

FIRST National Assessment Database: What's in it for me?

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Overview

- What is the FIRST database?
- Demonstration of upload functionality
- Examples of Use Cases
- Use Case workshop exercise
- Not addressing IRB/FERPA issues in this workshop but can discuss later

Goals of the FIRST Database

- Developing faculty expertise in assessing student learning
- Evaluating innovations based on analyses of these data

FIRST Database

- Support data-driven instructional decision making
- Storing, searching and classifying assessment data
- Support analyses of the data

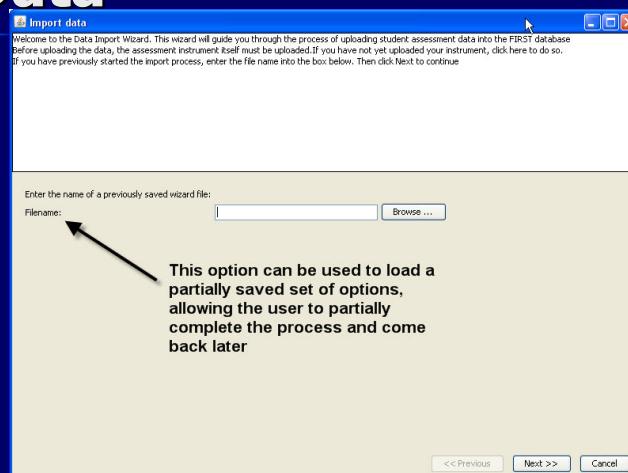
Functionality

- Upload, store, search, download assessment items
- Store meta-data about assessments
 - Scoring rubrics
 - Content descriptors (e.g., evolution, cell signaling)
 - Cognitive descriptors (e.g., Blooms taxonomy)
- Upload, de-identify, store, search student responses
- Upload, de-identify, store student demographic data
- Join and query datasets
- Share assessments and data with wider science education community

Demonstration of Assessment Upload

- Sample exam
- Upload process

Uploading Assessment Data



The screenshot shows a window titled "Import data" with a blue title bar. The main text area contains the following instructions: "Welcome to the Data Import Wizard. This wizard will guide you through the process of uploading student assessment data into the FIRST database. Before uploading the data, the assessment instrument itself must be uploaded. If you have not yet uploaded your instrument, click here to do so. If you have previously started the import process, enter the file name into the box below. Then click Next to continue." Below this text is a section with the heading "Enter the name of a previously saved wizard file:". It contains a label "Filename:" followed by a text input field and a "Browse ..." button. An arrow points from the input field to a text box that reads: "This option can be used to load a partially saved set of options, allowing the user to partially complete the process and come back later". At the bottom right of the window are three buttons: "<< Previous", "Next >>", and "Cancel".

Specifying Assessment Data Being Imported

Import data

Select the assessment instrument for which you would like to import student data. You can filter the available assessments using the controls shown below

If the assessment you are importing is not shown, either you do not have permission to upload data for that assessment, or it has not been imported into the database

To see a list of all assessments associated with the selected course, click [here](#)

To import a new assessment into the database, click [here](#)

Term/Semester	Course	Assessment
Spring 2007	RHO 301	Homework 1
Fall 2007		Quiz 1

Select Term Select Course Select Assessment

<< Previous Next >> Cancel

Choosing Import Format

Import data

Select Data File Format

In the next step of the import process you will be asked to specify information about the types and locations of data in the data table. If you have previously saved a description of the particular file format you are importing, select that description from the list below. Otherwise, select "I'm working with a new data file format"

☐ I'm working with a new data file format

Format Name:

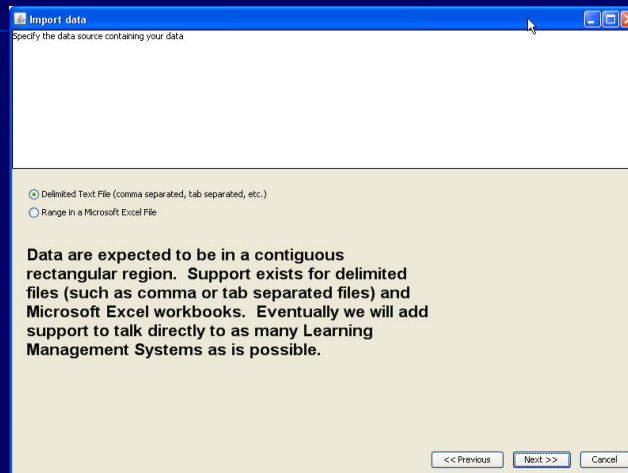
☒ Use Existing Format MSU Scoring Office

The first time you work with a format, you'll give it a name here so that it can be used again later.

