

TECHNOLOGY ENHANCED LECTURES: PEDAGOGIC DESIGN OF LIVE POWERPOINT-TV LECTURES

Many distance teaching institutions have video conferencing facilities that enable live interactive TV. This section concerns the use of PowerPoint to provide visualisations that enhance the live lecture that precedes the interactivity.

A multimedia presentation, such as might be envisaged for live TV delivery through EDUSAT (EduSat India, 2005), might include video clips or animations containing their own commentary. Screenwriting principles for video clips and animations are given in Chapters 5 and 8 of Koumi (2006).

However, when the rest of the live multimedia presentation also contains an audio commentary, further screenwriting principles are required. A framework of such principles is in section 4 below.

Section 4 is preceded by some essential production points, regarding images in section 1 and the development process in sections 2 and 3.

1. The images

The images can be equations, text, sequences of diagrams, e.g. in a presentation:

- about evolution – photographs and descriptions of the species and subspecies of finches in the Galapagos islands, as described by Taylor, Sumner and Law (1997)
- relating Homer's poems with archaeological data – the text of Homer's poems and archaeological site plans, as described by Laurillard (1998)
- about how to format Computer-marked assignments – advice to undergraduates.
- (PowerPoint with the presenter in vision) proposing an online adaptation of an existing distance learning course for Vietnamese schoolteachers (see Appendix 1 for some of the images)
- describing an Internet Tutorial concerning evaluation of Websites – segments of Websites, plus tables of results (see Appendix 2 for some of the images)
- about the system of differential equations describing the motion of particles that are joined by springs (see Appendix 3 for some of the images)

The audio could do all the teaching about the images. However, preferably, some sparse text would give an outline explanation, and the audio would elaborate on the outline.

2. How to prepare for the presentation

2.1 Consider/Specify

- the topic: choose one for which a PowerPoint lecture is more suited than other media
- intended learning outcomes, reappraised and refined as the pedagogic storyline is developed.
- target audience: age, commitment, previous knowledge, learning context.

2.2 Compose an outline storyboard of your slides, side by side with narration.

For example, an equation might appear at the top, over which the presenter would speak a sentence of narration, followed one second later by a line of text that prepares learners for some further narration, then a diagram (with more narration). Appendix 3 is an example of the final storyboard for such an image build-up. However, in your outline

storyboard, you need only include the completed built-up slide (as in the bottom left box in Appendix 3), together with the whole narration.

Recommended



You have seen three different layouts for a storyboard, in Appendices 1, 2 and 3. You may like to read Mishra, S. (2003), a 4-page work that recommends some alternative multimedia scripting and storyboarding techniques.

2.3 *Schedule script discussions, materials development and a rehearsal*

To facilitate final alterations, schedule rehearsal *before the afternoon of the presentation day minus 1*.

2.4 *Incorporate feedback from colleagues*

Circulate copies of your outline slide designs to your colleagues, omitting the interim build-up stages – just showing the *completed slides* (e.g. the final box, bottom left in Appendix 3). To make it easier for busy colleagues, the slides alone, *without the audio commentary script*, should constitute a full outline of the content. Make revisions based on your colleagues' feedback.

2.5 *Tape-record a first draft of the audio commentary (the narration)*

Working from your revised draft of the slides, speak your first draft commentary into a tape recorder, *before* writing it out as a script. This ensures that your commentary sounds like *conversational speech*. Then listen to the tape and transcribe it. Then work on the transcript to improve it – but resist reverting to a *written word* style.

2.6 *Finalise slides, narration and transition points*

Mark up the audio script, indicating PowerPoint transitions, (i.e. when each image or bullet-point should appear).

2.7. *The typed layout of the script should be easy to read*

Type the rehearsal script and (later) the final script so that they are easy to read. Two techniques, 7 words per line and 1½-spacing make it easier for the speaker to find the beginning of each successive line. Transfer to the Teleprompt facility (the mechanism on the front of the camera that displays the script to the speaker).

2.8. *Preparation and management at teaching end and learner centre end*

This phase is important to the success of the interactive lecture. Unfortunately, we do not have sufficient space to cover the details.

Recommended



A good source of advice can be found in CEMSA (2005, p 58-62)

3. The Presentation

3.1 Speaker rehearses while a colleague formatively evaluates by playing the role of the student. There will usually be some final changes.

