# User Guide for Assessment Cascade System (ACS)

## Introduction

Efforts to improve undergraduate biology education have emphasized the importance of valid and reliable assessment of student understanding. Assessments can be used for a variety of purposes including assisting instructors plan learning experiences based on student pre-existing knowledge; measuring student achievement to guide learning; evaluating the effectiveness of strategies, classes, or programs; and performing cognitive research(National Research Council, 1999; Seymour, 2001, 2002).



## Overview of the System

The assessment application was designed with multiple user roles in mind. Figure 1 illustrates the relationship among the instructor, student, and database components of the assessment cascade. The instructor role allows the user to create instruments. As the instructor creates the instrument in the interface, they enter the name of the instrument, a brief description of its purpose, a citation recognizing the authors, and instructions for the students. Once the instruments are in the system, the instructor can assemble a survey with a variety of item types and associate the survey with a specific class offering. For example, an instructor can assemble the closed-response Measure of Attitudes about the Theory of Evolution (MATE)(Rutledge and Warden 1999) with open-response Views on the Nature of Science (VNOS) (Lederman, Abd-El-Khalick et al. 2002) and the Evolutionary Gain and Loss Test (EGALT) (Is there a reference for this in press?) into one questionnaire that is associated with the instructor's class. The instructor can then specify start and end dates and times to limit the time that the instrument is available to the participants. Once the questionnaire is complete, the system provides a URL to provide the students.

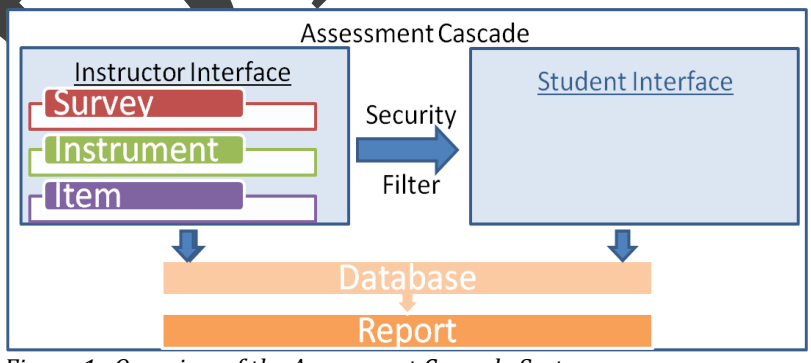


*Figure 1. Overview of the Assessment Cascade System.*

# Interfaces

## Instructor Interface

The instructor sees the screen displayed in Figure 2 when developing a new survey. The instructor can select the start and end time for the survey availability, identify student class participant group, and select the instruments to be assembled into the survey. The order of the instruments may be changed by dragging and dropping them into new positions.

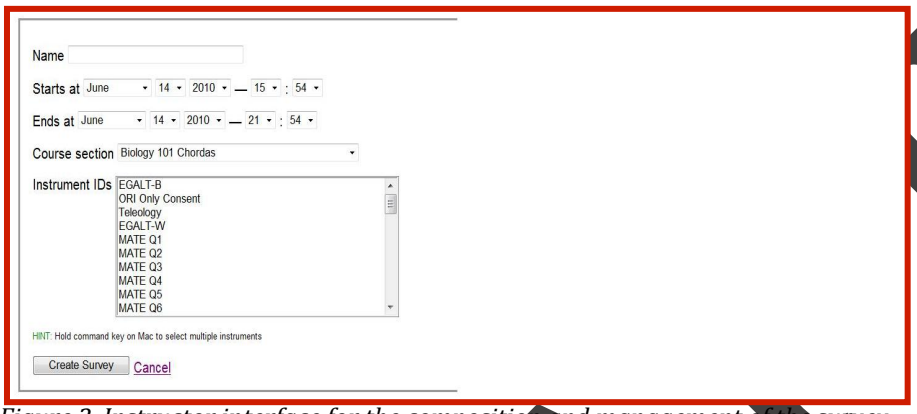


*Figure 2. Instructor interface for the composition and management of the survey*

When instructors enter a new instrument into the system, they may add a description to help other instructors considering the instrument, a citation for the instrument that will appear on the student view, and instructions for the students. At this point the instructor can decide if the items are displayed individually or as a group. The order of the items may be changed by the instructor by dragging and dropping them to a new position. Directions on how to do this will follow in subsequent sections.

