University of Piraeus
Department of Digital Systems

Technology Enhanced Learning Programs for Whole Child Development

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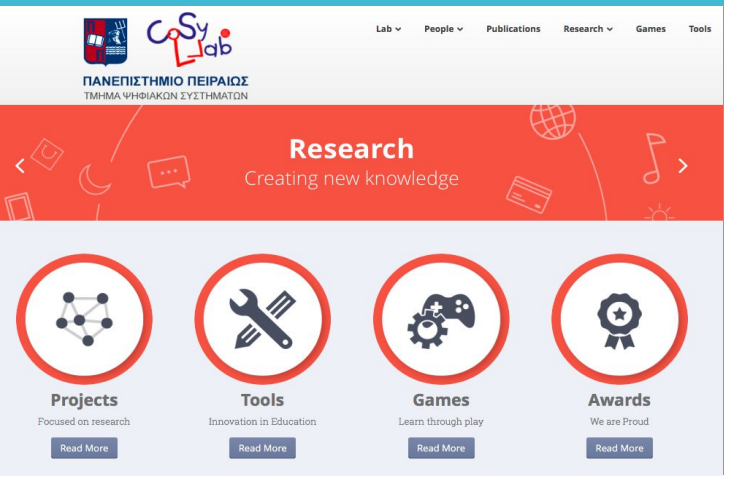
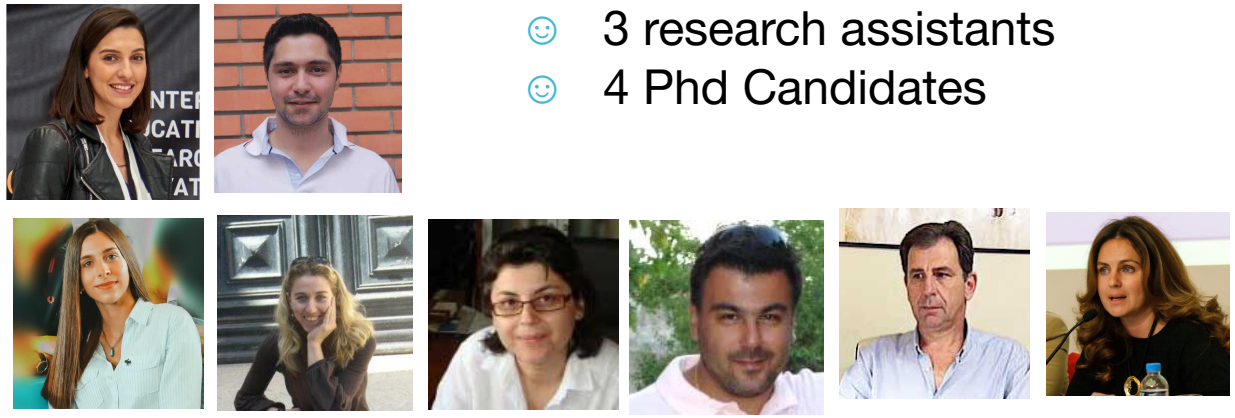


