



# Platform for Innovative Learning Assessments

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# What is PILA?

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**Free, open-source** digital platform to create and share **interactive experiences** powered by AI, where assessment and learning occur simultaneously



Formative assessment system to enable **teachers to support and monitor** how students develop a wide set of disciplinary and 21st century skills



Ongoing **international collaboration** between public organisations, teachers and multi-disciplinary experts

# PILA experts

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- Disciplinary concepts and 21st century competences
- Accessible competency models

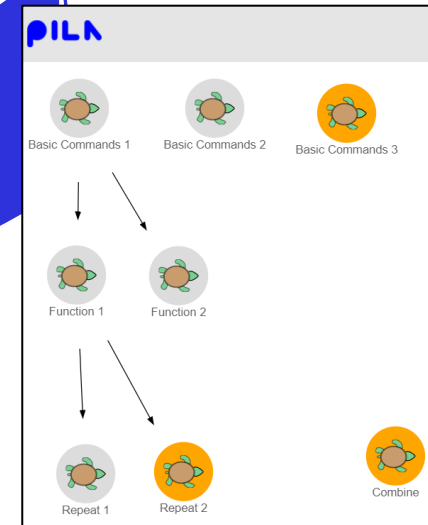
## 1. MODULES

- Open-ended learning environments
- Embedded & secure data collection

## 2. APPLICATIONS

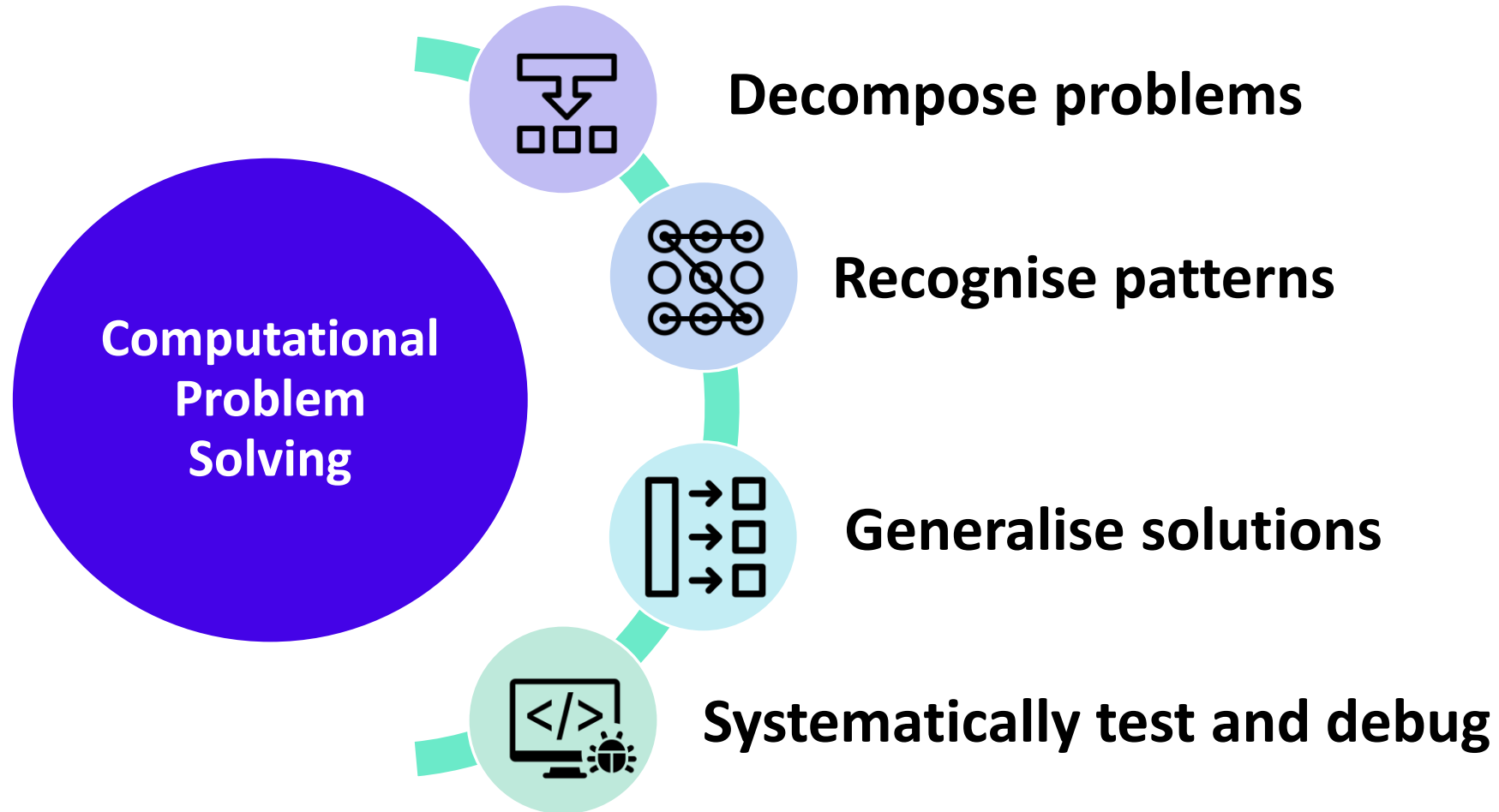
- Progression of tasks (see image to right) designed by experts or by teachers
- Real-time monitoring and multi-dimensional reporting

