

# Media and students' culture of (m)learning

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# Introduction

- Multimedia technology has proved its potential in revolutionizing the education.
- It enhances the efficacy of educational systems by effective domain knowledge representation (in some cases, better than real representations).
- Visualisation and audio components fit well with the nature of Nintendo generation students!

## Is there learning?

- Current multimedia based systems put too much emphasis on the affective and psychomotor aspects.
- Learners are lured by spectacular effects of images, animations, video and so on.
- Emphasis is shifted from adequate learning outcomes and cognitive development.

## So, does multimedia provide learning?

- Just a collection and integration of visual or audio components does not guarantee or enhance learning.
- Learning happens when multimedia complements the educational objectives and learner attributes.

## Effect of Multimedia

- Mobile devices open up many possibilities in terms of flexibility but they also limit the richness of content presentation.
- Learners are likely to benefit from richer presentations due to multiple stimulus.
- Therefore, use of multimedia in mobile learning requires a fine alignment between the effectiveness of media, learner attributes and educational pedagogy.

Multiple Representation Approach →

# Multiple Representation Approach

- Presents multimedia objects (such as audio, pictures, animations) into a multimedia interface world where the relationships of the objects to the world are governed by the educational framework.

# Components of MRA

- Multimedia object selection
- Navigational object selection
- Integration of multimedia objects

## Components of Multiple Representation Approach

### Multimedia object selection

- *Task specificity and learner's competence*
  - Different multimedia objects are suitable for different tasks
    - ✓ Audio is good to stimulate imagination
    - ✓ Video clips for action information
    - ✓ Text to convey details
    - ✓ Diagrams are good to convey ideas

## Components of Multiple Representation Approach

### **Multimedia object selection**

- *Task specificity and learner's competence*
  - Level of learner's domain competence in the current situation should be considered
  - Curriculum should follow a granular structure to allow assessment on individual units
  - This will ensure context based selection of multimedia objects

## Components of Multiple Representation Approach

# Multimedia object selection

### ➤ *Expectations*

- Expectations of learner and of domain about representation of the tasks should be considered
- If they don't match, possibly provide presentations in more than one form to suit all expectations (e.g. learner wants overview by graphic, but domain requires textual details, give both)

## Components of Multiple Representation Approach

### **Multimedia object selection**

- *Reference & revisits of already learned domain content*
  - a. enforces links between current and referred concept
  - b. enhances mental model of previous concept and its generalisation in multiple scenarios
  - c. ease in learning current concept by making analogy with past learning experiences

## Components of Multiple Representation Approach

### Multimedia object selection

- *Use of multi-sensory channels*
  - Adequate use the visual, aural and tactile senses of the learner.
  - Chances of getting distraction due to the unused channel are high.
  - Reception enhances if the representation of domain content involves various sensory channels.

## Components of Multiple Representation Approach

### **Multimedia object selection**

- *Context based selection of multimedia objects*
  - Presentation should use the most suitable object in the context
  - Demand of domain should determine which multimedia object is required for which task and in which context.

## Components of Multiple Representation Approach

### Multimedia object selection

- *Authenticity of multimedia objects*
  - The learner should be aware of the authenticity of the multimedia objects.

Navigational Objects Selection →

## Components of Multiple Representation Approach

### **Navigational object selection**

- Navigation is typically via links
- A link does not say what happens when the user activates the link (Rada, 1995)
- Learner's expectations of outcome should be matched with the presentation of actual resulting interface

## Components of Multiple Representation Approach

### **Navigational object selection**

- Type of link should suit to the context and learner's expectations.
- Links should be used for the tasks for which they suit best and do not put cognitive overload on the learner.
- Links should not deviate learner's attention from main learning task.
- The existence of link should be as transparent as possible.

## Components of Multiple Representation Approach

### **Navigational object selection**

#### **Direct successor**

- Leading to the successive domain unit in knowledge hierarchy, keeping the current context.

#### **Parallel concept link**

- Analogy based

#### **Fine grained unit link**

- Focused query once some missing or misconceptions are identified
- Very contextual

## Components of Multiple Representation Approach

# Navigational object selection

### Glossary link

- Pop-up
- Explicit action required

### Excursion link

- Outside the current knowledge hierarchy, within current context

### Problem link

- Resulting from system's inference of learning criteria fulfilment

Integration of multimedia objects →

## Components of Multiple Representation Approach

# Integration of multimedia object

- No more than one active multimedia object at a time on the screen (except comparative studies)
- Integration of multimedia objects should be complimentary and synchronised
- Same material should not be repeated using different multimedia objects at the same time

## Components of Multiple Representation Approach

# Integration of multimedia object

- Integration of decision intensive objects is not recommended due to their high cognitive load demand
- Integration of dynamic and static objects should be such that both objects should not use same sensory channel at the same time

# Prototype architecture

