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Teaching Cycle 2 – Student lead discussions to provide variation in learning

1. **The Issue**

In planning a teaching session and deciding on what types of teaching activities are to be used, it is important to consider the learning style of the students we are teaching. Some students are more “academic” than others and do well under a range of teaching and learning environments (from passive, low level engagement learning situations such as lectures through to active, higher level engagement learning activities such a problem-based exercises), whereas less academically capable students tend to learn better with the active learning style (Biggs, 2003). Therefore, as a teacher, using techniques that engage students in active learning activities means that the whole spectrum of learning styles will be catered for.

By actively engaging students in learning we are getting them to apply and use their knowledge rather than just take knowledge or facts on board to be regurgitated at a later date in an exam. However, just participating in these learning activities (by thinking and doing) is not enough to ensure learning is taking place effectively or that the learning experience is being retained. In order for this to occur effectively a four stage model of learning should be followed, Kolb’s learning cycle (Figure 1).

![Kolb's Learning Cycle](image)

Figure 1. Kolb’s learning cycle (adapted from Gibbs (1988))

For teaching to be most effective we should be aiming to get students around this learning cycle in each session (the learner can enter the cycle at any point). In practice most University teaching sessions focus on theory and practical aspects (doing and concluding) but tend to miss out the planning and reflection aspects. Introducing student led discussions into classes not only introduces the doing, thinking and concluding aspects of Kolb’s learning cycle, but also provides variation in learning and encourages active rather than passive learning – all of which have been shown to increase student learning and understanding (see below for references).

Research has shown that introducing variation in the way a subject is taught which enables a student to view a problem or issue from a number of perspectives can improve student learning (Fazey and
Marton, 2002; Laurillard, 1995; Ueno et al, 1990; Marton and Wenestam, 1988). By introducing this variation, teachers can break what is called the “natural attitude” (Fazey and Marton, 2002) which is the assumption by the learner that what they experience is reality and that everyone else shares the same reality or point of view. Variation can break the “natural attitude” by showing that there are different points of view and that one student’s reality may not necessarily be that of others. A particularly efficient way of breaking the “natural attitude” is by arranging for people to exchange and share views (Fazey and Marton, 2002) – this can be done in a classroom situation by allowing students to discuss ideas and question each other on their understanding of issues.

The term ‘active learning’ has been used to describe different approaches to make a learner take responsibility for their own learning process (Bonwell and Eison, 1991). Several strategies to engage learners in active learning have been described, e.g. working in pairs, using role-play or case studies (Bonwell and Eison, 1991). Discussion in class is one of the most common strategies promoting active learning. If the objectives of a course are to promote long-term retention of information, to motivate students toward further learning, to allow students to apply information in new settings, or to develop students’ thinking skills, then discussion is preferable to lecture (McKeachie et al. 1986). Whilst classroom discussions are a useful tool for promoting active learning often students lack the confidence or desire to participate, therefore methods need to be introduced into the classroom to encourage engagement and interaction amongst students.

There are a number of techniques available to facilitate discussion including rounds (each student speaks in turn); circular interviewing (students ask questions of each other in a round); buzz groups, pairs and triads (small impromptu discussion groups); pyramids (snowball type discussions); syndicates (groups working on parallel tasks); fishbowls (2 circles of chairs, inner circle discusses, outer circle can “tap” to enter inner circle when they want to speak); cross-overs (small group discussion then members re-mixed so one of each original group in new group); poster tours (group works on task on poster, put them on wall then tour other groups posters); debates; brainstorms (free thinking, launching ideas without analysis or discussion); line-ups (students physically arranging themselves in a line based on their views on a controversial issue) and five minutes each way (students take in turn in pairs to talk through an argument without interruption).

These methods may not work with all groups; it will depend on how well the group know each other, the groups previous experience of such activities and how confident they feel in the subject being discussed.

