



Erasmus+



The classification of embodied digital learning apps and their contribution to students' learning

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INTELed's main aims:

#1 Social inclusion

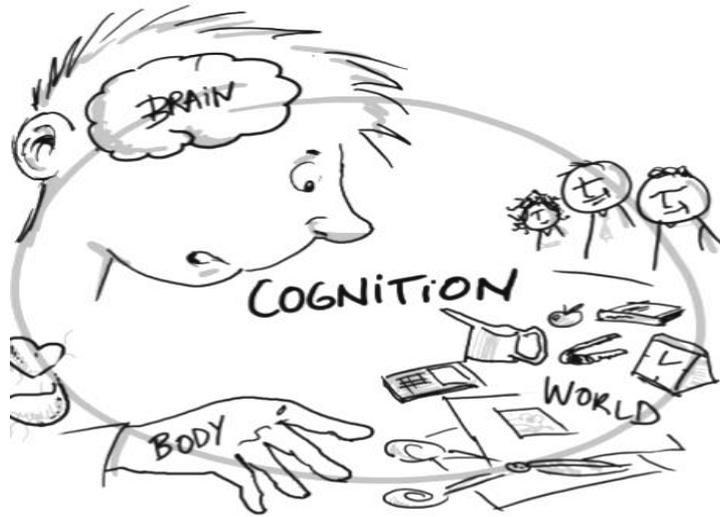
- Promote social inclusion through innovation in Special and Inclusive education
- Create opportunities for ALL students with and without disabilities through a pedagogical and methodological framework, which is driven by the embodied cognition theories and the use of the multisensory technologies

INTELed's main aims:

#2 Teachers' professional development

- In-service teachers' professional development and support
- Support schools in order to provide qualitative education to ALL students

Theoretical framework: Embodied cognition



An inseparable connection between the mind (cognition) - the body and the world that surrounds us!

Human intelligence is perceived and understood in relation to the human body, and vice versa, the body as a physical entity that acts and interacts with the physical world has the ability to influence and change the cognition (mental/ cognitive functions)

From the embodied cognition to the embodied learning...

Embodied learning theory is defined as the ability of learning any information that is affected by a sensorimotor stimulus.

According to the embodied learning theory, body is recognized as a source of knowledge:

- We perceive information from the environment through our body.
- In addition, human senses play also an important role.

From the embodied cognition...to the embodied learning...

The correlation between embodied cognition theory and learning has been expanded, especially the past few years.

e.g. The way of students understand mathematics is based on the embodied cognition perspectives

- Understanding/counting in decimal system using their fingers
- Understanding the arithmetic line with body movements to the left/right



The advantages of embodied learning...



- **Increased processing levels:** Multiple multi-sensory stimulus
- **Decreased cognitive load levels:** Usage of motion for offloading cognitive sources
- **Connect abstract – specific:** Abstract concepts and ideas become more concrete and substantial through children's interaction with the physical world

Innovative and interactive technologies



Innovative emerging technologies which allow motion, natural interaction, and full body involvement, have resulted in the increase of learning environments that are grounded on the embodied cognition theory.

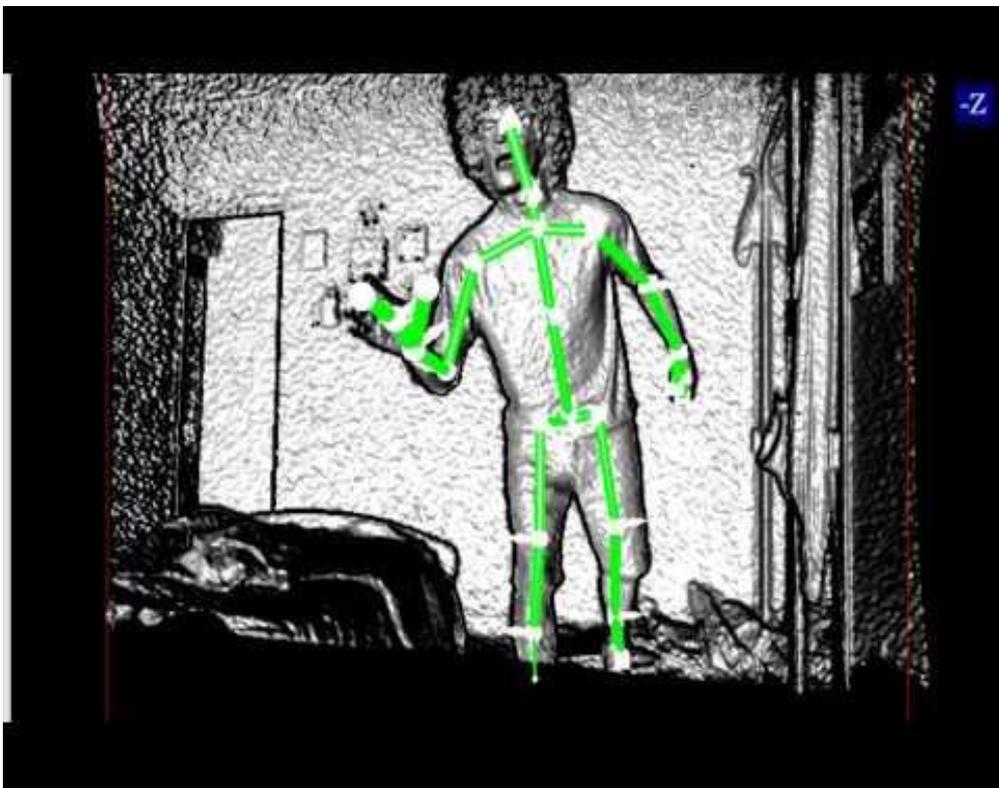
Embodied learning multi-sensory technologies

