Semantic Tagging in edX

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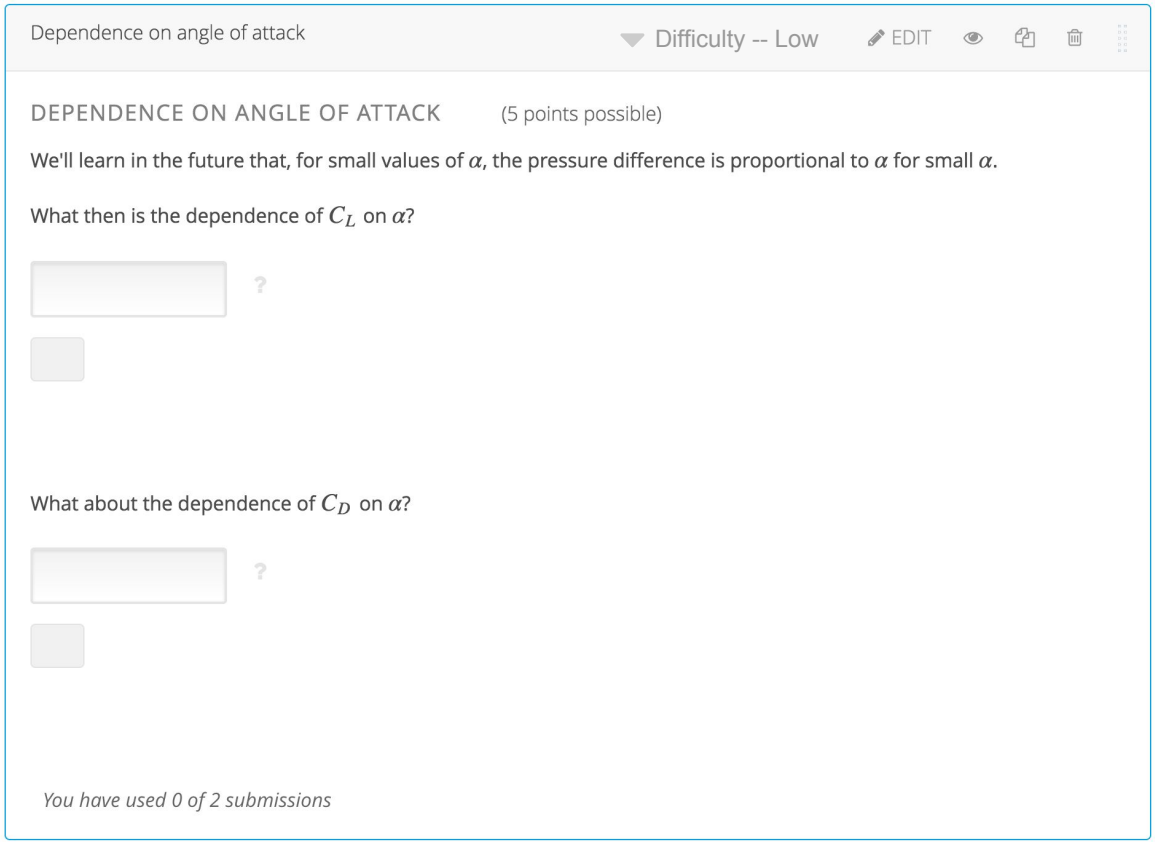
Overview

- XBlock Asides
- Example Use Cases
- OLI and MIT Use Cases
- Demo
- Next Steps for Asides

XBlock Asides

- An Aside is an XBlock “Decorator” that allows association of metadata with the XBlock
- Pluggable using the same extension mechanism as XBlocks themselves
- Multiple Asides can decorate a given XBlock

Use Case: Difficulty Tagging



Use Case: Upvoting/Downvoting

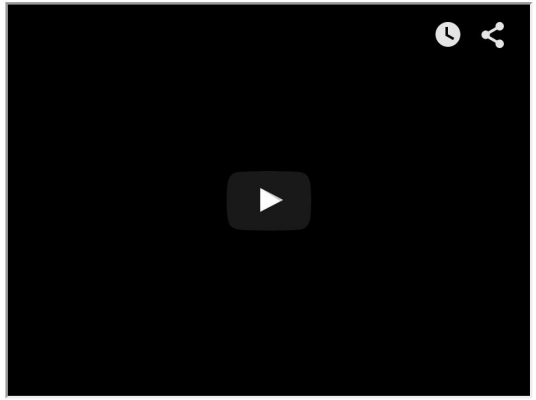
0↑ 0↓

average and instantaneous acceleration

Average and Instantaneous acceleration.

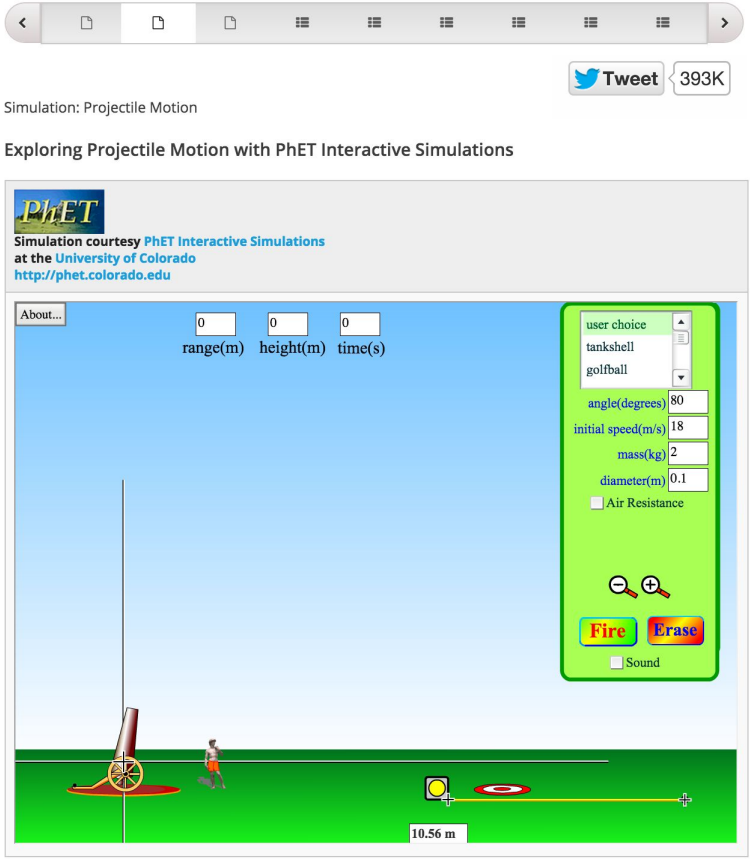
Note: Many notations are used in different books to represent the time average of a variable. Prof. Lewin uses a bar at the top of the variable, in this case the acceleration. Other common notations are a_{avg} and <a>.

Definition of the average acceleration



Click here to download this video.

Use Case: Social Media



Asides Becomes an Enabler for Tagging...