The techniques described in this section (variation in teaching methods, encouraging active learning and engagement and interaction by students) will be used in this teaching intervention to improve student learning and understanding.
2. The Plan – Student lead discussions to provide variation in learning

Background to module and rationale

The intervention will take place in a third year undergraduate Institute of Biological, Environmental and Rural Sciences (IBERS) module entitled The Management and Health of Organic Livestock. The module consists of 9 students from a range of degree schemes within IBERS, including organic agriculture, animal science and general agriculture. Students therefore have a wide range of experience in terms of the content of the module and are all starting from varying degrees of base knowledge. The summative assessment for the module consists of a 3000 word essay and presentation worth 40% of their mark and an examination worth 60%. The module is co-taught with a postgraduate module which differs somewhat in the form of assessment (includes summative essay and group project). The postgraduate students (2) will participate in the process of the intervention but evaluation of the intervention will be confined to the undergraduate module.

The learning outcomes of the module are:

- Discuss the role and integration of livestock in organic farming systems;
- identify the regulations governing organic livestock production in the European Union, and describe the way these regulations are implemented in the UK;
- state the key factors governing forage quality and utilisation and its contribution to livestock nutrition, health and performance;
- assess the suitability of feedstuffs and their combination for optimal health and performance;
- state the key factors governing livestock health, and discuss their application in practice, with particular reference to nutritional deficiencies, fertility, parasites and disease prevention through the use of appropriate management strategies;
- determine appropriate uses of conventional therapeutic medicines, vaccines and alternative/complementary therapies for the control of disease;
- state the key factors governing animal welfare and behaviour, and assess the impact of organic practices with particular reference to housing and health;
- discuss the role of breeding in enhancing productivity and parasite/disease resistance and define appropriate breeding objectives;
- specify appropriate production objectives and management practices for individual livestock species.

The reason this intervention is to be implemented is that the module consists of two 2 hour lecture sessions a week and it is very difficult to not only lecture for this period of time but to maintain student interest and engagement. The intervention is designed to provide variation in the method of learning, to encourage active rather than passive learning and to increase student engagement and interaction.
Toward the end of the semester there are a series of four farm systems lectures (organic beef, sheep, pig and poultry systems) that draw together the various aspects of nutrition, animal health, housing, animal behaviour and organic regulation that have been covered in lectures earlier in the semester. These four sessions lend themselves well to discussion type activities as they highlight key issues that are facing the various industries and students have enough background knowledge to discuss these issues intelligently and offer potential solutions to problems.

**The Steps in the Intervention Plan**

Below are the instructions that were circulated to the students two weeks prior to the start of the intervention. These instructions clearly outline the steps in the intervention.

1. Four farm systems topics (organic beef, sheep, pigs and poultry systems) across four 2 hour lecture slots.
2. Propose 50 minutes lecture on the farm systems topic followed by 50 minutes student led discussion.
3. Two postgraduates work together, rest of the class work in groups of three.
4. Groups allocated to each of one of the four farm system topics.
5. Each group to find one or two (preferably related) short key readings on a current hot issue related to the farm system/animal industry allocated to you – can be to do with any aspect of the system (e.g. markets, certification, production systems, welfare, feeding etc.) and can be controversial. The readings must be submitted to the teacher for approval before wider circulation to the class.
6. Sources may include review articles, popular press articles, Farmers Weekly, internet news articles, short peer reviewed articles.
7. Students are to have article(s) ready for distribution to the rest of the class in the lecture session before the one in which the discussion takes place:
   a. Sheep production needed by 21 November
   b. Beef production needed by 26 November
   c. Poultry production needed by 28 November
   d. Pig production needed by 3 December
8. Alongside the article, groups are to prepare 5 questions on which to base the group discussion. These must be distributed at the same time as the reading(s) and again must be pre-approved by the teacher.
9. The whole class must have read and made some attempt to think about the questions prior to class.
10. In the session, the leading group will give a short introduction of why they chose the article(s), a brief summary of the article and then lead the discussion based on the five questions.
11. Leading group should summarise the key points of the discussion at the end of the session and each class member should identify one key thing they have learned from the discussion or identify their "muddiest point" (for us to try and clarify either in the same session or at the start of the next session).
12. Need to establish group rules on which to base discussion:
   a. All class members to do some preparation

