

**Innovative Supports:
Tools that support self directed learning and
competency based learning**

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Micro-credential Learning Model

Learn a specific competency they can immediately apply

Plan how they will apply this teaching practice in their classes

Do and Document apply and document the process authentically

Reflect upon the experience and document the insights

Peer evaluation uploading the entire process to a peer evaluation component and assess each other's work



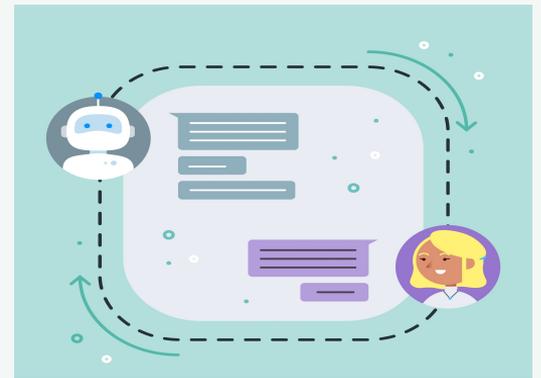
Three main Tools



Micro-lab



Peer Evaluation



Chat-bot

Micro-lab



The main goal:

demonstrating teaching practices in a clear and accurate way.



The way\why:

producing video simulations would help teachers understand how the application of these practices in their own classes would probably look like.

Teachers get

1. To observe a **concrete vivid rich demonstration** of those practices in a way they can relate to (pain, conflicts)
2. To **discuss** and **analyze** the recorded simulations with their peers or instructors, and deepen their specific understanding of the practice
3. To watch the practice **over and over again** until they feel **confident** enough to apply it in their classes



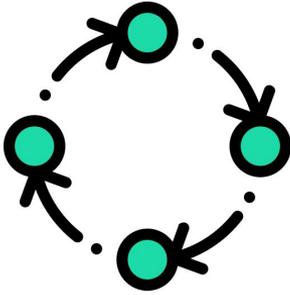
An example



The Set



Peer Assessment



The process:

- Full product
- Twice a year
- Random



The Assessment:

- Precise indicator
- Refers to the model stages



Teachers:

- tend to be critic
- Learn a lot about their own work
- Modeling for an essential skill

Chat-bot

A smart personal assistant which communicates with the user through writing or voice-based conversation. Bots technology is developing and expanding, and may become a whole new way to use the Internet.



A screenshot of a chatbot interface. At the top, there is a header in Hebrew: "צפה ביחידה בסטודיו" (View in the studio unit). Below this is a white chat bubble containing the text "1 Learn" next to a yellow circle with the number "1". To the right of the bubble is a question in English: "How can i help you?" and a small cartoon character icon. Below the chat bubble is a white text box with the following text: "This is the first stage in which you will learn the skill in a focused manner. Take the time to understand the students' challenge and how you can help them cope with it." At the bottom of the interface, there is a green banner with the text "THE APPOINTMENT CLOCK" in large, bold, white letters.

Chat-bot



24/7
Availability



Engagement
and Interactivity



Academic feedback and
psychological value

Next stage is more complex AI-based services

One issue of current micro platforms – The streetlight effect



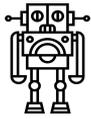
Callender

"I'm searching for my keys."

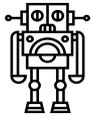
AI and Multimodal data can help us mitigate the streetlight effect



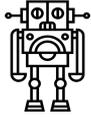
AI and Multimodal Data has great potential for the interpretation and support of complex **competence development**.



Competence development is a complex process that involve **dynamic combinations** of skills, abilities, and knowledge.

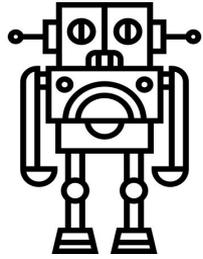


Learning happens *in situ*, where the learner is.



