Guidelines for pedagogic video design and production

A range of common-sense design principles - a subset of the design principles in Chapters 5 and 6 of my book “Designing video and multimedia for open and flexible learning” (Routledge 2206)

Table 1 part (a) deals with considerations prior to your designing the video. Then part (b) outlines pedagogic design guidelines.

Table 1. A pedagogic framework of narrative screenwriting principles

(a) How will the video be used? 

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<th>By whom</th>
<th>A. TARGET AUDIENCE</th>
<th>Examples</th>
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<tr>
<td>In what context</td>
<td>B. LEARNING CONTEXT AND COMPLEMENTARY LEARNING</td>
<td>Year 5</td>
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<td>For what purpose</td>
<td>C. TEACHING INTENTIONS</td>
<td>Supplementary video notes</td>
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| 1. Cognitive Learning Outcomes | 1. Apply a scientific theory |
| Provision of Experiences | 2. Take viewers on a virtual field trip |
| Nurturing (motivations, feelings) | 3. Influence attitudes |

(b) Pedagogic screenwriting structure

| Make them want to know | 1. HOOK (capture attention and sustain interest) | Examples |
| Tell them what you will do | 2. SIGNPOST (information about what’s coming) | Shock close-up of moist human brain. Narration: This is a real human brain |
| Do it, pedagogically | 3. ENCOURAGE ATTENTIVE VIEWING (CONCENTRATION) | Scene: four monkeys eating. Narration: let’s concentrate on social behaviour |

| 4. ENABLE INDIVIDUAL CONSTRUCTION OF KNOWLEDGE | Presenter says: helium in this balloon, carbon dioxide in this one. What will happen when I release the balloons? |
| 5. SENITIZE | e.g. don’t blanket shots with narration: leave slack for contemplation. |
| 6. ELUCIDATE | e.g. timely occurrence of music |
| 7. REINFORCE | e.g. uncluttered, simplifying graphics |

| Tell them what you have done | 8. CONSOLIDATE / CONCLUDE | e.g. summarize key features, helping viewers to stand back from the story |

|  e.g. repetition from a different angle |
More examples of the pedagogic structure guidelines of Table 1(b) - presented as subcategories of the 8 structural categories of Table 1b – see table 2 at the end for a summary

1. **HOOK**
   
   **a. Capture Attention: delight, surprise, shock**
   The unexpected, whether negative (shock), neutral (surprise) or positive (delight) will rouse the viewer.
   
   For example, the video starts with the shock close-up of a moist human brain, with the narration, *This is a real human brain (PAUSE 4 sec FOR CONTEMPLATION).*
   
   An example whereby you might surprise the viewer (in a chemistry video): the presenter releases a balloon filled with carbon dioxide, or a heavier gas, and it *drops like a stone.*
   
   An example whereby you might delight the viewer, in a programme involving family life: show babies doing baby things, such as toddling then overbalancing onto their bottoms.

   **b. Sustain Interest: fascinate, entertain/amuse, appetise, create suspense**
   Having roused viewers through 1a, above, you have to sustain their interest – through bringing out the fascination of the topic, and/or entertaining/amusing them (humour is powerful), and/or appetizing them with a foretaste of interesting later items, and/or creating suspense (which stimulates them out of a receptive mode into one of active anticipation).

2. **SIGNPOST**
   
   **a. Chapter Heading**
   Telling viewers what comes next, as in, *Let’s now concentrate on social behaviour.*

   **b. Focus signpost: what to look out for**
   This directs the learner’s attention to particular aspects of the next item. For example,
   
   *As you watch the flight of the helicopter, concentrate on what happens when it tilts forward…*
   
   Another example:
   
   *In the next clip, concentrate on the arms of the spinning skater*
   
   Both of these examples focus visual attention. Alternatively, it is often helpful to focus cognitive attention. For example
   
   Instead of the teacher saying, *Let’s work out the formula for the area of a circle,* the teacher says, *The area of a circle is πr² - let’s see why.*
   
   Thereby, viewers can keep comparing the current situation with the target solution.

3. **FACILITATE ATTENTIVE VIEWING (CONCENTRATION)**
   
   **a. Pose questions**
   - Most often, *question, pause, answer* (i.e. rhetorical questions).
   - Special case: pose implicit visual questions by *partial animation* so that viewers have to imagine the in-between pictures.
• Explicit questions, with a visual device that informs viewers when the answer will be revealed. For example, what are the reflective symmetries of this object? – repeated as a printed caption – then a rotating clock-hand counts down 10 seconds.
• For questions requiring lengthy deliberation, viewers can be invited to stop the video and re-start when ready, perhaps after referring to complementary print material (or the stop and complementary print could be automatically provided in a multimedia package containing video clips).

b. Encourage prediction
• Inviting viewers to guess what is coming next keeps their minds active. For example, in a video about chemical elements, the teacher, holding two balloons, says, This balloon contains helium, the other contains carbon dioxide. What’s going to happen when I release the balloons, what do you think? (PAUSES BEFORE RELEASING BALLOONS)
• Also, implicit questions, so that viewers will be tempted to predict the answers, such as: we’re going to investigate why, more and more these days, teenage boys lack self-esteem ...

