A Selection of Activities from Study Sessions

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For:

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From:
Peer Assisted Learning Facilitators in the courses offered by the Faculty of Biological & Chemical Sciences and the Faculty of Physical Sciences at the University of Queensland:

- Animal Biology (BIOL 1012)
- Molecular & Microbial Biology (BIOL1O14)
- Human Biology (BIOL1O15)
- Ecology & the Environment (BIOL1O16)
- Chemistry 1A (CHEM1O12)
- Chemistry 1B (CHEM1O13)
- Statistical Analysis of Biological Data & Experiments (STAT12O1)

In response to the following request:

Trigger:
“Could you please email me a description of an activity (or more) that you have designed for your students, in as much detail as you can remember, that has worked well. Could you tell us particularly why you consider that it has been a successful learning activity?”
Hope I am not too late..

The activity I liked most and thought it is really beneficial, is writing sets of questions only, with no answers, putting the students into groups (of 4 for example) and letting them write possible multiple choice answers. At the end, I get all sets of questions, put them together, and give each student the whole set and they can answer the questions written by their peers.

Letting them think about the various options around a certain topic is, in my opinion, an excellent way of learning and remembering. They would know exactly what’s wrong and what’s right about it and look at all the facts behind every concept.

I have been doing this since last year and been working really well

Hope that helps:)

Noor

Here’s a typical activity to start or summarize a topic (good for bonding as there are a few categories to choose from)

Get students into a certain amount of small groups (depending on how many topics there are) and ask them to write on butcher paper a summary of a particular topic (e.g. works very well for bonding: quantum numbers, ionic bonding, Lewis structures, wave properties of atoms etc.). Before you send them to work, firstly let them know that EVERYONE has to at least explain one part of their topic (this gets everyone involved in the collating process as they know they are going to have to talk in front of everyone about it), and secondly give each group a question with which to show their application of the knowledge they are summarising (as this is obviously what they have to do in exams and it shows they truly understand if they can explain their method of solving the problems to others). This activity enables those who already are comfortable to practice and check their understanding of the topic, whilst helping those who are unsure, who are thus also benefiting.

Hope this was of some help.

Tim

Hi Valda,

With regards to PASS, I think the most successful PASS activity I’ve been involved with was a small group ‘role-play’ activity. This was designed by Wentzel:

Students were given a small sheet of paper which had a description of a neurological disorder. Once they had identified the disease, in their groups, students adopted a role of either doctor, patient or family member. From these points of view, they acted out a skit to tell the remaining class members: the symptoms, the pathophysiology of the disease, and the available treatments. This activity worked well because it encouraged group discussion and participation. The activity was designed so that it would include all the essential information the students would be required to know. The skits performed were very informative, yet presented in a relaxed manner. I found the students really enjoyed the activity.

Thanks,

Oressia
Hi Valda,

This wasn’t actually an activity that I designed but Wentzel and I used it in one of our sessions because it had been successful in one of Wentzel’s past PASS sessions.

The activity was based on the neuropharmacology lectures the BIOL1015 students had attended. The class was divided into smaller groups which were all given a doctor-patient pharmacist type situation. One group did depression, another did epilepsy and another did Parkinson’s (if you want the exact situations given to the students I can arrange for you to get a copy). The students were given about half an hour to gather information from their lecture notes and textbooks and to formulate a role play.

The resulting sketches were actually quite well done. Most of them went something like this: The patient explained and in some cases demonstrated the symptoms of their disease state, the doctor then diagnosed the condition and explained in lay terms to the patient what was wrong and some of the approaches that could be taken to fix it, then some groups had a pharmacist type character which explained to the patient how the drug that the doctor prescribed works.

I think that this was a particularly valuable learning task because the students were faced with a problem/situation in which they had to figure out what was wrong, explore possible treatments and come up with a therapy and understand how it all works. After they had done this they then had to translate it into terms which any person could understand, which is always a good skill to have. It would also have been beneficial to the others in the class, as they could listen to each other’s role plays and have their lecture material presented to them in a different way. Some of the explanations were really good, I was surprised at the level of understanding and the standard of communication of some of the groups.

Hope it helps

Panayiota

Hi,

Here’s an activity that I did last Sem. (it seemed to have worked quite well)

The group was divided into 3 groups (I think it was about 3-4 students per group). Each group was a different set of questions that consisted of the name of a compound that they had to draw and a draw compound they had to name. The groups were given 5-10 mins to complete the task. Then each group presented their answers to the class. (While they had been working we (leaders) had made sure that they presented the right answer but giving hints).

