

FE.22 Evaluation of the effectiveness of a series of digitised video clips as a teaching aid

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Background

I teach Science to Access students at Sandwell College. Our students tend to be motivated mature students who are attempting to gain entry to Higher Education by developing their study skills without having to undergo a traditional A level route which may be neither academically necessary, nor appropriate to their current circumstances

Whilst much of Access Science teaching concerns 'Theory', a large proportion of it involves 'Practical Work', either as a series of demonstrations by the lecturer, or work by the students, as individuals or in small groups. If a student misses a piece of theory work, s/he can be given the appropriate handouts and coursework exercises, and be asked to 'read about it' and so 'catch up' at home or in the library.

However, if a piece of practical work is missed, it is much more difficult to 'catch up', since it cannot be done at home (because of lack of specialised equipment and the absence of specialised supervision needed for Health and Safety reasons).

It was decided at Sandwell College to investigate the possibility of producing short video clips of relevant demonstrations and student practical work, so that, whilst the student could not acquire skills from performing the work themselves, they could at least see the specialised techniques needed, together with an appreciation (albeit somewhat superficial) of how specific pieces of machinery or scientific instruments were constructed and operated.

The idea was that the students could take a copy of the digitised video clip from their lecturer, in the form of a Windows media file, and load the file(s) onto a Flash Memory Stick. They could then play back the clip(s) either on their home computer, or in the college Learning Resource Centre. This method of storage would be necessary since the usual floppy disks have a maximum capacity of 1.44 MB, but the video clips (even the smallest) were likely to be at least two or three times this size. If several clips were produced, they could possibly be 'burned' onto a CD or DVD, and given to the students in this form. Perhaps students could be given the CD/DVD at the start of the course, rather than waiting until they had a period of absence from college.

It must be emphasised that this idea was purely to help overcome a student's absence from college - it was not intended to be part of an open learning course. Although it is possible for students to learn some scientific theories and concepts via open learning, it obviously would not be possible for them to acquire practical skills and operate sophisticated scientific instruments in their home environment. This initiative was directed towards Access students who may be highly motivated, but whose current social and domestic responsibilities often make it difficult to attend all classes.

Developing the Project

The Science part of the Access to Higher Education course at Sandwell College comprises six different Science units, namely Biology, Chemistry, Physics, Practical Project, Genetics and Environmental Science.

As a starting point, it was decided to make two or three video clips for each subject, with more produced later, if successful and if time and other resources permitted. As an indication of the topics to be videoed, the following aspects of the Biology unit were filmed:

- 1) The construction and operation of an optical microscope. The various parts of a microscope were pointed out and their use explained. Then a prepared microscope slide was

examined and the image recorded. To complete this clip, the preparation of a microscopic specimen for examination was shown, together with the observation of this specimen.

2) The second clip was to show the application of specialist tests to food specimens. These involved adding certain specific chemical reagents to the foods, contained in test tubes and the observation of the results, such as colour changes. The exact nature of the reagents was explained, and the analytical techniques involved were shown clearly.

These two clips showed the students the nature of the equipment involved, together with how it was constructed. The tests were especially useful in that they showed the correct handling of potentially dangerous chemicals and the manipulation of delicate glass apparatus, as well as the stated objective of showing food tests.

For the Chemistry unit, it is hoped that the construction and use of expensive equipment (such as mass Spectrometers and other types of Spectrometer) can be shown. It may be possible to collaborate with the Chemistry sections of local universities where the equipment is not available at Sandwell College.

The initial project was started earlier this academic year, and a number of short videos were made. There are some expected problems with this project. These involve the compatibility issues between the college-produced materials and the students' home equipment. For example, if the video clips are put in the form of a Windows media File, the students will need a reasonably up-to-date form of Windows operating system. Those using Windows M.E. will need to download and install the late version of Windows Media Player. Even if the students have the ability to do this, they can probably only afford a dial-up Internet Service Provider and so downloads will take a considerable time (and involve a large phone bill). Because they may not have a suitable CD/DVD player linked to their computer, separate clips, on students' memory sticks, will be made available. Even this assumes their computer is equipped with a USB socket. Whilst several students will have these facilities, in a socially deprived area such as Sandwell this may not be the majority.

Nevertheless, the project has commenced, initial materials have been produced, and initial observations by students and colleagues have been encouraging. It is hoped that the project will continue and that financial and staff support continues to be available to produce further materials and so enhance students' learning experiences and achievements.

Evaluating The Initiative

A series of short video clips were made for use by students, each lasting about 2 minutes, to illustrate certain key aspects of practical science. They were to be played by students if they had missed the particular practical lesson, because it was not feasible to repeat the lesson for the benefit of just one or two students.

The clips were made as envisaged. This process was successful, although it took a considerable time as it was not easy to find periods of time when the practical demonstrator, the cameraman and the laboratory were all free simultaneously. It also proved difficult to film colourless glass apparatus and to minimise extraneous noises coming from the corridor outside. However, the short films were made and kept in a digital form. The "Testbed" staff also spent a considerable time linking the videos to the course syllabus, putting in titles and student instructions, etc. The clips were deliberately recorded in ~Window Media Format, to make them as accessible as possible. and were burned on recordable CDs. The "burning" process proved to be fairly hassle-free, using software such as "Nero". Students were then able to borrow the CDs, which had the video clips burned on them

As expected, not all students had computers with CD players; this was partially overcome by saving the appropriate files on the student's flash memory sticks. This was only moderately successful, mainly because each clip took up several dozen megabytes of memory, and so very few could be put on the stick. This was especially the case if the memory sticks had

been given to the students during the enrolment period, as part of their "free gifts" for being on the course - the college could only afford to give away cheap memory sticks which only had very small capacities. Nevertheless, the principle was valid, and most students were able to see the clips, albeit one at a time. For those students having computers with built in optical drives, the problem did not exist.

The student's views were ascertained in a variety of ways. The obvious method was to have a group discussion in class, with a series of "shows of hands" on various aspects of the evaluation. A second method was also trialled, namely giving the students a questionnaire regarding similar aspects of the evaluation. The responses from both methods were very similar, but the advantage of the class discussions was that the students were more likely to make comments - perhaps it took more effort to write them down on the questionnaires. The overall conclusion was that the class discussion was by far the best way, and took much less preparation, though, if teaching time was very short, the questionnaire would have its place.

The student responses were all very positive - the clips were the next best thing to a personal demonstration. The clips helped the students to see the techniques that they had previously only heard or read about. They were grateful for any additions to the inevitable handouts used to cover the work they had missed.

The staff comments were more mixed, they felt that their own students would benefit from seeing the clips. However, there were several comments along the lines of "if only you could have included...., and perhaps done it at a more advanced level." This is understandable - they have generally more advanced students and would like to show them more techniques, However, simplicity was the main object of the exercise for Access students, and other staff could always make their own clips if they wished (though "we don't have the time" was the usual reply to this suggestion!).

In conclusion this has been a very worthwhile exercise. Whilst ordinary videos could have been made, students do have access to computers (certainly whilst they are in college, and frequently at home), and this provides an easy way for them to catch up on, or revise, any techniques they may have missed. Certainly, it is very labour intensive as far as staff time is concerned, to make the clips, but they can be tailored specifically to student needs. This is especially useful when commercial videos would otherwise have to be used, possibly with only a small part of the whole video being relevant