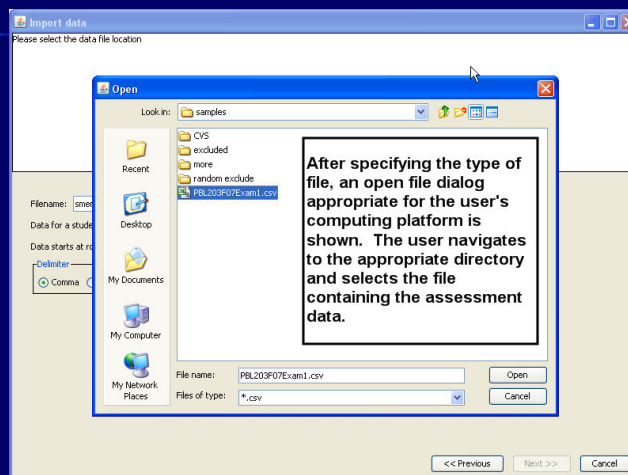
Saved formats allow you to start with a common group of settings, so that you don't have to do the same things over and over again.

<< Previous Next >> Cancel

Selecting Type of Data



Locating Data File



Previewing Selected Data

Import data

Please select the data file location

Filename:

Data for a student are located in a single ☐ Row ☐ Column

Data starts at row ☒ First row contains column labels

Delimiter: ☒ Comma ☐ Tab ☐ Space ☐ Semicolon ☐ Other

Preview

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Student	Q1...	Q1...	Q2...	Q2...	Q3...	Q3...	Q4...	Q4...	Q5...	Q5...	Q...	Q...	Q...	Q...	Q...
Key	A	B	C	C	A	B	A	C							
A	S	A	S	B	S	C	S	A	0	A	S	A	0	B	
B	S	A	0	A	S	C	S	A	S	B	S	A	0	B	
C	0	B	S	B	S	C	S	A	S	B	S	A	0	B	
D	S	A	S	B	S	C	0	B	S	B	S	A	S	C	
E	0	C	S	B	S	C	S	A	S	B	S	A	S	C	
F	0	B	0	C	S	C	S	A	0	C	S	A	0	A	

<< Previous Next >> Cancel

Many of these options are not yet implemented, but will allow the user to select the portion of the data table containing the information to be imported.

Indicating Data Types to Import

Import data

Indicate the types of information you would like to upload

You can import any combination of student scores, student responses and feedback into the database. This information can be located in the data file itself, or stored in separate files. Please indicate which of these types of information you would like to import:

☒ Scores
☒ Responses
☐ Feedback

On this screen, the user indicates which types of data are to be imported. We anticipate that scores, responses and feedback from the grader are the only data that will be stored.

<< Previous Next >> Cancel

Additional Data Files

Import data

Information may be contained in files other than the file being uploaded. For example, student answer sheets might have been scanned. Please indicate whether you have such files to upload. If you do, you will be given a chance to select them on the next page.

Is any of the selected information to be uploaded stored in a file other than PBL203F07Exam1.csv?

☒ Yes
☐ No

This screen asks the user whether any files other than the file containing the data table need to be uploaded. This might happen if free response questions were part of the exam and student answer sheets were scanned, for example.

<< Previous Next >> Cancel

Specifying Additional Data Files

Import data

Select the file(s) that contain information to be uploaded.

On this screen, an interface is presented that allows the user to specify those files that should be uploaded in addition to the main data file.

The file exploring interface will match the standard file explorer for the user's computing platform.

Select each file containing needed information from the list below, and click 'Add' to include it.

Desktop

- My Documents
- My Computer
- My Network Places
- Links
- Change Password
- Dynknow
- Eclipse
- Mozilla Firefox
- Share-to-Web Upload Folder
- 114 Final Grades.pdf
- 221 Final Grades.pdf
- 481 Final Grades.pdf
- benison aom receipt.pdf
- Completed Seaplane.a2w
- Document.pdf

114 Final Grades.pdf

...\\ncf\\all\\Windows Config\\Desktop\\114 Final Grades.p...

Remove <<

Add >> Add all files in folder Include sub-folders

<< Previous Next >> Cancel

Locating Student Identifier

Import data

Please identify which column contains the student identifier

Select the column that contains the student identifier from the data table shown below, and then click next.