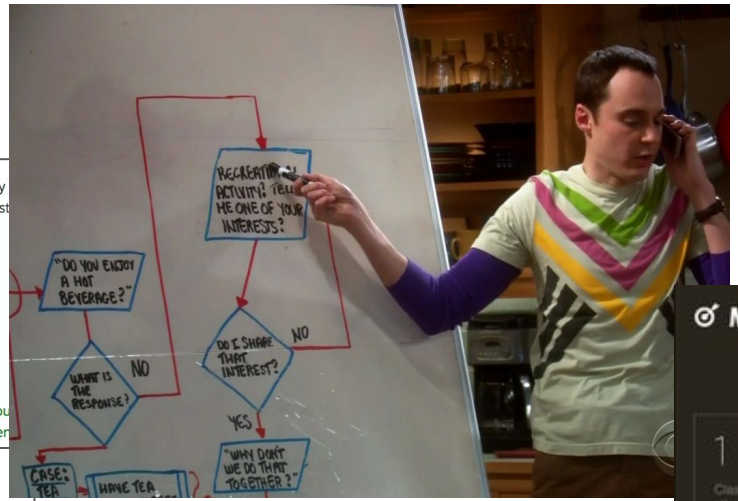
- Difficulty level of a problem (easy/medium/hard)
- Learning objective for a component
- Metadata needed for more advanced analytics
- Large reusable problem banks
- Adaptive learning experiences
- Authorship and copyright/licensing information
- Improved content management
- New, more granular pedagogical research

Use Case: Open Learning Initiative (OLI) at Stanford

- Goal: “Outcome-based” analytics
- Model student’s knowledge state to predict level of mastery by learning objective/outcome
- Inputs to model:
    - Student performance on problems (using log data)
    - Association map of problems to learning objectives/outcomes (using Asides!)

Use Case: Open Learning Initiative (OLI) at Stanford

Predictive Statistical Algorithm



Student Performance Data

A family plans to have 3 children. For each birth, assume that the probability of a boy
the same as the probability of a girl. What is the probability that they will have at least
one boy and at least one girl?

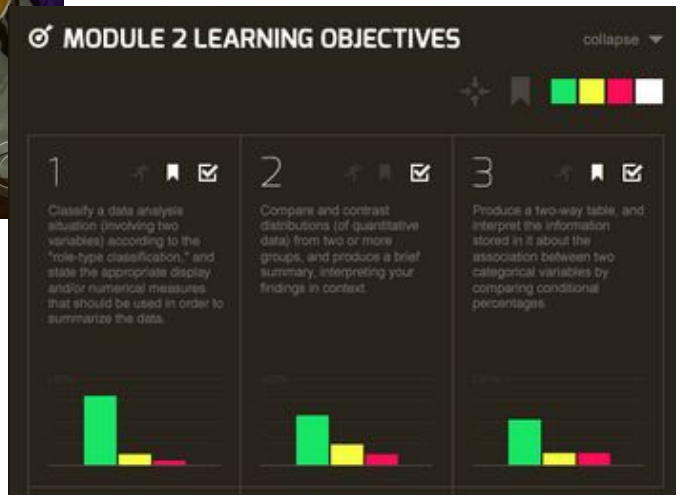
- 0.5
- 0.125
- 0.75 ✔
- 0.875

Correct:
The outcomes are equally likely, so the easiest way to work this problem is to write ou
the 8 outcomes in this sample space. In two outcomes the gender of all three children
the sar

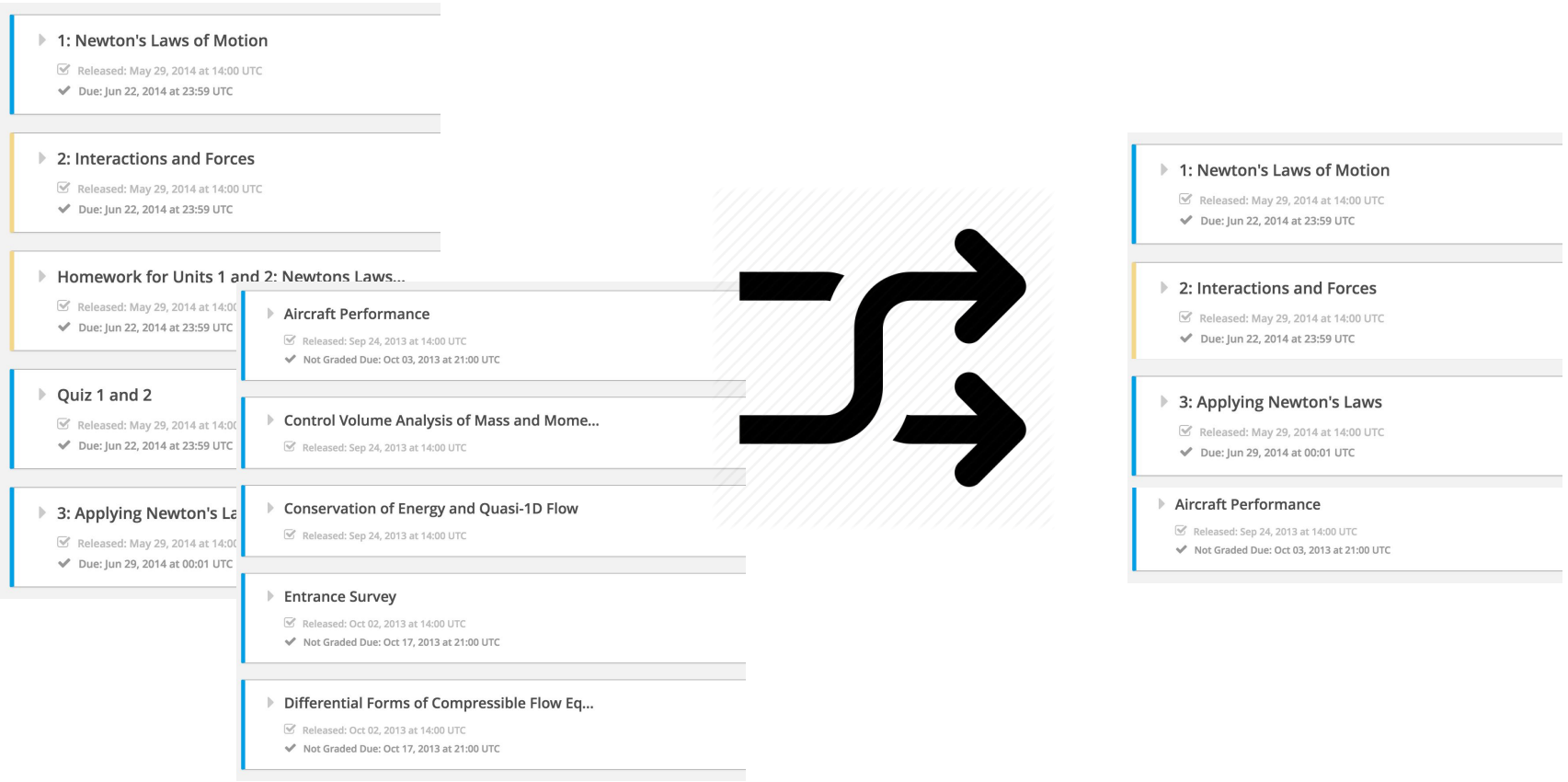
```
<resources id="stem_readiness">
    <resource id="arithmetic_p3_q1">
        <skills>
            <skill idref="arithmetic_operations_communitive"/>
            <skill idref="arithmetic_operations_decimal"/>
            <skill idref="arithmetic_operations_divide"/>
        </skills>
    </resource>
    <resource id="arithmetic_p3_q2">
        <skills>
            <skill idref="arithmetic_operations_communitive"/>
            <skill idref="arithmetic_operations_whole"/>
            <skill idref="arithmetic_operations_add"/>
        </skills>
    </resource>
```