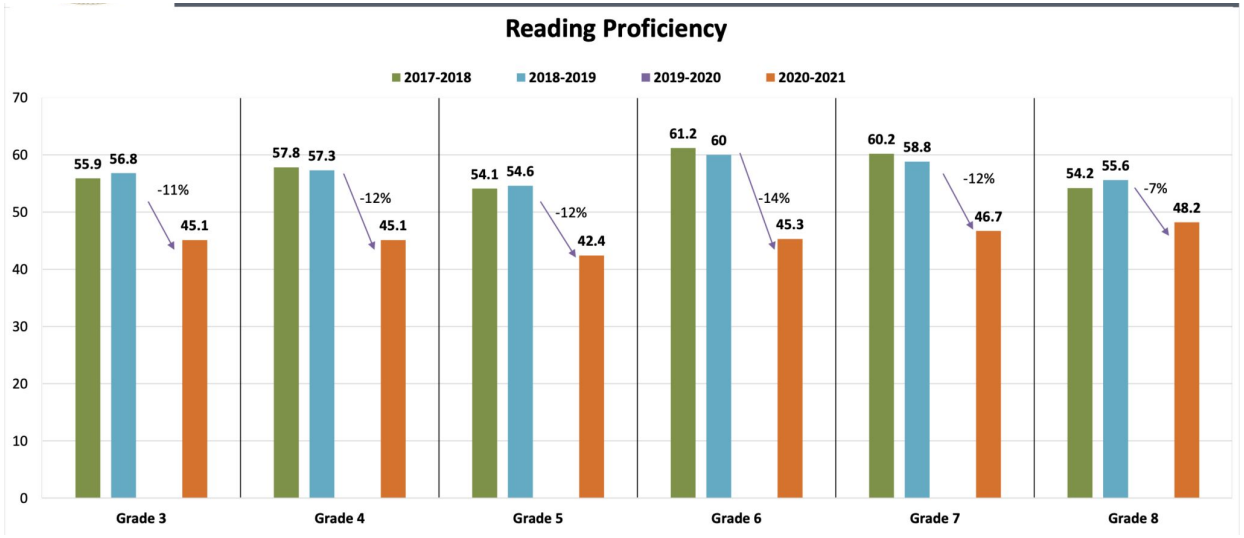
http://cosy.ds.unipi.gr

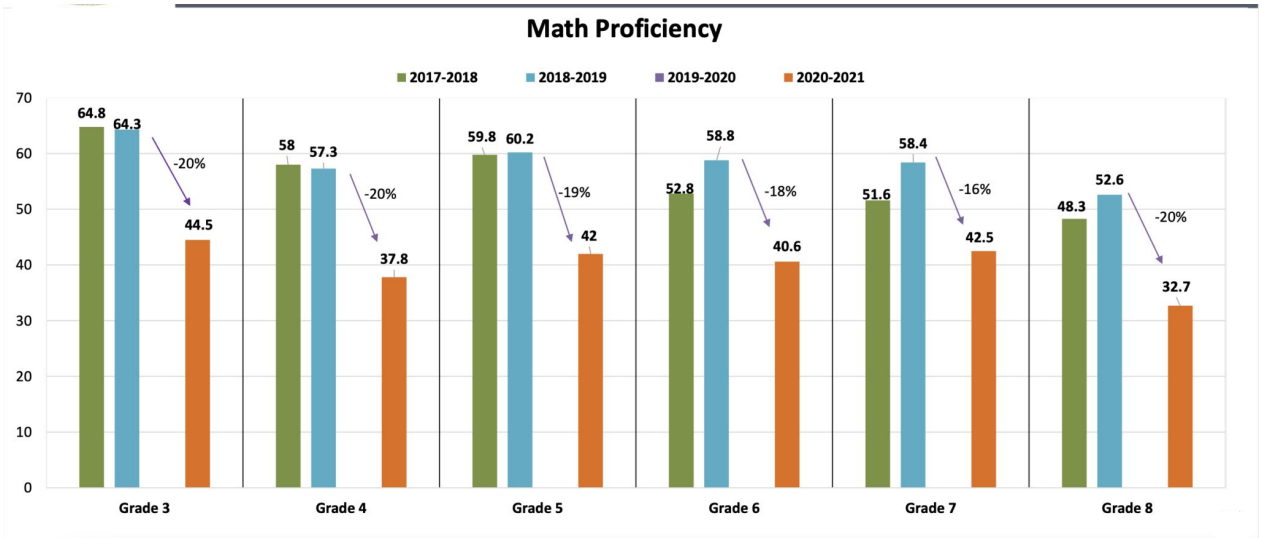
- R&D in interactive learning applications (learning engineering)
- Applications to authentic educational environments
  - **Formal Education:** K-12 mainstream schools & special education
  - **Informal Learning:** Not-for-profit organizations
  - **LifeLong Learning:** Corporate Training

Συνεργάτες

- ☺ 1 post doc
- ☺ 3 research assistants
- ☺ 4 Phd Candidates







According to a study by NWEA, math and reading levels were lower than usual for third through eighth graders during fall 2021. Source: EducationNC