- 3.2 Speaker presents the PPT sequence. Transmit through videoconferencing facility.
- 3.3 The post-presentation interaction between the presenter and the learning centres requires careful planning and management. CEMSA (2005) advises the facilitator at the learner centre to:

Encourage the learners to interact and ask relevant questions. Club (amalgamate) questions of similar nature for meaningful interaction (p 62)



Further guidelines for during and after conference activities can be found in CEMSA (2005, pp 62-63)

4. Pedagogic guidelines for slide/audio design

Use of language

- 4.1 Long sentences, which normally contain conditional clauses, are difficult to understand. So convert every long sentence into two or more short ones.
- 4.2 Use *conversational speech*, to be spoken and listened to, *not* to be read.

Layout and build-up of the slide

- 4.3 Students cannot easily process dense visual layout while listening to commentary: the layout should be uncluttered and easy-to-follow. Concerning text, a rule of thumb is to use only 25% of the normal print density found in books. (Use a large font so as to fit only 7 or 8 words across the screen – and use generous line spacing)
- 4.4 A standard technique is *progressive disclosure* or *text-build* in which the slide is developed line by line, synchronising with the narration. However, this could irritate students if each line is easy to follow – they might prefer to see all the lines from the outset and to choose whether or not to read ahead, rather than being forcibly blinkered. (Examples are slides 2, 4 and 5 of Appendix 1,.

Relationship of slide text to audio commentary

- 4.5 If the narration is explaining diagrams, why use text at all?
Answer. Some explanation of content could be reinforced by key-word text. Such text can serve as visual reference points, which anchor attention. They can also reduce the load on students' auditory memory.
- 4.6 But avoid too much text. In some PowerPoint presentations the text duplicates the entire narration. Yet, literate students can read faster (about 280 wpm) than you can speak (about 180 wpm). So they would process the visual and audio text sources asynchronously, causing mutual interference. Hence slide text should précis narration, not duplicate it.
Reducing the amount of screen-text also reduces the danger that students would miss critical diagram changes while attending to text.
- 4.7 Item 2.4 recommended designing "completed" slides to be a full outline of the topic. Students should have access to these slides for later revision, without having to re-listen to the audio. Your slides can achieve a sufficiently full outline of the

topic with an economical amount of text. This is because the text gains new meaning once students have listened to the commentary.

- 4.8 If you find that it is not possible to make slides sparse enough to be followed during listening to the audio, then you have chosen the wrong medium. A time-based medium is not appropriate when the learning task is complex and requires self-paced, sustained concentration. In such a case, use the print medium. However, if only one or two slides require dense text and sustained concentration, there is a context in which you do not need to switch to the print medium. This is if your lecture is being delivered on the web or DVD: then you can just advise students to pause the presentation in order to study the text.

The images and the commentary should reinforce each other

- 4.9 Indicate clearly where to look on the screen. This often requires a visual cue such as highlighting a part of a diagram when it is mentioned.
- 4.10 Highlighting an item when it is mentioned is an example of the images synchronising with the corresponding words. Such synchronisation is appropriate in many situations. However, there are other occasions when the images should precede the corresponding words: whenever students need a visual reference on which to anchor the narration. For example, mathematical formulae are difficult to listen to unless they can already be seen.
- 4.11 Give students time to apprehend the images. For example, give time for their eyes to settle on a new slide before commenting on it.

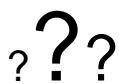
Pedagogically structured narrative

- 4.12 The pedagogical efficacy of narrative structure has been proposed by many writers, as cited in Koumi (2005, just above guideline 4.22).

5. Conclusion

Given all the above, it should be clear that you cannot design a perfect picture-word presentation with your first draft: you need several draft designs and script discussions. Your aim, through such diligence, is to **pre-empt students' intellectual difficulties** – to predict and answer all the questions that students might ask. If you could be 100% successful, there would be no need for the post-presentation question and answer session.

Of course you cannot hope for 100% success, so some students will still have questions outstanding. But do not abdicate your responsibility to design a clear, unambiguous pedagogic narrative – do not merely hope that a subsequent interactive session will compensate for inadequacies. At each stage of your presentation's development, get inside the student's mind – keep agonising over: *what would the students be thinking at this point, what will they be looking at?*



Activity 1. Should your slides be a comprehensive outline of the topic? (allow 10 minutes)

Concerning guidelines 4.6 and 4.7, just *how* sparse should the slide text be? Should the slides by themselves (without the audio) be just barely comprehensible to a really top expert in the subject matter, or should they

	constitute a more substantial outline of the content? In the space below make a note of what you think.
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Feedback for Activity 1. There is no simple answer to this question. Some lecturers take it for granted that many students will miss their live lecture. So their slides duplicate their entire narration, and they post these on the web. But according to 4.6, this will disadvantage the diligent students who do attend the lecture.

