AUDITORY AND VISUAL EFFECTS ON VISUAL ATTENTION AND ON COMPREHENSION OF ELECTRONIC MAGAZINES. STUDY WITH EYE TRACKER TECHNOLOGY

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Abstract

Digital reading has become an important means of reading, but the visual process for digital and paper reading are different.

With eye tracking techniques, experimental design and regression model, this paper wants to analyzed audiences’ eye movement reading Chinese e-magazine under visual and auditory stimuli.

An experimental e-magazine was created and 80 graduate students (40 men and 40 women) were randomly selected. All participants underwent the same setup but used different stimuli; they had to read short sentences while an eye tracker records their eye movements; after completion, participants answer a comprehension questionnaire.

Hypotheses

1. Fast-paced rhythm of the background music negatively affects reading efficiency.
2. Special visual effects have a positive effect on reading efficiency.
3. Inserted picture related to the text has positive effect on the early recognition of its content.
4. Text dubbing has a positive effect on the processing time of the content.
5. Visual stimulation and auditory stimulation have an integral impact on the comprehension of e-magazines’ content.

Results

The speed of the rhythm of the background music has no significant effect on reading efficiency.

The special visual effect has no significant effect on reading efficiency.

The inserted picture related to the text has a positive effect on its early recognition.

Text dubbing has a significant effect on average gaze duration, which decreases in this situation.

Regression model

\[ Y = 44.079 + 19.907X2 - 10.220X1 \]

The regression model suggests that text dubbing (X2) and a cool background color (X1) have a significant effect on COMPREHENSION RATE. When the text dubbing X2 = 1, which means with text dubbing, it will have a higher comprehension rate; when the background color is cool X1 = 0, it will have a higher comprehension rate.

Then comes the CONCLUSION that with text dubbing and cool background colors, the dissemination effects of the electronic magazine are better.

Some References


Methodology

Participants 80 graduate students 40 men / 40 women

- DEPENDENT VARIABLES
  - Fixation count (spatial distance)
  - Fixation duration (spatial duration)
  - Gaze deviation
  - Reading comprehension

- INDEPENDENT VARIABLES
  - Eye tracker results
  - Reading speed
  - Rhythm of background music
  - Effects

- Orthogonal design

- VARIABLES
  - Background color
  - Reading speed
  - Rhythm of background music
  - Effects

Conclusions

The speed of the rhythm of the background music doesn’t affect the reading efficiency in terms of number of fixations.

- The special visual effect doesn’t affect the reading efficiency, so adding variety of special effects in the electronic magazine will not affect people’s reading efficiency.

- Reading voice has a significant effect on the average gaze duration, as means on the processing time of the contents. Adding text dubbing to the e-magazine makes the reader follow the rhythm of the voice to read.

- Text dubbing and background colors have a significant effect on the reading comprehension, so with text dubbing and cool background colors, the accuracy rate is higher.