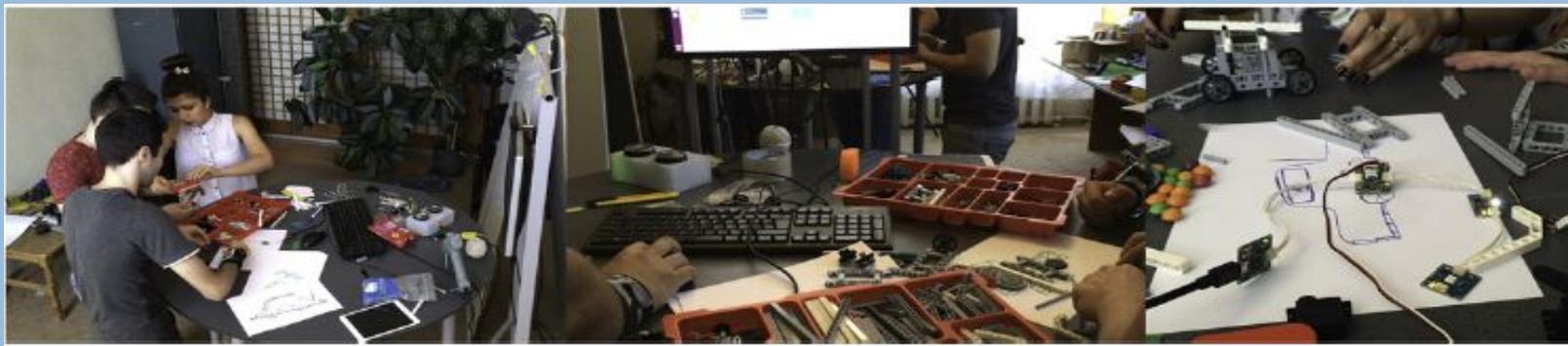
Competencies are **not** necessarily **static**; and change over time, they are **not** an **all or nothing** concepts.

A Multimodal Learning Analytics Platform



- Investigated both secondary and tertiary contexts.
- Open-ended, design-based projects of students.
- Mainly investigated the collaboration competence.