## Student Interface

The students have a different role in the application. In order to access the course page in the CMS, the students first have to log in. This authenticates the student as a student in the class using the Shibboleth system. Since Scarlet uses the same authentication system as the CMS, and since the URLs will only open for students registered in the instructor's course, once students click on the URL, they are taken directly to their version of the questionnaire. Several accomplishments result from dovetailing these two systems. First, access is limited to the users who are registered in the class. This helps keep the system secure. Second, as previously mentioned, multiple versions of the same questionnaire can be distributed to groups in the same class without confusing participants about which questionnaire they are supposed to complete. Third, since students are accustomed to accessing course content through Carmen, they will not have problems locating and accessing the questionnaire. In the past, attempts to email the URL to the students have

proven to be problematic. Many emails bounced back, and many of those that did not bunce back were reportedly not received. The security of the email was not a concern because only those authenticated by Shibboleth would have access to the questionnaire, but a mechanism was needed to insure that students could get to the correct URLs. The course site in Carmen gives them that sure access.

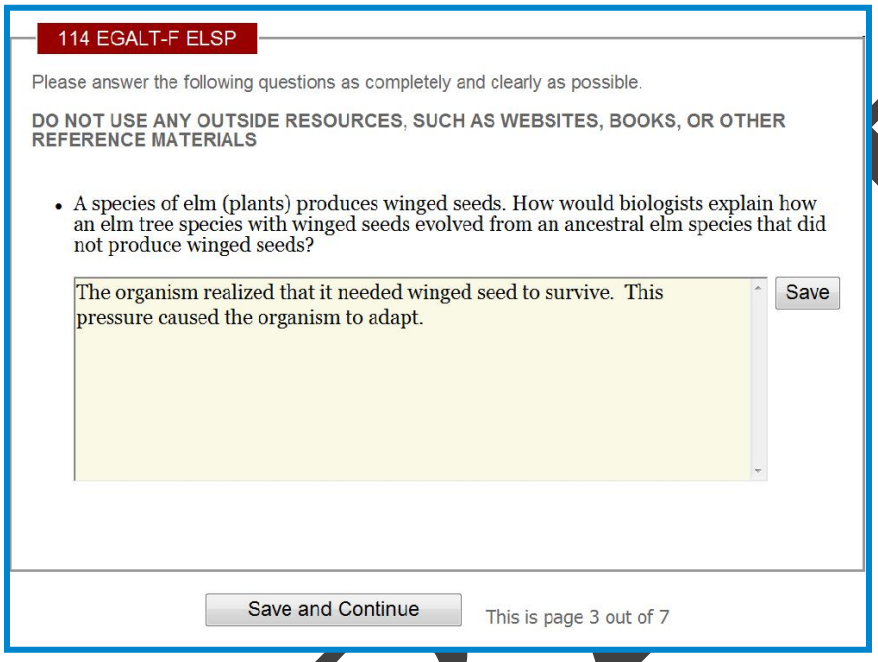


*Figure 5. Sample Student open-response interface.*

## Report Interface

Once students have completed the questionnaires, instructors need a user-friendly reporting system that presents the data in a useable, understandable format. When the instructor selects a report, they are first presented with an HTML version of the data. For closed-response items, the data are displayed with the questions in histograms. If the data are open-text, the student responses and their responses to follow-up items are presented together without the student names.

