

Students' presentations as a teaching tool

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Abstract. In an endeavour to increase throughput at the undergraduate level, we constantly search for ways of making learning fun as we emphasize more of concept understanding in our strategies. Traditional teaching style, where the lecturer has been the main figure in the class has been effective to some extent, while other students need variety. In making sure that students are effectively involved with the content of their courses throughout the semester, students presentations were introduced in our module, as a lecturing tool. Students were grouped and prepared in time to look at the specific topic that will be covered in their course. Each group had a specific section to cover, where each member in the group also had an opportunity to present. At the end of the presentations, questions were asked and clarity was given with the aid of a lecturer. Here we present the results of this teaching method based on the comments from the students.

1. Introduction

Teaching and learning happens in many different avenues, with several different considerations. Students can be partners in planning throughout education, whether selecting topics of interest, determining classroom behaviour guidelines, or participating in teaching other students in class. A study conducted by the Australian Council of Learned Academies [1] recommends curriculum reform to engage students in science, technology, engineering and mathematics (STEM) through active learning approaches. Engaging students as partners in education, teaching and learning illustrates how a variety of everyday class activities, curriculum development, personnel management, personal learning plans, can embody meaningful student involvement. This engagement concentrates on students preparing the lesson, presenting the lesson and taking questions from fellow students in class. When students move from a passive role (that is, listening to lectures or watching a demonstration) to an active role (that is, designing experiments or interacting with others), they retain a larger percentage of the material and concepts [2]. That is how meaningful student involvement improves content knowledge and education in general for all students.

Recently, we witnessed the pace of life changing at universities, with students engaging universities on how and what must be in their curriculum. This informs how the pace of life accelerates, the university populations become diverse and the medium of instruction through teaching and learning become more complex, more than ever before. We as lecturers and researchers must equally consider the relevance of our teaching methodology and what our students need to learn, how they must learn to prepare themselves for the future ahead. It is time that we count on our students among those with authority to participate both in the teaching and learning of their education. One of the very realistic challenges to engaging students in throughput improvement is identifying their motivation for participating. Some students might participate in lesson planning activities simply to earn credits or pleasing the lecturer. Whatever their reason for participating is, when activities meet the characteristics of meaningful student involvement, any student can experience the benefits of meaningful involvement. Meaningful student

involvement engages students as lesson planners by ensuring that they know what, how, why, where, when and how effectively they are learning from the teaching activities they undertake. This includes students co-creating lesson designs, or other activities that build upon their prior knowledge, ideas, opinions and the execution of their planned lessons. We must share the powers we have in our courses or modules with our students by involving them in the teaching of their classmates. Through teaching classmates, every student in the module can have opportunities to positively participate in, gain insight and becomes a master of the content taught and affect throughout positively.

2. Methodology

2.1. The data was collected from the physics second years of four year program life sciences (PHYL3E1) students. This data was collected using the google forms in the form of questionnaires. Students were given the questionnaires to answer out of class and were given only one opportunity to answer. The class consisted of 21 students and only 11 student participated in the questionnaires. Open-ended 11 questionnaires were given to students at the end of the module for this study.

2.2. PLACES FOR STUDENTS AS LESSON PLANNERS

Places in class that can engage students as educational lesson planners include:

- **Outside Classrooms:** Students co-design their lesson plans amongst group partners; create project-based learning opportunities for themselves and their peers; and set personal learning goals.
- **Classroom:** Students present their specific sections in front of everyone and take questions as a team.
- **Administration:** Lecturer is involved in administrating the execution/participation of all students as per schedule and provide marks.
- **Culture:** Lecturer and students co-create classroom behavior standards; lecturer participate in professional development settings to learn student/lecturer partnership activities.

3. Discussion and Results

In the following subsections, we present the results of students' answers to the general aspects of the physics module for some of the questions. In each case, we present the most common answers and their reasoning. Then we describe in detail how students reflected in the student meaningful involvement through their explanations.

3.1.1. Content

3.1.1.1 *Briefly discuss your experience of the theoretical sessions of this module you had this semester PHYL3E1.*

We used this question to analyze students' experiences of the theoretical aspects of the module. Students were asked to provide their own experiences and explain any challenges they encountered. To answer this question students are expected to share their experiences openly. Some of the answerers given are as follows:

i. The theoretical sessions have been productive as we were exposed to more insight with regards to each topic we did in class. The videos, sketches and derivations were thoroughly explained by the lecturer and the presentation task for chapter 24 was fun and informative. Hence they brought more interest in the subject and improved the results.

ii. *PHYL3E1 was a great module for this semester, since we had a good lecture who explained things for us more thoroughly she also had many exercises for us to practice with and she also made sure that we understood everything and the tutor also helped us understand things we didn't quite understand in class, so overall I got to understand and enjoy PHYL3E1 this semester.*

iii. *It was a very pleasant and helpful experience because in every section, it got into details. It gave courage to go deeper and find more information on our own. This was a module that could be easily understandable when giving some little of the time in life.*

iv. *The theoretical session allowed us to participate in the section discussed in class to have better understanding. Most students indicated that they enjoyed the module and their physics understanding has improved. They acknowledged the experience gained from their lecture during class interaction.*