The impact of COVID-19 on student learning worldwide has been substantial

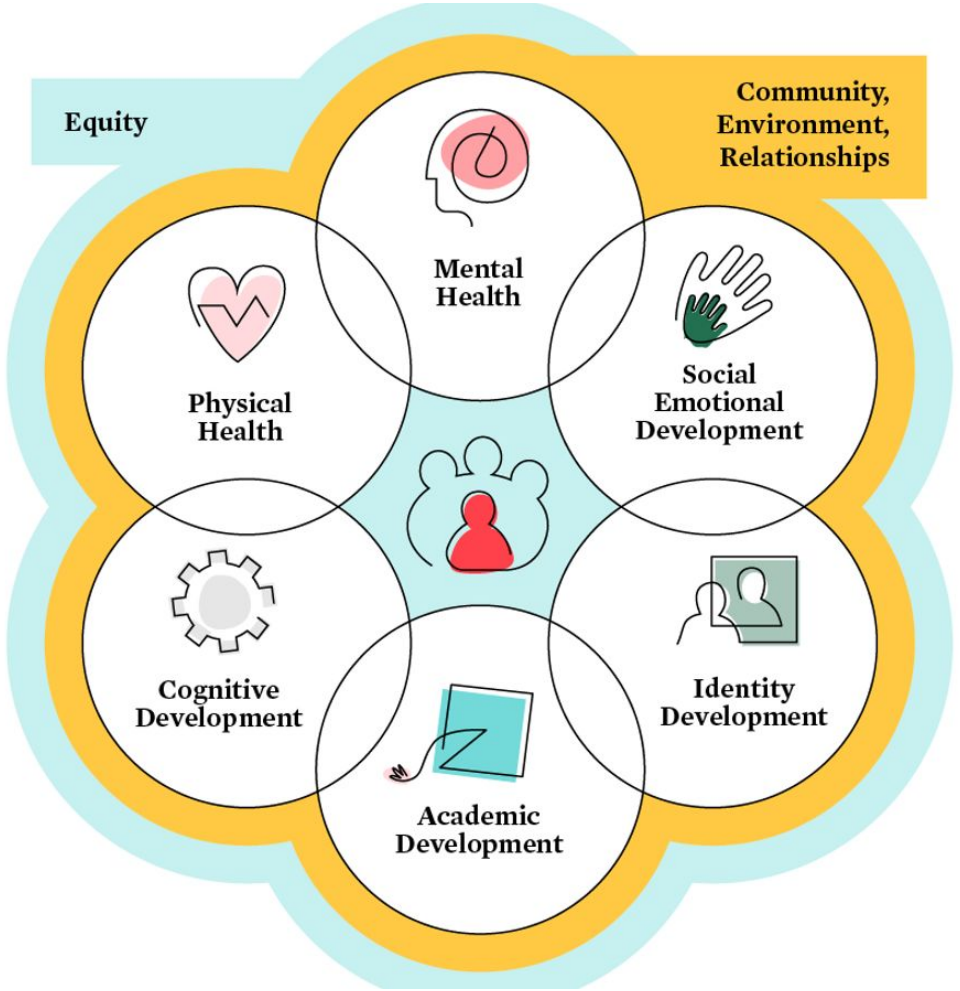
Student well-being has become a concern - the importance of a balance between psychological, social, emotional, and physical aspects of student live

Donnelly, R., Patrinos, H.A. Learning loss during Covid-19: An early systematic review. Prospects 51, 601–609 (2022).