Map of Learning Objectives to Resource IDs

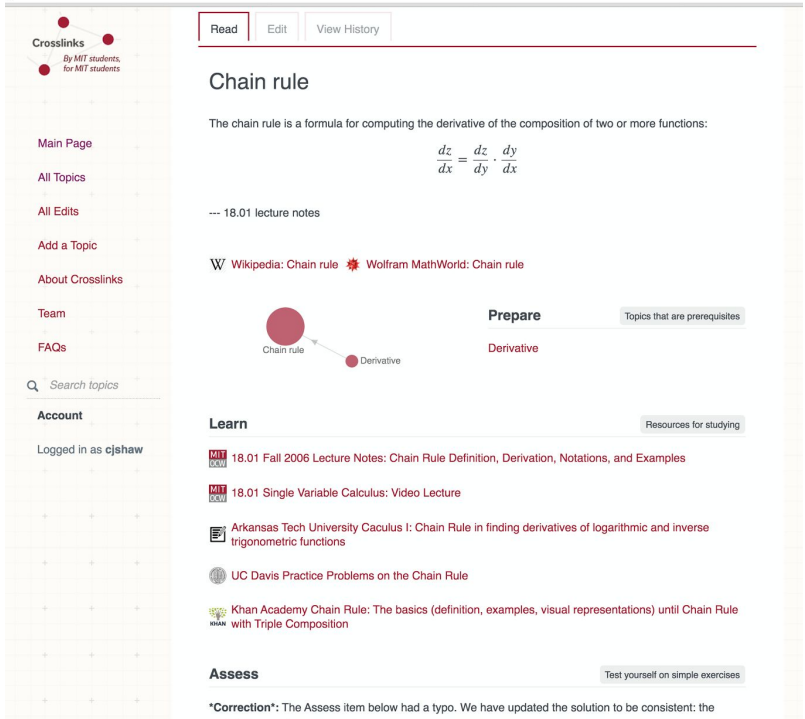
Dashboard displays that predict mastery by learning objective