I think this worked well as an activity because it encouraged the students to work together as a group. The class also got to hear different approaches to the problems. However, I think that it is important that a leader has checked that they work is correct before they present so that the students are not corrected in front of the entire group which could be a embarrassing.

Hope this helps,
Hey Valda,

I’ve been away all weekend, hope it’s not too late.

BIOL1 016
Last week I did an activity based on the assignment topics that involved the entire class and didn’t put anyone in a threatening situation. Basically we went through each topic as a group and those people that were researching the topic gave us background info which I wrote up on the board. As a group, we then went through the pros and cons of the topic and thought about what discourses were effected and effects on the environment. The group as a whole enjoyed yelling ideas out at me while I wrote them up. Everyone participated as each person had researched something and felt they had knowledge enough to contribute. By the end, everyone was giving ideas on topics they hadn’t researched as the critical thinking involved developed.

STAT1 201
Stats is generally hard to make activities for as there is very little learning of definitions and abstract concepts. What works well is setting a task that involves working out the maths and stats of a problem and working through theory as a class. For example, three groups are given data to which they have to do a t-test. All three groups work out different data using the same type of test. Facilitators move through the groups asking appropriate questions and giving advice when asked. With 10 minutes to go, groups are stopped and results pooled on the board. The class then discusses the theory behind the results so that noone is singled out. Usually one group member has already explained to the rest of the group the theory so it’s really just a consolidation activity at the end.

Hope that helps, let me know if you need more info.

alecia

Hi Valda

The Expected Value/Casino Game worked well when I did it last year. I had intended it to be one of three activities to be done on a rotational basis around the room for about 15-20 minutes, but they lasted longer than planned.

It was based on playing Keno (20 numbers written on pieces of paper in a container) with matches instead of money, with someone being the house and having 20 matches to start with, with everyone else having only 10 matches to start with. I provided 5 different styles of Keno, with different costs (# of matches) to enter, different prizes (# of matches) for winning, different penalties for loosing, and different amount of numbers drawn out of the container. I recommended playing 5-10 hands of each (or more depending on time) and asking the question ‘Which game had the best long-run average for a poor Uni student to win rent money?’ and with the formula for the expected value they could work out which worked out better.

It stuck in the minds and helped them understand/remember the Expected Value idea/formula/concept.

It was probably the activity that worked best of all the ones that I did.

Regards

Vicki
Hi Valda,

I have a couple of different things that I do for STAT1 201.

Lab books.
In order to make the most of the pass session, i like to get through 2 labbooks in 1 class. Also students probably find it a better use of their time as well. When there is a big class, the way to get everyone to participate is to have them in small groups. I tend to split the whole group in half and assign a lab book to each group. Within those new groups, they have to split themselves up so that 1/2 can do the title, method, aim and limitations. The other half does the results and discussion. Before they split, they often brainstorm for which dataset to use (often we give them an example of the right kind of thing to use) and then they set to work. This goes on for about 30mm and then i get them to swap lab books and to edit each other’s so that they also have to understand the other lab book. This encourages critical thinking and understanding because they have to really know what they are doing in order to adjust and edit the other group’s work.

After this editing section they give this copy to us and we the email it to everyone else or photocopy it and give it to them the following week. It took a couple of goes to perfect this but it seems to work very well now. The important thing for this activity is to get everyone to participate which can sometimes be hard in large groups.

The second technique i use is when i am covering theory of statistics. Often during my PASS planning we will sort out which things we would like to cover (often 4). It is important that you cover enough material that the quick students don’t get bored, but that it is not too overwhelming for the not so able. For each different concept of theory that we want to cover, i will come up with about 4 specific questions for each topic which they have to answer. These questions cover the important features of that concept. These questions are answered by a small group on butcher’s paper and then presented to the rest of the class. The advantage of doing this is that all of the notes that are made are student generated, with some specific guidance (ie the questions asked). As pass leaders we only step in if they didn’t quite understand something or if they may have misinterpreted something. However, in my experience so far I have not had this problem.

Also when doing theory i will often give out a problem sheet on the theory concepts that we covered in that pass session so that the material that they cover is then put into practice. This reinforces learning and gives them practical experience. It is also a good way to keep the quick students satisfied.

Hope that helps and makes sense. I know i talked to you friday about this. If i think of anything i do, then I’ll let you know.

Cheers, Emma

Hey Valda!