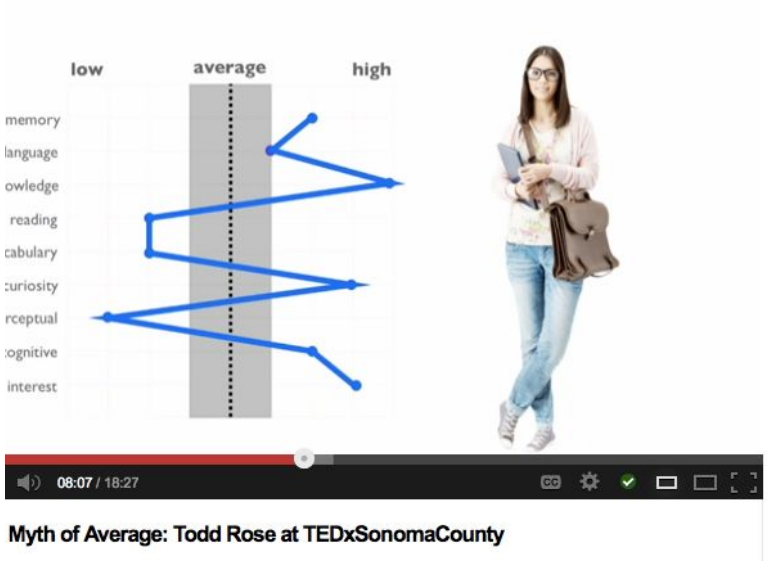
Whole Child Approach to Learning

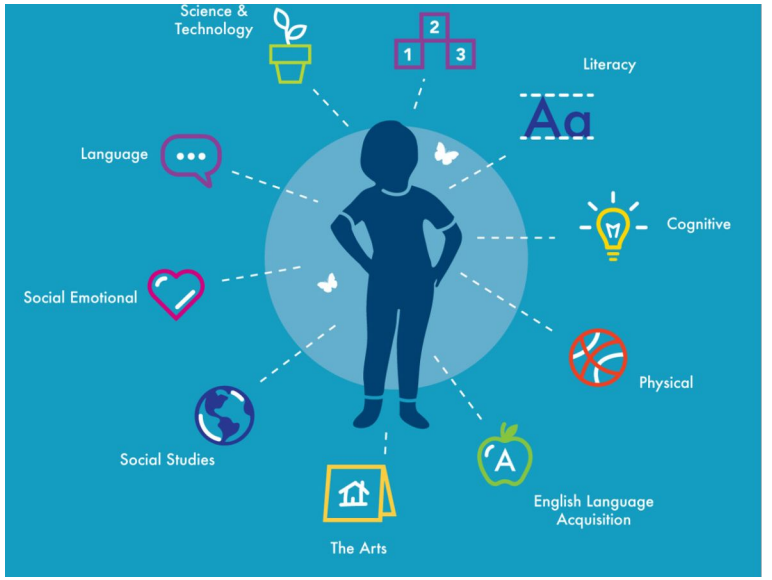
Our schools play a critical role in ensuring that they do.

- Healthy
- Safe
- Engaged
- Supported
- Challenged



Source: “The Whole Child Framework”, The Chan Zuckerberg Initiative





"Myth of the Average" Todd Rose

We need to find ways to structure our schools to better support the personalized needs of a wide range of students.

Achieve what Benjamin Bloom stated "we must keep searching for ways to ensure that every child learns well"

Support the design and implementation of a **flexible, responsive curriculum** that provides opportunities for the participation and achievement of all students

Provide **flexibility in the ways information is presented**, the ways students respond or demonstrate knowledge and skills and **the ways students are engaged**

One size won't fit all;

Use of multiple representations

Use of a 'multimodal' approach

1

Provide multiple means of representation

2

Provide multiple means of action & expression

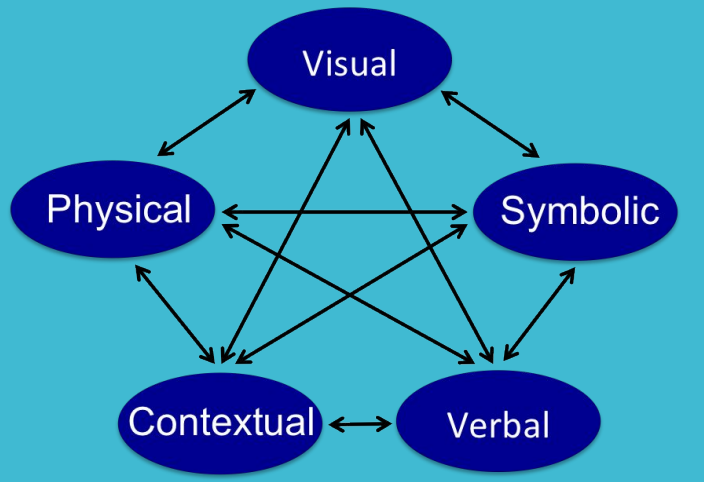
3

Provide multiple means of engagement

Three Principles of multimodal approach (UDL)

Source: CAST. Universal Design for Learning Guidelines

Challenge
Multiple Representations & Multi-modalities



- How can teachers support students in making **connections** between and within **different types of representations**?