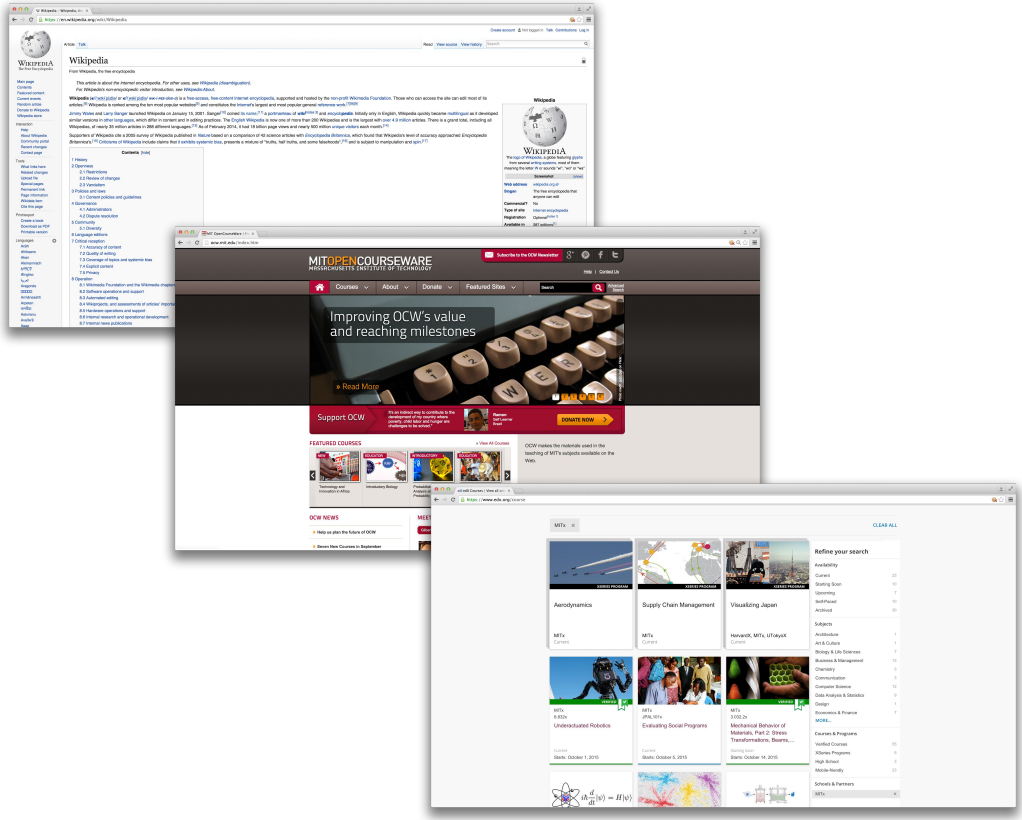


MIT Backstage Use Case -- Modularity & Pathways

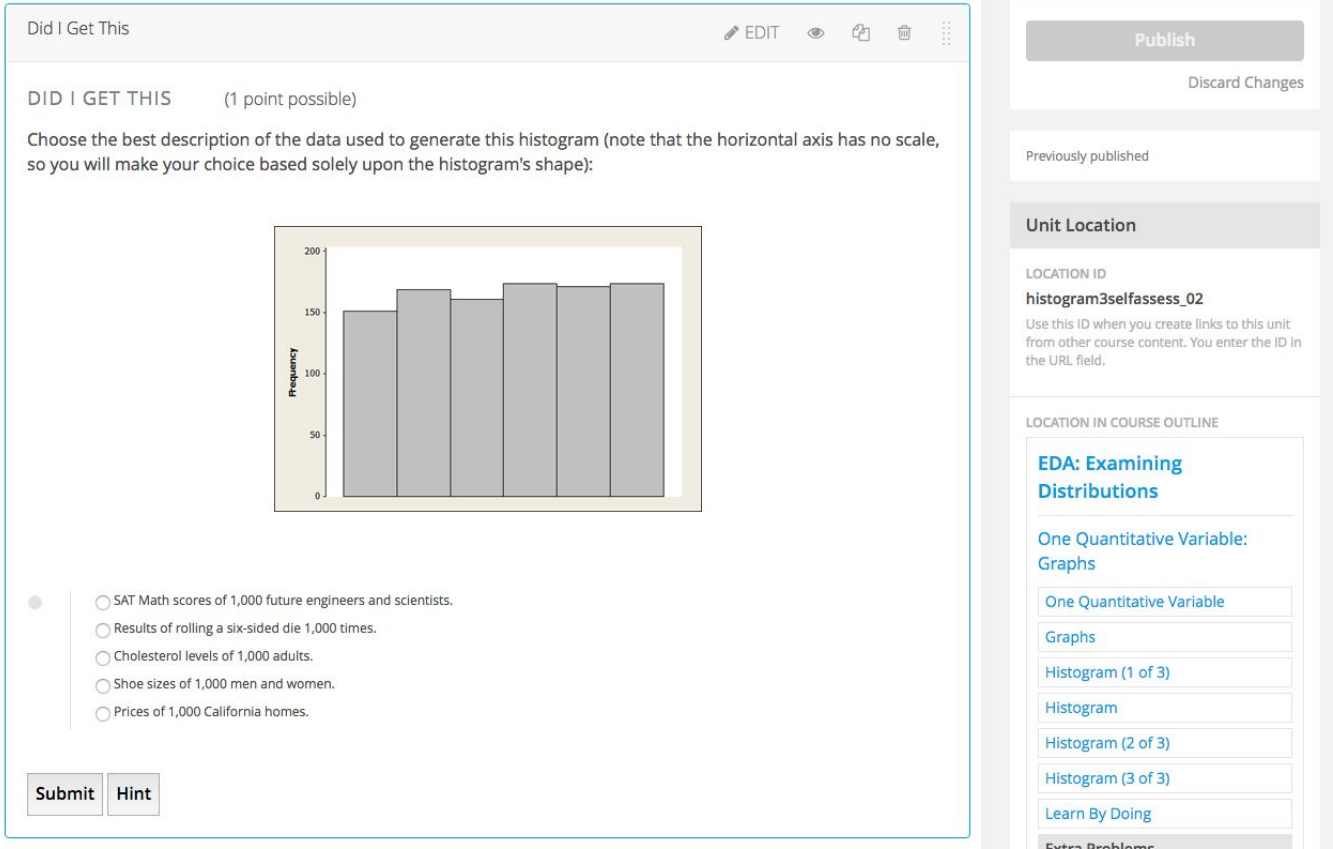


MIT Backstage Use Case -- Crosslinks





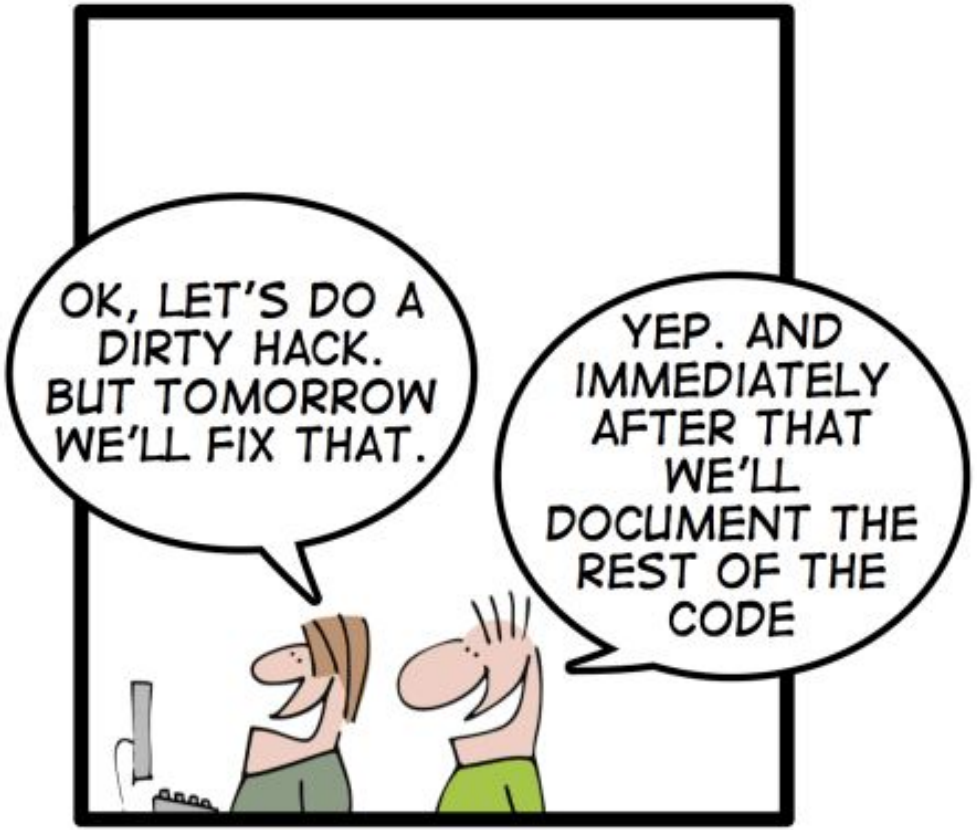
How can we integrate this into Studio workflow?