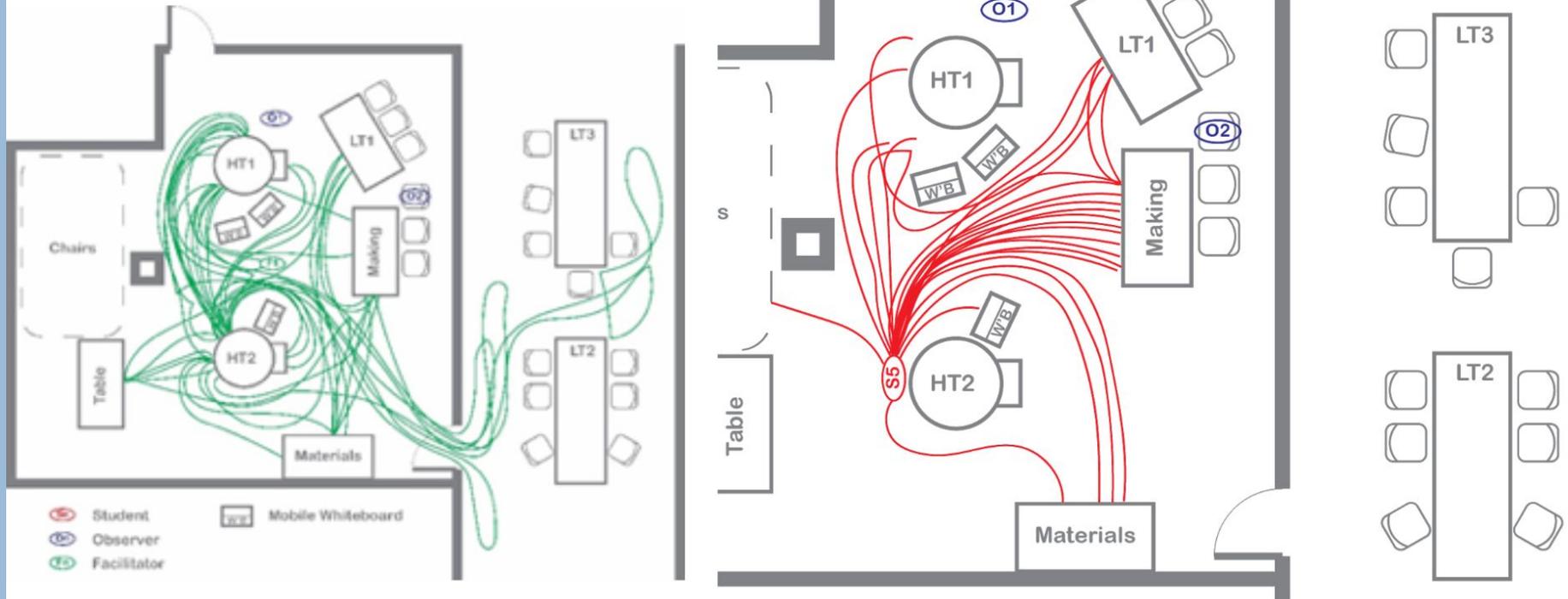




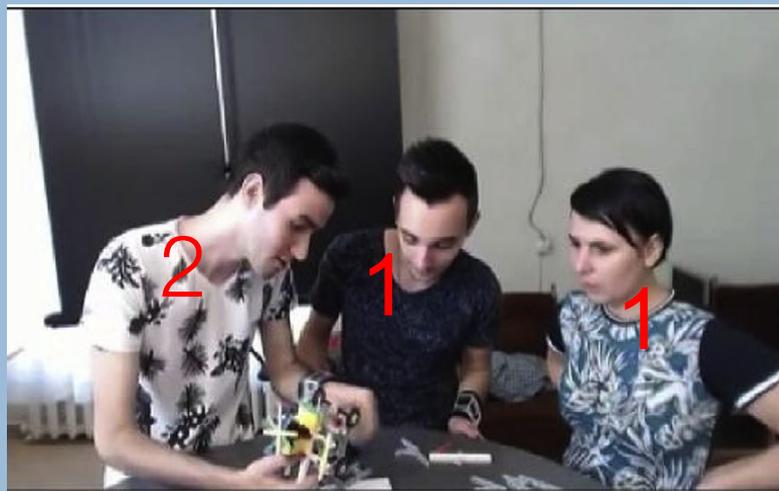
Think about a classroom context



Data to optimise collaborative learning environments – Contextual Approach



Healion, D., Russell, S., Cukurova, M., & Spikol, D. (2017). Tracing physical movement during practice-based learning through Multimodal Learning Analytics. Association for Computing Machinery (ACM) *Proceeding Series* (Vol. 7, pp. 588-589).



Interpretations of **Collaboration Competence** from **Machine Observables**

Associating code triplets to behavioral patterns of students

In particular we identify:

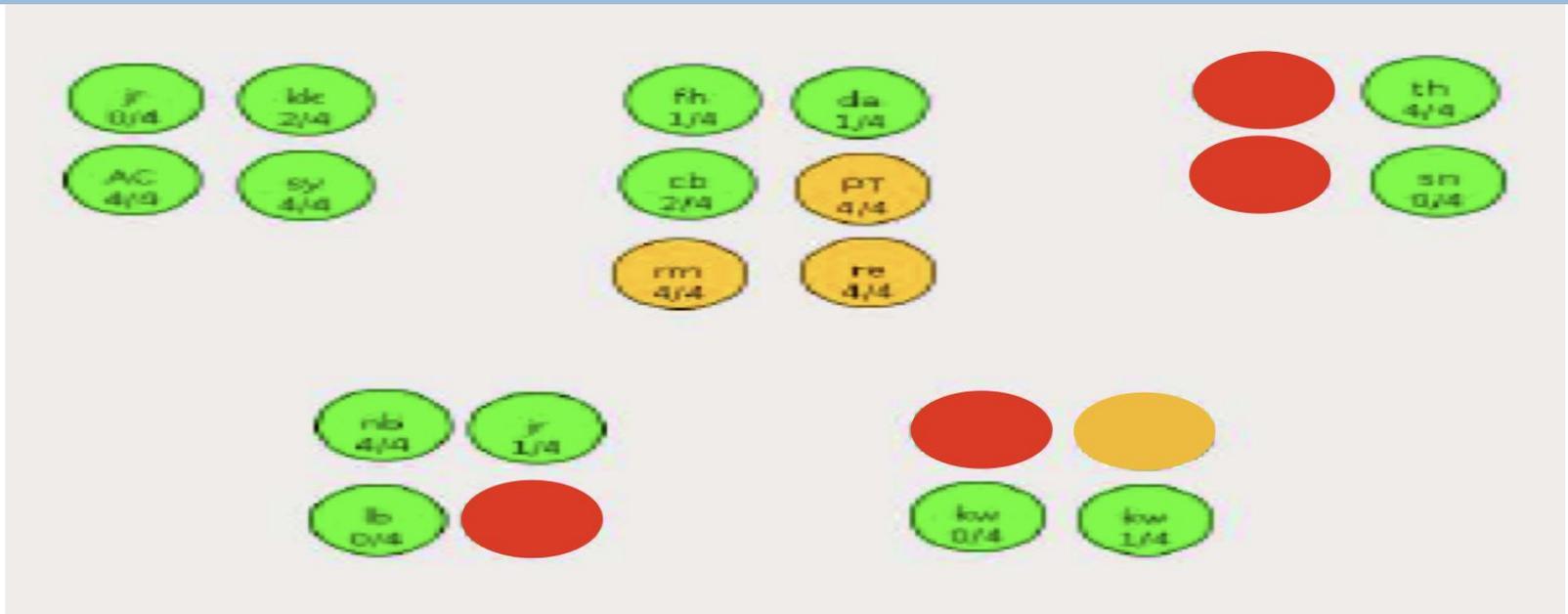
- 111 => All looking at a facilitator
- 000 => All distracted