- Can **Educational Technology** support this **paradigm** shift as well as
  - Help children **reach their full potential**, and
  - make the learning process
    - meaningful, joyful, socially interactive, actively engaging and effective

Kinems

LEARNING GAMES

Kinems
LEARNING GAMES

Movement-based touchless educational gaming platform for practicing multiple skills with multiple modalities

Physical Skills

Fine & gross motor skills, Eye-hand coordination, Balance body awareness, Spatial awareness

Academic Skills

Math & Literacy PreK-5

Executive Function

Visual & auditory processing, Short term memory, Eye-hand coordination, Concentration, Attention

Philosophy: Combine State Standards & OT/PT Best Practices

For multi-skill activities according to intervention protocols

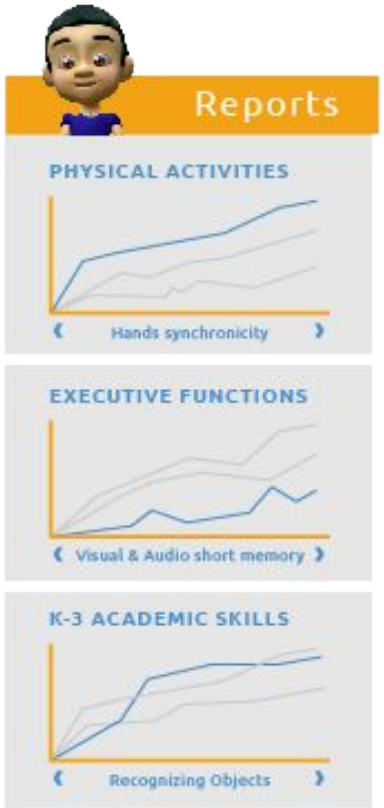
Learning exercises

Body activities

Fun and engaging movement-based learning games, providing customization of learning content, game elements, hand & body gestures

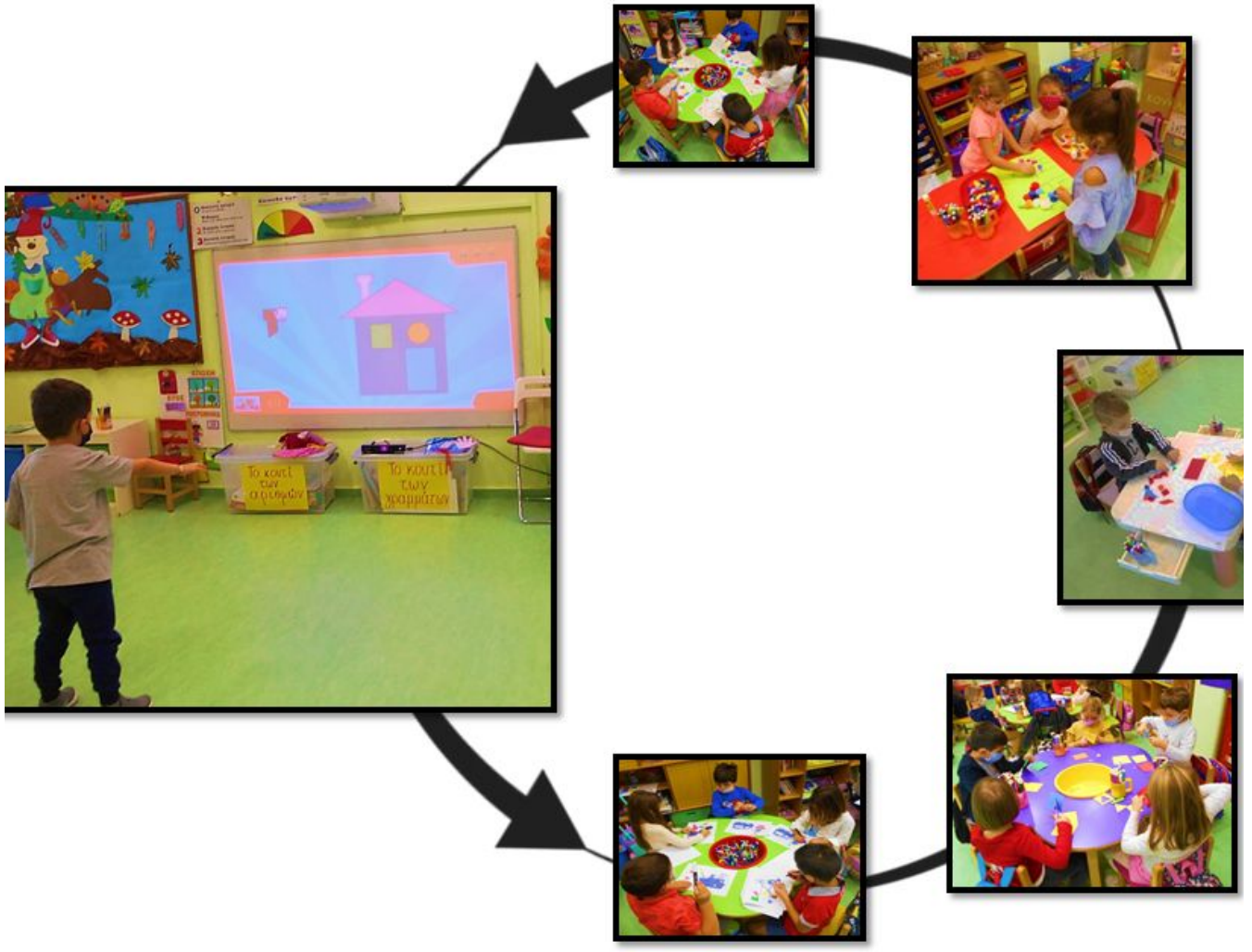
Embodied Learning - Full Body Tracking sensors

