PSLC DataShop

a data analysis service for the learning science community

application: pslcdatashop.org
project info: pslcdatashop.org/about
email: datashop-help@lists.andrew.cmu.edu
phone: 412 268 2196

indicates a public project
Indicates papers are attached

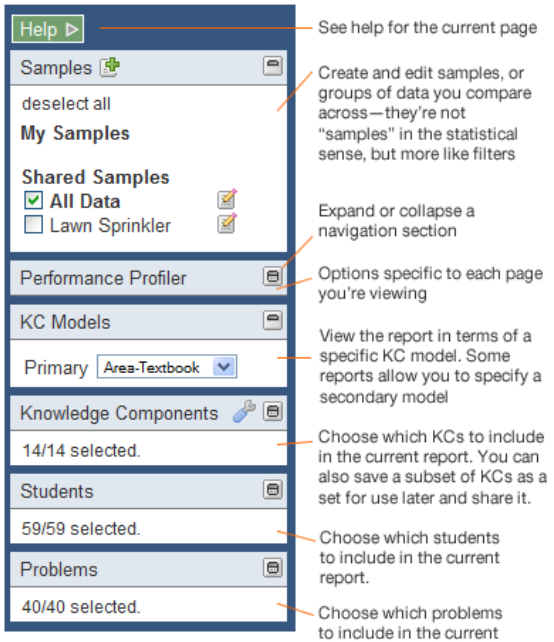
Sample Selector

add a new sample
edit an existing sample
indicates a shared sample
delete a sample

Columns for creating samples of data

Condition Name
Condition Type
Dataset Level Name
Dataset Level Title
Problem Name
Problem Description
School Name
Student Anon ID

Tutor Transaction
- Time Stamp
- Attempt Number
- Student Response Type
- Tutor Response Type
- Student Response Subtype
- Tutor Response Subtype



Glossary

http://pslcdatashop.org/help?page=terms

Transaction. An interaction between the student and the tutoring system. Each hint request, incorrect attempt, or correct attempt is a transaction.

Step. An observable part of the solution to a problem, which can involve one or more transactions.

Problem. A task for a student to perform that typically involves multiple steps.

KC (Knowledge Component). A piece of information that can be used to accomplish tasks, perhaps along with other knowledge components.

KC Model. A list of mappings between each step and one or more knowledge components; also known as a Transfer Model or a Skill Model.

Opportunity. A chance for a student to demonstrate whether he or she has learned a given knowledge component. Exists each time a step is present with the associated knowledge component.

Observation. An observation is a group of transactions for a particular student working on a particular step within an instance of a problem (a problem view)

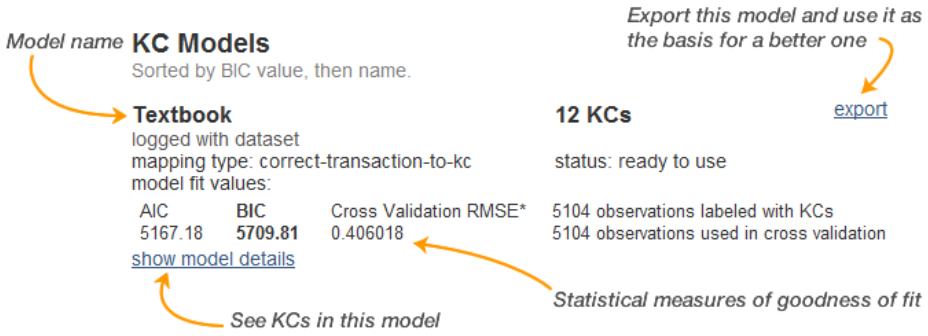
Error Rate. The percentage of students that asked for a hint or were incorrect on their first attempt.

KC Modeling (Dataset Info > KC Models)

Do you want to create or improve a cognitive model for a dataset?

