

The Production of Worksheets to Accompany the Video Series 'Intimate Strangers: Unseen Life on Earth'



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Introduction

In 1999, the American Society for Microbiology (ASM) produced a series of 12 x 30 minute videos entitled 'Intimate Strangers: Unseen Life on Earth'. These videos were intended to be used as teaching aids, with different permutations of the series recommended for different degree programmes. However, few learning activities have been disseminated to accompany the series, except for those described at ASM Conferences on Undergraduate Education, and accompanying publications. Furthermore, the series was not advertised to audiences outside the US, thus there has been little opportunity to utilise a potentially valuable resource, which is also now beginning to date.

The aim of this student project was to produce learning support materials for use with the videos.

Project Background

A second year undergraduate student (KM) undertook the project as an alternative to industrial placement. The project encompassed a 6 month period (April - September 2003), with funding from the University Faculty of Science and Engineering Learning and Teaching Fund 'Bids to Make a Difference', and the LTSN Education Development Grant Scheme used to support the student placement. The project was divided into two parts:

- University funded - use of the videos in undergraduate provision, for a newly submitted and approved degree programme at MMU (commencing September 2003)
- LTSN funded - identification of short clips from the series, and development of accompanying learning activities/material, for widely accessible use on the web. Once clips were identified, ASM would seek copyright permission for use.

This presentation particularly addresses the first part of the project.

Activities

i) Critique of series

The series is beginning to date, and is let down occasionally by some poor quality animations. However, each video includes some fascinating case studies, there are several descriptions of eminent microbiologists and their research, and film of applied aspects of microbiology provides a valuable resource.

ii) Selection of videos

Microbial Universe, Metabolism, Microbial Diversity, Microbial Ecology, Microbial Control, Microbial Interactions, Microbes and Human Disease were identified for development. Microbial Evolution and Reading the Code of Life also had potential for use in first year modules. Criteria for selection related to the module outlines in the course curriculum.

iii) Liaising with module leaders

Focus group discussion with a group of 6 lecturers (microbiologists and cell biology module leaders) assisted in clarification of activities. It was felt that the content of the Metabolism video was not sufficiently in-depth for the year two Microbiology module.

iv) Production of learning support material

It was decided to produce question sheets for completion while students were watching videos (year one) 'Microbial Evolution', 'Microbial Diversity' and 'Microbial Interactions' for use within the 'Life on Earth' module. 'Microbial Universe' would be shown to students at the beginning of 'Cells and Society' (GC). LTSN provided external mentors to give advice on the question sheet structure. It was the student's decision to use this approach, since in her experience it had proved valuable.

v) Trial learning material

Questions were produced to accompany the video 'Microbial Ecology', for the 'Sex and Survival' module, but the activity was not evaluated by staff, hence was not incorporated into the module. The video 'Microbes and Human Disease' was used to introduce the concept of emerging diseases, and as a preface to tutorial preparation and activity in a year three Medical Microbiology module (JV).

Year One: 'Life on Earth' (over 100 students on 4 deliveries)

- This cross-discipline module includes 5 introductory lectures on microbiology. Videos were used in three of them: extraneous information was edited out (introduction/revision to video, case study of one scientist) so that the lecture could also include more traditional information delivery.
- Question sheets accompanied the videos (**ATTACHED**)
- Correct answers were provided by the lecturer in a brief video overview.
- Four questions on the videos were included in the final module examination (out of 50, plus two essay questions) - assessment has yet to be carried out.
- Students were also provided with evaluation sheets to indicate what they liked and disliked about the videos, and what was new/interesting.

Findings

In general, students found the videos well produced with good images. There was some dislike of the enthusiastic American presenter, and mixed views concerning the use of musical notes as an analogy to DNA. For each of the videos, there was always at least one story/case study which attracted attention and positive comments. These were:

Microbial Universe: the discovery of SAR 11, a non-culturable ubiquitous marine microorganism.

