

4-21-2017

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Recommended Citation

Repository citation: Altman, Evan; Kiley, Michael; and Powers, Mark, "The JanDY Survey System" (2017). *16th Annual Celebration of Undergraduate Research and Creative Performance (2017)*. Paper 85.

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The JanDY Survey System

Evan Altman, Michael Kiley, Mark Powers, and Dr. Ryan McFall
Hope College Summer Research 2016

Introduction

The JanDY Survey System is Hope College's proprietary survey creation, editing, and completion software. It is currently used primarily in the administration of Hope's Student Assessment of Learning & Teaching (SALT) surveys. JanDY was created to allow potentially sensitive data regarding the college community to be stored on a Hope-owned database instead of being controlled by an outside company.

Summer 2016 Additions:

- New question types and new interface
- User interface for creating and editing surveys
- Improved test suite

Tools



AngularJS is a Javascript framework that allows the Model-View-Controller design pattern to be used with HTML and Javascript. This means that the program is divided in a way that allows the data, user interface, and data manipulation logic to be independent from one another.

To apply consistent styling throughout JanDY, we used a language called Sass. Sass is compiled to CSS. It has many advantages over CSS, such as allowing for class inheritance, calculations in the style rules, and variables to track values.



JanDY uses Bower and Maven to manage the project's files. Bower is used for frontend Javascript dependencies, such as JQuery, Lodash, TinyMCE, and Bootstrap. Bower automatically downloads and organizes the files that JanDY needs to function.



Maven is a project manager that ensures that Java projects on the backend are properly linked to one another..

JanDY runs on a Tomcat server. The server-side code is written in Java and consists of numerous HTTP servlets. As users navigate JanDY, the browser sends requests to the server based on what the user is doing. Specific calls to the server are mapped to different HTTP servlets, which interact with the database in the necessary way and return the necessary information to the client.



We coordinated our work on PivotalTracker, which is a website that allows development teams to keep track of tasks that need to be completed and who is working on what. We used SourceTree to manage our code base, which allowed us to work on separate computers and push changes that we made to a central repository for the rest of the team to access.



Testing

While developing JanDY, we practiced test-driven development, meaning whenever possible, we wrote unit tests first and then the code that would be tested. This created a comprehensive suite of unit tests which allowed us to make changes to our code with confidence.



Front-end Testing

We used Karma to run tests written using the Jasmine testing framework to test our JavaScript. Jasmine's system for mocking HTTP calls and spying on functions allowed us to test our system even though it runs asynchronously.

Back-end Testing

We wrote JUnit tests to test our server-side Java code, taking advantage of the Mockito testing framework to mock database interactions. This allowed us to test our backend code without relying on the execution of database calls.



Continuous Integration

We implemented continuous integration on this project using CodeShip, allowing for all of our tests to be run each time we pushed new changes to the repository. This made sure we were always aware of any broken code and prevented it from being pushed to the live version. It also helped us catch any test failures not occurring on local versions of the project.

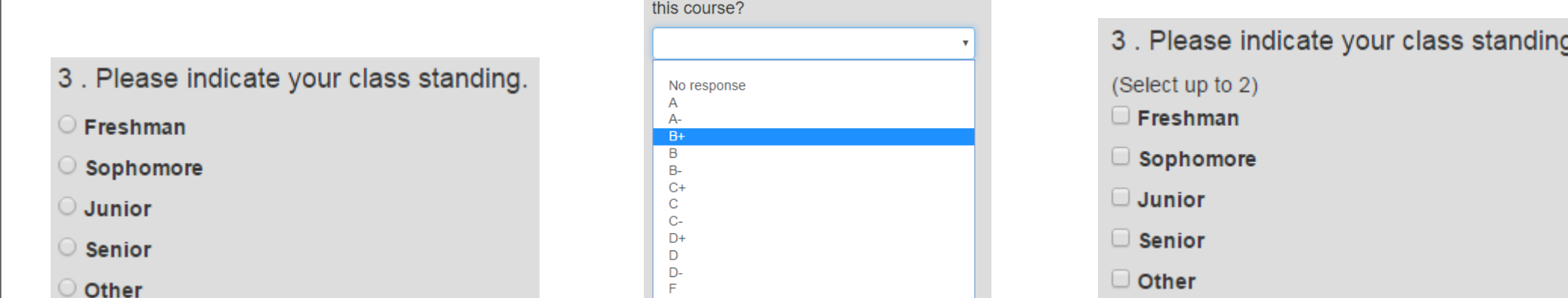


Question Types

JanDY allows for many different types of questions to be used for its surveys. There are five types of questions, each of which allows for numerous configurations to suit the survey creator's needs.