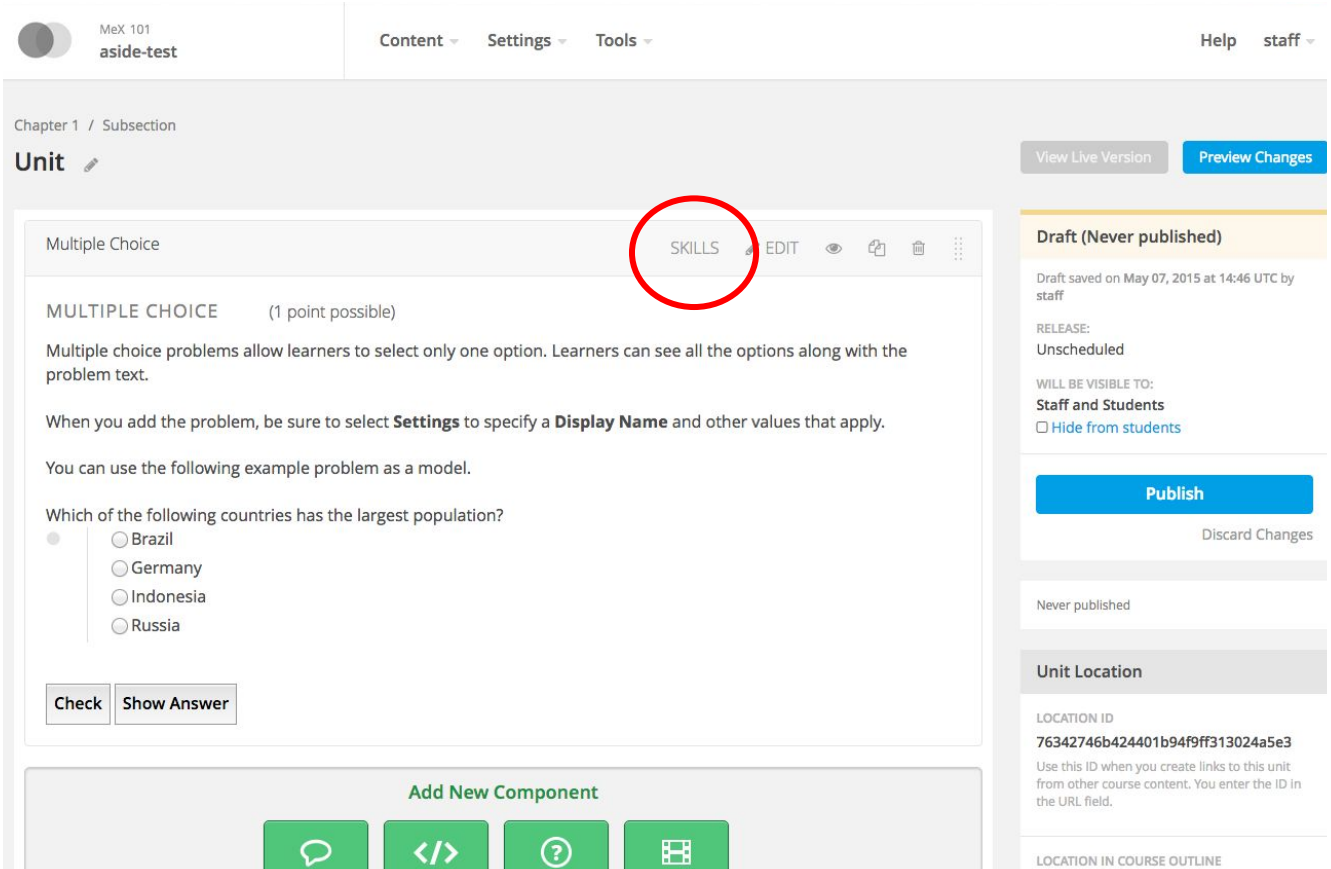
Demo

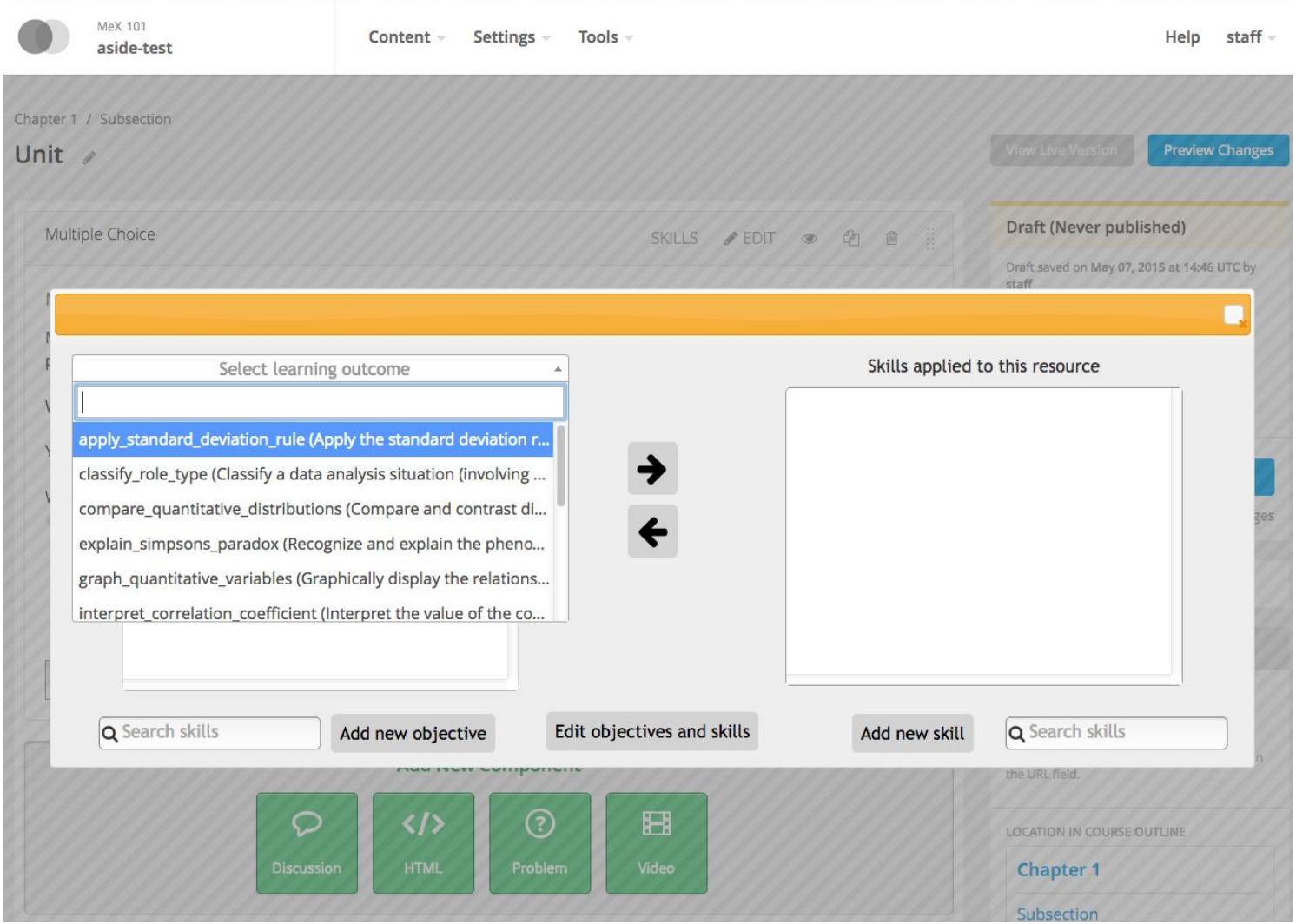
Let's see a Tagging Aside in action -- in Studio

Warning: currently a bit of a hack!



Demo


MeX 101
aside-test
Content
Settings
Tools
Help
staff
Chapter 1 / Subsection
Unit
View Live Version
Preview Changes
Multiple Choice
SKILLS
EDIT
MULTIPLE CHOICE
(1 point possible)
Multiple choice problems allow learners to select only one option. Learners can see all the options along with the problem text.
When you add the problem, be sure to select Settings to specify a Display Name and other values that apply.
You can use the following example problem as a model.
Which of the following countries has the largest population?
Brazil
Germany
Indonesia
Russia
Check
Show Answer
Add New Component
Draft (Never published)
Draft saved on May 07, 2015 at 14:46 UTC by staff
RELEASE:
Unscheduled
WILL BE VISIBLE TO:
Staff and Students
Hide from students
Publish
Discard Changes
Never published
Unit Location
LOCATION ID
76342746b424401b94f9ff313024a5e3
Use this ID when you create links to this unit from other course content. You enter the ID in the URL field.
LOCATION IN COURSE OUTLINE