I wasn’t sure whether to email you back the activity, if i send it to someone else just let me know! Hope your weekend is enjoyable!!! Here is the activity:

My partner and I were finding that our PASS students were struggling to learn body structures and details for different animal phylums (namely porifera, cnidaria, nematodes and platyhelminthes) for first year Animal Biology. There were approximately 20 students in our PASS session, so my partner and i split them into four groups of five students. Each group was then given a phylum. The students were told that they had to find out every detail about why their given phylum was
interesting and what made them unique from other phylums. They were then asked to “sell” their phylum to the rest of the class just like a real estate agent was selling a house, by providing interesting snippets of information of that phylum. They had to be persuasive and capture the rest of the class’ attention and encourage them to believe that their phylum really was the most important. My partner was assigned to two groups and I was assigned to the other two groups. We also contributed by having an initial “play off”. We chose two topics such as why second year was harder then third year, or in his case, why third year was harder then second year to demonstrate to the students how they should go about completing this given task.

My partner and I found that this activity was extremely beneficial to the students as they enjoyed it enormously. The students were captivated by our “play off” and they were keen to see if they could provide a debate similar to ours. Many interesting topics came up and the students were very persuasive. Diseases or wounding that these animals provided was one of the key issues discussed. By turning the tedious task of rote learning animal body structures into a debate, or “Real Estate,” the students not only learnt about their phylum, but also learnt about the other phylums as they had to pay attention in order to make appropriate “come-backs” in their debate.

I hope this helps!

Frances

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Hi Valda

One of the most successful activities we conducted was in the form of group work, we took out several key concepts from the lectures of that week and assigned one topic to each group. The groups are then given around 10-15 minutes to discuss the topic amongst themselves with the aid of the leaders, text books, and other materials, this is followed by short presentations from each group (usually with the aid of butcher’s paper) demonstrating to the rest of the class their understanding of their given topic.

Another activity based around a similar structure is to give each group a difficult question to work out. the good thing about these types of activities is to encourage group work, since we are not “tutors” we try to promote the students to work with each other so that they can not only get to know their fellow students, but also learn from each other and share their knowledge. hope that helps:)

Hi Valda

One of the activites for lab book we did was:

Doing this we can run through some of the lecture materials (eg. side by side plot in this case) through lab book activity.

1. We ask the students to pick a set of data they like and we collect data from everyone, eg. number of hours spent on the phone everyday and separate the data into males and females group.
2. (This is more interesting then just heights or give them data or get a data set from textbook and they will get more involved and more interactive.)
3. We ask the students to work in groups and come up with different ways (eg. numerical summary, line graph, histogram, box plot) and ask them to describe the disadvantages and advantages of each way and guide them to use the best way to represent the data.
4. We give the students a few mins to discuss in groups how the lab book should be structured (giving details of intro, results and discussion)
5. Then we combine the students response and put the main points on the blackboard. If they leave out anything we will try to give them some hints of what else they should include, rather then telling them right away.

I think this was a successful activity because firstly getting the students to participate and analyse something that is interesting and concerns them is more interesting. This way they are more motivated to learn. Working in groups will get the students to interact with each other and share ideas, which in turn help them share ideas with us. Getting the students to explore different ways to analyse the data will let them learn outside the square, but still very relevant to the assessments that they need to hand in (lab book)

Valda

Sorry about the late reply, this semester has just been so busy.

Well there is the classic bingo. To set it up I go away and write about 25-30 questions most of which come from the lecture notes and a few others from my knowledge, textbooks and the internet. Then you get them to set up a three by three grid and put a work in each. The questions are them asked and they cross the ones that they know off. The winner gets some candy and then we go through the questions again and get them to tell us the answers. We also usually give them a copy of the sheet to go away with to study latter. The activity is a classic as they all get involved and it encourages them to study there notes if you play it again.

In Ecology we have been getting them to discuss some major issues from lectures and the assignment topics for part of a session. It can be hard some times to get a lot of people to join in but asking people who have not said much to contribute one statement when a fresh topic comes up usually works. This activity seems to work well for Ecology as a lot of the topics seem to have a range of issues involved and it is not just cut and dry eg GM crops, the green house effect and the artesian basin.

Luke

Dear Valda,

An activity that I have found very useful and entertaining is jeopardy. This is especially useful as a revision activity as questions on different modules, in varying levels of difficulty can be set. The students split into teams. Each question is assigned a value 500, 1000, 1500, 2000, 2500 points, from which they can choose. And this is repeated for each topic or module of the course. This gives students an incentive to tackle difficult questions. It also incorporates strategy into the activity which is essential skill in choosing and tackling exam questions.

I have also found the use of visual aids or models effective in teaching processes such as the electron transfer chain/oxidative phosphorylation taught in BIOL1014 or the action of CAMP on lactose production. Using cutouts that stick to the blackboard and getting students to place the complexes in the correct places and follow the actions and changes to these compounds throughout the process. Visualising and acting out the process promotes real understanding rather then simply reproducing the steps listed in the lecture notes.

