

Intern Physics Teacher at Allerton High School

Introduction

Throughout my time at university I have always tried to think ahead. Thus, I have undertaken numerous internships in pursuit of my next steps in starting a career. I have chosen to undergo an internship with the Ogden Trust as I believe that teaching is a rewarding job. The sense of service to the community is enticing, as well as inspiring the younger generation to pursue a subject that I, myself, am passionate and enthusiastic about.

During my short internship I have been in several classes covering many classes ranging from psychology to physics as well as different year groups from year 7 to sixth form. Myself and my supervisor, Mr. Allcock, have agreed that this was the best method to which to get the most out of this internship. By utilising my time as such, I was able to observe several teaching styles to several audiences. I believe this gave me a better idea of the day-to-day of a true science teacher, as a secondary science teacher will not only teach one specialised subject.

Throughout my internship I have been able to take part and observe several activities such as sport day, field trip, science practical, etc. Throughout this short essay I will endeavour to address some of the scenarios I have been faced or observed.

Field trip to the University of Leeds

During my internship, I was delighted to find that on the first day I was accompanying a handful of year 8 pupils to the University of Leeds to participate in an Institute of Physics workshop (IoP). The workshop was designed to train the year 8 pupils to demonstrate a series of small experiments which they may demonstrate to their local primary school in their area. One of the main goals of this workshop was to void the reoccurring stereotypes of females in STEM related subjects such as physics.

Several schools participated in this workshop from all over West Yorkshire. The pupils were dominated by girls. My role throughout this event was to be a mentor, a person who talks through the science of the demonstrations and to encourage the pupils to participate. The person leading the workshop had mixed up the children and put them in smaller mentor groups to take them out of their friendship groups. Though pupils were hesitant to engage each other at the beginning, the pupils soon broke this "barrier". Though the pupils were out of their friendship groups, there was another problem with dominance within each mentor group; within my mentor group there were one or two pupils who were more hesitant to participate. This was not related to them being shy but rather because they felt less capable in adding to the conversations. I have also observed this with the other mentor groups. Many of the other mentors have resolved this problem by simply talking to the individuals and talking them through some simple ideas behind the demonstrations.

Routine and Repetition

As I have stated earlier, I have been in a variety of science classes. I have observed in many of the classes that there are key things that remain constant. For instance, at the start of the class the teacher always expects the student to do the following:

- Planner and equipment out
- Lesson title and date to be written in their note book
- Start the starter activity whilst the register is being taken

In some instances, the starter may be to list and define some key words from the previous lesson, this repetition tests the recollection of the pupils and firmly imbeds the information in their brains. This routine across the all science classes helps the teachers get the lesson “rolling”.

A routine was also observed when the pupils undertook an end of unit test. Upon receiving the result of the test, the pupils are expected to do, what is called, PINS (Positive, Improvements and Next Steps). With this the pupils can see which topics where they excelled (Positives) and topics where they did not (Improvement and Next Steps). The teacher will allow the students to time to does their next steps. This was the done such that the pupils may work independently. This was done in all the classes across all of science classes.

Though out the one-hour lesson time, there will be one or two lesson objectives. The objective will usually be a simple concept for example “static electricity”. The teacher will introduce this simple concept and the for the remainder of the lesson, repetitions of this concept have been discussed in context of everyday scenario. Furthering the understanding of the concepts.

Resources

In several classes I have observed that the many of the power point used are recycled by different teachers teaching different classes. I later found out the lessons are created by one teacher. A teacher will gather resources and devise activities and will design the flow of the lesson just as he or she will teach that subject. The other teachers will then use the same lesson as it was made or will add or subtract certain sections.

In many of the lessons I have noticed that the teachers will hand out sheets with power point slides on them. There are missing words so that the pupils will have to fill them in. speaking to some of the teachers does this such that the students are not pressured to writing notes and are able to participate in the class discussion.

On many of the lesson the pupils are shown videos related to topic there are learning. The use of videos in class are a great way to reward the pupils as well giving the lesson a good break. Some teachers use videos as time spacers. By this I mean that if the lesson is going faster than expected the videos are used to be able to buy some time such that the student is somewhat occupied.

Class Discussion Positive Reinforcement

It is helpful for teachers guide the thinking process of the children. A teacher standing on the front of the class dictating information to the class would be less effective to the learning of the pupils. When teaching a new topic, the teacher will normally state some facts. Then they will build on this idea by having a class discussion. The teacher will guide the conversation by asking the relevant questions. For example, in biology beginning the topic of food chains and food webs the teacher might start with the statement; “A food chain is a series of organism which are dependent on the previous as a source of food” then start a discussion by initiating the beginning a food chain.

As the discussions elapsed the teacher will add further to the topic by introducing key words and more complex ideas. For some of the majority of the lesson the build-up of the concept is primarily based on the inputs of the pupils. By the teachers structuring questions such as “If ... then what do we think will happen to the...?” the pupils are essentially doing guess work. However, the conversation could be guided by the directly stating whether the student was factually correct or otherwise. When the student is factually correct the teacher will give a complement to the pupil as a sort of positive reinforcement. I have found that positive reenrolment is one of the key tools used by teachers. This method not only develops the confidence of the pupils to learning but also encourages the pupils to actively participate.