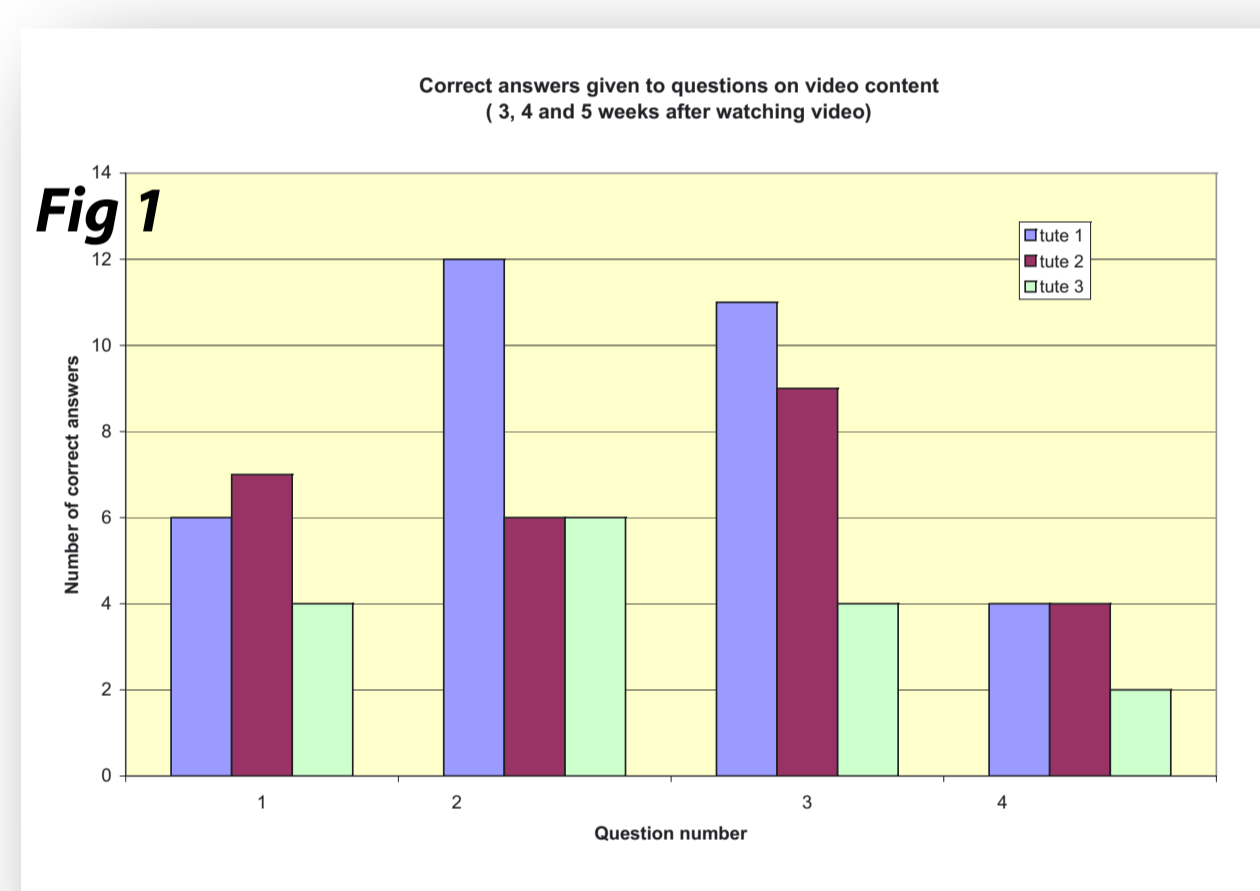
Microbial Evolution: Woese's classification system, the Tree of Life, and his interview in the video, appeared to have been particularly thought provoking ('It told me, that in a way, we are related to plants...!') Students were also intrigued by the presence of microorganisms in boiling water.

