Course Builder Skill Maps

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Introduction

On-line learners need upto-date information on their progress, areas of strength and weakness, how to adapt their learning behavior, and personalized paths through the material they are learning. And instructors need deeper insights into student learning than summative scores.

The CB Skill Map Model

YOUR LOGO HERE

In our model a **skill** is an unit of knowledge which can be **taught** or assessed.

Lessons contains videos, text, and interacfives, and are tagged with the skills they **teach**.

Questions in assessments are

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Unit 1 - Arithmetic 🖉	

About Course Builder

Course Builder is an open-source platform developed by Google for delivering online courses at scale. Over the past four years, Google, nonprofit organizations and universities have used CB hundreds of courses in multiple languages reaching millions of students worldwide.

Skill mapping provides fine-grained information about the content and the structure of the couse which can guide student and inform instructors.



tagged with the skills they assess.

Skills depend on other skills and form a **directed** graph of prerequisites and follow-ons.

We implemented this skill map model in CB 1.10 and added a **collapsible** knowledge panel to show the student the skills taught in each lesson.

The knowledge panel shows the student which skills they are building on and which skills follow on from the current lesson, as well as their **proficiency** level at these skills.

Addition counting 1.2 Addition add single digit Taught in this lesson: 1.3 Subtraction 1.4 Multiplication Addition (often signified by the plus symbol "+") is one of the four basic operations o Sample Skill Mapping Class 🗙 → C A Docalhost:8081/skills/unit?unit=1&lesson=2 cı 🧔 🕥 🔳 test@example.com | Logout Search Education Announcements **Course** Progress Search Dashboard Course > Unit 1 > Lesson 2 Next Page Unit 1 - Arithmetic 🗸 1.1 Numbers and Addition counting 1.2 Addition add single digit **Faught in this I** 1.3 Subtraction 1.4 Multiplication Depends or Proficiency level identify place value Recognize ones, tens, and Lessons 1.1 Numbers and counting Leads to: Subtract one single-digi number from anothe Lessons 1.3 Subtraction



https://www.google.com/edu/openonline https://github.com/google/coursebuilder-core

Using Skill Maps

Skills are shown on the instructors **course outline view** and there's a dedicated skill dashboard to create and edit the skill map. The dashboard includes a graphical view showing the skill map as a directed graph.

The skill dashboard encourages **objective-oriented** course design, where content creation starts by identifying the objectives (skills) to be learned.

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Related Systems

The CB skill map model is related to the approaches of the **Open Learning Initiative** (OLI) and **Learning Space Theory** (ALEKS).

Unlike OLI, our model is **single-tiered** and adds the prerequisite relation. OLI uses a second level of tagging ("objectives") for roll-ups. We anticipate a faceted approach to aggregating skills based multiple dimensions. The prerequisite relation enables us to make stronger inferences about the student learning state and could be used for efficient adaptive testing.

> Unlike LST, CB explicitly defines the knowledge domain with relation. This is limited in is less expensive to ap is designed by domain is assumed correct but plete ("expert blind-spot") validated more efficiently.

identify place value	add single digit	
Recognize ones, tens, and hundreds	Add two single digits	
Lessons 1.1 Numbers and counting	Lessons 1.2 Addition	
ecommended Next		
count by 10's	subtract single digit	add dou
Count forward in steps of 10	Subtract one single-digit number from another	Add two on numbers
Lessons	Lessons	Lesson
1.1 Numbers and counting	1.3 Subtraction	1.2

On their profile page the student sees a summary of **achievements** and recommendations based on analysis of their progress through the full skill-map



The skill map opens up interesting new analytics information. New dashboards display student proficiency distributions on the skills and visualizations of student progress through skills.