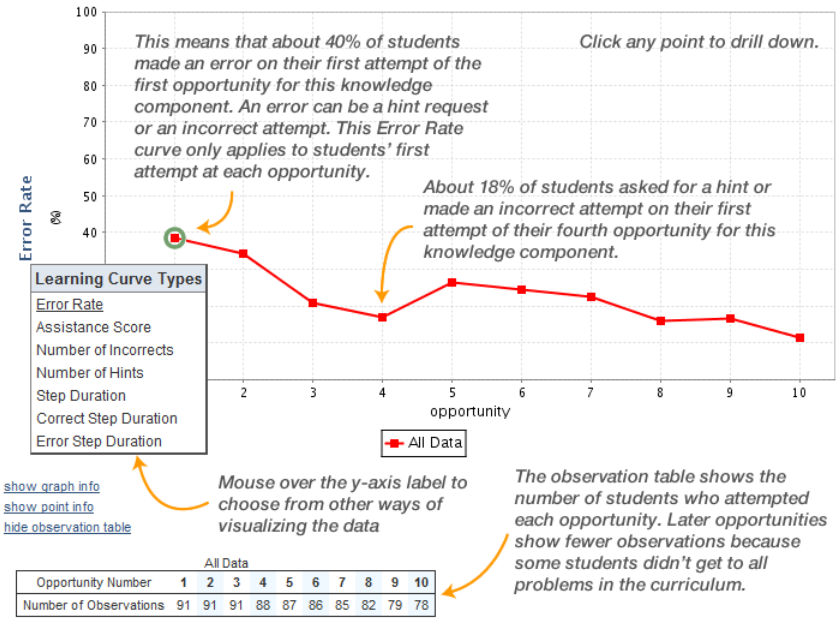
In DataShop, each step can map to one or more knowledge components. From the KC Models page, you can compare existing KC models, export an existing model, or create and import a new KC model.

On the KC Models page, each model is described by:
- number of KCs
- number of observations labeled with KCs
- measures of goodness of fit for the model: AIC, BIC, and Cross Validation RMSE



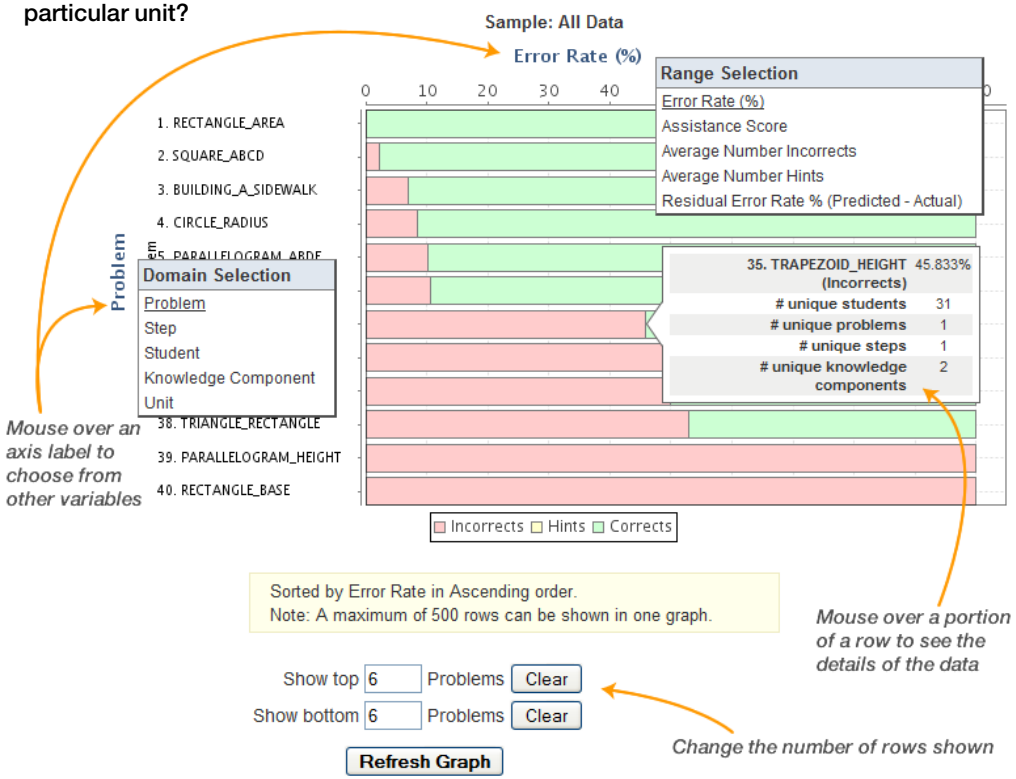
Learning Curves

How can I visualize student performance over time?