Jacinta
Hi Valda,

Each week we provide revision worksheets with focus questions from the previous week’s lectures. These include important definitions as well as more conceptual questions. Example questions from this week were:

1. Define a keystone species.
2. Do keystone species always have to be top predators?

We work through these sheets at the beginning of each class so that everyone has the answers written down. Providing revision worksheets has worked well for several reasons: it helps to highlight key points from the lectures that the student’s may have missed, they’re useful for exam revision, and the students like to have something concrete that they can refer to after the PASS session.

This week we used one of the articles that are required reading from the lectures, divided it into parts and had the student’s formulate a summary of each part in groups then present it to the class. I think this worked well because some students learn better when they listen to information than when they read it and this activity accommodates both types of students. It is also something that they would have had to do at home anyway.

Hi

The most effective activity that I have done, to be honest, was simply working through a sheet in class. It usually gets everyone working and I quickly find out what needs explaining. Then I can work through the problem on the board or ask for a volunteer to do it. Other activities involving butchers paper/making posters etc. don’t get a great response and some people don’t participate at all.

I know that’s not very innovative, but in chemistry, where there are less facts to remember and more problem solving, things like “celebrity chemistry concepts” can only go so far.

cheers

Kresten

hi valda:)

One of the best working activities was like so:

After learning about different classification of habitat (i.e. sclerophyll forest, arid zone, woodlands, rangelands etc etc), I compiled a big table summarising all the info into a table - the rows said things like “rainfall, vegetation size, vegetation type, animals”. Then i drew the empty table on the board, and made little cardboard cut-outs (like a blue raindrop that says ‘>50mm’, or a tree that says ‘1 0-20m tall’ or a tree that says ‘palms’ or ‘ferns’ etc etc) and then handed them out randomly. then all the students took their cardboard bits and stuck them in the table, wherever they thought it fits. then as a class we discussed if anything needs swapping around (similar to ‘the price is right’ - that showcase game at the end).

Once we reached a concensus on where everything goes we talked about why each thing belongs there, and pointed out easy to remember patterns etc.

good luck, ;), michael
One of my favourite things we’ve done is splitting the class into small groups and having them answer some questions or explore concepts specific to the course and then presenting it in poster form to the rest of the group. Generally, each group will have a different topic so everyone will have something different to talk about.

I felt it encouraged the students to converse with their peers and establish a working relationship with them, thereby making the session more comfortable for them to learn in.

Also, having them ‘teach’ the others in the group reinforced what they had learnt and also allowed the audience to see a particular topic from another student’s perspective. Having done this activity myself, in PASS sessions as a first-year, I thought oral presentation was particularly helpful in boosting confidence levels.

Overall, I think this activity is deceptively simple but works really well in helping students learn and improving group dynamics.

Regards,

Nina

Probably the exercise that the students and I have enjoyed the most was the game of pictionary conducted last Wednesday. Some of the words provided were basic concepts that the students confirmed they knew via vivid graphical descriptions whereas some concepts were slightly more complex. This exercise highlighted the students understanding of terms and phrases that may have been fleetingly referenced during lectures but not elaborated upon despite them being fundamental concepts to further understanding and learning. The interactive format and casual attitude during this activity made it enjoyable for the students.

Something I just whipped up - is this the kind of thing you are after? feel free to edit at will

gerard

Group Activities
Each week I would chose a critical concept covered in the lecture notes from the previous week and construct a series of questions accompanying this concept. I would also try and throw in an unlabelled diagram or 2 to get the kids thinking My partner would do the same and at the session we would divide the class into 2 groups and discuss the concepts separately. This way the groups are fairly small and on almost a 1-to-i level rather than in the awkward feel of a normal tutorial.

My group would then go through each question and discuss each area of this concept. From this they would generate a list of everything they would need to know on this topic and any queries would be cleared up while the material is still fresh in their minds from the lecture. If the group got stuck on a question, I would show them where in the lecture material this point came from to remind them about what they covered in the lecture and sometimes I would discuss areas of this concept that I have been recently learning in second year to get them interested in different areas of science. The difficult part of these activities was trying to get both groups to cover both critical concepts.

In the first week we tried to get each group to stand up and present their concept to the other group, explaining the major points they must know using diagrams etc. As a PASS student and as a PASS leader I personally have never really been a fan of this “butcher’s paper” method because:

- It freaks some students out to present material to the class
- Some students can’t present topics very well (and that means the other group doesn’t learn this topic as effectively as the f
- Students benefit the most when they are actively researching a topic rather than just listening to another group’s interpretation of the topic
- If all the group’s findings are put on 1 piece of butcher’s paper only 1 person in the group can take home the notes for later review before the exam

From the 3rd week onwards we decided not to use this method and instead used a method that Frances had found worked well in other PASS sessions. The group activities would be structured the same but instead of presenting their findings to the class, each group would construct 5 questions covering all of the major points they had just discussed under this heading. This way the group would go through and analyse the key points they think they must know for this concept and they would ask these questions to the other group.