## 3. ASSESSMENT EXPERIENCES



# PILA module 1: Computational problem solving

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# Assessment application: Karel

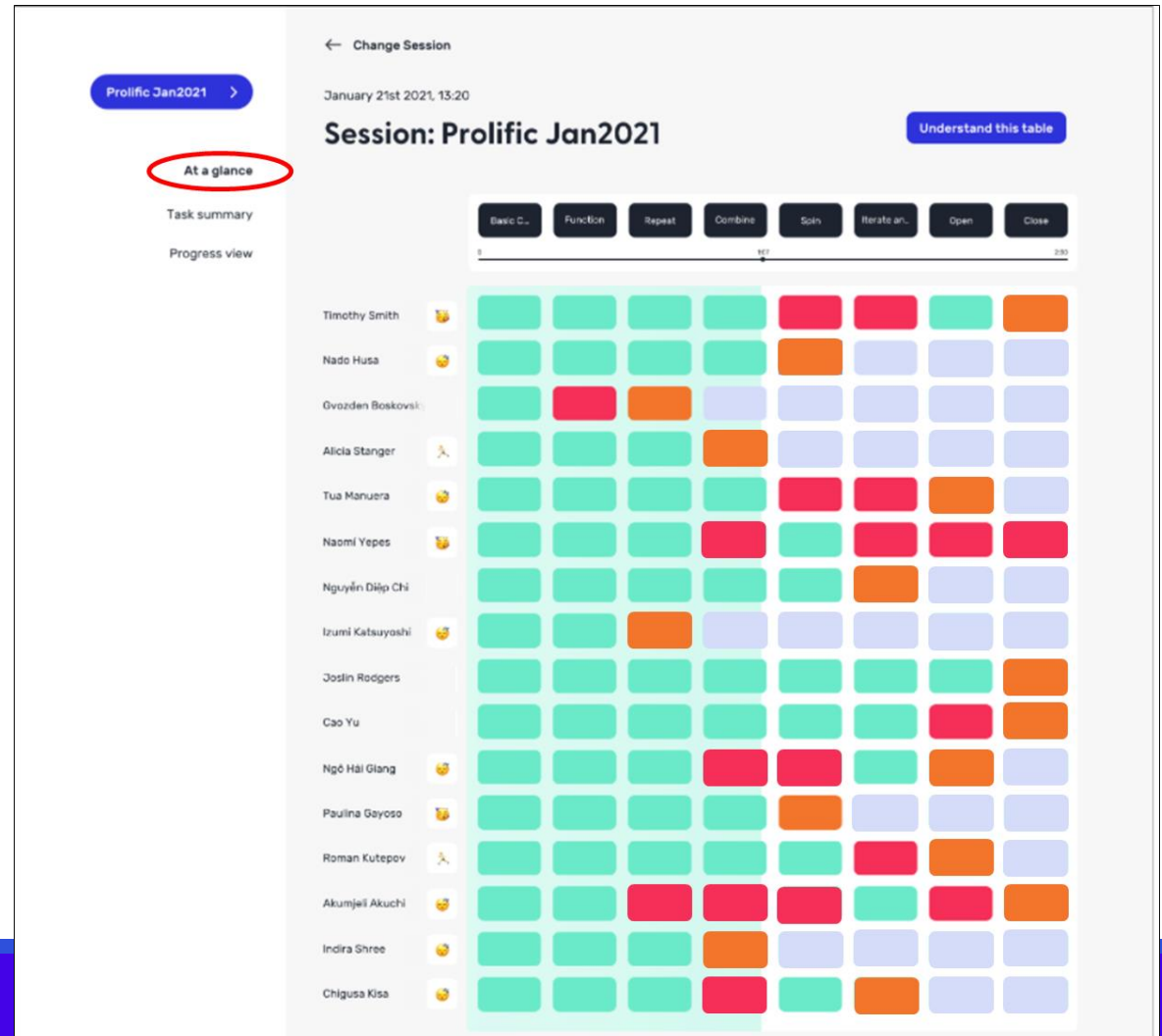
A robotic agent ('Karel') in the shape of a turtle needs help to navigate and collect/place stones in a grid-like 'world'. Students will be asked to learn and apply computational problem-solving concepts and skills in a block-based programming environment to ensure Karel can achieve its goals.

