Activity: Student-Created Concept Maps

Activity Type: Small Group work, group presentations

Goals: To show discussion leaders a few techniques for guided concept maps.

Abstract:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have discussion leaders bring lecture notes for last three lectures</td>
<td>0 min</td>
</tr>
<tr>
<td>Groups pick 10 main vocab words on a given topic, write them on index cards</td>
<td>10 min</td>
</tr>
<tr>
<td>Groups go to board and organize cards in map, using markers to form connections</td>
<td>20 min</td>
</tr>
<tr>
<td>Groups describe relationships given in their maps</td>
<td>20 min</td>
</tr>
</tbody>
</table>

Time needed: 50 minutes

Materials needed: lecture notes for discussion leaders, index cards, tape or magnets to attach cards to white boards, dry erase markers for each group

Before class:
1. Look through last week’s lecture notes and choose 3-4 major topics. Suggested topics are:
   a. Cloning a gene
   b. Cloning a tissue
   c. Cloning an organism
2. Create a list of 10 important vocabulary words and concepts for each topic. Have lists available to pass out.

As class begins:

Hi everyone! Today I’m going to show you a technique that is useful for students in group work in your discussion, and is also a tool they can use to study on their own. It’s called concept mapping.

The general philosphy is as follows: (draw a sample map like this one shown). A topic in biology consists of major concepts linked by cause, effect, and mechanism. For instance, if we were going to talk about global warming, we might put that in a box in the center of a board. Then, the major areas of the discussion (evidence, causes, management) would follow from that. We could then focus on the management, or the different types of
evidence, and the characteristics of each. As you can see, building a concept map is a good way to organize lots of information in a way that’s different than the linear method usually presented in a lecture.

Making a concept map from scratch is something that takes practice, so when I introduce it in a discussion I provide a lot of assistance. I’m going to walk you through the steps now, and I’ll mention ways you can adjust the technique as we go along.

1. Introduce concept mapping. Most of your students have never done it before, so they will need a quick introduction. You can use the climate change one I’ve given here, or invent your own on some relevant subject in class (but not a topic that they will be making a map of).

Before I go on to what to do next with your students, do any of you have any questions about the idea of a concept map? No? Okay.

2. Choosing a main topic. Students aren’t very good at figuring out what the main topic is if it crosses more than one lecture, or is within the lecture. Concept maps can be done on a very large scale (covering multiple lectures) or on a small scale (half of one lecture). In discussion, you can talk about how to choose a topic, but you should set up groups and give each group a topic. Again, remember to keep groups small, and you can give more than one group the same topic.

Let’s get into groups right now, and I’m going to assign you topics from lecture. Please move your desks near each other and keep groups at three people or less. Good! Now, here are your topics.

- Cloning a gene
- Cloning a tissue
- Cloning an organism

This is the topic that will go into the middle of your map.

3. The next step is choosing what to make as the main aspects of the topic. If you have the time, you can do this as a small group exercise, where you have students look through their lecture notes on the topic and write down what they think are the three (or so) major aspects of the topic. They can call you over when they are done, and you can check that they picked good ones. Then, they should add 7 more important vocabulary words or concepts to their list.

Or, if time is tight, you can just give them a list of 10 words that already list the 3 main aspects plus important vocabulary words (present the words out of order).

You guys are pretty quicki, though, so why don’t you decide what the best 10 words would be to work with. Do that now, and write the words on these 10 index cards in big letters.

4. In traditional mapping, a person would sit with a piece of paper and start drawing words and arrows. For group work, there is much better involvement if the words are mobile, and can be moved as students change their minds. Have the students write the 10 words on 10 index cards with a thick marker, so the words can be seen across the room. Send groups to the white board with their cards. They will attach the cards onto the board, and should draw
arrows to form links and relationships. Some discussion leaders love to tape small magnets on the back of the index cards, but taping them to the board works also.

I didn’t have magnets, so here is tape. I’ve split the boards into four sections, so each group can go and set up their concept map. Add as many arrows and additional words as you need to thoroughly explain your type of cloning. Also keep in mind how your type of cloning differs from the other two types, so that your map is different than those of the other groups. I’ll give you 10-15 minutes to work on your map. Go!

Good job! While the students are working, it’s a good idea to go from group to group and make sure all the major parts of the topic are being covered. It’s probably also a good idea to keep groups with the same topic separated from each other, so the maps have a chance of being different.

5. As groups finish up, tell them you are going to have them explain their map to the class. I recommend you have all the groups except the first sit down and get out their lecture notes that are relevant to the first map. Then have the first group explain the biology using their map. If you think of good questions to ask, ask the class rather than the presenters. It will keep the class alert and reduce the presentation stress on the students. Then have the next group present, while students look at those lecture notes. If you are out of time, you can also summarize the maps yourself. Point out good connections, point out different-but-good arrangements by groups with the same main topic. If you need to make any corrections, be encouraging about parts that were correct.

6. End by reinforcing that this is a technique that students can use on their own while studying. It is a good way to summarize a single lecture, or a group of lectures on one topic, or even the whole course for a final exam review.

Now, let me get your comments. What aspects of this activity would be good for your particular discussions? What would not work well for you? What learning styles is this good for? Do any of you use something similar when you study?