The effects of control versus autonomy in hypermedia learning environments

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The effects of control versus autonomy in hypermedia learning environments

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This study concerns the effect of autonomy when studying learning material on students' motivation, perceived mental effort and learning results, taken into account students' prior domain knowledge, learning ability and attitude towards learning. The objective of this study is to find a balance between the implications, for the design of educational instruction, of Cognitive Load Theory (CLT) and Self Determination Theory (SDT) with regard to the amount of control that is optimal for learning.

Method

A total of 86 grade 5 students have participated in this study, which is set up according to a between subjects design with three conditions. Data-collection still continues.

Conditions
In all conditions students are presented with the same tasks (short essay questions) which they have to answer by watching video material. The domain for this study, is volcano's and earthquakes. (The video material comes from the digital audiovisual database ED*IT. ED*IT is an initiative from the Dutch Institute for Sound and Vision, Teleac/NOT and Kennisnet.)

The conditions differ in the type of control students have when working their way through the material.

1. Fixed procedure condition: students work their way through the tasks and study material in a predetermined way. All the students study the same material in the same order.
2. Learner control condition: students are given a database containing all the study material. The students get the freedom to choose the materials for each task (for which they may also choose the order), no structure is given. They may stop when they think they have enough information to answering the task.
3. Autonomy condition: students get to control the type of control for each task. They are free to choose their own learning materials (from the database of condition two) for task completion, but they can also choose for each separate task to follow the structured learning path (as presented in condition one), or create a mix of the two. They may also stop when they think they have enough information to answering the task.

For each condition students work individually for 4-8 hours with a digital learning environment (build for this study) on a computer. Student's actions are logged, and time is measured.

Measures
In a pre-test the student's prior domain knowledge and attitudes towards school (Academic Self-Regulation Questionnaire) are measured. For learning ability the CITO-scores (Central Institute for Test Development scores from the monitoring and evaluation system on math, spelling and text comprehension) are used. Their perceived mental effort and motivation are measured after each task. At the end, learning results are measured (by a factual knowledge test and an in-depth knowledge test), as well as motivation and basis psychological needs fulfilment (Intrinsic Motivation Inventory combined with the Basic Psychological Needs Scale).

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