The screenshot shows a web browser window with the URL `https://run.knowlearning.systems/9bd93f70-10af-11ec-9e0a-4f9e6aeaaee`. The page title is "Basic Commands". A "Back to Map" button is visible. A challenge box contains the text: "Challenge: Write a program that makes Karel move to the position shown in the 'Goal' world." Below the challenge are two grid worlds. The "Start" world shows a green turtle with a '+' on its shell at the bottom-left corner of a 2x2 grid, with '+' symbols at the top-left and bottom-right corners. The "Goal" world shows the same 2x2 grid, but the turtle is now at the top-right corner. To the right of the grids is a block-based programming interface with buttons for "move forward", "turn left", "place stone", and "pickup stone", along with a "define main" button. At the bottom right, there is a "Play Speed" slider with a blue dot, ranging from "(slow)" to "(fast)". A green "play" button is located at the bottom left of the grid area.

# Teacher dashboard: Live monitoring

As students complete an assigned assessment experience, the teacher can monitor their students work and identify who may need additional help, and in what concepts/skills.

In this example, 16 students (rows) are working through an assessment experience consisting of 8 tasks (columns).



# Teacher dashboard: Performance and progress on tasks

After students have finished working on an assessment experience, teachers will have access to the task summary and progress views.

This view provides more detailed information on how and what students did in each task, such as:

- Whether they accessed resources to help them make progress (e.g. hints, examples);
- How many times they tested their code using the run button ('attempts'); and
- How long until their first action and to reach a solution.

← Change Session

Prolific Jan2021 >

At a glance

**Task summary**

Progress view

January 21st 2021, 13:20

Session: Prolific Jan2021

Understand this table

Basic Commands ▾

	Completed	Opened example	TTF action	Time to success	Attempts
Timothy Smith	█	█	0.07	1.44	1
Nado Husa	█	█	0.12	1.35	5
Gvozden Boskovsky	█	█	0.30	1.24	6
Alicia Stanger	█	█	0.45	2.23	3
Tua Manuera	█	█	0.09	2.10	2
Naomi Yepes	█	█	0.13	2.51	3
Nguyễn Diệp Chi	█	█	0.17	1.33	3
Izumi Katsuyoshi	█	█	0.28	1.25	4
Joslin Rodgers	█	█	0.55	1.45	1
Cao Yu	█	█	0.03	1.55	3
Ngô Hải Giang	█	█	0.07	1.21	3
Paulina Gayoso	█	█	0.23	0.56	2
Roman Kutepov	█	█	0.17	0.52	7
Akumjeli Akuchi	█	█	0.07	1.44	1
Indira Shree	█	█	0.12	1.35	5
Chigusa Kisa	█	█	0.30	1.24	6



# Customisation tools

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- Intuitive authoring tools
  - **Assessment (or 'map') builder tool** – add and arrange tasks to create new assessments for students to work through during or after class
  - **Karel task customiser tool** – create new problems for students to solve in the Karel application
- Embedded and secure data collection

# PILA Module 2: Systems thinking/conceptual modelling

The screenshot shows the Betty's Brain interface. At the top, a chat window displays a message from Betty: "Betty: Hey, what's up?". Below the chat is a text input field with the placeholder "Select your response and click 'Send'." and a "Send" button. The main interface is divided into several sections:

- Navigation:** "Causal Map", "Science Book", "Notes", and "Quiz Results" tabs.
- Quiz History:** A table titled "Everything Quiz taken on Wednesday, March 26 at 9:15 AM".
- Concept Map:** A diagram showing relationships between "fossil fuel use", "carbon dioxide", and "vegetation".

