

An Engine producing Orchestration Graphs

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■ CHILI

computer-human interaction
in learning and instruction

LEARN
Center for Learning Sciences

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Let me tell you a story



You are a teacher.

Let me tell you a story



You are a teacher.

You need to teach **proofs by induction**

Let me tell you a story

You are a teacher.

You need to teach **proofs by induction** to this class:



Let me tell you a story

You are a teacher.

You need to teach **proofs by induction** to this class:



You have 90 minutes.

Orchestration graph

You may already have the prototype of a lesson plan:



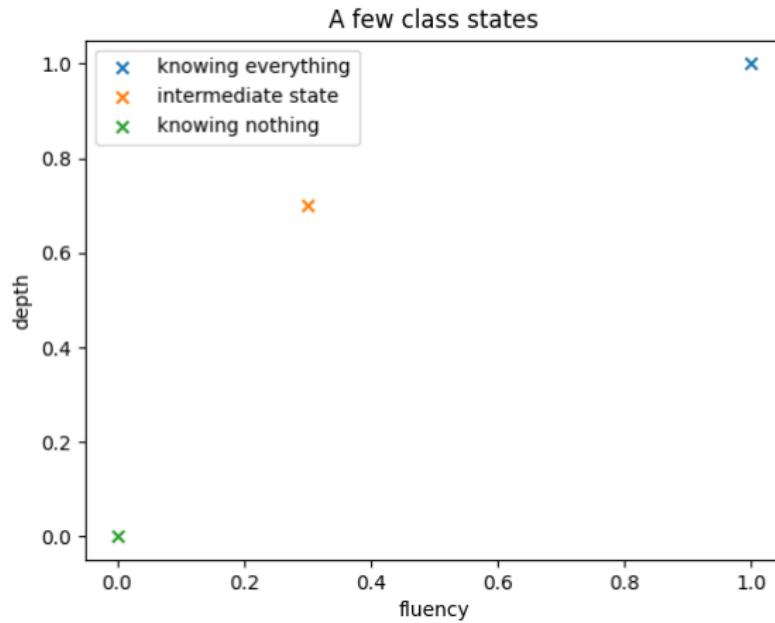
Figure: An orchestration graph

Scope of the project

This project takes **the first steps** in the broad goal of creating a platform that could support teachers in diversifying lesson plans with evidence-based suggestions and foster collaboration between educators and learning scientists.

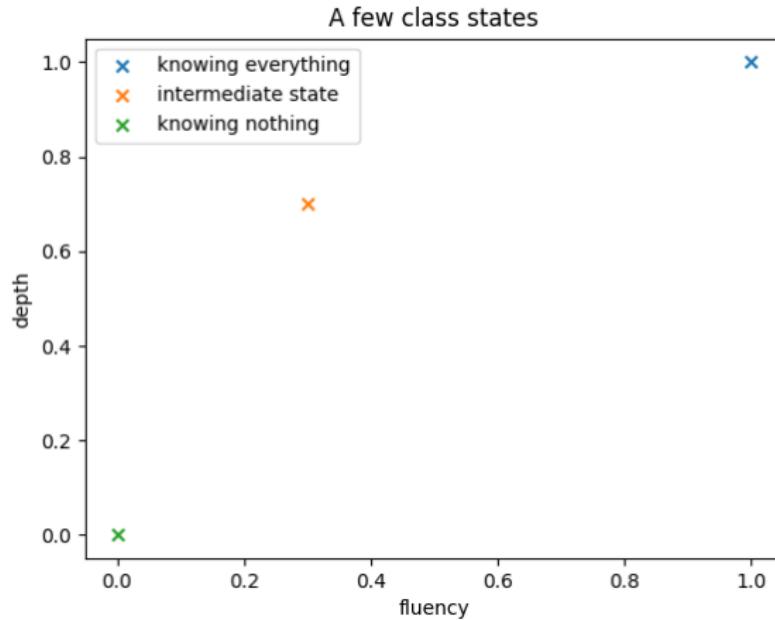
How to represent the class state?

We simplify the complex **state of the class** with respect to a specific learning goal by only two variables.



How to represent the class state?

We simplify the complex **state of the class** with respect to a specific learning goal by **only two variables** (see the report for ideas for more).



Recall

Keep in mind that these examples use a **prototype** library, with no science supporting the values.



Figure: The small library of activities used for this example.

