The Signaling Effect

Theory

The signaling effect presents the increase in learning outcomes due to guiding and promotion of attention to relevant information. Signals are based on natural attention attractors like movement, contrast or sound. In multimedia this effect can also be achieved through various methods like[1]:

1. enumeration, → arrows, underlining,
2. **bold text**, *italic text*, coloring,
3. summaries or overviews.

Practice

Examples of signaling implementation in practice:

- preview **summary** paragraph[2]
- **section headings**[3]
- **labels color change** synchronized with a spoken explanation[4][5]
- **step-by-step presentation** of diagram elements synchronized with a spoken explanation[6]
- text **underlining**[7]
- text **capitalization**[8]

Research results

A recent research[9] has confirmed and attempted to explain the signaling effect using recorded eye movements data of the experiment participants. Some of the conclusions of this and similar studies concerning the signaling effect are:

- Signaling can guide attention to relevant information, which reduces cognitive resources normally assigned for search of information[10]
- Eye-tracking studies confirmed that signaling results in more attention devoted to relevant information[11]
- Some studies have found increase in retention tests performance, but not on transfer tests[12], but others found positive effects of signaling on transfer tests, but not on retention tests[13][14]
- In cases when signaling is used, time for finding information is usually reduced, but duration of time spent watching/processing this information increases when compared to no signaling conditions

1), 4), 9), 10), 11), 13)
Ozcelik, Erol, Ismahan Arslan-Ari, and Kursat Cagiltay. Why does signaling enhance multimedia learning? Evidence from eye movements. Computers in Human Behavior 26, no. 1: 110-117. January 2010.

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