Microbial Interactions: 'The importance of fungi in the rainforest' was a welcome positive response to this relatively unpopular group of microorganisms. Information on the rumen was accompanied by film of a cow being used experimentally with a hole in its side. This produced a very mixed response. The importance of microorganisms in recycling was also strongly recognised.

Microbial Diversity: The importance of microorganisms appeared to be the major message received by students in this video.

Suggestions for improving the exercise

These videos have been shown in previous years, with the same comments being obtained from students. Learning activities to accompany the videos will need to change as the videos date: tutorial discussion, student centred work would provide the opportunity for updating so that useful content will not be lost.



Year Three Medical Microbiology (40 students) The Video Series

- The video 'Microbes and Human Disease' was shown at the beginning of the module, subsequent to lectures on epidemiology, monitoring and surveillance of infectious disease. It describes the emergence of Hantavirus, outlines the concept of emergence and re-emergence, and draws parallels with the epidemiology of the English Sweats in Tudor times. Question sheets were provided (**ATTACHED**), with a tear-off strip handed back to the lecturer (JV), for comments on the video.
- A tutorial followed, with groups of 12 - 13 students attending at different intervals after the lecture (up to five weeks later).
- Preparation work for the tutorial was required. Students were asked to select 5 emerging diseases, consider reasons for emergence, and identify possible reasons for the apparent increase in emerging diseases at the present time. Work was collected in and marked.
- At the beginning of the tutorial, a question sheet was completed (not assessed) to determine how much information had been retained from the video (**ATTACHED**).
- During the tutorial, a list of emerging/re-emerging diseases was compiled, and general points were discussed.
- A handout was provided to the class at the end of the tutorials, summarising key points (**ATTACHED**).
- An MCQ test on practicals and tutorials included 15 questions on emerging diseases.
- After all module assessments, the class was asked to write (freehand) their views on the video and its use within the topic of emerging diseases.

Findings

Initial reaction to the video and question sheet:

Most students preferred the video to having a lecture address the content. The video 'made a change'. Most felt that the question sheet helped learning, but some felt that it distracted from watching the video.

Remembering video content:

It was apparent from reading student responses that the questions posed on the revision sheet circulated at the beginning of the tutorial could have been improved, although they were almost identical to some of the questions on the original sheet:

Question 1: What was the name of the virus?

The video did not present the virus name in writing: thus Hantavirus, Antivirus, Antevirus, Hebantervirus were amongst the names recalled!

Question 2: What type of microorganism was it?

It was fairly easy to recall that the agent was a virus.

Question 3: What was the carrier of the disease?

As time progressed, students remembered rodents, but forgot that deer mice were the vectors.

Questions 4 and 5: Give two additional examples of diseases transmitted from animal to human. What reasons were given for the emergence of the disease?

These were too complicated for students to describe briefly.

Question 6: What was the name given to the disease described in London in Tudor times?

Few students remembered the English Sweats.

Question 7: Name 6 diseases which are deemed to be 'emerging'

This was included so that students could list their 5 selected emerging diseases.

The number of students correctly answering questions 1, 2, 3 and 6 across the three tutorials (a 5 week period) was recorded. There was a loss in recall over time (Fig 1). The same pattern was observed for a smaller group of students who took the medical microbiology module in a previous semester.

The tutorial:

In all cases, the tutorial proved successful, with students offering examples of diseases and reasons for emergence. Discussion was active. Prepared work was of an excellent standard, and a wide range of diseases was investigated.

The MCQ:

Student performance for the 15 questions related to emerging disease was improved over the MCQ performance profile in general (Fig 2). Of course, this is not necessarily due to the use of the video.

Students' final comments:

Overall, students felt that the video made a welcome supplement and change to lectures. They would have preferred more discussion alongside the video.