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1 50 minutes is the standard lecture time in IBERS and in RS36620 consists of the lecturer talking, showing slides and photographs, asking questions of the students and offering the students opportunity to question the lecturer.
b. Treat each other with respect (no put downs)
c. It’s ok to make mistakes
d. Others? (for the class to decide)

13. It is up to you in the group to decide how to allocate tasks within the discussion leading group and what techniques you use to get people involved in the discussion. Attached is some material that provides ideas for getting people involved in discussions that may be useful (Appendix 1).

14. The idea of having student lead discussion is to keep them relatively informal. The teacher will be there to answer technical questions you may have and facilitate if necessary but does not intend to be involved in the discussion.

Intended outcomes

- To provide variation in learning
- To encourage active rather than passive learning
- To increase level of student engagement and interaction within the class

Evaluation of the intervention

Examination results will be compared with the 4 previous academic sessions (03/04, 04/05, 05/06 and 06/07) to see if student marks have been influenced at all by the intervention. A teaching intervention involving rounds of formative assessment in relation to essay writing was carried out in the academic year 06/07 (see Teaching Cycle 1), this same process was also undertaken with the 07/08 cohort in addition to the new intervention described here. A comparison of 07/08 and 06/07 results will be particularly interesting therefore.

In addition to the analysis of marks, students were required to answer a short questionnaire on the teaching intervention when they completed their usual module review at the end of the semester. These comments will be presented as part of the evaluation.

3. Progress

Each group were required to submit their articles and questions electronically to lecturer in time for them to be approved and distributed to the rest of the class in the lecture session prior to the discussion. The allowed time for the class to read and digest the articles and think about the discussion questions. The deadlines were as follows:

- Sheep production by 21 November – completed, article on sheep scab in organic production, plus 5 questions.
- Beef production by 26 November – completed, 3 related articles on organic beef markets, plus 5 questions.
- Poultry production by 28 November – completed, article on poultry feed availability and regulations, plus 5 questions.
Pig production by 3 December – completed, articles on organic pig production and regulations and MRSA in conventional pig production, plus 5 questions.

Participation in the discussion of the first two topics was rather limited to a few more confident students. The groups leading the third and fourth discussions were encouraged to use some of the discussion group techniques to stimulate full participation; however neither group did this to great effect. Discussion participation did improve with practice between the first and fourth sessions.

4. Summary of Feedback

Student Feedback on Process

8 of the 9 students in the class responded to the module and intervention evaluation questionnaire, not all students answered all questions.

Q. Did you enjoy the farm systems discussions we had? Please explain why or why not.

- They were good and enjoyable though could be time consuming with other work to do in other modules at the same time. Some marks could be provided to get all group members to participate, some did not.
- Yes, they gave an understanding of issues, make you work in groups and talk out in front of people to build confidence. Also gave view of other peoples opinions.
- Yes, got class participation, made us think about the different systems.
- Yes it increases your understanding of the subject and different rules/standards.
- Yes other peoples experience was interesting
- Yes because the class got closer to the practical management issues of livestock. Sometimes the discussions felt a little forced though.
- They were a bit tortuous at times with the same people contributing each time. Also, I had no prior experience of this of thing and think this should be available in modules prior to my 4th year.

Q. Do you think the farm systems discussions we had were effective at deepening and/or broadening your understanding of issues facing the organic livestock sector? Please explain.

- Did learn a lot but saw that there is a lot more research needed in the organic sector which has a lot of unanswered questions.
- Yes, gave a greater understanding of the problems facing the industry.
- Yes, students brought up different ideas than the lecturer may have thought.
- Yes about different countries and comparing organic and conventional.
- They were really effective in deepening understanding of issues. The idea of finding and researching current affairs for the particular species was enlightening.
- Not very, as too little time was available before them to research the subject and not everybody (too few) participated voluntarily.