Model of a lesson plan

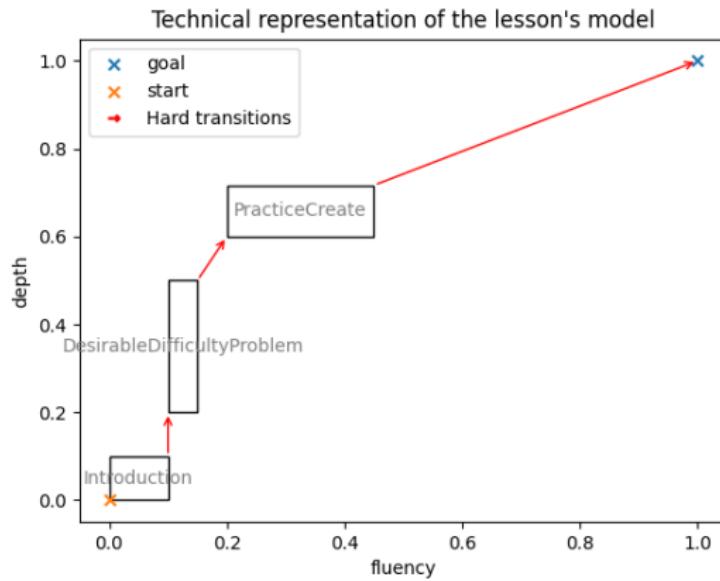


Figure: This model represents the lesson plan presented before.

The application shows hard transitions

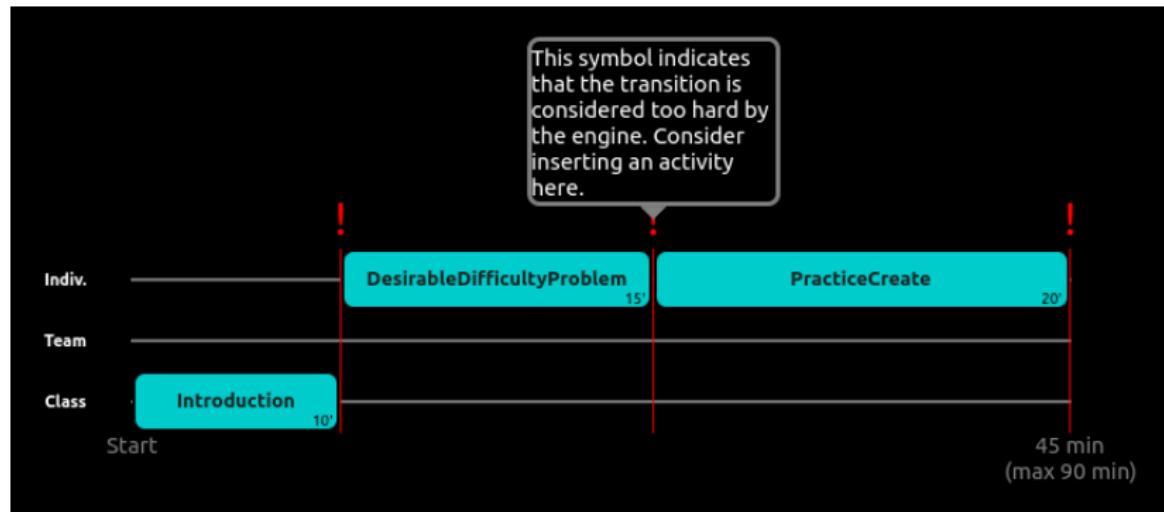
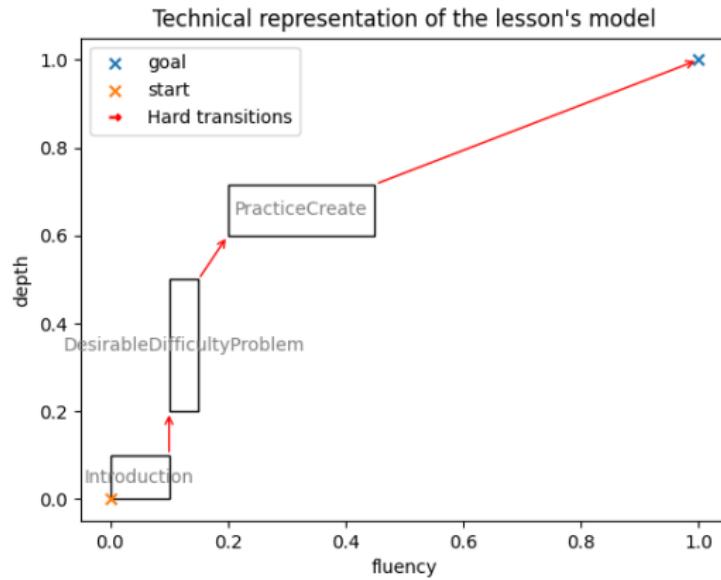