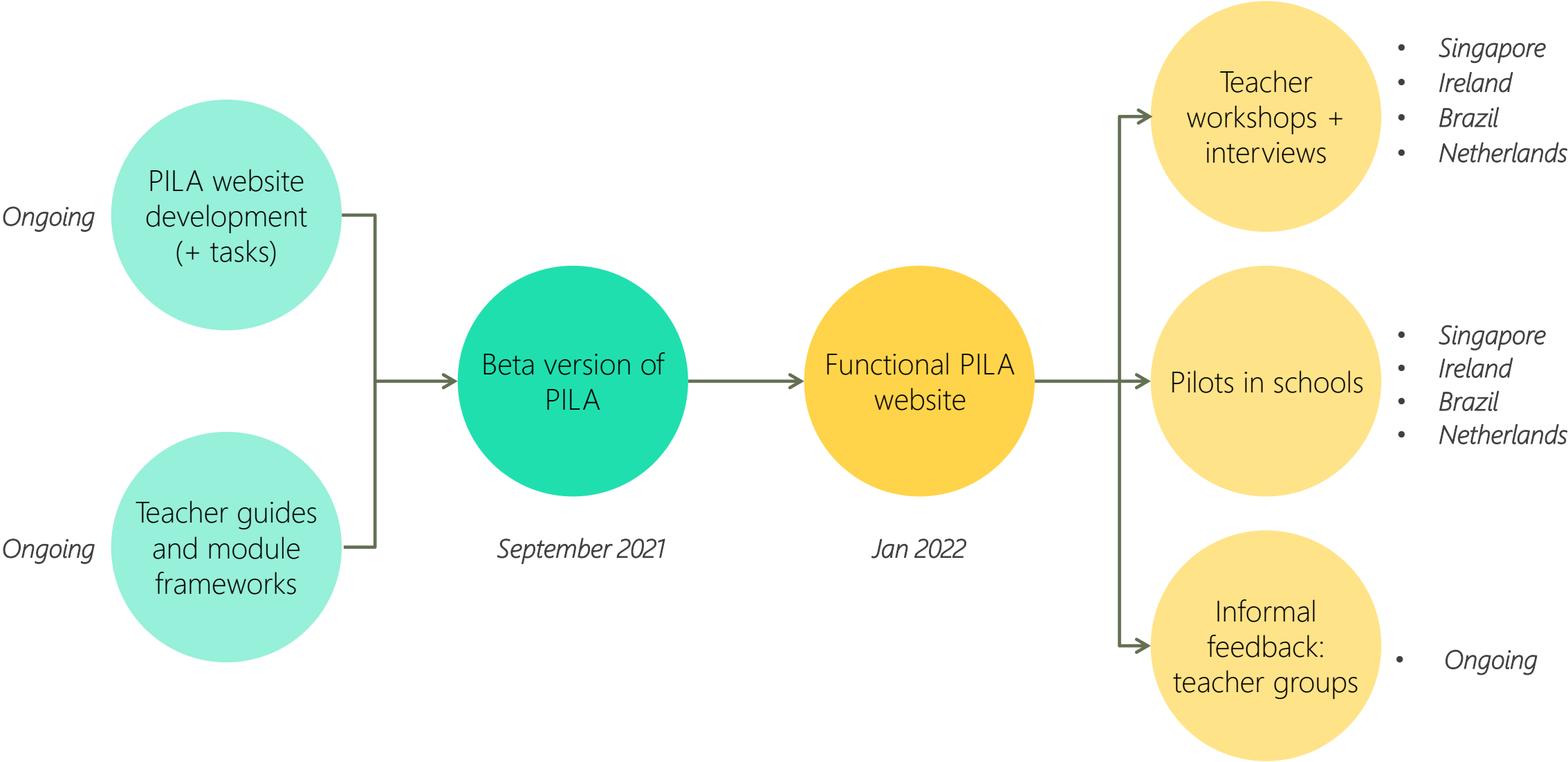
#	Question	Answer	Grade
4.	If vegetation increases, then what happens to ocean levels?	ocean levels will decrease.	✓
5.	If deforestation increases, then what happens to heat reflected t...	heat reflected to Earth will increase.	✓
6.	If deforestation increases, then what happens to electricity gener...	electricity generation will increase.	✗
7.	If vehicle use increases, then what happens to electricity generat...	electricity generation will increase.	✗
8.	If vegetation increases, then what happens to electricity generati...	electricity generation will decrease.	✗

Quiz Score: 38%  
The Concept Map used for this Quiz

```
graph TD
    FFU[fossil fuel use] -- creates --> CO2[carbon dioxide]
    CO2 -- traps --> CO2
    CO2 -- absorbs --> V[vegetation]
    V -- destroys --> CO2
```

- Assessing students' capacity to understand complex phenomena and systems' dynamics
- First application: Betty's Brain - a learning-by-teaching paradigm
- First unit on climate change
  
- Development in collaboration with Vanderbilt University
- Expected in mid-2022

# PILA development and validation timeline



# Pilot study design

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## Teacher engagement

- 2 Workshops (Introductory and follow-up)
- Brief interview (optional)
- Questionnaire (optional)



## Student engagement

- Tutorial, background questionnaire and computational thinking test (45 min total)
- 2 assessment experiences (50 min each)



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Interested in participating in the PISA pilot?