Q. Please make suggestions for improving the discussion sessions for increasing your understanding of the organic livestock sector.

- Give some marks for doing them, people may respond better
- Title of discussions may be set by the lecturer so that discussions do not overlap or cover the same subjects.
- Maybe have discussions after every lecture on the lecture topic.
- Each person has 1 issue and 1 question then briefly presents that issue and uses the question to simulate discussion.
- There should be some way of ensuring everybody contributes their thoughts as those students with/without an agricultural background have different valuable experiences.
An analysis of the coursework marks for RS36620 (Figure 1.) indicates that in the intervention year (07/08) both essay and total coursework marks were lower than the previous academic year (06/07) but were similar to previous years (03/04 to 05/06). The presentation marks in 07/08, however, were very similar to 06/07 which were both higher than previous years (especially 03/04 and 05/06).

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The coursework, exam and overall module marks for RS36620 (Figure 2.) show that student performance in 07/08 was not as good as the previous year (06/07) but was on a par with years prior to that (03/04 to 05/06).

5. Evaluation of Student Learning Experience

The intended outcomes for the intervention were:

- To provide variation in learning
- To encourage active rather than passive learning
- To increase level of student engagement and interaction within the class

With respect to the first intended outcome, providing variation in learning, it appears from the students comments that they enjoyed the discussions in the main and several students suggested ways that they might be improved for future use within the class – indicating that they thought such discussions would be useful in future modules. A comment from one student saying that they had never experienced such class discussions before in their degree (they were in their 4th year) indicated that some students are not exposed to much variation in their teaching and learning methods.

Comments from students such as “...The idea of finding and researching current affairs for the particular species was enlightening” indicate that some students at least found the active process of identifying current affairs related to a specific topic, thinking about and generating questions related to the current affairs and leading a class discussion on them particularly stimulating compared with usual methods of teaching on the module such as lectures. Many students found the discussion “interesting” and they said they “improved their understanding” of issues by researching the issue, participating in the discussion and hearing other people’s points of view. There were some comments that not all students participated actively in both the researching and discussion aspects of the intervention and several students suggested that attaching some form of summative assessment to the activity might encourage more people to participate.

The comments from students indicate that for the most part, the level of engagement and interaction in the class was increased by the intervention.

“...they (discussions) gave an understanding of issues, make you work in groups and talk out in from of people to build confidence. Also gave view of other peoples opinions.”

“...other peoples experience was interesting”

However, 2 students felt that the discussions were a bit forced at times and that it was the same students contributing to the discussion every time. None of the groups leading the discussion chose to use the group discussion techniques they were given information on (Appendix 1). One valid suggestion to increase engagement of all students was for each student to identify an issue and related question for
discussion—obviously more time would have to be allocated to discussion but this could easily be accommodated across the whole semester. Most of the suggestions for improvement of the process related to allocating some marks to the task because it was quite time consuming and to encourage everyone to participate. Another suggestion (by 2 students) was to have more direction from the lecturer as to the issues discussed. This directly contradicts the comments of another student who found the process of actually identifying important issues to be a valuable part of the process.

The analysis of marks indicates that in 07/08, the year of the intervention, there was no improvement of marks compared to the years 03/04 to 05/06. Compared to 06/07, the marks in 07/08 were actually slightly worse. Teaching Intervention 1 was carried out in 06/07 and this same intervention was also carried out in 07/08 as well as Teaching Intervention 2 because it appeared to be successful and the students found it useful. In hindsight it may have been better to do only the second teaching intervention as with both interventions the students were exposed to a lot of “new” learning techniques compared to their experiences in other modules and they were perhaps a little overwhelmed. One interesting point that is raised in the analysis is that in both years where teaching interventions take place and the students are engaging and interacting more in class presentation marks are higher than in other years. This could be due to increased levels of confidence gained by the students having to speak in front of the group regularly. This is support by statements such as “...make you work in groups and talk out in front of people to build confidence.” and the fact that anecdotally students have said the presentations are one of the most feared aspects of the module.