3.1.1.2 *Do you think the content learnt in this module will help you in your career, involving life sciences? Support your answer.*

We used this question to determine if students appreciated the content learnt in this module. Students are asked to indicate if the module will help them in their other subjects/modules and generally in their life science career. Some of the answers given are as follows:

i. *Yes, due to the problems we were exposed to, problem-solving skills were better established and improved which is a requirement in the career of life sciences. Being able to work in a group, discuss and share thoughts and ideas will come in handy in the near future. Further-more, being able to present your findings after thorough research and experiments, one will be eligible to attain more knowledge and better working skills in the world of work.*

ii. *Yes, because it have life sciences inside which goes with my career. Physics for life sciences help me to correlate the two and how physics comes in to life science and the important of it. Especially the x-ray chapter.*

iii. *Yes because as a life science student, I need to understand everything concerning our lives. So with this module there are more concepts involving life sciences, which in turn will be easy in future. Looking at concepts like "work and heat for non-mechanical systems", there is a section where it tells about how work is done in the lungs, which help understand that even in our body work is done.*

iv. *Yes, because some of the topics we did in physics, we do them in other modules such as in chemistry and it will also help us apply for other careers that involve physics.*

All students indicated that they enjoyed the module and their physics understanding has improved and most importantly doing the presentations on their own was helpful.

3.1.1.3 *Given a chance to contribute to this course/module, how would you prefer to be like, what would you add or subtract?*

We used this question to determine if students would like to contribute towards formulating more relevant topics to the module or are they satisfied with the content of the module. Some of the answers given are as follows:

i. *I would introduce more group work after classes to help students who need extra help with regards to any topic they are struggling with. Students should have science excursions which will inspire them to do more than just being in class by simply going to experts in the module which they are doing and asking questions. I would subtract late classes as students fail to attend them due to transport problems.*

ii. *I think they should allow for more presentations, allow students to do some research so they can learn from the lecturer and from each other*

iii. *Every chapter have to have presentation because it developed our mind and allows me to think large and asking questions why is it so and try to get more information to understand better.*

iv. *I would change nothing. The content is good.*

v. *Honestly speaking I would appreciate if we did practicals that were relevant to our module, for example do a practical on X-rays. Perhaps if we did practicals that were related to our module we would be able to pass the theoretical sessions.*

Most students enjoyed the introduction of the presentation in the module and they would like to have more of the presentations for other topics. All students indicated that they enjoyed the module and their physics understanding has improved and most importantly doing the presentations on their own. Some students stated that they will leave the module content as is and some advocates slight changes (e.g. group work, science excursions and e presentations).

3.1.1.4 Which section did you enjoy the most in this module? Support your answer.

We used this question to determine if there is a specific or sections students enjoyed in this module. Students are asked to provide the section they enjoyed and support their choice or answer To answer this question students are expected to share openly what are they enjoyed in this module. Some of the answers given are as follows:

i. *I enjoyed the X-ray topic because I was able to learn about what really happens when you perform an X-ray to a person. I was able to learn about the people who came with the X-ray theory for example Compton. Even the presentations made the topic to be phenomenal.*

ii. *Presentation, because we had the chance to do research on our own and also present to our classmates.*

iii. *Chapter 24, X-rays because I did not only learn about X-rays but I got experience as well from the presentation*

iv. *X-ray part, because it was the one that we were presenting and I learnt most of the thing I have never heard about before. I've learnt how to generate x-rays and which method do I have to consider in order to generate x-ray. That presentation it was more effective.*

v. *The section of x-rays because it made us work on our own. It made us explore and find more information than those we would have learnt in class, for example: in the text-book only two types of doses where discussed but after the investigation it was found that there are three types of doses.*

All students indicated positive rewards from the presentations of the X-ray section. The presentations helped them to do research on their own and learned a lot through this exercise. They also mentioned the real life experiences and relevance of their presentation as a learning curve.

3.1.1.5 What was your experience of students' presentations?

We used this question to determine if students experienced the presentations as enhancing their theoretical contented knowledge for this module. Students are asked to provide their own experiences and explain any challenges they encountered.

i. *The experience was great because students were amazing. They were on point with the presentation and it proved that they prepared for the presentation.*

ii. *My experience with the presentations were really good because I got to work with new people and they were dedicated with their work and we had a good presentation even though standing in front of people can be really scary.*

iii. *I've realized that presentation gave us courage to work independently without lecture's help. It also help us build our self-confidence, helping us to be able to stand in front of people without any fright, which prepare us well for the future, and lastly it helped us realize that time is a very precious thing to be respected.*

iv. *It was a great experience, I was very nervous but I got all the support therefore I think I learnt a lot from my group members and peers.*

All students had a positive experience with the presentation of the section in X-ray, since this helped them to appreciate working in groups. They acknowledge that they learned a lot form each other through the research on the topic and the courage to work independently without lecturers help. Their self-confidence was built through presenting in front of the classmates and this prepares them well for the future work environment.