Section Objectives

We do not expect you to memorise all the above guidelines. However, after studying this section you should be able to:

- apply the *spirit* of the guidelines to improve the design of your next PowerPoint enhanced lecture
- evaluate how far your design matched up to the guidelines

6. REFERENCES

CEMSA (2005) *Teleconferencing: a training kit*, Commonwealth Education Media Centre for Asia. Retrieved March 2006 from <http://cemca.org/books/teleconf.pdf>

EduSat India (2005): A dedicated satellite for Education, <http://www.edusatindia.org/>

Koumi J (2005) Pedagogic design guidelines for multimedia materials: a mismatch between intuitive practitioners and experimental researchers"
http://www.eurodl.org/materials/contrib/2005/Jack_Koumi.htm.

Koumi J (2006), *Achieving the pedagogic potential of Video and Multimedia*, RoutledgeFalmer

Laurillard D M (1998), *Multimedia and the Learner's Experience of Narrative*, Computers and Education, 31 (2) 229-242

Mishra, S. (2003). Scripting for multimedia. In U.V. Reddy and S. Mishra (Eds), *Educational Multimedia: a handbook for teacher developers*. New Delhi: Commonwealth Educational Media Centre for Asia (pp. 39-42). Retrieved March 2007 from <http://www.cemca.org/EMHandbook/Prelims.pdf>

Taylor J, Sumner T and Law, A (1997) *Talking about multimedia: a layered design framework*, Journal of Educational Media, 23(2/3) 215-241

APPENDIX 1. PowerPoint presentation proposing online adaptation of an existing course

1

Online adaptation of a distance learning course for Vietnamese school teachers

Jack Koumi
Educational Media Production Training

(PAUSE 5 secs)

2

Online adaptation of a distance learning course for Vietnamese school teachers

Current course:

- 3-year course
- Instructivist → learner-centred
- 15 videos
- Groups view, re-view in segments ← Printed Study Guide

Currently, Primary School teachers in Vietnam study a **three-year** in-service course to convert their **instructivist** approach to a learner-centred methodology.

15 video recordings of classroom teaching are sent to each school, on DVDs. The videos exemplify the new methodologies.

Teachers form small **groups** and each group **views** the video once all the way through – then later they **view it again** in short **segments** – and after each segment a **printed Study Guide** suggests specific discussion activities

3

Online adaptation of a distance learning course for Vietnamese school teachers

Current course:

- 3-year course
- Instructivist → learner-centred
- 15 videos
- Groups view, re-view in segments ← Printed Study Guide

Online adaptation:

- Multimedia Study Guide, streamed video, asynchronous discussion tutor moderated

This paper proposes an **online adaptation** of the course: **multimedia** versions of the Study Guides would accompany **streamed** video, followed by **asynchronous** discussion, **tutor** moderated.

4

Overview of the current course

- Videos: observation of “modern” lessons
- Narration in printed Study Guide:

A quick **overview** of the current course.

The **videos** take the form of **pure observation** of so called **modern methodology** lessons – **without** narration – the **narration** resides instead in the printed **Study Guides**.

5

Overview of the current course

- Videos: observation of “modern” lessons
- Narration in printed Study Guide:
 1. Points to look out for on first viewing
 2. Post-viewing: group discuss these points
 3. Teaching practice
 4. Main section: subsections ↔ video segments
 5. Feedback

Each Guide consists of five main sections:

1. A few **main points** to look out for on first viewing
2. **Post-viewing** activity: **discussion** of those points
3. An invitation to undertake **Teaching Practice** (of the techniques on the video), and that’s observed & evaluated by peers.

Section **four** is the **main section** and has several **subsections**, each one specifying discussion activities relating to a short **segment** of the video. Teachers view the video again, stopping after each segment to carry out the activities. Finally, section **five** gives feedback on the activities.

So. You can see that this teaching and learning approach

6

Overview of the current course

- Videos: observation of “modern” lessons
- Narration in printed Study Guide:
 1. Points to look out for on first viewing
 2. Post-viewing: group discuss these points
 3. Teaching practice
 4. Main section: subsections ↔ video segments
 5. Feedback
- Cognitive Apprenticeship

incorporates Cognitive Apprenticeship (at a distance): novice teachers observe a *master* classroom teacher modeling the new methodology. Coaching is provided through the Study Guide, which directs learners to analyze particular aspects of the master’s performance.

So. That summarises the current course.

7

Online Adaptation

- Study Guide text next to video window
- Viewers glance occasionally at text
- Key phrases plus audio elaboration

Now for the online adaptation.

The **Study Guide**, suitably edited, would be positioned on-screen next to the window showing the streamed video, **thus** directing teachers’ attention to relevant features of the teaching methodology.

