Segmentation effect and eye movement modelling examples in learning renal physiology

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Attention guided by an Eye Movement Modelling

- The Eye Movement Model prompts participants to look at the same items as the model, it allows learners to look at the important items. (Jarodzka et al., 2013; Chisari et al., 2020).
  - No effect on learning
  - Or specific to low prior knowledge
- Transient information effect / multimedia learning (Leahy & Sweller, 2016).
Segmentation

✓ Segmenting content improves learning and decreases the depletion of attentional resources (Chen et al., 2018).
Problem

- What is the effect of time and guidance using an Eye Movement Model on learning?
Variables

- Dependent variable: Learning gain
- Independent variable 1: Pause vs No pause
- Independent variable 2: Eye Movement Model vs Without Eye Movement Model
- Independent variable 3: Low prior knowledge vs High prior knowledge
Hypotheses

- H1: Videos with insertion of pauses would allow better learning than videos without pause time.

- H2: Videos with eye movement model would allow better learning than videos without an eye movement model.
Participants and materials

195 medical students, 2\textsuperscript{nd} year

- Content and recording of eye movements using eye-tracking.
- Insertion of pauses
  - 25\% of the original video
  - 62 pauses of 5.15 seconds.

<table>
<thead>
<tr>
<th></th>
<th>With Eye Movement Model</th>
<th>Without Eye Movement Model</th>
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</thead>
<tbody>
<tr>
<td>Pauses</td>
<td>43 students</td>
<td>51 students</td>
</tr>
<tr>
<td>Without pauses</td>
<td>46 students</td>
<td>55 students</td>
</tr>
</tbody>
</table>
Procedure

Pré-test  Video (randomly assigned)  Subjective Cognitive Load (Leppink et al., 2013)  Posttest
Results: Main effect of pauses

Learning gain depending of pauses

- **PAUSES**: 2.20
- **WITHOUT PAUSES**: 1.57

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No main effect of Eye Movement Model

Learning gain depending on eye movement model

- EYE MOVEMENT MODEL: 1.70
- WITHOUT EYE MOVEMENT MODEL: 2.01
No interaction effect between pauses and Eye Movement Model

Learning gain depending pauses and eye movement model
Effect of students prior knowledge on learning gain

Learning gain depending on pauses, eye movement model, and prior knowledge

- *** Main effect of pauses and prior knowledge
- ** Eye Movement Model effect
- * Pauses effect

Bar chart showing learning gain for low and high prior knowledge groups with and without pauses, and with and without the Eye Movement Model.
Discussion

- Possible explanation for the mixed results regarding the effectiveness of Eye Movement Model.
  - Prior knowledge and pauses in learning video

- Interesting prospects for other types of more visual content.
Thank you!