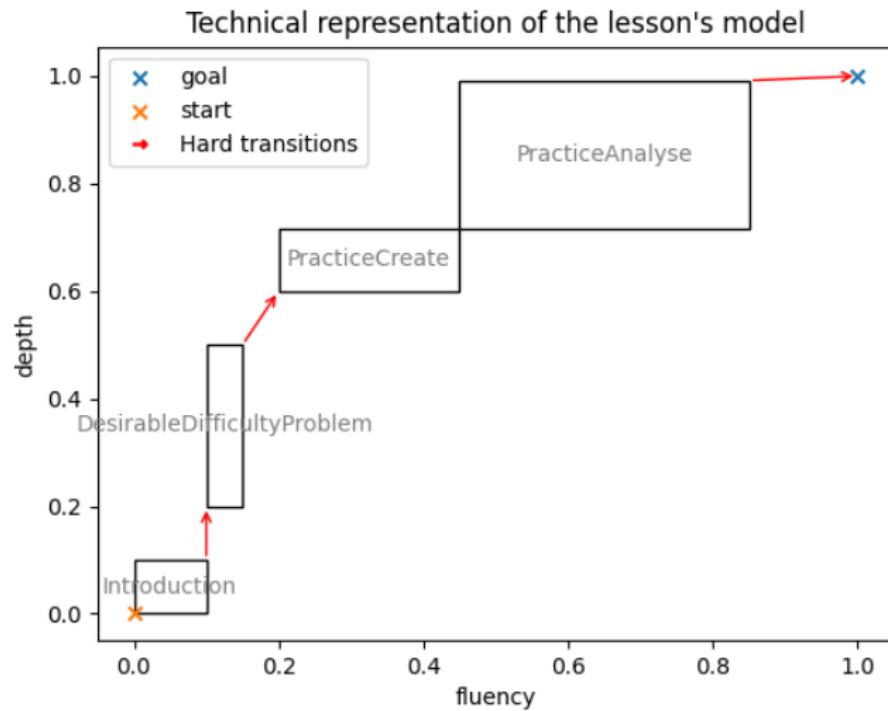
Figure: When hovering over a hard transition.

A key feature

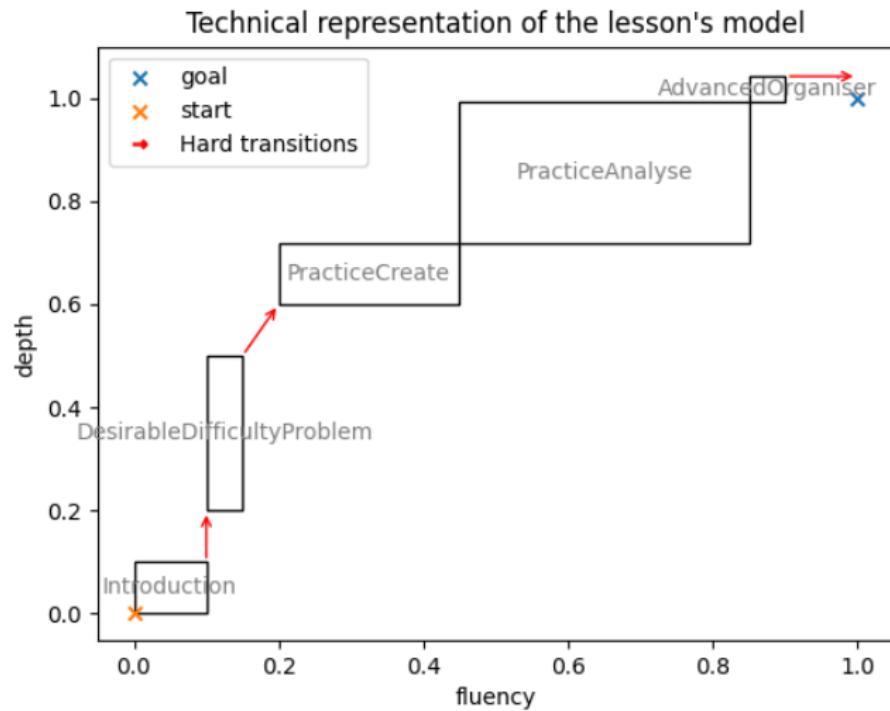
A key feature:
The application recommends activities for specific transitions.