Before question time, each group would quickly revise the other group’s concept so that they can answer their questions. This way both critical concepts would be covered and the knowledge of both groups would be tested (so they could see what they had just learnt) yet neither group had to present a topic to the class (difficult and ineffective).

Both group exercise sheets would be attached to the back of the homework sheet so that closer to the exam the students could review what they covered in these group exercises. A couple of examples are below:

**Paul’s Group Exercise:**

**Osmosis and the concept of concentration gradients**

Task: As a group, explain using diagrams the concept of osmosis and concentration gradients. The group must discuss this area, address each of the points below and formulate 5 questions for the other group on this topic.

In doing so you must address the following areas:
- Define osmosis
- Explain resting membrane potential
- Explain the reason for this being negative
- Explain how the resting membrane potential is maintained [Hint: explain the function of the Na/r ATPase]
- Explain the rules which determine the transfer of molecules across the phospholipid bi-layer
- Explain passive and active transport in terms of concentration gradients and give examples of each method

One activity I often use is to break the students up into approximately four groups, depending on the session size, then give each group a question. OHT pens and transparencies are provided to each group to answer the question with. After approximately 20 minutes, depending upon the depth and difficulty of the question, the groups are asked to present with the aid of an overhead projector. During these 20 minutes the PASS leaders will ask the students individually or ask the group as a whole, questions relating to their assigned question in order to gain an understanding of their knowledge and provide them with prompts to further explore the question and its concept/concepts. When presenting other students are encouraged to ask questions and the PASS leaders make a point of asking questions to further gauge the understanding of the presenters and provide further information to the students as a whole. The OHTs are then photocopied and distributed to students the following week. This is an improvement over the butcher’s paper strategy as all students are
able to receive a copy of the notes. Also, it encourages students to return the following week to receive the notes.

**Paul’s Group Exercise**

**Action potentials**

**Task:** As a group, you are to research the lecture material and areas of the text book concerning action potentials. The group must then discuss this area, address each of the points below and formulate 5 questions for the other group on this topic.

You must address the following areas:
- What are local potentials? Where on a neuron would they be generated?
- What are 3 examples of local potentials?
- What are depolarising and hyperpolarising local potentials? Why are they called this?? [hyper = greater!!] What ions do they each involve?
- What needs to happen for an action potential to be generated? Where on a neuron does the initiation of an action potential occur?
- Why do we need action potentials rather than just having local potentials?
- What causes local potentials to decay???
- Explain the events of each part of the following diagram and the ions which are moving.

- On the above diagram explain the two refractory periods and why they exist. Is it possible to initiate a new action potential in either of them??
- How does saltatory conduction [of myelination] increase the speed of action potential propagation?

**Quiz Activities**

At the end of each session we would have a quick quiz activity covering the concepts of the last week of lectures. This would put together both of the 2 major concepts from the group activities so both groups are tested on what they had just learnt from the session and what areas they would need to study in the future. The class would remain divided into the 2 groups and a tally would be kept such that the group with the most correct answers would win a bag of lollies to share.

There were a couple of different quizzes we tried but the one the works the best is a “sale of the century” type quiz. The class would be asked questions and to give an answer the students must bang the desk. The quizzes were really versatile as we could put up multi- choice questions on overheads or diagrams on the board or ask for definitions etc.
Other types of quizzes could be

- **Pictionary** [member of the group is given a concept and must explain it on the board without speaking or writing words—just diagrams so that their group can say what the concept was and receive a mark on the tally]

- **Jeopardy** [group would take turns at answering questions from a list under a concept, each question is awarded a different number of points]

**Homework Sheets**

At the end of every session the students would be given a homework sheet of MCQ’s, short answer questions and fill in the diagram style questions that the students could do during the week and bring back for next week. Then at the beginning of the next session the PASS leader would go through the answers for these on the OHP. But the PASS leader would ask the class each question before just revealing the answers.

These were effective because it covered all of the concepts from the last 2 weeks, not just focusing on 1 or 2 concepts. It gave incentive for the students to come back the next week so that they could discuss the answers and ask the PASS leader any queries they have had with the material and while reviewing the answers in the next session it would often open up discussions into the material that often wouldn’t have happened otherwise.