## Downloading the Assessment Cascade

*I will get directions from Silas & Mike and complete this section*

## Beginning & Setting Up a New Survey

1. Name the survey.
2. Using the drop-down menus, choose a start date and time.
3. Using the drop-down menus, choose an end date and time.
4. Using the drop-down menu, choose the course(s) you wish to include in this survey. *(QUESTION: can you choose more than one course per survey? If so, how?)*
5. Choose the Instruments you wish to include in the survey by clicking on the name. If you wish to add multiple instruments, hold down the command key while clicking on the instruments (on Mac computers) and the ___ key on PCs.
6. Click the Create Survey button at the bottom of the screen.

*[Here I will include a screen shot with numbered arrows for each step]*

After clicking on Create Survey the screen will look like this:

[*Add screen shot of the next screen]*

At the top of this screen will see when the survey is available to users (students), the course for which it is assigned, and the instruments included in the survey.

At this point, the instructor can click on each of the instruments to edit, preview, duplicate, or lock them. Each of these choices has a button at the top of the page.

A new instrument can also be added by clicking on the "New Instrument" choice at the top of the list. Now a new survey can be created.

[*add screen shot of this screen, blank survey, include numbered arrows for the following steps]*

1. At the top of this page you will find four boxes, **Save**, **Preview**, **Copy** and **Delete**. Click on these boxes to facilitate the four functions they describe.
2. **Name:** Name the instrument.
3. **Description:** Describe what the instrument is measuring.
4. **Citation:** Include the citation if you are using an existing instrument, or if your instrument is published.
5. **Instructions for students:** Type in explicit instructions for how and what you want the students to include.
6. Click in the box **"Display items to students one at a time"** if students should only see one question at a time. If students can see multiple items or questions on the screen at a given time, do not click this box.

7. Click the button "**Create Instrument**" at the bottom of the screen.

The screen now changes to include "**Items**" on the right side. This is where new questions, called *items*, can be added. (*include screen shot)*

To create a new item for the instrument, click on "**Add an item**." This adds an item box at the bottom of the screen, below the existing "Instrument" box. [*include screen shot here]*

1. **Stem:** In this box type the stem of the question.
2. **Stem Abbreviating for Reporting (optional):** If you wish to abbreviate the stem of the question for ease in reporting, type the desired abbreviation here. (This is not a required field.)
3. **Response:** From the drop down menu titled "Select a Response Type," choose the type of response the students will have. Choices include True/False, Multiple Choice, Long Answer, Short Answer, or No Response. How to create each of these follows, in the order above.

   Click on the **Save** button after choosing each response type.
   This takes saves the response type and returns the screen to include the "**Items**" box at the top right.
   The new item just added shows, either under the abbreviation created or the complete question.

**<u>Adding True/False Items</u>**

When adding an item that allows only true or false answers, the screen immediately returns to the "Items" box at the top right of the page, as the screen shot above shows. This is because there are no answer choices to be added by the user.

**<u>Adding Multiple Choice Items</u>**

If **Multiple Choice** is selected from the drop down menu, the following screen is displayed. (*include screen shot)*

1. Click on "**Add a multiple choose field**." *<u>(NOTE TO ADMINSITRATORS: there is a typo here…it should say "choice", not "choose"!!!)</u>*
2. New blanks appear, one titled "**Option Available to Participant**" and next to it "**Value for Reporting**." In the first box, add your answer choice, and in the second, add the value that answer choice will give if chosen. (As a general rule, 0 is the value for incorrect answers, and 1 is the value for the correct response.)
3. Click on "**Add a multiple choose field**" for each answer choice you wish to include, and fill in the boxes as described in 2 for each.
4. When finished adding your answer choices, click on the "**Save**" button at the bottom of the screen. Doing so takes you back to the **Items** box on the top right of the screen. This shows your items as they are added.

## Adding Long Answer Items

If the item requires a long answer on the part of the student, this screen will show once **Long Answer** is chosen from the drop down menu.