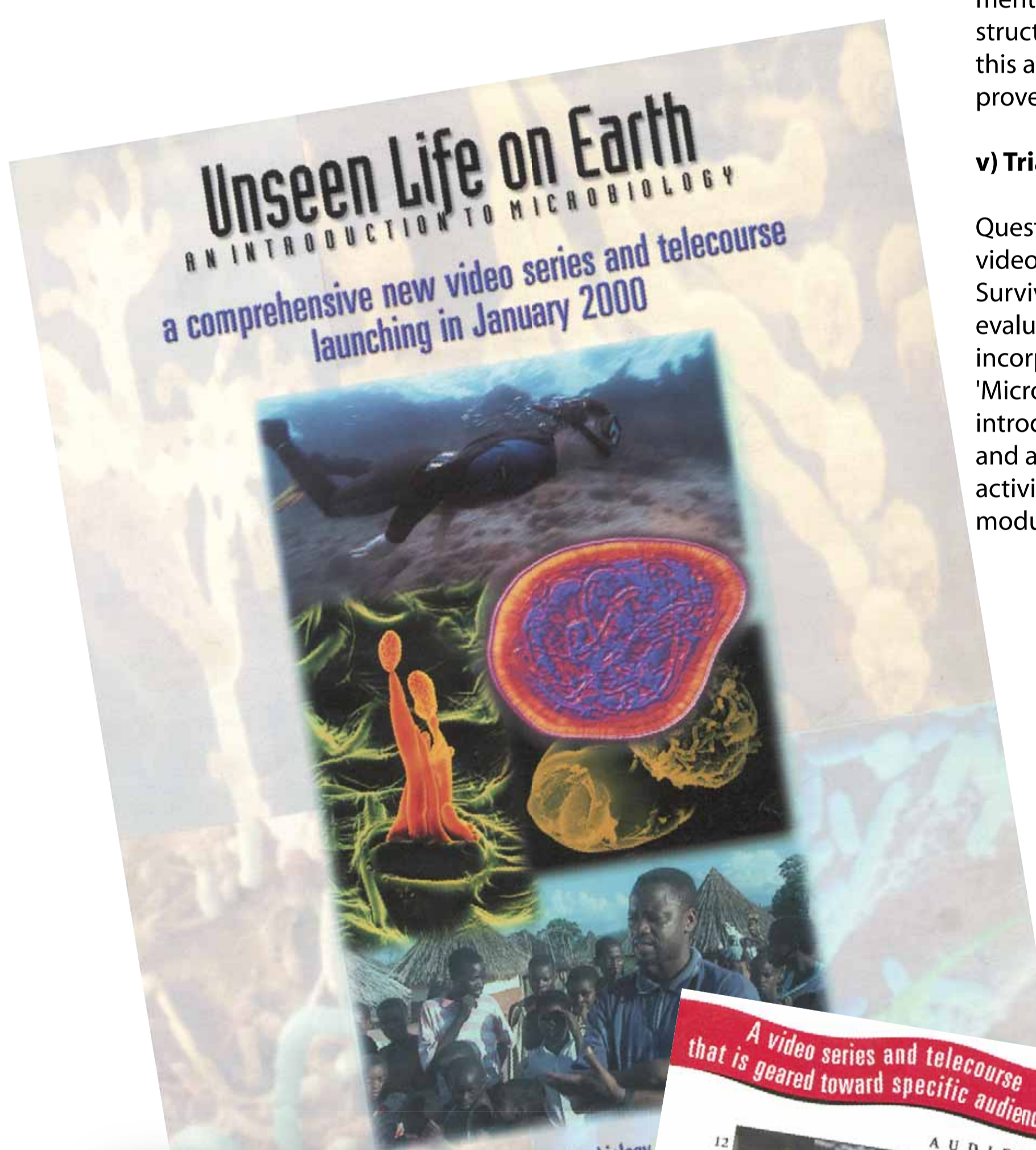
Suggestions for improving the exercise and its analysis:

Inclusion of a control group who watch the video without any question sheet.