Body tracking sensors can detect every part of the anatomy. Tracks a student practicing occupational therapists' exercises



Video: https://youtu.be/3mrrZlumIho

How about Multiple Representations & Multi-modalities ?



Movement Station – Kinect

Get students active to play Kinems learning games using **hand and body gestures**.

Technology Station

Play Kinems learning games using **PCs, laptops and/or tablets**.

Individual Learning Station

Generalize the acquired skills via **printables** and practice with pen and paper.

Collaboration Station

Print, cut, glue and play **Board Games** with other children.

Multiple stations & multiple modalities

Evidence-based Ed Tech Solution

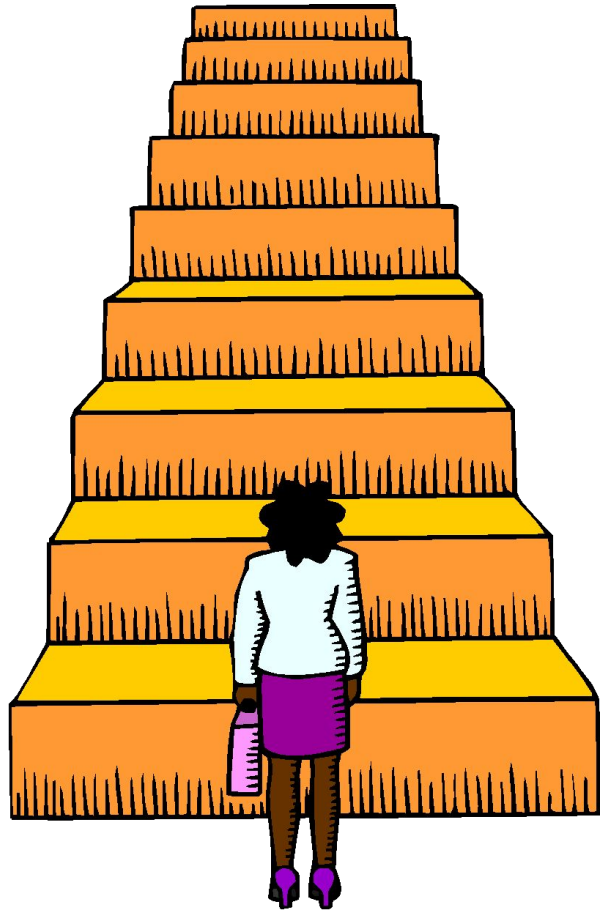
- 49 students from 2 departments of the same private Kindergarten school
- Math curriculum using Kinems multimodal throughout the school year using a pacing didactic guide
- Following the intervention the students presented with **statistically significant improvement**
  - E.g. improved **calculation abilities** (pre-test: 2.83±1.08 vs post-test: 3.60±0.53; $p<0.001$)

All children try to achieve each goal and I am proud of the skills they acquire but mainly of the effort they put into playing and laughing" Kindergarten Teacher.