3.1.1.6 What did you learn from the preparation of the presentations? Support your answer.

We used this question to analyze students' experiences of the preparation of the presentation. Students are asked to provide their own experiences and explain any challenges they encountered. Some of the answers:

- i. *I learnt about on how to make your power point slide look beautiful and grab the listeners' attention. I learnt about dressing properly for presentations. I learnt about how to keep your listeners' attention. Lastly I learnt about the subheadings under the X-ray, learning about radiation dose, generating of X-rays, Compton scattering and photoelectric effect in detail. Learning in detail helped me to be able to understand the concept better.*
- ii. *Working as a united group yields excellent results and improves one's group-working skills.*
- iii. *I learnt more content of the topic because of the different understandings and opinions, understood why groups make better decisions than individuals and also got an insight to real working world.*
- iv. *That working together let you know other people's wonderful ideas because students have many different ideas which together are really amazing. The other thing is self-respect to each other.*
- v. *I have learnt that time, work is very important and that if you prepare early you can actually do good when you present.*

It is very interesting to learn that through this approach, students learnt more than physics concepts. Tools like time management, presentation preparation, communication to your peers at a broader level, team work, all of which are important life skills that every student will need even in work environment. In science fields, it is very crucial that every finding be communicated properly to others, whether to the superiors and in conferences.

3.1.1.7 How did you manage team work, (with your co-presenters)?

We used this question to determine how students experienced or managed working as a team. Students are asked to provide their own experiences when working with a team and explain any challenges they encountered. Some of the answers given are as follows:

- i. *The team work was great, actually excellent because the people I worked with are dedicated with school work and only want the best for everyone. I was able to manage team work because we were able to listen to each other and put our differences aside. Having the same mission also helped us, the mission was to kill the presentation.*
- ii. *We sub-divided the topic into sub-topics in which one person would present about a certain sub-topic and the other will follow up on what the previous presenter was presenting on. This helped us to identify our roles and minimize lack of preparation and enhance presenting skills.*
- iii. *Since all of my group members were my friends, we actually tried balancing ourselves out since we knew each others weaknesses and strength and we also did the work in time and worked together very easily.*
- iv. *we assigned each one of us with a different role, we did not interfere with each others work but we listened, respected, corrected and supported one another.*
- v. *With patience, dedication and love of what I was doing. Working with other students was very hard but also wonderful, it only needs perseverance. I made it also by listening and giving my group members time to tell their opinion.*

Working in a group allowed students to be free in voicing out their opinions as well as to ask freely without intimidation from the lecturer. The sharing of ideas, and the allowance of everyone's input made them learn that it's important to work as a collective and accept other unconditionally. Students learnt to trust one another, with regards to the outcome that was going to benefit each and every one of them. Patience and interpersonal understanding is greatly achieved as well.

3.1.1.8 Was it better to learn from the peers than from the lecturer? Support your answer.

- i. *Yes it was because peers are not strictly formal and I was able to ask them questions because I feel comfortable speaking to a peer than a lecturer.*
- ii. *Yes- From my peers, I learnt a lot of things that I did not know and that they researched and came up with facts and explained some diagrams effectively. No! Some of the things my peers could not really explain and*

needed a lecturer's clarification and some of the things that were in the sections of the topic were never researched and needed the lecturer to explain them.

iii. Yes, because we have similar level of understanding so everything was in simple terms

iv. No, I think it wasn't because with peers when you don't understand a certain topic they'll never explain that topic to your level of understanding but their own, and at the end they'll end up saying, "I don't know how to explain then". Peers doesn't give information the way you feel they must, they often become impatient.

v. Lecturer, because one can ask questions immediately if there's confusion.

From these responses it is learnt that among students there are those who are unable to participate in the class, not because they don't know, but simply because they are intimidated to participate in the class. Others are not comfortable to talk to the lecturer and or in the presence of the lecturer. Having such approaches allows such students to feel part of the group as they freely participate in learning amongst their peers. Whilst, others seem to be adjusting well with learning from peers, there is also a challenge that should always be monitored, that is, the introduction of misconceptions as students try to explain to one another. While learning from peers is good, some of the students might be lost in the midst learning from each other.

3.1.1.9 Do you think more of students' presentations should be done in the future?

i. Yes, these presentations improve presenting skills and train one to be confident, audible and best at presenting. The feedback from the lecturer helps students to note their weaknesses and strengths and enables them to work on them more often.

ii. Yes, but for their own benefits and not for the listeners, this presentation gives students self-esteem and helping them for their future career.

iii. Yes, they benefit the students in significant ways

From students' responses it is evident that students prefer this kind of learning process as it has proven to be more efficient for most of them. As it allows freedom in learning of most of them, it is highly recommended that the method be used frequently in the curriculum.

4. Conclusion

Students' presentations of the content reveal that it could be used a tool for teaching and learning. Working in a group allowed students to be free in voicing out their opinions as well as to ask freely without intimidation from the lecturer. Students learnt more than physics concepts. Tools like time management, presentation preparation, communication to their peers at a broader level, team work, all of which are important life skills that every student will need even in work environment. They acknowledge that they learned a lot from each other through the research on the topic and the courage to work independently without lecturers help.

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References

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