

Learners' Responses to Multiple Intelligence Differentiated Instructional Material in an ITS

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1. Introduction

Research on learning has shown that students learn differently and that they process knowledge in various ways. But observing and identifying learning characteristics is difficult. It is also not clear which aspects of learning characteristics are worth modelling, how the modelling can take place and what can be done differently for users with different learning characteristics. Traditionally questionnaires and psychometric tests are used to assess and diagnose learning characteristics. This event will investigate how the Intelligent Tutoring System EDUCE builds a model of the users learning characteristics thus providing a basis on which marco-adaptation of material may take place.

The motivation behind EDUCE is that intelligence is not a fixed static entity but something that can be enhanced significantly through the provision of different material that accommodates how the student learns. It uses a pedagogical model based on Gardner's Multiple Intelligence concept to classify content, model the student and deliver material in diverse ways. Multiple Intelligences is a learning theory which states that different intelligences are used to solve problems and fashion products. The Multiple Intelligence concept defines intelligence as the capacity to solve problems or fashion products that are of value and states that there are different ways to demonstrate this intelligence. EDUCE utilises learning characteristics and the Multiple Intelligence concept to provide an individualised learning environment. It uses four different intelligences: verbal/linguistic, visual/spatial, logical/mathematical and musical intelligences, to provide a framework for the development of a broad range of content that supports creative, multimodal teaching

This event will investigate using EDUCE the learner's response when faced with a choice of Multiple Intelligence differentiated instructional material. Participants will become part of an experimental study in which they will get the opportunity to discover for themselves their own learning characteristics. They will get the opportunity to navigate through a tutorial on Static Electricity making choices about which Multiple Intelligence differentiated material to view and will analyse how the MI concept may be utilised within an ITS. Also presented will be results from an experimental study carried out with two groups of teenagers that tentatively suggest that learners do exhibit strong preferences, that within a group of learners there is a diversity of preferences and that EDUCE is a useful tool for investigating learning characteristics.

The purpose of the highly interactive event in which participants will be to investigate

- Can the Multiple Intelligence concept be applied to online learning ?
- Do learners exhibit strong preferences for different Multiple Intelligence differentiated material ?
- Within a group of learners there is a diversity of preferences ?
- Is EDUCE a useful tool for investigating learning characteristics ?
- It is possible to build an ITS that will increase student learning based upon the MI theory ?

2. Event Script

1. Introduction to EDUCE

A brief introduction to the concept of Multiple Intelligence will be given. This will be followed by a short demonstration on how to navigate through tutorial. The framework for integrating the Multiple Intelligence concept will also be outlined.

2. Hands on Tutorial

For a period of approximately 20 minutes duration participants will navigate through tutorial. During the online tutorial participants will express their preferences for the different type of material and answer interactive questions on the content

3. Individual Feedback

After the tutorial, participants will receive individual feedback on their preferred mode of material.

4. Experimental Study Results

Some results from an experimental study conducted with two groups of teenagers will be briefly presented.

5. Plenary Feedback

Here a group discussion on the use of Multiple Intelligences in an Intelligent Tutoring System will take place. The participant's experience during the tutorial will provide the bedrock for a discussion that will include the following questions:

Tutorial specific Questions:

- Which option do you prefer ?
- Which option do you remember ?
- Which option do you understand the best ?
- What are the differences between the various options ?
- Do you have a favourite choice ?
- How long did it take you to discover your favourite choice ?
- After you discovered your favourite choice, did you still try other choices ? Why ?
- Was their consistent pattern in your decision making ?

General Questions:

- Do the different choices reflect the different Multiple Intelligences ?
- What is the benefit in providing choice of material ?

- Do learners exhibit preferences for different Multiple Intelligence differentiated instructional material ?
- How can an MI enhanced ITS facilitate learning gain ?
- Is EDUCE a useful tool for investigating learning characteristics ?
- How can an ITS adaptively recognise learning characteristics ?
- What is the benefit in an ITS, as opposed to the learner, in making presentation decisions ?
- Can an ITS provide a richer learning environment by learning how to adapt the presentation of material using learning characteristics ?

3. Related Work in Conference

The related work in the conference is a short paper titled

“Learners Responses to Multiple Intelligence Differentiated Instructional Material in an ITS
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