The **viewers** (the in-service teachers) can **glance occasionally** at the text to remind themselves what to **look out for** while viewing.

But, if there is too much text, the trainees’ reading would disrupt their video viewing. So we should shorten the text to a few **key phrases**. AND, to ensure that these phrases are understood, we’ll add some **audio elaboration**.

8

Demonstration

- Video: Grade 1 lesson in Natural Science
- Methodology: single-task, same-ability

Let me **demonstrate**. The **Video** I’m going to play shows a grade 1 lesson in Natural Science – the **methodology** is “single-task, same-ability group work”. Here’s what happens when students click *play*.

9

Video 3B, same task, same ability

AUDIO #1a EMBEDDED WITH SLIDE

While watching the video, which will start in a moment,

10

Video 3B, same task, same ability

COMPARE YOUR
CLASSROOM FACILITIES

AUDIO #1b EMBEDDED WITH SLIDE

always compare the classroom facilities in the video with your own. If the facilities in your classroom are different, how would you make alternative provisions to achieve similar results in your lessons?(PAUSE 1 SEC) In addition,

11

Video 3B, same task, same ability

COMPARE YOUR
CLASSROOM FACILITIES

INTENDED METHODOLOGY
same ability groups, single task,
teacher supports

AUDIO #1c EMBEDDED WITH SLIDE

think about the intentions of the teacher on the video. Regarding methodology, the teacher intends to organise the class into same ability groups and set a single task. The teacher will circulate to support group learning, adjusting her support according to group abilities. (PAUSE 1)

12

Video 3B, same task, same ability

COMPARE YOUR
CLASSROOM FACILITIES

INTENDED METHODOLOGY
same ability groups, single task,
teacher supports

INTENDED OUTCOMES
pupils learn vegetables' names,
parts, nutrition

AUDIO #1d EMBEDDED WITH SLIDE

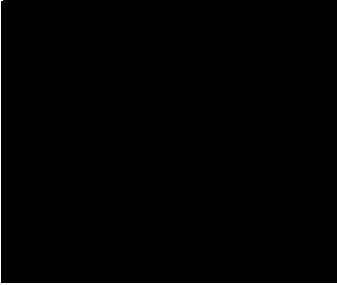
And the teacher's intentions concerning learning outcomes, are that pupils should learn the names of all the vegetables shown, also the names of the major parts of the vegetables and finally the nutritional benefits of the parts.

Video 3B, same task, same ability

COMPARE YOUR CLASSROOM FACILITIES

INTENDED METHODOLOGY
same ability groups, single task, teacher supports

INTENDED OUTCOMES
pupils learn vegetables' names, parts, nutrition

**VIDEO EMBEDDED WITH SLIDE**


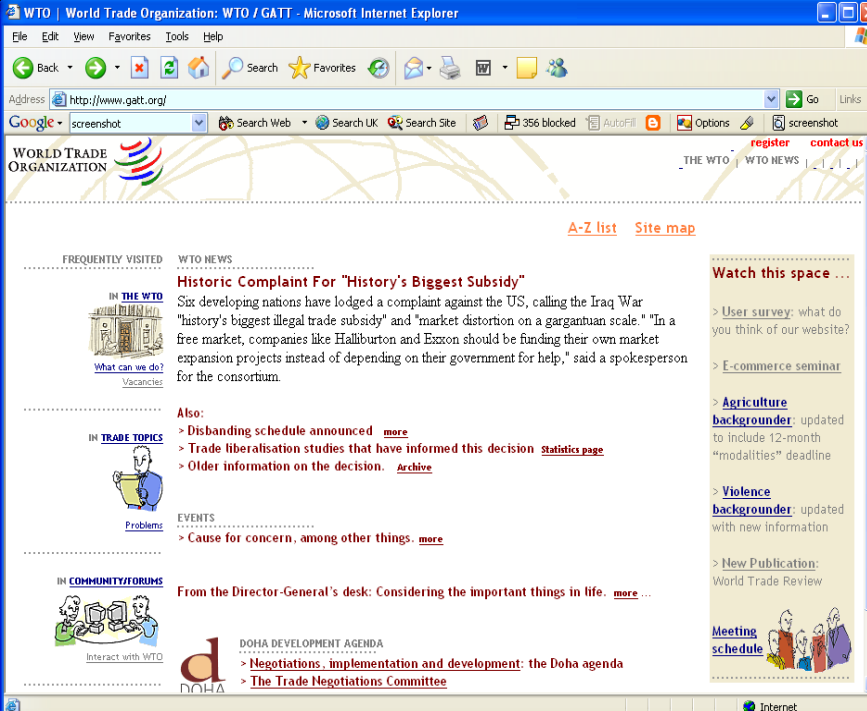
As video plays, at 1st stop-caption, SAY
I'll explain what this caption says later.