Multiple Choice:

A standard question type, where the user selects a choice from a list. The list can be displayed as either a set of choices or as a dropdown menu. Multiple choice questions can also allow more than one answer to be selected.



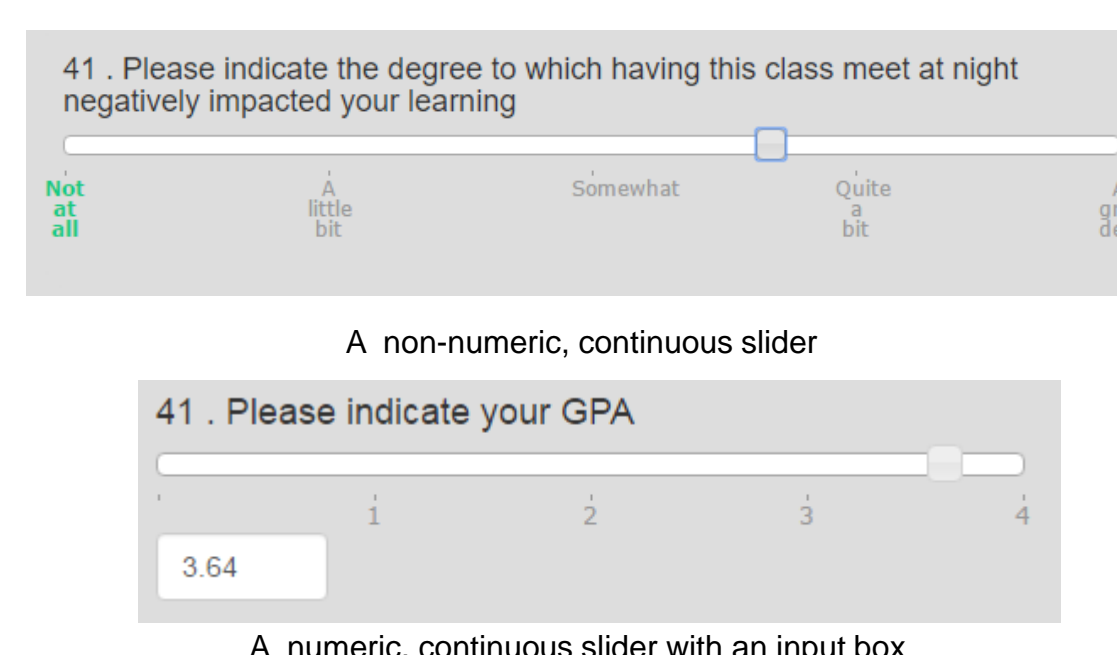
Grid:

A question similar to multiple choice, but where many questions have the same choices.

	A great deal	Quite a bit	Somewhat	A little bit	Not at all	No response
8. Make logical and relevant connections, weigh evidence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Use mathematics to interpret, make inferences, and solve problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Better understand and appreciate what I read, listen to, or view	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Make effective use of computer technology and library research facilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Use writing as a means to communicate clearly and effectively to varied readers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Use effective oral communication.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Respect ideas and cultures of the past, understand how the past influences the present	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Be creative and innovative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