[*include screen shot here]*

1. A text box is added following the stem for long answer items. To see what it looks like, click on the item in the Items box (top right of the page), then click the **Preview** button at the top of the page. This shows you what it looks like.

   If you wish to allow follow up questions to have students further elaborate o their answers, the following is an option.

2. There is a box titled "**Followup**" which includes a box for **Keyword**. Fill this in as appropriate.
3. In the **Stem** box, add the follow up question.
4. In the **Stem Abbreviation for Reporting**, add an abbreviation for this follow up if desired. This is not a required field.
5. Select a **Response Type** from the drop down menu.
6. Click **Save** at the bottom of the screen.

This item and the follow up are now saved. To see your item as it will look in the final survey, scroll to the top of the screen and click the **Preview** button.

## Adding Short Answer Items

If the item requires a short answer on the part of the student and that option is chosen from the drop down menu, the same instructions apply as for the **Long Answer** choice. This screen will appear:

*[add screen shot here]*

1. A text box is added following the stem for short answer items. To see what this looks like, click on the item in the **Items** box (at the top right of the page), then click the **Preview** button at the top of the page. This shows you what it looks like in the survey.

   If you wish to allow follow up questions to have students further elaborate o their answers, the following is an option.

2. There is a box titled "**Followup**" which includes a box for **Keyword**. Fill this in as appropriate.

3. In the **Stem** box, add the follow up question.
4. In the **Stem Abbreviation for Reporting**, add an abbreviation for this follow up if desired. This is not a required field.
5. Select a **Response Type** from the drop down menu.
6. Click **Save** at the bottom of the screen.

## Adding a No Response Item

When an item does not require a response from the student choose **No Response** from the drop down menu. Click **Save**, and you will be returned to the Items box at the top right of the screen. Because there is no response allowed, there is no need for follow up questions or to add multiple choice options.

No Response items can be used in the following cases: (I NEED EXAMPLES FOR THIS).

To see this item in the final survey, click on the item in the **Items** box and then click the **Preview** button at the top of the screen.

At any time, more items can be added by simply clicking on **Add an item** in the **Items** box a the top right of the screen and following the instructions for the specific type of item you wish to add.

## Finishing the Instrument

When all the items are added, click on the **Done** button at the top right of the screen.

This takes you to the following page:

[*add screen shot here]*

This screen shows everything that was added from the title of the survey to the items and follow ups.

To see your items, click on **Expand all** in the **Items** box.

To Edit, Preview, Duplicate or Lock the instrument, click on the respective box at the top of the screen.

## Duplicating a Survey

To duplicate any survey, simply open that survey and click on the **Duplicate** box at the top of the screen.

1. An empty box appears.

2. Add a name to this box, naming the duplicate survey. It will not accept a name that has already been used.
3. Click **Submit**.

This duplicate is now added to the list of instruments available for use (See Beginning and Setting Up a New Survey).

## Locking a Survey

Locking the instrument prevents others from editing it or making unauthorized changes.

To unlock it again, only the instructor has that choice. (IS THIS TRUE? DESCRIPTION needed.)

Simply click on **Unlock**, then **Edit**.

*(I need to ask Mike and/or Silas how to Unlock an instrument, then I will add those instructions)*

## Report Features

The Assessment Cascade System is designed for easy report features from each survey.

From the **Surveys** screen, choose the survey for which you wish to generate a report. The following screen will display.

[*add screen shot here*]

1. Click the **Report** button at the top of the page.
   *Be patient while the report generates. It may take some time.*
2. The report that displays will depend on the types of responses the survey contains.
3. The report will show the total number of responses for each item, and will display each in a numbered list following each item.

   It will indicate Keywords matched (if applicable), and display those along with the number of the response.

[*I would like to add a screen shot of the report here, however, the ones I sampled were long because they were all long or short answer. I will check with Silas and Mike to see if I can add a screen shot of just a portion of a report*]