MeX 101
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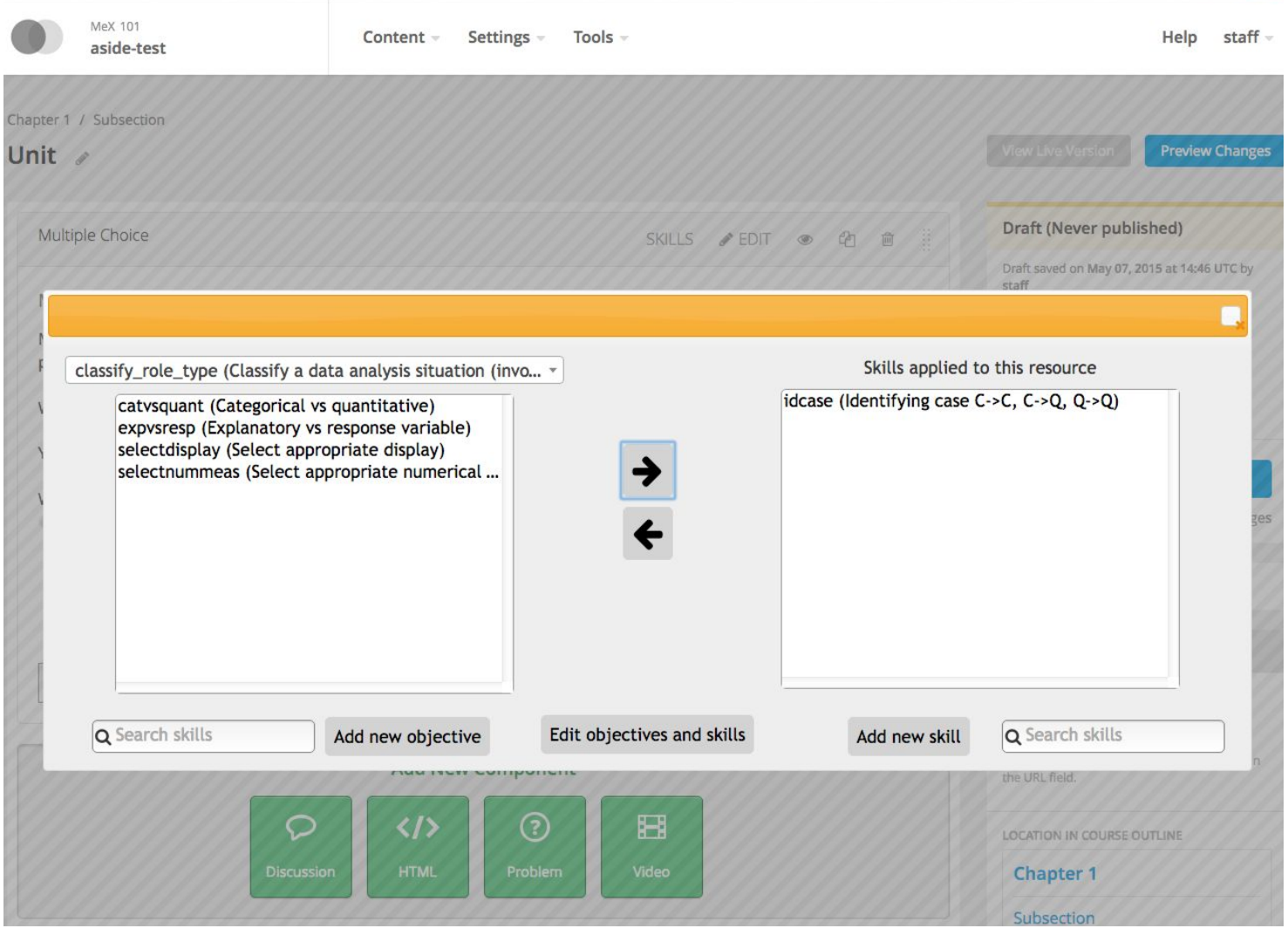
Tools
Help
staff
Chapter 1 / Subsection
Unit
View Live Version
Preview Changes
Multiple Choice
SKILLS
EDIT
Draft (Never published)
Draft saved on May 07, 2015 at 14:46 UTC by staff
Select learning outcome
apply_standard_deviation_rule (Apply the standard deviation r...
classify_role_type (Classify a data analysis situation (involving ...
compare_quantitative_distributions (Compare and contrast di...
explain_simpsons_paradox (Recognize and explain the pheno...
graph_quantitative_variables (Graphically display the relations...
interpret_correlation_coefficient (Interpret the value of the co...
Skills applied to this resource
Search skills
Add new objective
Edit objectives and skills
Add new skill
Search skills
Discussion
HTML
Problem
Video
the URL field.
LOCATION IN COURSE OUTLINE
Chapter 1
Subsection