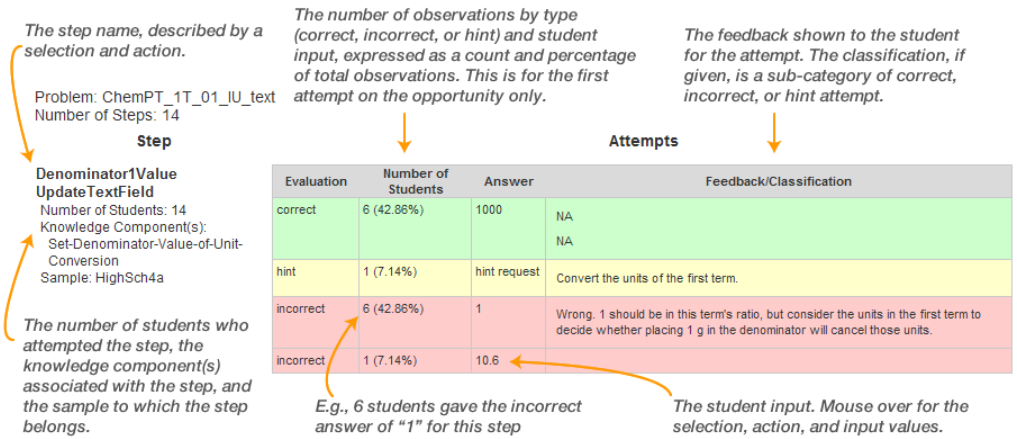
Performance Profiler

What was the hardest problem for students? How many students worked in a particular unit?



Error Report

How can I explore the errors students made and drill down to see actual responses and feedback?



Web Services

API: http://pslcdatashop.org/api/

How can I programmatically retrieve data from DataShop?

Get dataset metadata

https://pslcdatashop.web.cmu.edu/services/datasets/[?id]
access = all, editable, or viewable
verbose = true or false

Get sample metadata

https://pslcdatashop.web.cmu.edu/services/datasets/[id]/samples/[?id]
access = editable or viewable
verbose = true or false

Get transactions

https://pslcdatashop.web.cmu.edu/services/datasets/[id]/[?samples/id]/transactions
zip = true or false
cols = comma-delimited list of columns
cfs = all or none
headers = true or false
limit = a number between 1 and 5,000
offset = a number between 0 and the number of rows in the dataset

Get student-step records

https:// pslcdatashop.web.cmu.edu/services/datasets/[id]/[?samples/id]/steps
zip = true or false
cols = comma-delimited list of columns
kcms = all or none
headers = true or false
limit = a number between 1 and 5,000
offset = a number between 0 and the number of rows in the dataset

Import

http://pslcdatashop.org/help?page=import

- Log data directly to DataShop from an educational application
- Import manually by DataShop team

Export

http://pslcdatashop.org/help?page=export

Location/Type	Description
Export > By Transaction (or Web Services)	Data at the finest level of granularity possible—the level at which the data was logged.
Export > By Student-Step (or Web Services)	Aggregates data by student-step: each row represents a student attempting to complete a step.
Export > By Student-Problem	Aggregates data by student and problem, describing unique problems students have engaged in.
Dataset Info > Problem Breakdown	Lists all unique problems and steps in the curriculum
Dataset Info > KC Models	Lists and describes all unique steps in the curriculum and how various KC models are mapped to them
Learning Curve > Model Values	Describes how well the AFM statistical model fits the data and how well it might generalize to another dataset

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Web Application Export Columns

http://pslcdatashop.org/help?page=export

Transaction

Export > By Transaction. Data at the finest level of granularity possible—the level at which it was logged.

Row	Sample Name	Anon Student Id*	Session Id	Time	Time Zone	Duration (sec)	Student Response Type	Student Response Subtype	Tutor Response Type	Tutor Response Subtype	Level*	Problem Name	Step Name	Attempt At Step
Outcome	Selection*	Action*	Input*	Feedback Text	Feedback Classification	Help Level	Total Num Hints	Condition Name *	Condition Type *	KC Knowledge Component	KC Category	School	Class	CF* Custom Field

Student-Step

Export > By Student-Step. Data aggregated by student-step: each row represents a student attempting to complete a step.

