

Integration of digital video sequences and supportive interactive animations into the Level 1 module Introductory Microbiology, to enhance the delivery and effectiveness of experimental microbiology

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Background and rationale

From a previous innovations project during 2002/2003, the feasibility of producing and editing digital video of experimental microbiological procedures was established. The digital video was produced for eventual use on the Level 1 Introductory Microbiology within the University of Wolverhampton virtual learning environment (WOLF), to improve an understanding of the principles and practice of experimental procedures encountered on the module. In addition to the video sequences, supportive animations of the practical exercises were produced, to be viewed eventually by students in association with the video also via WOLF.

The end of the previous project had produced several video and animation sequences, although these had not, at that time, been added to the WOLF topic.

To provide an effective package of video and animation sequences to fully support the practical component of the module, more sequences were required, together with refinement of existing material. In addition, following integration into the WOLF topic, an analysis of the effectiveness of the sequences, in supporting an understanding of the theory and practice of the experimental exercises, was considered to be of value.

To progress the existing work, an embedding project was funded to:

- produce new and refine existing video and animation
- integrate these sequences into WOLF
- determine the effectiveness of the sequences at supporting the practical component of the module

Video and animation

A total of eight video and two animation sequences were eventually produced and made available via WOLF for the beginning of Semester 1, 2003.

The video sequences with sound and text annotation were:

How to flame a transfer loop

How to use a Finn pipette

Preparation of Gram Stained bacteria

Preparation of a Dilution Series

The Pour Plate Technique

The Spread Plate Technique

The Miles and Misra Technique

Preparation of a Dilution Streak Plate

The animations were:

Gram staining

Preparation of a Dilution Series

The effectiveness of the sequences was assessed by an analysis of student practical component performance for the module during 2003/2004, compared with the previous year before integration of the sequences into WOLF.

In addition, a questionnaire was used at the end of the module to determine the extent to which students used the sequences via WOLF and how useful they were considered to be.

Outcomes and evaluation

Practical component marks

The practical component grade-point average for the module during 2002/2003 before the availability of video and animation on WOLF was B11.3. The practical component average grade-point for 2003/2004 was C10.0.

Although the practical component average mark fell slightly for 2003/2004 it is difficult to draw firm conclusions from analysis between only two years.

Questionnaire Responses

The table below gives the responses to the questionnaire.

	Yes	No
1 Did you look at the practical videos on WOLF?	65.5	34.5
2 If yes to 1, did the video improve your understanding of the practical? (of yes respondents)	97.4	2.6
3 If yes to 1, did the video enable you to undertake the practical more efficiently? (of yes respondents)	92.3	7.7
4 Would you prefer for more video clips of experimental microbiology to be made available?	82.8	17.2
5 Would you prefer for video to replace demonstration at the start of the practical session?	32.8	67.2

Given the extent of publicity on the existence of the sequences during the module, it was surprising that only two thirds of the student cohort responded that they had viewed them. This may have been at least in part due to technical problems experienced during the module, which prevented some students from accessing the sequences. Computer facilities have subsequently been upgraded with resolution of the technical problem, which may improve video usage in the future.

For those who viewed the video, responses strongly suggested that they were of value in improving an understanding of the practical exercises and contributed to an improvement in the efficient operation of the actual practical classes.

Students also responded by more than a two thirds majority that they would prefer demonstration at the beginning of a practical class to be undertaken by a member of academic staff, as is common practice on this module, rather than by pre-recorded video.

Future developments

It is intended to continue the project during 2004/2005 with further evaluation at the end of Semester 1.