools contributed significantly to the social presence in the course.

Student perceptions

Students did not seem to overly enjoy collaborative activities. Whilst 50% indicated that they found the group assignment useful for their learning, 25% strongly disagreed with this statement. However, in the qualitative responses, students indicated that they did not so much resent the group assignment itself but suggest that there be changes to the way it is structure and how instructions are given. Especially internal students seemed to think that they were unfairly treated because the lecturer relied on them to communicate with the external students in their group and inform them of what happened in the face-to-face lectures. Attitudes towards the group assignment also seemed to change from the mid-semester evaluation (where students were in the process of writing the assignment) to the end of semester evaluation survey (where students had had time to reflect on the experience). Whilst 4 students in the mid-semester evaluation indicated that the group assignment was the least helpful aspect of the course, it was only mentioned once in the end semester evaluation.

In more detail, when asked: "How have you engaged in the online group work so far? Is it working for you? Why / why not?", students gave a variety of answers. Some indicated that the group assignment has worked well for them, and commented on the educational aspects of working in a group. However, also the students who were relatively happy with this part of the course made suggestions for improvement, such as having clearer instructions for everybody at the beginning, and they mentioned that the activity was very time consuming.

Other students were not so satisfied with the group assignment, indicating that it did not work for them. Issues of contention included unequal participation by group members, including the extra onus put on internal students to "chase and harass" external students, the difficulty in getting organised and managing time across the group, and technical problems. Further suggestions included the use of more sophisticated communication tools, and not setting different goals for external and internal students.

Instructor reflections

The students' perception is interesting that they felt it "unfair" that we used them to communicate what happened locally to their distant colleagues. I feel this is a real life scenario in a global community. I think this process replicates what happens in global corporations and especially airlines. In airlines not everyone gets to meetings as they are flying all over the place. It is up to team members who do attend the meetings to provide information and feedback to those who cant attend. If anyone should think the process was unfair I would have expected it to be those who cannot attend as they may feel they missed something. I fully intend to continue to use this process but may well spend more time providing reasoning behind the process for both local and distant students.

Learner-centeredness

Course observation

The course can be regarded as learner centred in that it puts the responsibility for students' learning squarely into their hands. This is achieved by a number of strategies.

The negotiation of marks is designed to prompt students to compare their work with that of their peers and to assess themselves based on that comparison. Thereby, students are required to work out what the indicators of a quality submission are, and how their own submission meets these. With this strategy, students have to look at their own submission from a marker's perspective, thereby fostering meta-cognition, and it encourages them to be conscious of the marking criteria. Some of the reasons contributing to these student perceptions may have resulted from a relative lack of criteria for this exercise. Whereas exemplars of good submissions were given, there were no clearly spelled-out criteria, the addition of which may be a suggestion for future uses of this strategy.

The group assignment is another strategy that puts responsibility for learning and engaging in the learning tasks into the students' domain. In this particular instance, the lecturer held tutorials for internal students to facilitate and help them get started with the group assignment, and they were in turn expected to pass this information on to external students.

The absence of "information delivery" via lectures is another indicator of student centredness in this course. As already mentioned, there were a series of lectures, but they were designed to scaffold students learning activities rather than as a transfer of information in the form of a traditional lecture. Information acquisition was done by students studying the resources available, whilst the learning activities were designed to help them understand the content.

Another factor contributing to learner centredness is flexibility in the pace and timing of learning. This course is flexible in terms of its medium and because there is no restriction in terms of access to information or instruction. Student can access the course materials when they like and can contribute to the forum in their own time, but within the deadlines set to help them structure their learning.

Student perceptions

Student perceptions in terms of student centredness were mixed. Not all students enjoyed the marks negotiation and found it very useful for their learning. 8.3% of respondents agreed that the exercise was useful, 16.7% thought it was very useful, 16.7% were not sure and 58% disagreed or disagreed strongly with the statement. When asked "What do learn from the Mark negotiations for the forum questions?", students were divided in their opinion. Whereas about a third of the students said that they saw this as an opportunity to reflect on their own efforts in comparison with others, find out if they are on track, and see things from a marker's point of view, others found this to be a distraction and a waste of time. Some students indicated they would rather receive conventional feedback on their contribution, and that they did not see the relation of this exercise to the course goals.

Student perceptions of the group assignment have been discussed in the previous section. Feedback for both strategies, however, needs to be examined in light of student expectations. Several comments in the survey indicated that some students expected to be "spoon-fed" in this course. Two respondents indicate that they are surprised they have learned so much, because it did not happen through the lecturer. Some students refer to a "lack of teaching", which they relate to the lack of formal lectures. This leads to the question how "ready" undergraduate students are for very learner centred activities, and what further support may be necessary to assist them in understanding these strategies and making the most of them.

As far as flexibility is concerned, many students commented on the advantage of online learning, as it allows them to participate in the course. Comments include: "Online learning was a new thing for me. I think its great."

Instructor reflections

I believe that there are many students who are ready for a student centred approach. I think there is another group who with the right coaching will deal with a student centred approach easily, and another group who simply want to be spoon-fed and who won't like the changes required. The first group is easily dealt with. The second group require more detailed information and a little more assistance with the changes so they feel included and not disenfranchised. The latter group however will continue to find this approach difficult and much thought needs to be given to an approach that will satisfy this group's needs.

Outcomes and conclusion

This article describes the design and evaluation of an undergraduate course based on a framework of principles that augment the quality of an online course. Whereas in this instance the design of the course was more or less consciously based on the five principles, and the evaluation was geared towards identifying the relative success of the teaching strategies resulting from the principles, we suggest that the framework can also be used to evaluate courses not founded on the principles as part of their design.

Depending on the nature of the course and the strategies used, indicators and measurements may have to be modified, but the principles of the framework and the suggested operational activities related to those can be useful for online courses in different contexts and with different learning goals.

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