Row	Sample	Anon Student Id†	Problem Hierarchy	Problem Name	Problem View	Step Name	Step Start Time	First Transaction Time	Correct Transaction Time	Step End Time
Step Duration (sec)	Correct Step Duration (sec)	Error Step Duration (sec)	First Attempt	Incorrects	Hints	Corrects	Condition	Knowledge Component† *	Opportunity† *	Predicted Error Rate† *

Student-Problem

Export > By Student-Problem. Data aggregated by student and problem, describing unique problems students have engaged in.

Row	Sample	Anon Student Id†	Problem Hierarchy	Problem Name	Problem View	Problem Start Time	Problem End Time	Latency (sec)	Steps Missing Start Times	Hints
Incorrects	Corrects	Avg Correct	Steps	Avg Assistance Score	Correct First Attempts	KCs	Steps Without KCs	KC List		

KC Model

Dataset Info > KC Models. Lists and describes all unique steps in the curriculum and how various KC models are mapped to them.

Step ID	Problem Hierarchy	Problem Name	Max Problem View	Step Name	Avg. Incorrects	Avg. Hints	Avg. Corrects	% First Attempt Incorrects	% First Attempt Hints	% First Attempt Corrects
Avg. Step Duration (sec)	Avg. Correct Step Duration (sec)	Avg. Error Step Duration (sec)	Total Students	Total Opportunities	KC Model*					

Problem Breakdown

Dataset Info > Problem Breakdown.
Lists all unique problems and steps in the curriculum.

Row	Problem Hierarchy	Problem Name	Step Name

* Column or column set may appear more than once.

† Will show additional rows if more than one KC or student is associated with a step.

Dataset Import File Columns

http://pslcdatashop.org/about/importverify.html

Anon Student Id*	Session Id	Time	Time Zone	Student Response Type	Student Response Subtype	Tutor Response Type	Tutor Response Subtype	Level*	Problem Name	Step Name	Attempt At Step	Outcome

Selection*	Action*	Input*	Feedback Text	Feedback Classification	Help Level	Total Num Hints	Condition Name *	Condition Type *	KC *	KC Category *	School	Class	CF*

Knowledge Component

required column

Custom Field

Web Services Export Columns

Transaction

http://pslcdatashop.org/about/webservices.html

Request

row	anon_student_id	session_id	time	time_zone	duration	student_response_type	student_response_subtype	tutor_response_type	tutor_response_subtype

problem_hierarchy	problem_name	step_name	attempt_at_step	outcome	selection	action	input	feedback	help_level	total_num_hints	condition	kcs	school	class

Response

Row	Anon Student Id*	Session Id	Time	Time Zone	Duration (sec)	Student Response Type	Student Response Subtype	Tutor Response Type	Tutor Response Subtype	Problem Hierarchy	Problem Name	Step Name	Attempt At Step

Outcome	Selection*	Action*	Input*	Feedback Text	Feedback Classification	Help Level	Total Num Hints	Condition Name *	Condition Type *	KC *	KC Category *	School	Class	CF*

Web services transaction format is almost the same as the web application's transaction format except the "Sample Name" column is omitted and the problem hierarchy appears in a single column.

Student-Step

Request

row	anon_student_id	problem_hierarchy	problem_name	problem_view	step_name	step_start_time	first_transaction_time	correct_transaction_time	step_end_time

step_duration	correct_step_duration	error_step_duration	first_attempt	incorrects	hints	corrects	condition	kcms

Response

Row	Anon Student Id†	Problem Hierarchy	Problem Name	Problem View	Step Name	Step Start Time	First Transaction Time	Correct Transaction Time	Step End Time

Step Duration (sec)	Correct Step Duration (sec)	Error Step Duration (sec)	First Attempt	Incorrects	Hints	Corrects	Condition	KC‡ *	Opportunity‡ *	Predicted Error Rate‡ *

* Column or column set may appear more than once.

† Will show additional rows if more than one student is associated with a step.

‡ Multiple KCs on a step are contained in a single value and delimited with two tildes ("~~"), resulting in a single row, which is different than the web application's student-step format.