4. ENABLE INDIVIDUAL CONSTRUCTION OF KNOWLEDGE

a. Concretize/activate existing knowledge
Use multiple analogies and metaphors in order to anchor into viewers’ prior knowledge.

b. Do not obscure the geography
When recording in a new location that contains objects of interest, start with an establishing shot – a wide a shot that establishes the geography.
CAVEAT. The big-close-up is a must for informing and maintaining interest – and sometimes this should not be postponed just in order to start with an establishing shot (especially if the viewer is expecting a close-up). On the other hand, close-ups should not be too tight – allow some visual elbow-room.

c. Don’t blinker, disclose the context (the conceptual geography)
• old in same shot with new for comparison. For example when one item in a mathematical equation is shown to change, retain the original unchanged equation in the same shot, for comparison. Similarly, show a close-up from the start of a chemical change (speeded up if necessary), rather than a 2-shot (presenter + object) and then a close-up later
• If developing an argument line by line of text (or box by box of a flow-chart), don’t always obscure the next line just because the commentary has not yet reached that point – show two lines (or three) from the start and highlight each as the commentary reaches it

d. Pause commentary for contemplation
As in Table 1b: do not blanket the shots with narration, leave slack for concentration

5. SENSITISE (put viewers into a receptive frame of mind)

a. Appropriate style of Music – occurring sparingly
The style of background music should be appropriate for the topic and learning task – and so should its occurrence: music over a whole video tends to tranquillise rather than sensitise. Consider doing without music during narration and introduce it only when the narration stops for a while, thus inviting viewers to contemplate the scene and make their own interpretation.

b. Signal Change of Topic
A new topic can be signalled by a pause at the end of a topic followed by a change of shot and immediate new narration. This immediacy indicates that the topic has changed, then the narration identifies the new topic.

c. Consistent style
Maintaining a particular style, such as the colour of captions, facilitates intake of information, because the learners become accustomed (or de-sensitised) to the background information (colour) so can ignore it. Hence they are more sensitive to the relevant information.

d. Conform to video grammar
Do not cut from a shot in which the camera is zooming or moving. Movement (especially of the whole picture) requires extra mental processing. Hence the viewer's mind cannot settle down until the movement stops and the picture remains static for a second or so.

6. ELUCIDATE (make the story clear)

a. Moderate intellectual depth/complexity
- Long sentences, which normally contain conditional clauses, are difficult to understand. So convert every long sentence into two or more short ones.
- Pedagogic graphic design – clear, informative – using flow charts, concept maps, colour coding, shape coding, animation. And NOTE: clarity of text must take priority over beauty – fancy fonts and colours can be less legible

b. Enhance Legibility / Audibility
- Speak clearly (even experienced presenters are prone to gabble when being recorded)
- Framing: arrange objects/graphics to match screen ratio – excessive wasted space means wider shots and hence less legible shots.
- Ensure that all performers and props are in the right place, doing the right things, and that conditions are purposely restricted to exclude extraneous noises or intrusive objects or people.
- Direct the learner's attention to the relevant part of the screen or aspect of the picture – with commentary or superimposed graphics or highlighting or a presenter pointing
- To convey three-dimensionality, the best technique is to move the object or camera. Additionally, three-dimensionality can be enhanced by interposing the presenter’s hand, sliding over the object. Appropriate key lighting is also necessary – to sculpture the object by creating differentiated light and shade and also shadows of protrusions
7. REINFORCE

a. Repetition (from a different angle)
Repetition for reinforcement can be repetition of words or of pictures. In either case, the repetition might be exact or, more usually, repetition of an idea from a different angle.

A second reason for repetition is not to reinforce but rather to compensate for inattention. Viewers’ concentration may fade in and out during a video segment. Such lapses will occur at different times for different viewers. Hence, the need for occasional redundancy – repeat the ideas in different words, enlarge upon the idea.

b. Compare/Contrast
When two objects or concepts are compared for similarities between them, each concept is understood better through analogy with the second concept.

A similar effect can be achieved by doing the opposite – contrasting two concepts for their differences. This sharpens appreciation of the concept that is being contrasted, i.e. the viewer understands what the concept is not.

c. Synergy between words and pictures
- Choose the shot that best amplifies rather than merely accompanies the words. For example, a sequence in a foundry, with the commentary, Safety is paramount when the heat is so fierce. In this case, don’t show a wide shot of the foundry – rather, show a close-up of a potentially dangerous activity – a worker pouring white-hot molten metal.
- Conversely, choose words that amplify the shot, e.g.
  Do not say this part of the object
  instead, say the top left part of the object or the pointed part of the object
- On some occasions, the pictures need to precede the words, e.g. when the pictures are mathematical expressions that are difficult to listen to unless they can be seen: for example, the corresponding formula needs to be seen during the commentary:
  \[ \text{minus } b, \text{ plus or minus the square root of, } b^2 - 4ac, \text{ all over two } a \]
- On other occasions, the words need to precede the pictures (to prepare the learners):
  In the next clip, watch the arms of the spinning skater.

8. CONSOLIDATE/CONCLUDE

a. Recapitulate
For example, following the first half of a video about the brain, the presenter says (over appropriate shots of parts of a model of the brain)

\[ \text{We’ve looked at four parts of the brain, a part of the brain concerned with language, at the ventricles, at the visual system and at the sensory cortex} \]

b. Summarize key features / consolidate
Summarizing is more extensive than recapitulating – it extends back and elaborates on the chapter by giving a précis of the key features. For example, following the recapitulation quoted above, the presenter summarizes, by saying

and in each case, as well as looking at their structure, we’ve looked at their function – what the parts of the brain actually do, the behaviour and the abilities and the sensations that they control
### c. Chapter Ending

Name the chapter and say that it has finished (usually a single sentence). For example, in a video about the brain, at the end of a section (chapter) describing the natural cavities in the brain (the ventricles), the narrator says,

> So that’s the ventricles, now for the visual system.

The first half of the sentence is the *chapter ending* – it names the chapter (the ventricles) and announces that it has ended (So that’s). Thereby the viewer closes the book on that topic and knows which book has been closed. (The second half of the sentence is an example of 2a, a Chapter Heading)

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