Text	Q1...	Q1...	Q2...	Q2...	Q3...	Q3...	Q4...	Q4...	Q5...	Q5...	Q6...	Q6...	Q7...	Q7...
Student	A	B	C	A	B	A	B	A	C	B	A	C		
Key	A	B	C	A	B	A	C	B	A	C	B	A	C	
A	5	A	5	B	5	C	5	A	0	A	5	A	0	B
B	5	A	0	A	5	C	5	A	5	B	5	A	0	B
C	0	B	5	B	5	C	5	A	5	B	5	A	0	B
D	5	A	5	B	5	C	0	B	5	B	5	A	5	C
E	0	C	5	B	5	C	5	A	5	B	5	A	5	C
F	0	B	0	C	5	C	5	A	0	C	5	A	0	A

The column containing the student identifier is indicated next. Either this software or a prior operation will ensure that this identifier is meaningless, but consistently generated so students can be tracked over time.

<< Previous Next >> Cancel

Regularly Spaced Column Check

Import data

If your data file has scores in regularly spaced columns (for example, the scores are in every other column), then the score columns can be automatically identified.

Are there an equal number of columns between the scores in the data table?

☒ Yes

☐ No

Select the first column in the data table containing scores and then click next.

Select the next column in the data table containing scores and then click next.

Select the last column in the data table containing scores and then click next.

A	first	C	next	E	F	G	H	I	J	K	L	...	last	O
St...	Q1 S...	Q...	Q2 S...	Q2...	Q3...	Q3...	Q4...	Q4...	Q5...	Q5...	Q...	Q...	Q7...	Q7...
Key	A	B	C	A	B	A	C	B	A	C	B	A	C	
A	5	A	5	B	5	C	5	A	0	A	5	A	0	B
B	5	A	0	A	5	C	5	A	5	B	5	A	0	B
C	0	B	5	B	5	C	5	A	5	B	5	A	0	B
D	5	A	5	B	5	C	0	B	5	B	5	A	5	C
E	0	C	5	B	5	C	5	A	5	B	5	A	5	C
F	0	B	0	C	5	C	5	A	0	C	5	A	0	A

The next step is to associate each column of the spreadsheet with a data item (for example, a score on a question or a student's response).

This page allows this task to be done more quickly if the spreadsheet is "regularly" organized, as our example is.

This page is repeated for each type of data being imported

<< Previous Next >> Cancel

Assigning Columns

Import data

Drag and drop the response identifiers onto the column in the data table containing the **Responses** for that response.

The final task is to label each column in the data table with the type of data it holds.

This page will be pre-filled with values if regularly-spaced column information was specified on the previous pages.

Drag each response identifier from the list on the left onto the appropriate column in the data table on the right containing the responses. When you have matched all of the responses with the correct data table column, click Next.

Available response items

Question 1
Question 2
Question 3
Question 4
Question 5
Question 6
Question 7

Data Table

A	B	Question 1	D	Question 2	F	G	H	I	...	...	...	...	...	...
St...	Q1...	Q1 Response	Q2...	Q2 Response	Q...	Q...	...	...	...	...	...	...	...	...
Key		A		B		C		A		B		A		C
A	S	A	S	B	S	C	S	A	D	A	S	A	D	B
B	S	A	D	A	S	C	S	A	S	B	S	A	D	B
C	D	B	S	B	S	C	S	A	S	B	S	A	D	B
D	S	A	S	B	S	C	D	B	S	B	S	A	S	C
E	D	C	S	B	S	C	S	A	S	B	S	A	S	C
F	D	B	D	C	S	C	S	A	D	C	S	A	D	A

Selecting a question in the list shows the text of the question here.

☐ Data for this item are stored in a different file, and not referenced in the data table

A population needs to have genetic variation in order to evolve. Indicate whether mitosis increases genetic variation, decreases genetic variation, or causes no change.

<< Previous Next >> Cancel

Use Cases

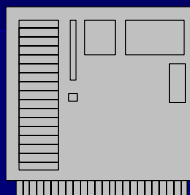
- Spreadsheets with faculty's records of student grades for each year



Have course grades in intro bio declined over the years?

- Query returns
 - Data set (spreadsheet) with semester, student grades
- Analysis
 - ANOVA comparing mean student grades across multiple years to determine if grades have declined

Have course grades in intro bio declined over the years?



	A	B	C	D	E
1	FS02	FS03	FS04	FS05	FS06
2	3.5	2.0	3.5	3.0	1.5
3	4.0	3.5	0.0	2.0	2.5
4	3.0	3.0	2.5	3.0	0.0
5	0.0	1.5	1.5	1.0	1.0
6	2.0	1.5	1.5	1.5	1.5
7	2.0	2.5	0.0	2.0	1.0
8	2.0	1.5	2.0	3.5	1.0
9	3.5	0.0	0.0	1.0	1.5
10	4.0	3.5	2.0	4.0	3.0

Have course grades in intro bio declined over the years?

