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Colloquium

Developing PowerPoint handouts to support meaningful learning

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Introduction

PowerPoint has developed as the preferred tool to support the inclusion of visual aids in the lecture theatre within higher education, with many advantages over the previous dominant technology—the overhead project (OHP). However, PowerPoint has its critics. Observers who have watched bad lectures have tended to concentrate on the prominent role of the software (eg, Ward, 2003), although such commentaries are rather like blaming a poor novel on the inadequacies of MSWord. However, as it becomes embedded in the culture of teaching, PowerPoint's role in higher education pedagogy does need to be evaluated, as its early appeal of offering students a 'novel experience', as described by Szabo and Hastings (2000), has probably long since expired.

Teaching philosophies reflected in PowerPoint

Tufte (2003) clearly lays the blame for dull, passive teaching at the feet of a software package. However, I suggest that what PowerPoint is actually doing is to make explicit the taken-for-granted assumptions and implicit epistemological leanings of lecturers who are using it. The stereotypic teacher-centred, noninteractive mode of lecturing that has been criticised as the standard teaching mode at universities by Bodner, Metz and Tobin (1997) is simply clarified and amplified by the use of PowerPoint. The bullet-point-dominated templates provided within the software may be seen as supportive of this, but are not the cause of it.

Handouts

Throughout the literature, there is a failure to examine adequately the role of handouts (PowerPoint handouts, in particular) in supporting students' learning. Tufte (2003, p. 22) states that 'PowerPoint slides are a lazy and ridiculous way' to format handouts, and describes how printed material in PowerPoint slide format typically offers 2–10% of the typographical richness of nonfiction bestsellers.

Lecturers typically spend hours designing and refining their PowerPoint slides, but when it comes to producing a handout to complement the presentation, a printout of the slides (usually six per page) is often produced, suggesting little thought about how it will be used by students. Such a handout is simply a repeat of the presentation. Rather

than supporting and directing further learning from the presentation, the handout merely acts as a record of what was seen. I would argue that the handout should do more than this. It should provide challenge for the students and have its own role in promoting student learning. The six-slides-to-a-sheet printout does not do this.

Vignettes

The vignettes given below have been derived from numerous observations of university teaching sessions in which PowerPoint has been used to support a lecture. Whilst the detail of the content on the slides presented here is not from any one particular lecture (in order to respect the anonymity of the colleagues observed and the copyright of their personal presentation materials), the issues raised within each of these examples have been observed on numerous occasions.

Example 1: Concept maps of PowerPoint slides

The slides that are depicted within Figure 1 were presented as part of a lecture on microbiology. The order of the slides that followed the lecture was delivered as part of a sequence of lectures. Therefore, in endeavouring to make links with the previous teaching session, the lecturer started with 'viruses' and ended with 'bacteria'. This may give a perception of false hierarchy, with students considering the first ideas to be presented as the 'big ideas'. Such false hierarchies have been shown to confuse students into constructing an image of a course that was not intended by the lecturer (Kinchin, DeLeij & Hay, 2005).

The 'expert view' of the course may be emphasised by the presentation of slides on the handout as a concept map, arranging the ideas as a framework of understanding rather than as a sequence to be presented (Figure 1). This map could act as an advance organiser (Willerman & MacHarg, 1991) for the presentation and/or for the rest of the handout. For this to be effective, it is important that the title line of each slide clearly indicates the main idea to be encompassed within it, avoiding category headings (Introduction, Results etc) that add little to the developing narrative.

Constructing a handout with the structure illustrated in Figure 1 may serve a dual function of supporting the lecturer's reflective practice through the development of the teaching session, whilst also guiding students through the ideas presented. In terms of teachers' professional development, the concept mapping approach helps the novice to go beyond the 'mastery of content' and how best the material can be transmitted towards an appreciation of pedagogy; also, how understanding can be variously constructed by students (Kinchin & Alias, 2005).

Example 2: Parallel processing of PowerPoint slides

The slides depicted within the handout in Figure 2 were shown as part of a lecture on ecology. The lecturer showed the slides as a sequence; and then, wishing to initiate some interaction with his students, asked them to compare the four definitions of ecology that had been displayed. No handout had been provided during this lecture, and so the