At inset caption SAY
Dividing class into 6 groups, 2 high ability ...

CLICK to stop video, SAY
Not going to show whole 17 min. Let me explain earlier caption. ***CLICK to show caption***


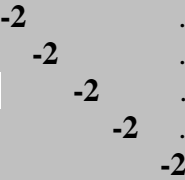
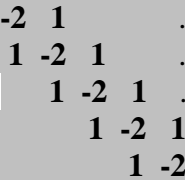
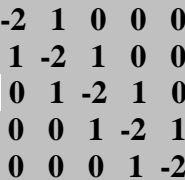
Etc, etc

APPENDIX 2. Story board for first 45 seconds of *Internet Detective Showcase*

	Visuals (in a split screen)	Audio
1.Video	2. Graphics	
	<p align="center">The Internet Detective - a WebCt tutorial</p>	<p>Narration: How would your students judge the quality of</p>
<p>Dick Barton image continues until Margaret appears</p>	<p>Pop-up Screenshot of WTO hoax site</p> 	<p>this website? (PAUSE 3). At first sight it looks OK,</p>
	<p>Jump in to this close-up (= middle of above web page) in 3 jumps</p> <p>Disbanding schedule announced more Trade liberalisation studies that have informed this decision Statistics page Older information on the decision. Archive</p>	<p>(PAUSE 2) but if you look at the links,</p>
	<p>Disbanding schedule announced more Trade liberalisation studies that have informed this decision Statistics page Older information on the decision. Archive</p>	<p>you'll find that the first link</p>
	<p>... its effects on developing countries, the World Trade Organization has decided to effect a cessation of all operations.</p>	<p>takes you to an unlikely story (PAUSE 7) The story continues with even less likely announcements.</p>

Visuals (in a split screen)		Audio
1.Video	2. Graphics	
	<p>RETURN TO pop-up of WTO hoax site</p>	<p>But would your students recognise this web site as a hoax?</p> <p>The validity of the content is just one of many aspects of quality.</p>
	<p>Content Criteria</p> <ul style="list-style-type: none"> • Validity • Accuracy • Authority • Uniqueness • Completeness • Coverage <p>Form Criteria</p> <ul style="list-style-type: none"> • Navigation • User Support • Appropriate Technologies <p>Process Criteria</p> <ul style="list-style-type: none"> • Information Integrity • Site Integrity • System Integrity 	<p>(PAUSE 3 sec)</p> <p>The Internet Detective tutorial addresses twelve aspects of quality (PAUSE 5 sec)</p>
<p>Margaret (Head and Shoulders)</p>	<p>The Internet Detective A WebCT tutorial</p> <p><i>Margaret Kendall</i> <i>Department of Information and Communications</i></p>	<p>Margaret: The Internet Detective tutorial helps students distinguish between good and poor quality resources on the Internet</p>

APPENDIX 3. Multimedia storyboard segment for one screen (one complete slide build)

Screen	Audio	Production Notes
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$	(PAUSE 2) Here's the vector equation of motion when there are n identical model springs (PAUSE 1)	Start the commentary 2 seconds after the graphics jump on.
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$ <p>$n-1$ moving particles, each of mass M/n</p>	where these springs are attached to $n-1$ moving particles, each of mass M -over- n . (PAUSE 2). So in this case,	
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$ <p>$n-1$ moving particles, each of mass M/n</p> <p>$\mathbf{A} =$ </p>	the matrix \mathbf{A} has dimension $(n-1)$ times $(n-1)$. (PAUSE 1) And it has entries,	Grey box empty at first. Later, reveal the diagonal (five "-2") see 1st change below . Then the diagonals either side (double 1's), see 2nd change below . Then jump on zeros see 3rd change below
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$ <p>$n-1$ moving particles, each of mass M/n</p> <p>$\mathbf{A} =$ </p>	"minus 2" down the diagonal and	1st change jump on -2's
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$ <p>$n-1$ moving particles, each of mass M/n</p> <p>$\mathbf{A} =$ </p>	"1" either side (PAUSE)	2nd change jump on 1's
$\ddot{\mathbf{y}} = n^2 \frac{T_{eq}}{ML} \mathbf{A} \mathbf{y} \quad (n \text{ model springs})$ <p>$n-1$ moving particles, each of mass M/n</p> <p>$\mathbf{A} =$ </p>	(PAUSE) This is the 5 x 5 matrix when $n = 6$.	3rd change jump on 0's