Syn(G) = percentage of 222 states in group G

IA(G) = percentage of (211, 222) - percentage of (002, 012, 022)

Eq.(G) = $\sum [(AI(s_1,t) - AI(s_2,t))^2 + (AI(s_1,t) - AI(s_3,t))^2 + (AI(s_2,t) - AI(s_3,t))^2]$

$$IV(s_i) = \frac{\sum_{k=1}^{N-1} (AI(s_i, t_{k+1}) - AI(s_i, t_k))^2}{N - 1}$$



Need immediate support



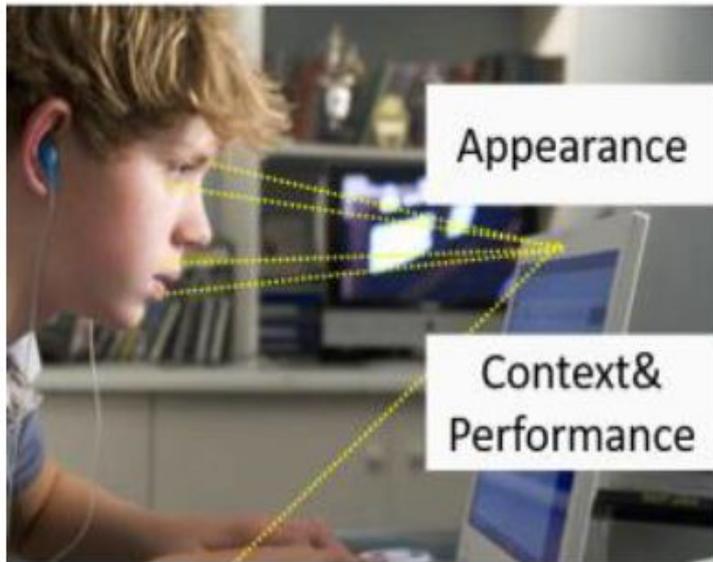
Not a Priority



Effectively Collaborating

Cukurova, M., Luckin, R., Mavrikis, M., & Millán, E. (2017). Machine and human observable differences in groups' collaborative problem-solving behaviours. *ECTEL* (pp. 17-29). Springer, Cham.

Multi-modal Sensing → Feature Extraction → Labels & Models



Appearance



Facial landmarks,
head pose, etc.

Context &
Performance



Content duration,
number of hints,
difficulty level, etc.