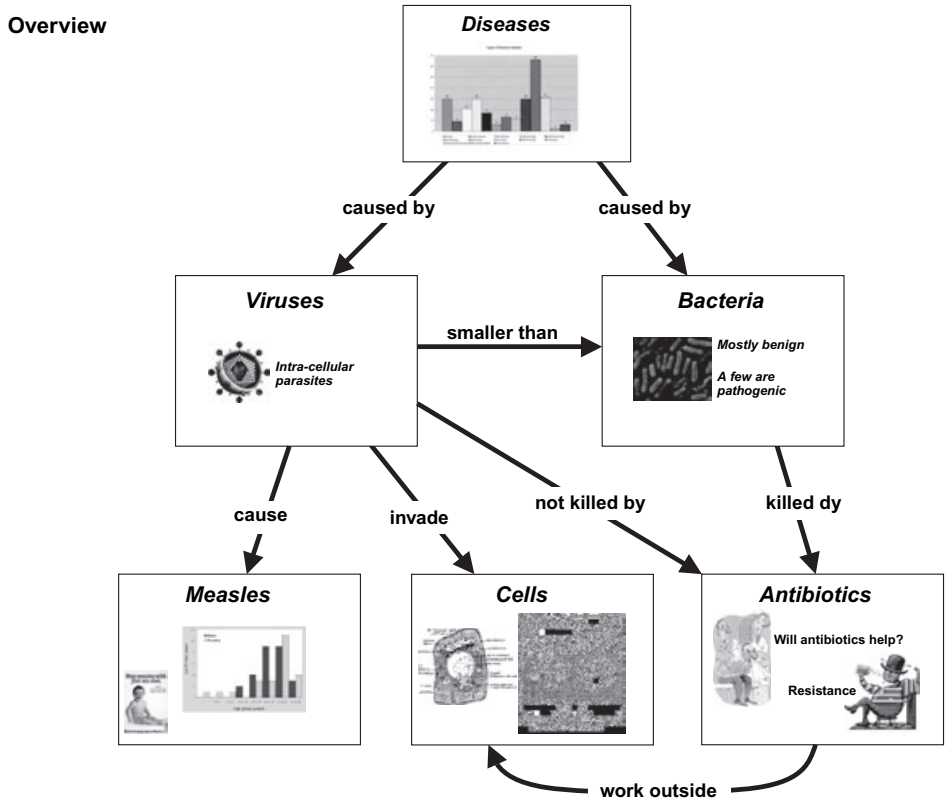

Figure 1: Key slides from a PowerPoint presentation, rearranged on a handout in the form of a concept map to reinforce the links between the main ideas presented

lecturer found himself flicking backwards and forwards through the slides to address the points made by the students. At this point, the technology was perceived to be getting in the way of the teaching rather than facilitating it.

When the parallel processing of information is required, the linear sequencing of materials that is forced by the nature of presentations may be viewed as a weakness of the PowerPoint platform. Placing all the information from the four slides, as depicted in Figure 2, on a single slide would have resulted in the slide carrying too much text; the resulting reduced font size make the text illegible for those at the back of the auditorium. The lecturer in this vignette had not considered the use of a handout to overcome this issue.

The handout depicted in Figure 2 presents the four slides adjacent to each other and also includes the questions that the lecturer wanted the students to consider. Presenta-

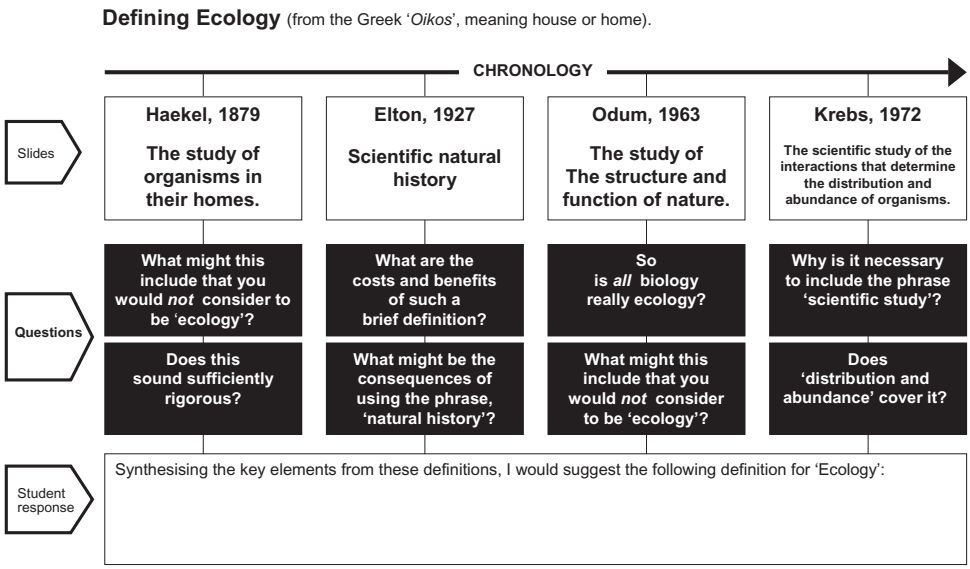

Figure 2: Handout designed to facilitate the comparison of four slides by students during a lecture

tion of material in a handout of this style respects Tufte's principle of 'adjacent in space' as opposed to 'stacked in time'.

Conclusion

Teachers within higher education spend many hours developing PowerPoint slides for their lectures. However good these presentations are, a poor handout may send contradictory messages to the students and may reinforce their expectations of passivity. In order to increase the level of student engagement, a handout should be challenging and should complement rather than duplicate a PowerPoint presentation.

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