- Analysis
 - ANOVA comparing mean student grades across multiple years to determine if grades have declined
- Data sources
 - Spreadsheets with faculty's records of student grades for each year
- Query returns
 - Data set (spreadsheet) with semester, student grades

Is there a relationship between clickers and exam scores?

- Analysis
 - Correlation between clicker score(s) and exam scores
 - Regression/partial correlation using GPA or other control variables
- Data sources
 - Exam questions from exam parser
 - Clicker question output from clicker software
 - Powerpoint, Excel, others?
 - Spreadsheet with unique ID, demographic data, GPA
 - Spreadsheets with clicker output, including answer keys
 - Clicker data may be by clicker ID so need a clicker ID to unique student ID mapping
 - ASCII or spreadsheet files with unique ID, exam responses for each student, answer key
- Query returns
 - Demographic data, GPA, exam responses, question "points", clicker responses & "points"
 - Exam and clicker questions for variable labels/names

Use Case Exercise

- Your data
 - Exams or assessments used with students
 - Information about the type of course(s) where the assessments were used
 - Answer keys and scoring rubrics for assessments
 - Student data for the assessments without student identifiers
- Use Case Worksheet
- Metadata Worksheet

Additional Use Cases

Are more students taking AP Bio and placing out of intro bio?

- **Analysis**
 - Distribution of AP bio scores of incoming students over the years and the target courses in which students enrolled
 - Relationship among ACT scores, AP bio scores and grades
- **Data sources**
 - Spreadsheet: unique ID, demographic data (gender, ethnicity, major, etc.) ACT, AP bio scores of incoming freshmen, first bio course taken, grade in bio course
 - Excel spreadsheets with faculty's records of student grades for each year
- **Query returns**
 - Demographic data, ACT, AP Bio, semester, first Bio course, Grade in bio course

What is the impact of multiple attempts at online homework on exam scores?

- Analysis
 - Correlation between number of tries and exam scores
 - Regression/partial correlation using GPA or other control variables
- Data sources
 - Exam questions from exam parser
 - Spreadsheet with unique ID, demographic data, GPA
 - Excel spreadsheets with data from CMS with Unique ID, number of tries / homework problem
 - ASCII or spreadsheet files with unique ID, exam responses for each student, answer key
- Query returns
 - Demographic data, GPA, exam responses, number of tries / homework
 - Exam and homework questions

How are my students doing on *topic* (tracing matter, etc.)?

- Analysis
 - Performance on individual *topic* questions on homework, clickers, exams
- Data sources
 - Exam questions from exam parser
 - Clicker question output from clicker software
 - Excel spreadsheets with data from CMS with Unique ID, number of tries / homework problem
 - ASCII or spreadsheet files with unique ID, exam responses for each student, answer key
 - Metadata with *Topic* Classifications for each item
- Query returns
 - Demographic data, GPA, exam responses, number of tries / homework
 - *Topic* classification for each question
 - Exam and homework questions

How reliable is my exam question taxonomy?

- Analysis
 - Cronbach Alpha and Intraclass correlation coefficient on ratings across questions by multiple raters
- Data sources
 - Exam questions from exam parser
 - Taxonomy system
 - Ratings on each question from multiple raters
- Query returns
 - Exam questions, rater ID, ratings on each question

How are my students doing on exam questions, based on taxonomy classification?

- Analysis
 - Descriptive statistics on questions based on classification
 - Cluster analysis of outcomes based on classification
- Data sources
 - Exam questions from parser
 - Classifications from each rater on each question
 - Spreadsheet with student ID, response on each question, "points" for each
- Query returns
 - Exam questions, rater ID, ratings on each question
 - Spreadsheet with exam questions, each question response, "points" question classification for variable label

What are my students' misconceptions about *topic* (CINS, etc.?)

- Analysis
 - Multiple correspondence analysis of individual foils on concept inventory
- Data sources
 - Exam questions from parser
 - Classifications of questions by topic
 - Classification of individual foils by misconception
 - Spreadsheet with student ID, response on each question
- Query returns
 - Exam questions and classification on topic/subtopic of each
 - Individual foils and classification of concepts/misconceptions of each
 - Spreadsheet with exam questions, each question response, question classification for variable label, foil classification for foil labels