Inclusion of a control group who do not watch the video.

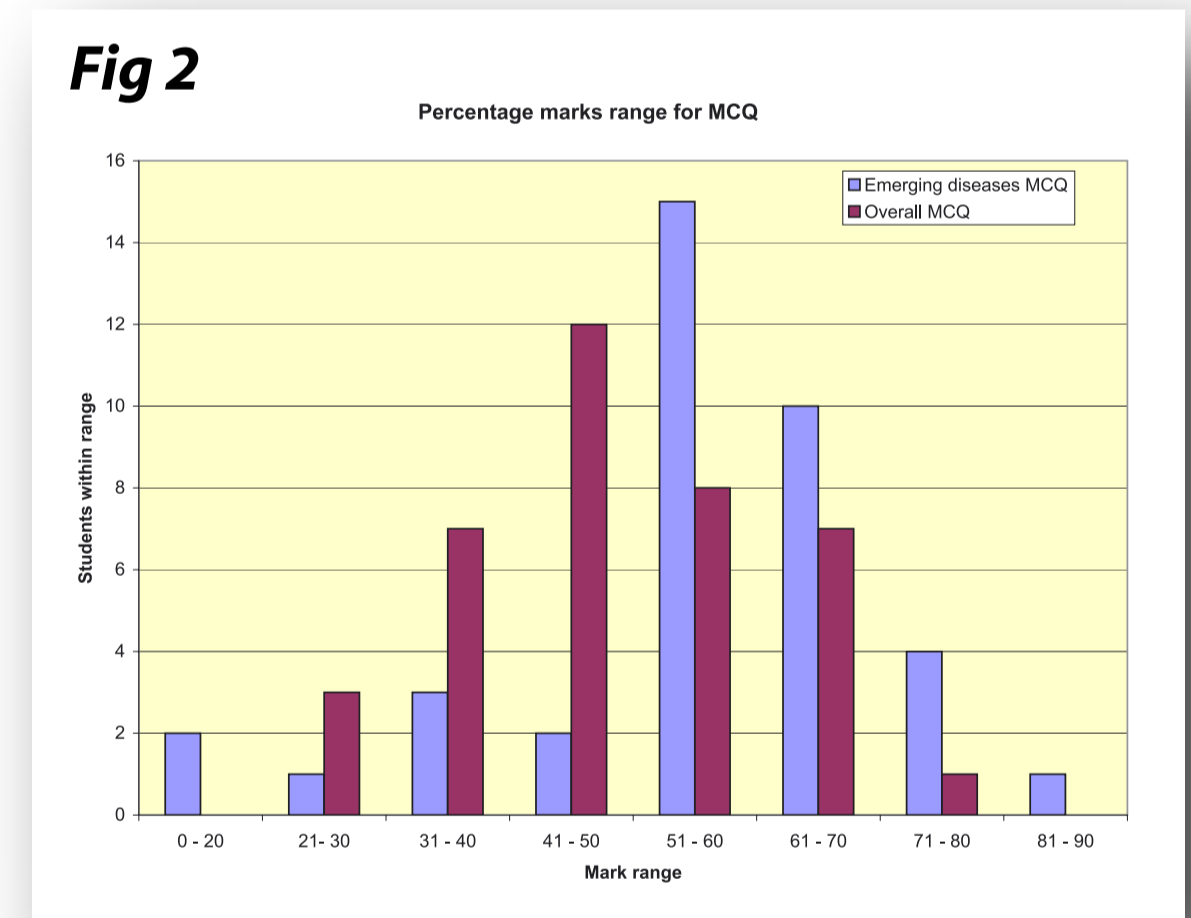
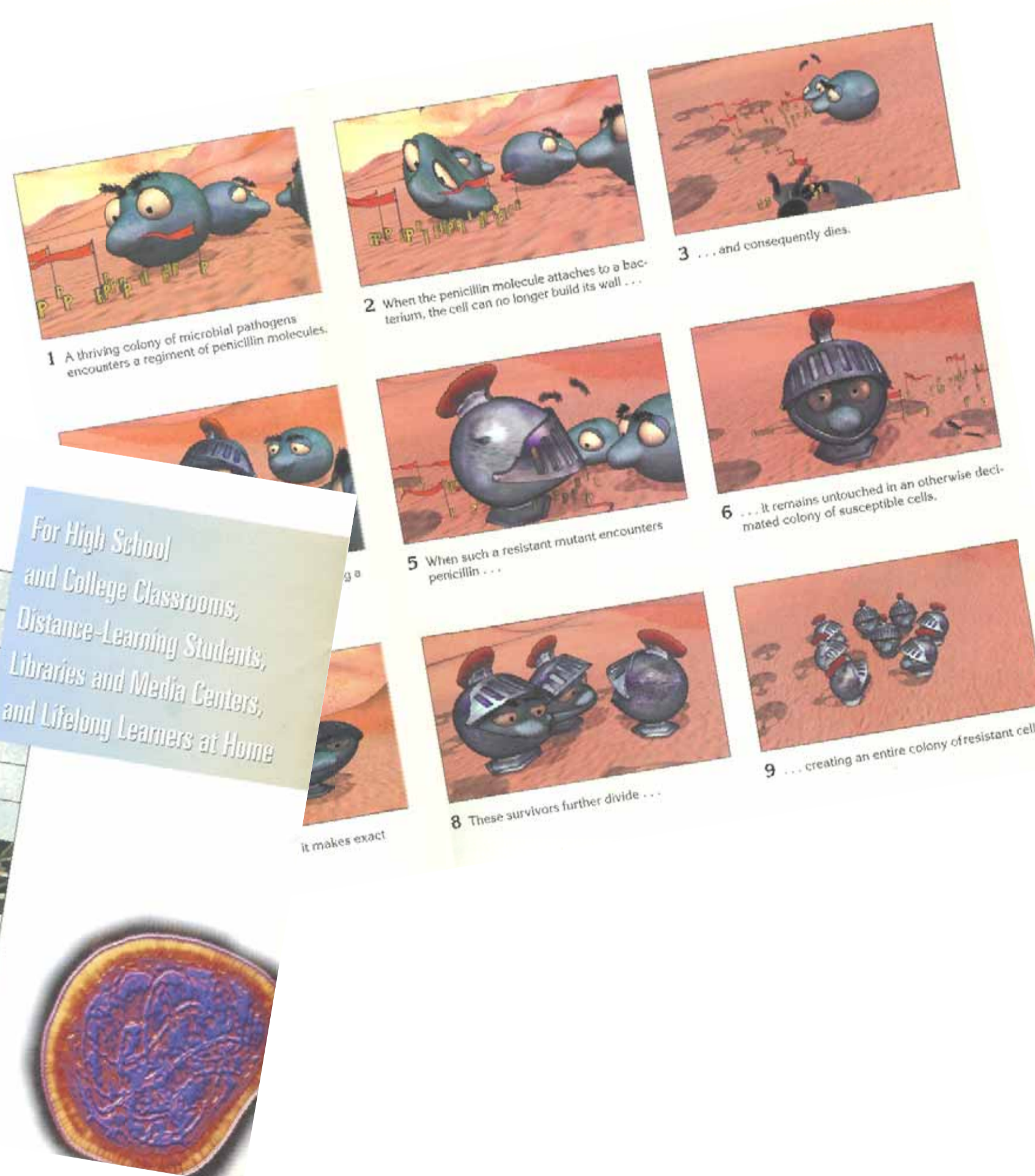
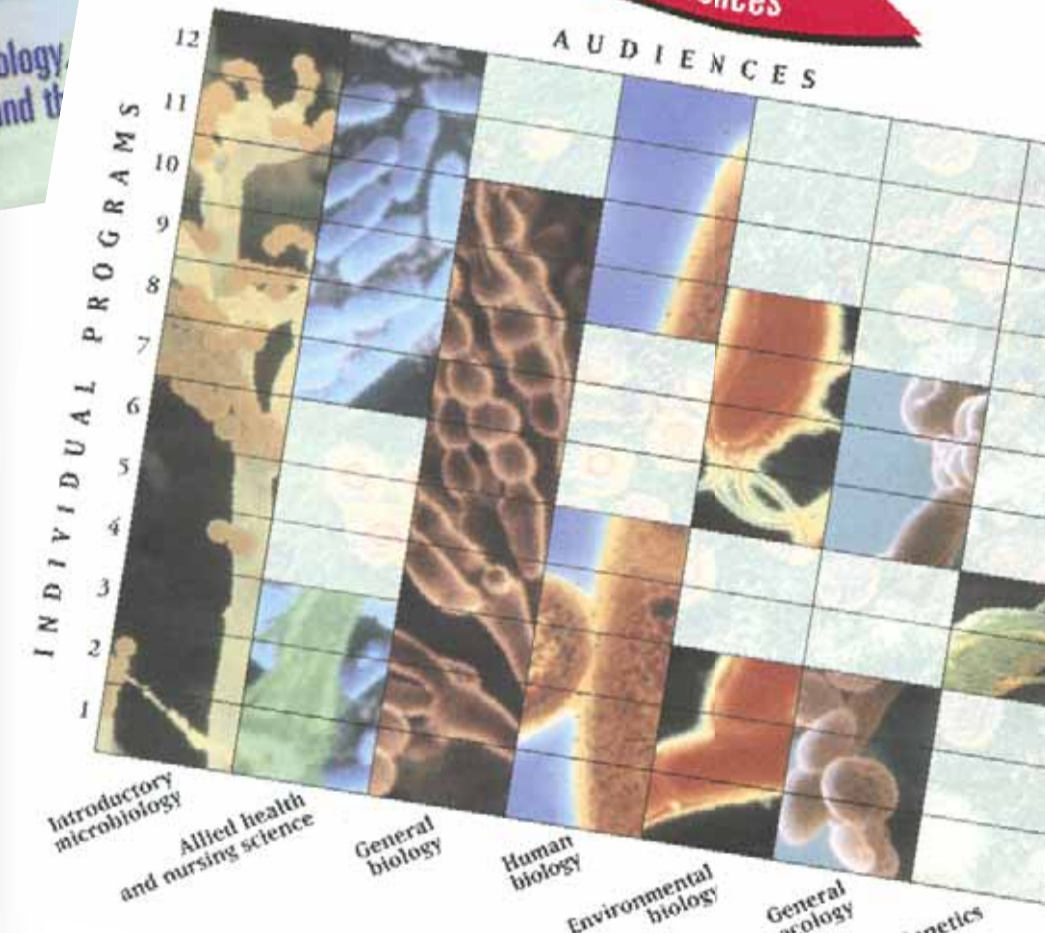
Use of better structured questions in recall test.

Seek students' opinion of overall video/lecture/tutorial/assessment package.



The Video Series

The videos are, in sequence:
 Microbial Universe
 Unity of Living Systems
 Metabolism
 Reading the Code of Life
 Genetic Transfer
 Microbial Evolution
 Microbial Diversity
 Microbial Ecology
 Microbial Control
 Microbial Interactions
 Human Defences
 Microbes and Human Disease



Concluding comments

The videos provided a useful and positive additional resource for year one and year three modules. A report was produced by the student (**ATTACHED**) summarising her project. The trialling of the worksheets took place after her project had finished. SGM has a set of videos which it will lend to interested individuals. Clips are available on the ASM Curriculum Resources website (asm.org).

The general principles of the learning activities can of course be used for any video or TV programme. The emerging diseases tutorial can be conducted without the video.

Acknowledgements

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