Leap motion



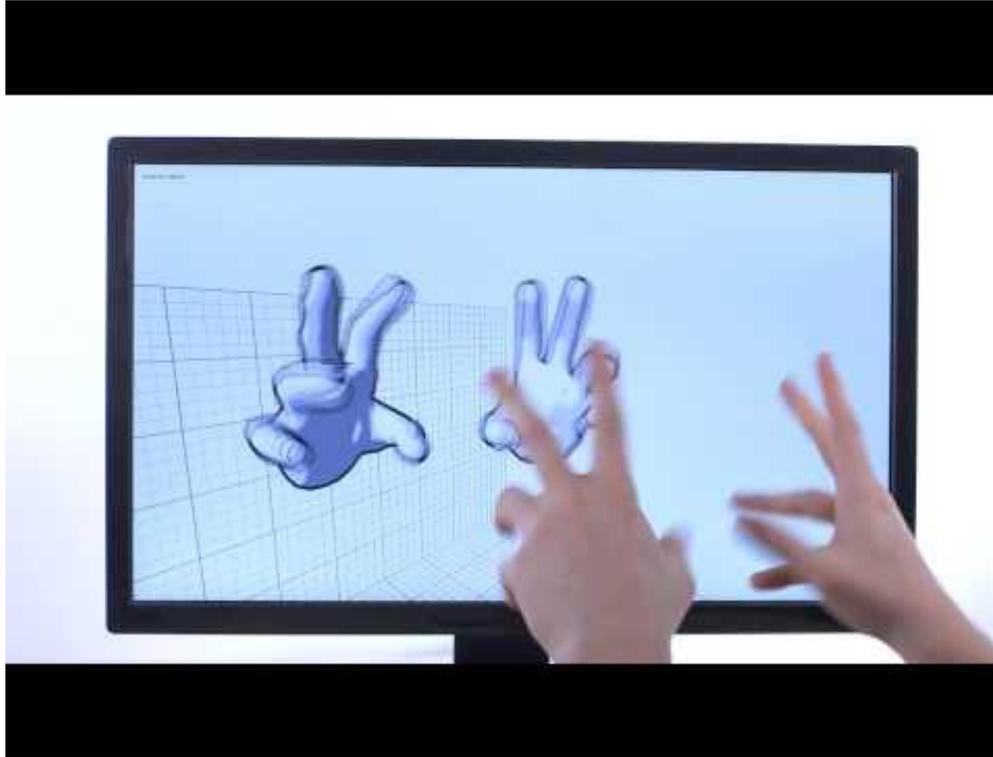
Kinect camera





http://www.youtube.com/watch?v=_Ahy0Gh69-M

Leap motion tracking



<http://www.youtube.com/watch?v=zXghYjh6Gro>

The contribution of educational technologies within the context of embodied learning



1. **Body representation and motions:** creating physical and mental representations
2. Provision of **dynamic feedback** with minimal disturbance
3. **Immersed** into the digital world that technologies create

Technological applications' capabilities for promoting embodied learning

Various technological applications – learning environments that are based on new technologies

- 1. To what extent are they based on the embodied cognition theories?**
- 2. Are they promoting embodied learning to the same extent?**

The classification of embodied learning digital applications

3 axes

Axis 1: Sensorimotor engagement

Axis 2: Cognitive/ Emotional immersion

Axis 3: Relevance between motion-learning context (Gestural congruence)

Axis 1: Sensorimotor engagement

- Technologies that provide opportunities for sensorimotor engagement can promote embodied learning to a greater extent
- Hands/full body movement Vs finger movement for handling a mouse/keyboard



Axis 2: Immersion



- Technologies that provide more realistic digital environments with the addition of acoustic – audio stimulus (e.g., virtual reality technologies) promote the sense of immersion
- The user feels that he/she is located and act into a digital world which promotes embodied learning

http://www.youtube.com/watch?v=EZmRdg_xFxE

Axis 3: Relevance between motion-learning context

- Technologies that provide opportunities for hand or full body movements, which are related to the learning context and concepts promote embodied learning.



Partners



Universidad de Valladolid

Supporters



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