MeX 101
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Unit
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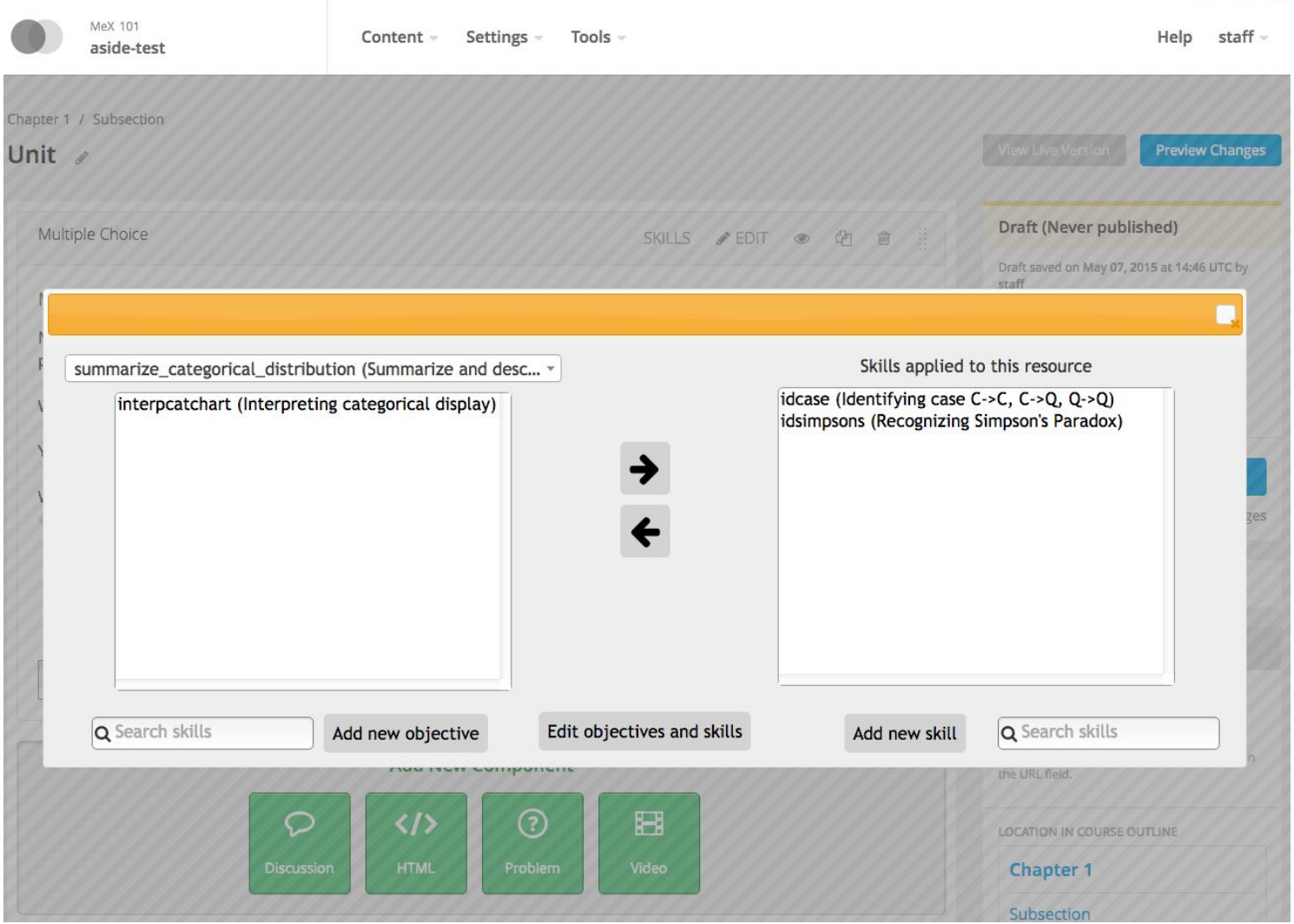
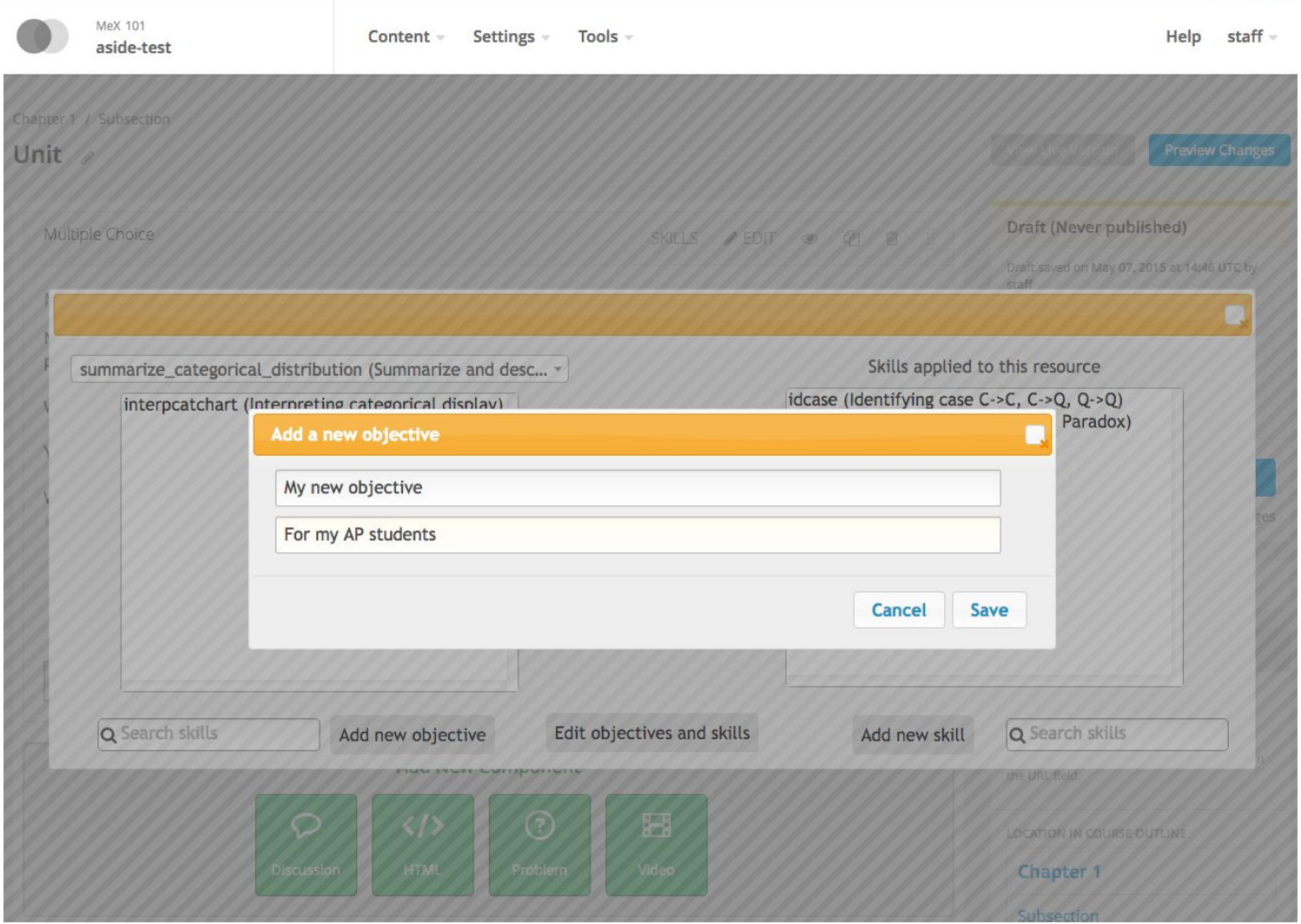
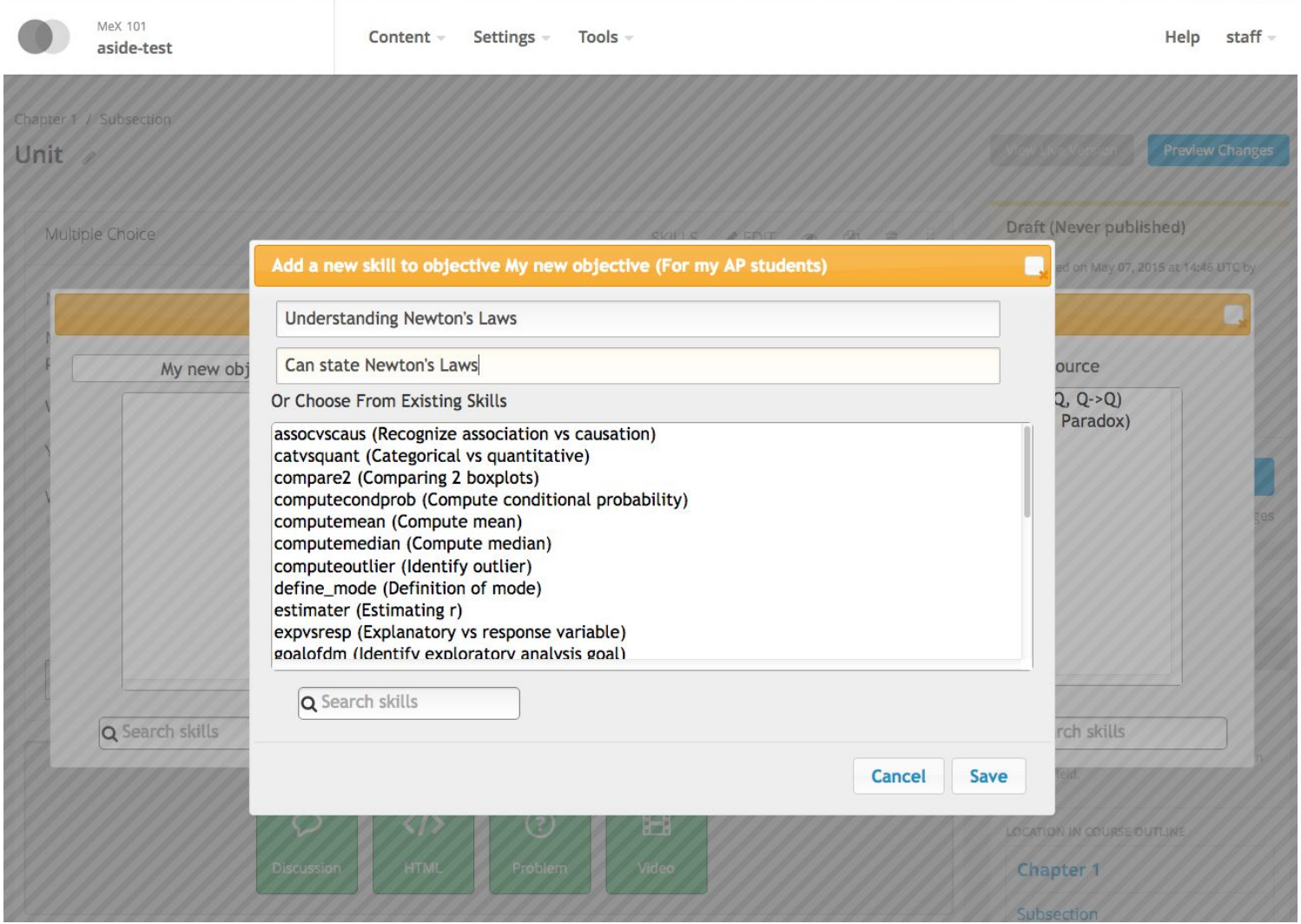
Preview Changes
Multiple Choice
SKILLS
EDIT
Draft (Never published)
Draft saved on May 07, 2015 at 14:46 UTC by staff
classify_role_type (Classify a data analysis situation (invo...
catvsquant (Categorical vs quantitative)
expvsresp (Explanatory vs response variable)
selectdisplay (Select appropriate display)
selectnummeas (Select appropriate numerical ...
Skills applied to this resource
idcase (Identifying case C->C, C->Q, Q->Q)
Search skills
Add new objective
Edit objectives and skills
Add new skill
Search skills
Discussion
HTML
Problem
Video
the URL field.
LOCATION IN COURSE OUTLINE
Chapter 1
Subsection