Concluding…

Nikos Kazantzakis

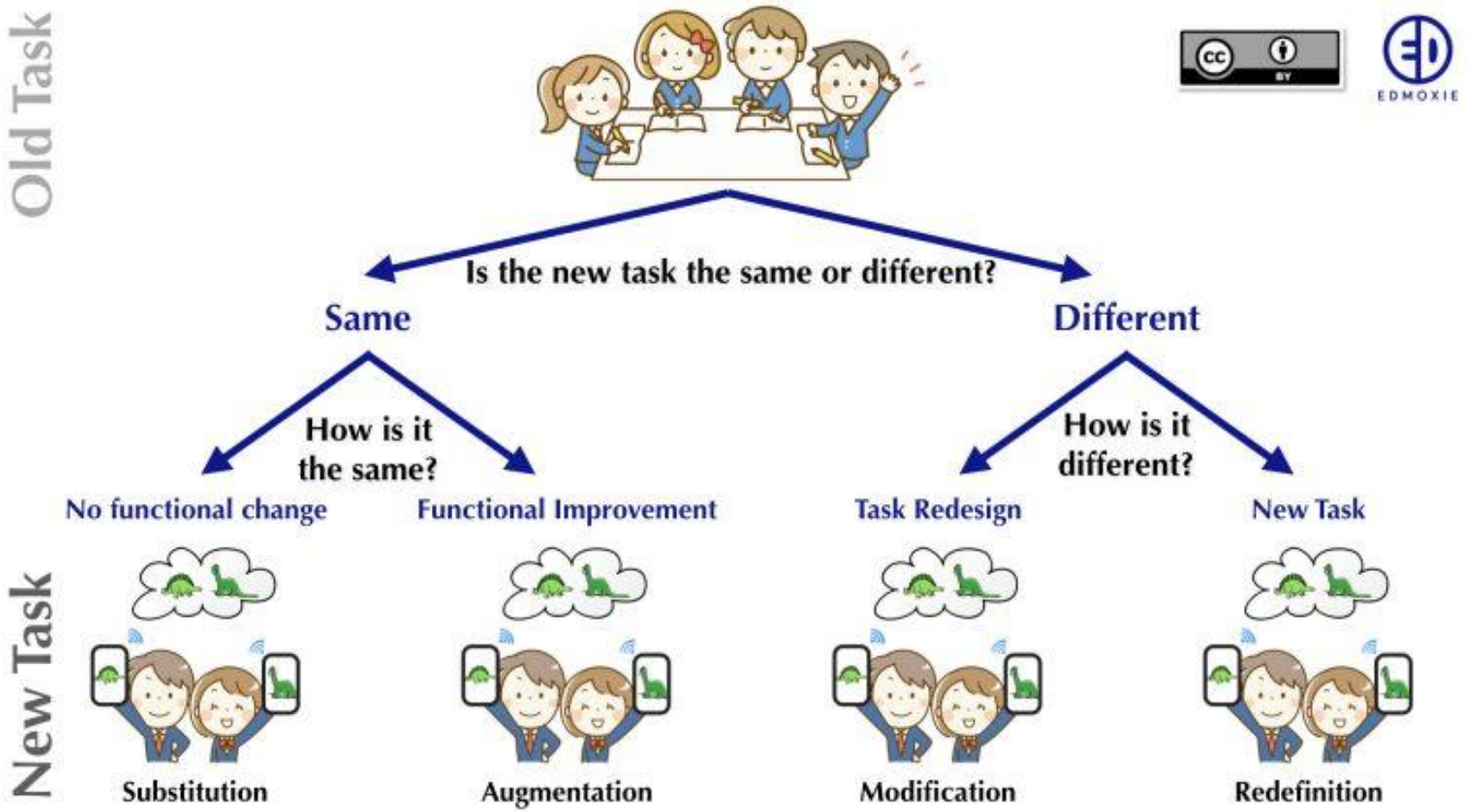
"ideal teachers are those who use themselves as bridges over which they invite their students to cross, then having facilitated their crossing, joyfully collapse, encouraging them to create bridges of their own"



Vaclav Havel

"It is not enough to stare up the steps… We must step up the stairs"

Technology Enhanced Learning Activities SAMR model



Source: https://edmoxie.com