Emotional States

Satisfied
Bored
Confused

Behavioral States

OnTask
OffTask

Contextual State	Behavioral State	Emotional State	Engagement Mapping	Color Code
On-Platform	On-Task	Satisfied	Engaged	Green
On-Platform	On-Task	Bored	Maybe Engaged	Yellow
On-Platform	On-Task	Confused	Maybe Engaged	Yellow
On-Platform	On-Task	Cannot Decide	Maybe Engaged	Yellow
On-Platform	Off-Task		Not Engaged	Red
Off-Platform			Not Engaged	Red

Alyuz, N. *et al.* (2019). Investigating Impact of a Multi-Modal and Real-Time Student Engagement Analytics Technology in Authentic Classrooms, *CHI'19, May, 2019, Glasgow, UK*



Ethan



Eli



Ethan



Eli



Ethan



Eli



Noah



July



Noah



July



Noah



July



July



Noah



July



Noah



July



Noah



Ethan



Tom



Ethan



Tom



Ethan



Tom

Class Intervention



Class Engagement Summary

Engagement for the Last 5 Minutes



Engagement History 14:00 - Now





July



Session Mood

Mostly **Satisfied**.
Sometimes **Confused**.
Sometimes **Bored**.

Engagement History



Take Action

15%
Maybe Not
Engaged

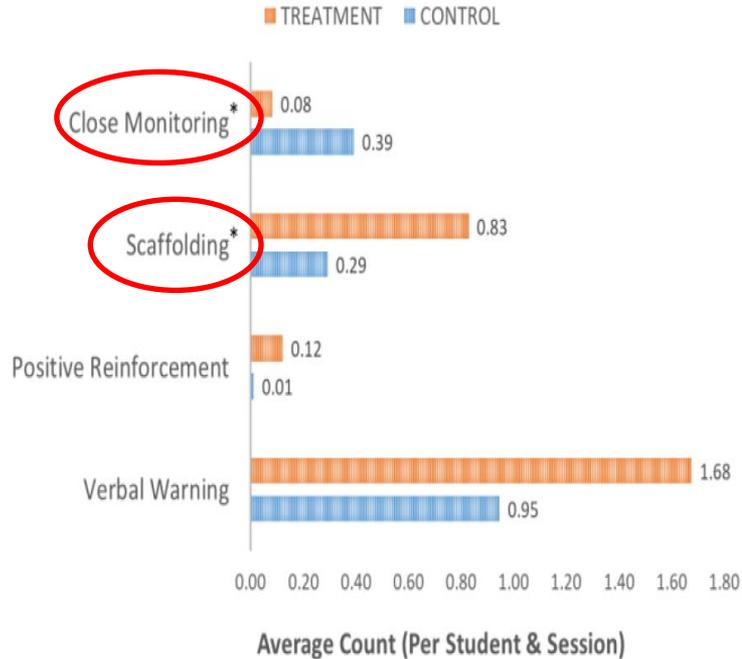


Teacher

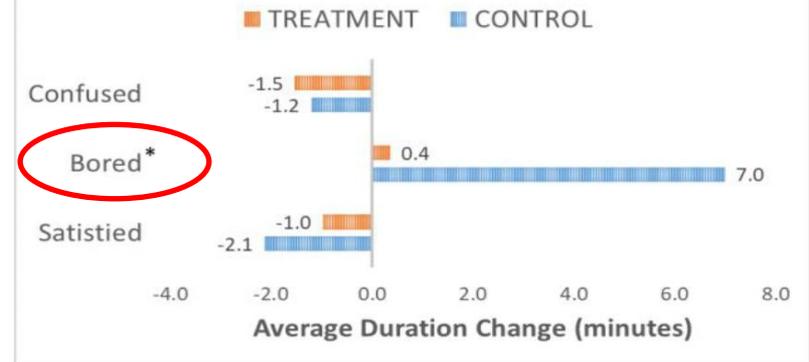
Technical Support

Researcher

TEACHER INTERVENTION TYPES



EMOTIONAL DURATION CHANGES





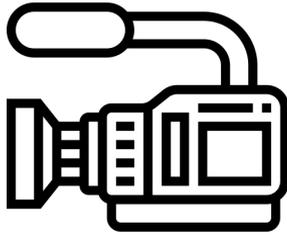
To Sum-up

Compared to micro environments with unimodal digital data, micros with AI and multimodal data can provide better opportunities for teaching and learning, particularly for competence development.

Thank you

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How To?



The simulation lab contains **professional video recording equipment** and production crew. A control position was also equipped with sophisticated equipment needed for an agile production process (“**Live To Tape**”).



precise **scripts** were written in **collaboration** with the content specialists who developed the course, instructional designers and professional screenwriters, in order **to best illustrate** the teaching practices.