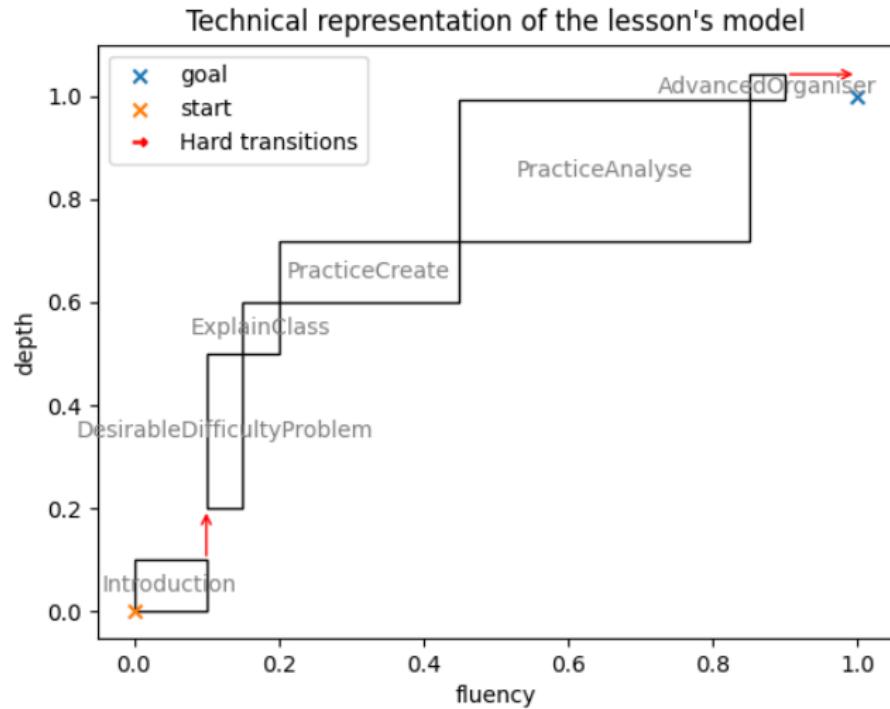
The application recommends activities



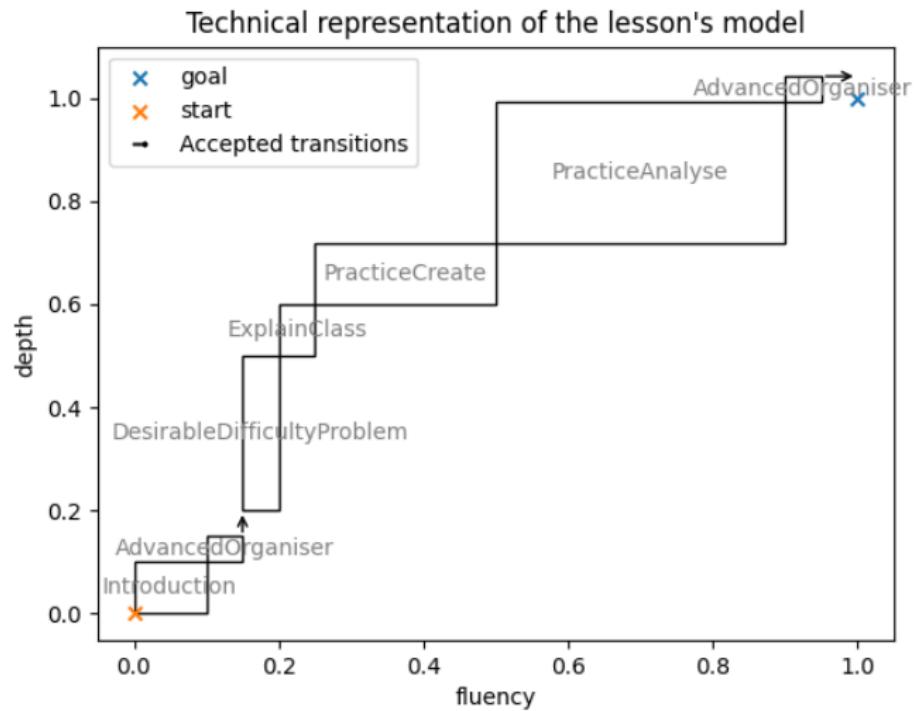
The application recommends activities



The application recommends activities



The application recommends activities



The hint

And with that, the lesson is considered complete.

But... Did you notice the catch?

The catch

The application recommends activities that are **locally** optimal but these activities affect the overall lesson.

The catch

The application recommends activities that are **locally** optimal but these activities affect the overall lesson.

There are solutions for that.

Orchestration Graph - Interactive Engine

Lesson teaching <description of the lesson>.
Using 45 out of allowed 50 minutes.
Has 2 transitions considered too hard by the engine, marked !

Reset Load Save Print Print (technical) Add Recommended here

The information indicates which activity fits for the selected transition

Indiv. Team Class Start

TellTheClass → PracticeAnalyse → DesirableDifficultyProblem

45 min (max 50 min)

RECOMMENDED

- TTClass TooMuch Time Useless
- DGProblem TooMuch Time Useless
- PMemory Time Useless
- PApply Time Useless
- PAnalyse Time Useless
- PEvaluate Time Useless
- PCreate Time Useless
- Organise Time
- Introduct Time
- EClass Time

Note: The goal was to have symbols indicating that an activity is too long or used too many times as flags for the user.
The user could hover them to see more details.
There are currently only textual.

Figure 1

Technical representation of the lesson's model

depth

fluency

Figure: A screenshot of the completed prototype application.

Thank you for your attention!



Any question?