

Difficulty of learning in multilingual environments: Learners' comprehension of multilingual slides and their visual attention distribution as measured with eye tracking

ラクシュミラ クスモ アダニ

<https://hdl.handle.net/2324/7329490>

出版情報 : Kyushu University, 2024, 博士 (芸術工学) , 課程博士
バージョン :
権利関係 :



氏 名	Laksmira Kusumo ADHANI			
論 文 名	Difficulty of learning in multilingual environments: Learners' comprehension of multilingual slides and their visual attention distribution as measured with eye tracking (多言語環境における学習の困難さ：学習者による多言語スライドの理解と眼球運動測定による視覚的注意の分布)			
論文調査委員	主 査	九州大学	准教授	Gerard B. Remijn
	副 査	九州大学	准教授	上田 和夫
	副 査	理化学研究所	上級技師	竹市 博臣

論 文 審 査 の 結 果 の 要 旨

Following efforts to promote internationalization at academic institutions, the use of multiple languages on educational slides (e.g., PowerPoint) has gradually increased. The purpose of this dissertation is to investigate how the layout of educational slides with multiple languages influences students' evaluations of the slides, their visual attention distribution, and content comprehension. Four studies were performed with a group of Indonesian and Japanese students, who had English as their second language (L2). The studies mainly investigated students' evaluations of multilingual slides and their visual attention distribution on the slides. Visual attention distribution in this research is defined as the total gaze duration (i.e., dwell time) on Areas of Interest (AOIs) on the slides, as measured with eye tracking. The slides were made in a so-called separated-block layout and a mixed layout. In the separated-block layout, information in multiple languages was given in separate sections, divided according to language. In the mixed layout, information in multiple languages was given line-by-line, alternating for each language. Three languages were used on the slides: English, Japanese, and Bahasa Indonesia.

The results showed the following. First, Study 1 revealed that one-third of 80 students (25–37%) thought their study performance was affected by external distractions while watching slides. Second, Study 2 showed that bilingual and trilingual slides with a mixed layout were evaluated (n=50) as significantly more complex as compared to slides with a separated-block layout. The results with eye tracking in both Studies 3 and 4 showed that students dwelled significantly longer on the AOIs in their native language (L1; either Bahasa Indonesia or Japanese) than their non-native language(s), including English, when they watched slides with a separated-block layout. Significant dwell time differences were not found for slides with a mixed layout, which were evaluated as significantly more complex, crowded, and required more mental effort than the separated-block slides (n=40). Importantly, however, the students' comprehension scores for the slides with a mixed layout were significantly higher than for the slides with a separated-block layout. It therefore can be concluded that, although judged as more crowded and requiring a wider attention distribution, slides with a mixed layout may be preferable for use in multilingual education. Since a solid amount of data was obtained to provide ground for this conclusion and the practical applicability of the research results in the field of education and learning in general, the committee members concluded that Ms. Laksmira Kusumo Adhani's thesis is of sufficient academic level, worthy of a doctoral degree.