Effect of guidance in learning a complex biological process using multimedia animations.

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Introduction

Animation = a lot different information

Animations can help learning, but not always (Höffler & Leutner, 2007; Berney & Bétrancourt, 2009)

Understand and learn with animation = create a relevant mental model by creating a causal chain between the different elements composing the animation (Lowe & Boucheix, 2008).

Aim: understand how we must present animated information in order to promote a better learning.

Creating a lesson + observing performances about 2 types of presentation:

- Guided = watch a segmented and coherent lesson.
- Non-guided = choose the order in which you want to learn.

We should observe better performances after lesson, especially in guided mode.

Method

➢ **Participants:**

N=103 middle school students

m=11,92 y/o

➢ **Material:** A lesson about organic matter decomposition

- Guided presentation:
  A video with organized information

- Non-guided presentation:
  choose the different parts of the video one by one

- Multiple choices test:
  40 statements
  Type of answers:
  - True
  - False
  - I don't know

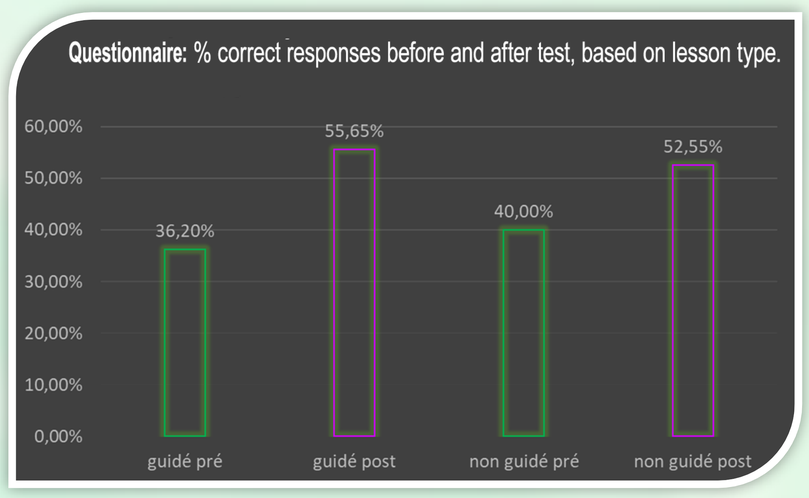
➢ **Organization of the experiment:**

Week 1 = pre-test

Week 2: test + post-test

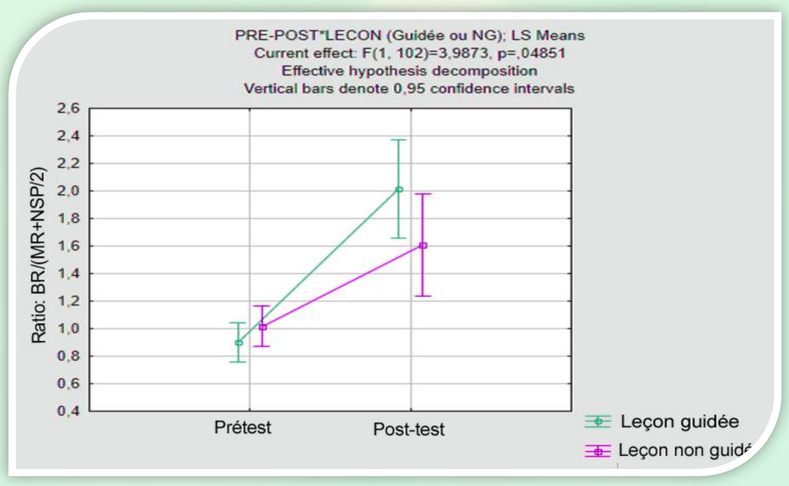
12min

Results



Better results after lesson → $F(1,102)=42,5151, p=.000, \eta^2=,99$ and for guided lesson group

Guided mode Wins!



In order to consider all types of response a ratio has been calculated:

right answer/(wrong answer+ don't know/2)

Interaction: lesson type on ratio score.

Discussion

It seems that understanding and therefore learning is better when the information is given coherently. If the different parts of the lesson are correct and provide knowledge, they must be presented correctly to help create a strong mental model and allow a better learning. This confirm our assumptions and join the APM model (Lowe & Boucheix, 2008). Due to the encouraging results we have achieved, we will focus our future work on other ways to guide the learner. To do this, we will focus on cueing and anti-cueing in understanding a complex virtual educational environment.

Our questions are the following:

- Is it better to make information salient in a complex environment?
- Is it better to bring the information little by little to achieve something complex and understand it without difficulty?

Berney, S. & Bétrancourt, M. (2009). When and why does animation enhance learning? A meta-analysis. *In Proceedings of the 13th EARLI biennal conference on Research on Learning and Instruction*, Aug. 28 - Sept. 1, Amsterdam (NL).

Höffler, T. N., & Leutner, D. (2007). Instructional animation versus static pictures: a meta-analysis. Learning and Instruction, 17, 722e738.

Lowe, R.K., & Boucheix, J.-M (2008). Learning from animated diagrams: how are mental models built? In G. Stapleton, J. Howse, & J. Lee (Eds.), *Theory and applications of diagrams* (pp.226-281) Berlin: Springer.