6. Implications for Professional Development

Teaching intervention clearly showed benefits to the students in terms providing variation in learning, encouraging active rather than passive learning and increasing student engagement and interaction. Although it was not an intended outcome of the intervention to improved module marks, the analysis of marks indicated that no improvement occurred (with the exception of presentation marks as discussed above). In terms of professional development there are several lessons that can be learned from this intervention:

Allowing for alternative methods of learning such as student lead discussions is appreciated by students who feel it offers them the opportunity to improve their understanding of issues and find out what other members of the class think.

Some students would prefer more direction from the lecturer in choosing issues to discuss whilst others see value in the process of identifying what the issues are. The existing format seems to extend the students more and for that reason is worth using in the future—individual help could perhaps be offered by the lecturer for those that are having trouble.

It was difficult to get the full participation of students in both the issue identification and discussion aspects of the intervention; this was despite the fact that students had been given advice on methods for stimulating group discussion (Appendix 1). Many students felt that allocating marks to the tasks would encourage greater participation—there is potential to do this, perhaps by replacing the existing oral presentation that accounts for a small amount of the coursework mark with a discussion based
exercise. Preferably, the exercises would remain independent of the module mark and perhaps with more practice and confidence building, greater participation can be encouraged. The suggestion of each student coming up with an issue and a discussion question is a good one for getting the entire class to participate and one which is worth experimenting with in the future. The main downside of that option is that the students would not get the opportunity to interact in their group of 3 to identify the issue and come up with the questions – a valuable stage in the process.

It is clear that many of the class had not experienced this type of discussion exercise before and this may have accounted for the difficulties getting full participation. The more exposure that students get to this type of learning activity, the greater confidence they will have and the more they are likely to get out of it. A tutorial on methods for stimulating group discussion, rather than simply handing out notes on the subject, would be very useful for students participating in such discussion exercises in future.

In summary the teaching intervention did achieve its intended objectives of providing variation in learning, encouraging active rather than passive learning and increasing the level of student engagement and interaction within the class. It is clear however that there are modifications, such as those described above, that could be made to improve the students learning experience.

References


Appendix 1 – Group discussion techniques

Below are some ideas for getting people involved in discussions that may be useful. Please feel free to use them if you wish.

Rounds

Involves each student in the group speaking briefly in turn. It works best if the group sits in a circle and the turn passes around the circle. Rounds work well to start a session as it gets everyone speaking before anyone speaks for a second time. This establishes a more balanced pattern of interaction and makes it more likely that individuals will speak again later.

Buzz groups, pairs, triads

Buzz groups are simply small groups of two or three students formed to discuss a topic for a short period. In the pair it is almost impossible for a student to stay silent and one students have spoken “in private” they are much more likely to speak afterwards “in public” in the whole group. Buzz groups are useful to get things going.

Pyramids

Pyramid groups, also known as “snowball” groups, involve students working alone, then in pairs, then in 4’s or 6’s and finally as a whole group in plenary. Working alone gives students time to develop ideas, in pairs students can risk being exploratory and tentative in a way that does not expose them to the whole group. In the 4’s and 6’s is where the real work is done and is an ideal size for good discussion. The plenary allows ideas and concepts to be pooled and summaries to be made.

Syndicates

Two groups (4 to 6) working in parallel on the same issue or task. Tend to be used for task oriented activities rather than simply discussion. Come together in a plenary session at the end to bring ideas together and summarise.

Thought Showers

Involves a group of up to 12 participants launching ideas, initially without discussion, elaboration or criticism, and then going back through the list of ideas generated to see which ones are worth pursuing. You will need a scribe and a flip chart or white board to record ideas. Groups members should then call out ideas but should not elaborate or explain in long sentences at this stage – the group can come back to this later. It is an excellent way of generating material that can then be developed in later discussion. This technique could be used instead of generating the 5 discussion questions beforehand – though it may be an idea to have questions to hand as a back up.