Positive reinforcement is also seen in other ways. For example, when doing PINS the teacher will always have iPads or laptops to help research the “next steps”. With student obtaining higher than 80% the task will be minimal and so the remainder of the lesson the pupils may enjoy free time of the laptop or iPad. Another example is the end of year meal for pupils who really excelled throughout the year. There are many other examples of such positive reinforcements.

Practical Lesson

Practical lessons make lessons more interesting. It allows students to observe first-hand how concepts which are being taught in class manifest in real life. The lesson will start by introducing the concept they are studying. The experiment will then be explained to the pupils and a discussion on the hypothesis is done. A practical set up will be demonstrated with special emphasis on the safety precautions required. As with anything we do, the priority is the safety of ourselves and of the people around us; so where possible the teacher will minimise the amount of danger associated with the experiment such as handling chemicals etc.

In many cases the hypothesis was not thoroughly discussed such that the pupils blindly collected data. By blindly taking data the students did not take initiative to check whether the experimental set up/ methodology was correct, leading to false or unusable data. In any case the teacher provided suitable data for the student to interpret. Though I think this is not the best way to learn, a few minutes discussing the hypothesis and things which may cause a bad set of data would further the understanding of the pupils.

Controlling a Lesson

There are a few methods of controlling the class. From my observation the best way to control a class is to create some sort of connection with the pupils. This obviously has some limitations for examples it would not work well with year 7's simply because this connection will not have evolved compared to a class of year 13's. Viewing how a teacher would handle year 7 class in comparison to year 13 the teacher would clearly be less strict to the year 13's even though they are as chatty as the year 7's. However, it is also evident that older classes respond to “commands” better than classes of lower years. The school has behaviour protocols which are used in class for any student behaving badly and/or not producing sufficient work. The protocol follows the standard protocols found in other schools such as written and verbal warnings, detentions etc. This again is used far more in lower years.

I have observed that when a teacher is stern but fair to the student this builds a trust with the student. This sort of trust can be seen when a guest takes over a class. When then the teacher holds such a trust the students are far more well behaved in comparison to a class of the same year and same guest where the teacher/pupils trust is not as good.

Generally, on a typical day of lessons, there are times throughout the day where the pupils are more behaved than others. Typically, the students are more behaved at the start of the day and lesson so by the final lesson. It is also observed that they are quite chatty the lessons following lunch and break. In most cases this is because they want to finish the conversation they were having during their break / lunch. This is something which cannot be avoided, however, many teachers recognise that shouting or other form of attempt to directly silence the entire class will cause more harm than good. Many teachers will set a simple task for the pupils to do and then take the time to go table by table “checking up”.

Teaching (My) Lesson

I have negotiated a lesson to teach a year 13 physics class. The subject was thermal physics and the objective was to experimentally obtain the temperature of a Bunsen burner. I used the resources which the usual teacher would have used. This is for ease of work for myself as well as maintaining

the teaching style they are a custom to. I presented my lesson on the last teaching day of the academic year which allowed me to observe this teaching style and allowed me to build up a relationship with the students.

I started the lesson discussing some concept of thermal physics such as specific heat. I then proceeded starting a discussion on how we might use the equipment to determine the temperature of the Bunsen burner. Allowing them to work out a method by themselves will embed the ideas associated with the practical more than just simply stating facts. I spent the first half of the lesson discussing the relevant equation for the experiment and

Since there are some dangerous aspects to the experiment it was imperative that they read the methodology carefully. To ensure that this is done carefully I have shown the methods on the board and asked the students to read the bullet points one after the other. I then demonstrated the experimental set up and put special emphasis on the relevant safety precautions. Since the experimental procedures are relatively quick; I was able to gather everyone again to discuss the flaws within the experiment. And with the suggested improvements, from the discussion, they repeated the experiment.

Overall, I think the lesson went well. The student seems to have engaged well with the content and though the results of the experiment did not come close to the expected value, the students could explain the flaws within the experiment. The experiments went well and nobody got hurt throughout the process.

Careers talk

For my careers talk, I took inspiration from a series of workshops from Connect. I have presented this series of workshops before to year 8s in a different school. One of the workshops was to introduce what jobs you could get from a physics degree. I started the workshop with how brainstorming in pairs ideas on how to get a job. I then proceeded with introducing the concept of recruitment agency. In groups of 5/6 each team received a team name and multiple CV's. I would then suggest a vacancy in a company and the individual groups will look through the CVs and suggest a candidate for job opening. A JavaScript then gives each team a score based on the candidate they put forward. This activity is aimed to give the pupils an idea what jobs are available with a physics degree (as all the candidates have physics degrees).

I did this with year 10s the students were chatty, and I found it hard to control them. But I think that the workshop was received very well. After I restructured the workshop I presented again with year 11. This time I included more content from what I did in my degree, what internships I did and my study abroad. I thought it was also nice to include where my friends from my course are doing now and what graduate jobs they got into. I think it was better than the previous workshop with year 10s as it was more personal, and it was more of a conversation with the class rather than simply presenting.

Conclusion

Looking back, I think I have learnt a lot about teaching science. It has a lot more difficulty than what I have thought it would, but I think I have enjoyed it more than I thought I would. I take a sense of satisfaction when a student understands the scientific concepts and I felt somewhat responsible for inspiring a number of them. I would like to give a thank you to Allerton High School for having me and a special thank you to the science department for making me feel welcome. I would also so like to explicitly thank Mr. Allcock for having supervised me and mentoring me throughout the weeks.