Understanding the human body: The effect of drugs

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It was a new subject, Understanding the Human Body. It was the first year of Science being an elective subject at year 10. The courses had all been rewritten and this was one that had to be written from scratch. The year 10 students had never attempted school assessed coursework where there was a prescribed time limit and where group and individual work was to be completed. This group had not performed any data logging activities before so there was part of the task that was a new technology to them. I was attempting to make the course exciting and relevant to their lives and to relate the classroom experience to effects on their own bodies. If the courses did not work students could now vote with their feet and there would be fewer classes in the following year. The pressure was on.

The week before the task

While I had an outline of our new course the context in which the topics were going to be taught was largely dependent on the time factor - time for preparation, time to prepare for effective learning and ultimately what could realistically be done. I was starting the topic on drugs and their effect on the human body but I did not want to base it on worksheets, research and the fear factor. I wanted something that would leave the students thinking about the effects of drug taking and the effect it could have on their bodies rather than my own thoughts and knowledge on the subject. I thought an effective method would be to get students to experience the effect of drugs on themselves but how was I going to present the effect of drugs on the human body using an experiential approach to the topic? I settled on the effects of caffeine on humans, specifically the heart.

I prepared the students by asking a series of open ended questions towards the end of a lesson to give the task they were doing in the next week some relevance and context:

“What is caffeine?”

“Where is it found?”

“What effects does it have on the human body?”

“Why are we going to be testing it in this class?”

“Choose your partner and choose your drink so that I can have them ready for next week.”

They got quite excited when I told them that they could order a caffeinated drink to use in the experiment.

“You will have to utilise your class time effectively to complete the task as you will only have 4 (45 minute) lessons to complete the task. You will be able to work in groups during the practical component but must complete all other tasks by yourself. I will help you with instruction but I will not tell you any answers.”

Little did they know that I had not made up the task and nothing had been committed to paper; what was I doing? No pressure!

Before the task the students had completed most of the unit on the heart and heart disease. The task required at least 7 computers set up in the classroom. There were 2 heart datalogging stations and one ECG measuring station. The set up took over two hours as computers needed to be moved from several
rooms. Four other computers were assigned for research using a specific web address. Students were also required to read and comprehend part of the document as there was no teacher instruction as to the background for ECG. Basically, students were on their own. I was simply going to be in the classroom for any technical difficulties. This had all the warning signs of a disaster - new technology that had not been used, 4 different tasks going on in the one classroom, group and individual work, a topic that had not been ‘taught’, an assessment technique that was being used for the first time and a large number of students drinking Coke or Red Bull.

The task

The students entered the room - computers and datalogging equipment were set up, drinks were out and the task was on their tables. The first question:

“So you really got the drinks we asked for Mr Eason?”

“Yes.” I replied. “But there were moments when I thought about ditching the whole task - especially the seven hours it took to research, type up and set up,” I thought to myself.

I gave students the basic outline of what was required:

“There are 4 tasks on the sheet which you will have to perform over 4 lessons. Task 1: complete the background comprehension questions on caffeine and the ECG from the sheet. Task 2: Using the datalogging equipment, determine heart rate before and after consuming a caffeinated drink. Task 3: Using the datalogging equipment, determine the ECG pattern of the heart before and after consuming caffeinated drinks. The work will be submitted at the end of each lesson so you need to time yourselves accordingly.”

I showed the students the various work stations and explained to them that there were full instructions for the technology and that I could give them a hand if they got stuck. I expected some comments about the fact that I was not teaching them, or the inevitable, “where do I start?”, but there was little disquiet. The students, naturally, wanted to launch straight into the caffeinated drinks until I explained that all had to complete the first 2 questions on caffeine to understand what they were drinking. This was an easy task and had the effect of settling them down. Groups were then assigned numbers as to when they could do the datalogging. Other groups could work at their own pace through the task. I reminded students that they may have to interrupt their schedule as machines became available and that time management was critical.

After the initial comprehension task the first few groups came up to begin the datalogging exercise. Attached to the ECG was the data projector so that the entire class could see the ECG of those being tested. While this could have been viewed as distracting it was an essential part of the exercise as each class member was engaged in the task at all times and I made it clear that they could make comments as to what was happening at any time. Here was where I thought I could have real problems - 3 groups using technology for the first time at the same time without instruction.

I need not have bothered - many of the students intuitively worked through the software without even referring to the instructions. The first ECG came up on the data projector - all the students stopped and watched and asked questions - I had to hold myself back as I could not answer any of the questions on the task. The students were interested and very keen to get their turn at the caffeinated drink. The first lot of students put up their results on the data projector starting with Jason.

Jason's normal ECG came up like this:
Then they compared it to his ECG after drinking red bull, which looked like this:

The results for Jason started the questions:

“What has happened to his heart?”

“Why is the top of that wave shorter?”

I didn’t answer them but I did tell them that their research on the internet would help as well as the comprehension tasks. The students were interested and eager to complete the work. I wondered:

“Can this be sustained for 4 lessons?”

There were a number of questions asked by the students, particularly in the first lesson. Typical of the questions were:

“Where do I find this answer?”

“How am I expected to know this?”

“How do I describe a graph?”

Some of the questions pertained to the terminology used in the comprehension task so I needed to make it a little more readable for this year level. What surprised me though was the way students were able to manage their time with the majority completing the task within the prescribed time limit. The number of questions decreased markedly after the first lesson as students grasped what was required; however, I
constantly reminded them about the need to plan their time and where they should be up to at various stages.

Students wanted to view many of their classmates’ results which were emailed to me and so I did a further presentation showing examples of students who normally drank a lot of caffeinated drinks compared to those who didn’t.

“What does this tell you about drug taking and the effect on the body?”

“What would a person who is a regular drug user require a greater hit than those that aren’t?”

“How does the evidence support this?”

**Four years later**

I was in the University library doing some research when I heard a couple of familiar voices:

“Easo how are you? What are you doing here?”

“A little bit of research,” I replied.

The two girls were from that very class and were now studying nursing.

“You know John I still remember Anna's results from that ECG prac we did with you that time.”

“Do you remember her heart rate going right up after drinking the coke and remember that was only her second drink of coke ever?”