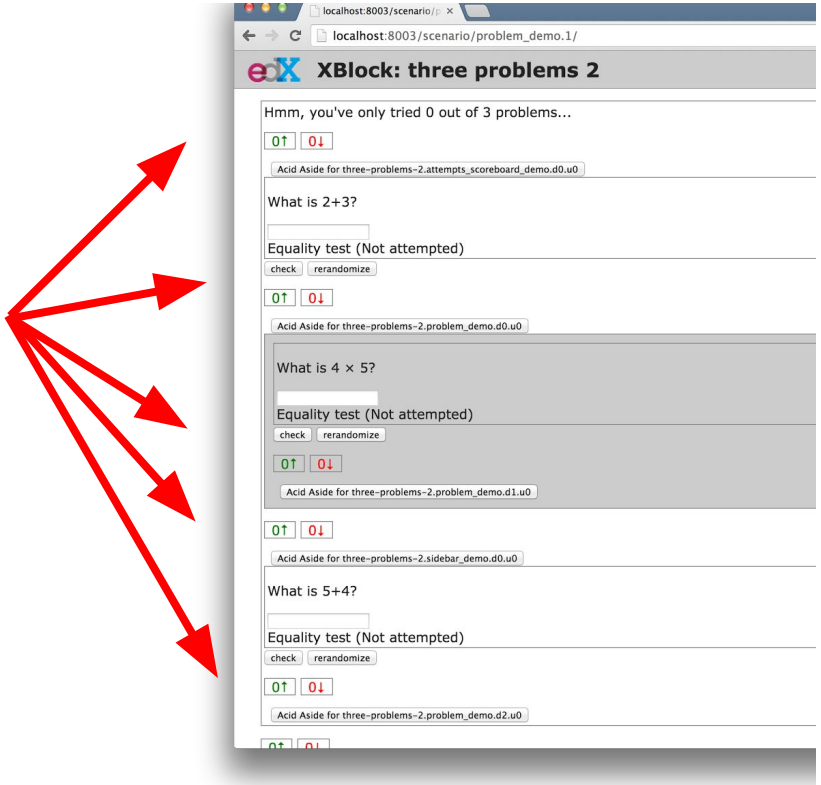

MeX 101
aside-test
Content
Settings
Tools
Help
staff
Chapter 1 / Subsection
Unit
View Live Version
Preview Changes
Multiple Choice
SKILLS
EDIT
Draft (Never published)
Draft saved on May 07, 2015 at 14:46 UTC by staff
summarize_categorical_distribution (Summarize and desc...
interpcatchart (Interpreting categorical display)
Skills applied to this resource
idcase (Identifying case C->C, C->Q, Q->Q)
idsimpsons (Recognizing Simpson's Paradox)
Search skills
Add new objective
Edit objectives and skills
Add new skill
Search skills
Discussion
HTML
Problem
Video
LOCATION IN COURSE OUTLINE
Chapter 1
Subsection


MeX 101
aside-test
Content
Settings
Tools
Help
staff
Chapter 1 / Subsection
Unit
Preview Changes
Multiple Choice
SKILLS
EDIT
Draft (Never published)
summarize_categorical_distribution (Summarize and desc...
Skills applied to this resource
interpcatchart (Interpreting categorical display)
idcase (Identifying case C->C, C->Q, Q->Q)
Paradox)
Add a new objective
My new objective
For my AP students
Cancel
Save
Search skills
Add new objective
Edit objectives and skills
Add new skill
Search skills
Discussion
HTML
Problem
Video
LOCATION IN COURSE OUTLINE
Chapter 1
Subsection


MeX 101
aside-test
Content
Settings
Tools
Help
staff
Chapter 1 / Subsection
Unit
Preview Changes
Multiple Choice
Draft (Never published)
Add a new skill to objective My new objective (For my AP students)
Understanding Newton's Laws
Can state Newton's Laws
Or Choose From Existing Skills
assocvscaus (Recognize association vs causation)
catvsquant (Categorical vs quantitative)
compare2 (Comparing 2 boxplots)
computecondprob (Compute conditional probability)
computemean (Compute mean)
computemedian (Compute median)
computeoutlier (Identify outlier)
define_mode (Definition of mode)
estimater (Estimating r)
expvsresp (Explanatory vs response variable)
goalofdm (Identify exploratory analysis goal)
Search skills
Cancel
Save
Discussion
HTML
Problem
Video
LOCATION IN COURSE OUTLINE
Chapter 1
Subsection

Next Steps, or How to Use XBlock Asides

- Initial work integrated into core platform in Dec 2014
  - underlying architecture available, but do not yet render in Studio or LMS
- Currently available in XBlock Workbench
  - which means YOU can also play around with Asides!
- EdX working on timeline to finish the feature



Still Needed

- Granular Asides configurability (turn on / off per course, configuration of storage mechanism, etc.)
- Improved Studio / LMS integration and rendering
- Platform tweaks to enable Asides

Questions?

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