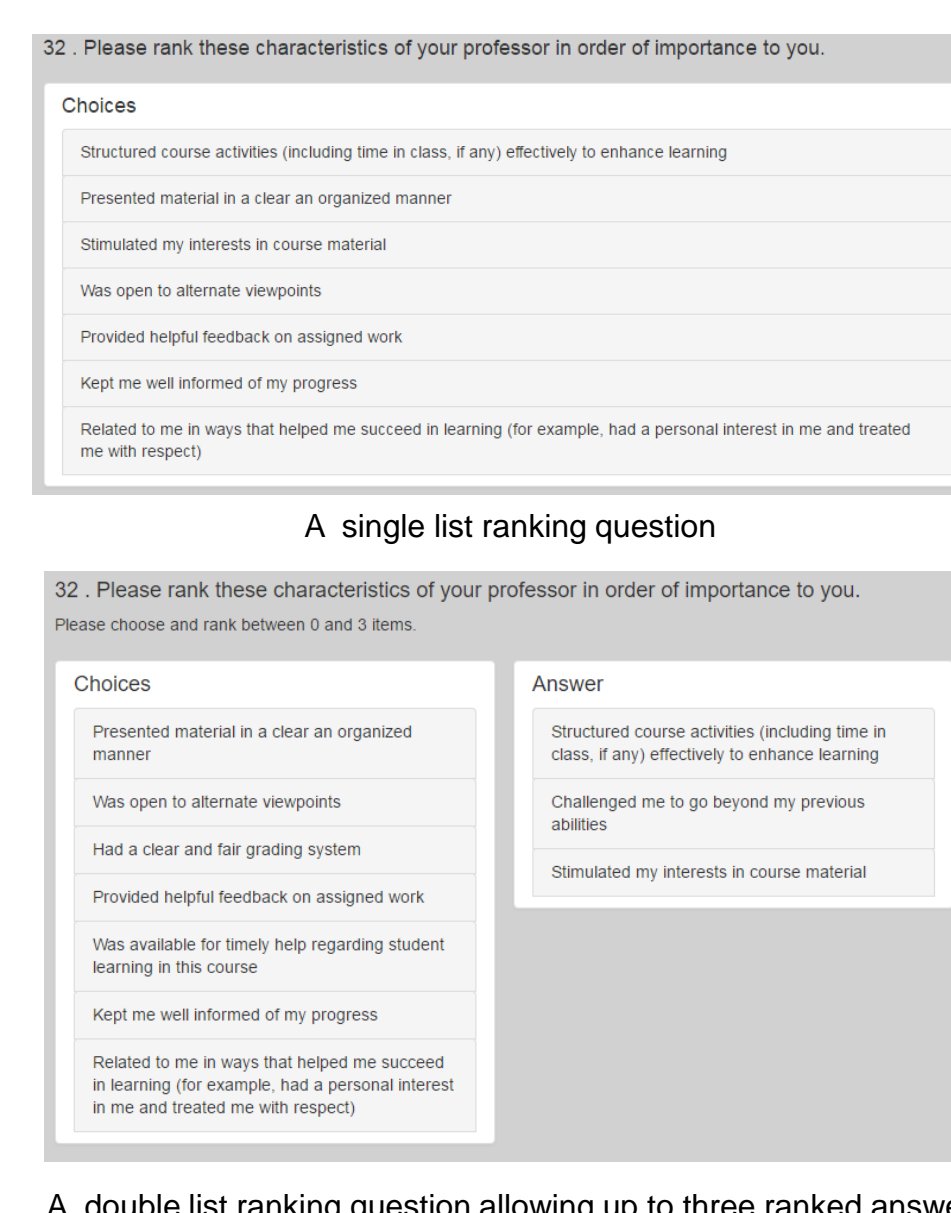
Slider:

A new question type that allows the user to indicate their response along a scale. The slider can be configured to snap to labels or allow continuous movement along the scale. There is also a numerical version, which includes an input box to enter a specific number.



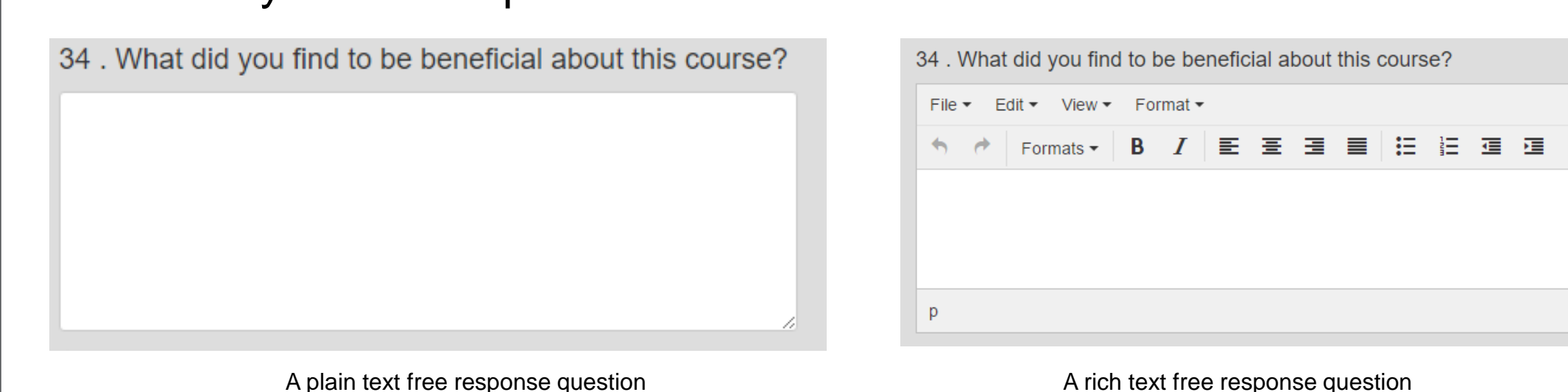
Ranking:

A question that allows users to drag and drop choices into an order they choose based on importance. The first type has a single list, where all the choices given are part of the answer. The other style allows limiting the amount of choices included in the ranked answer. This could be used for a 'pick your top 3' type question, for example.

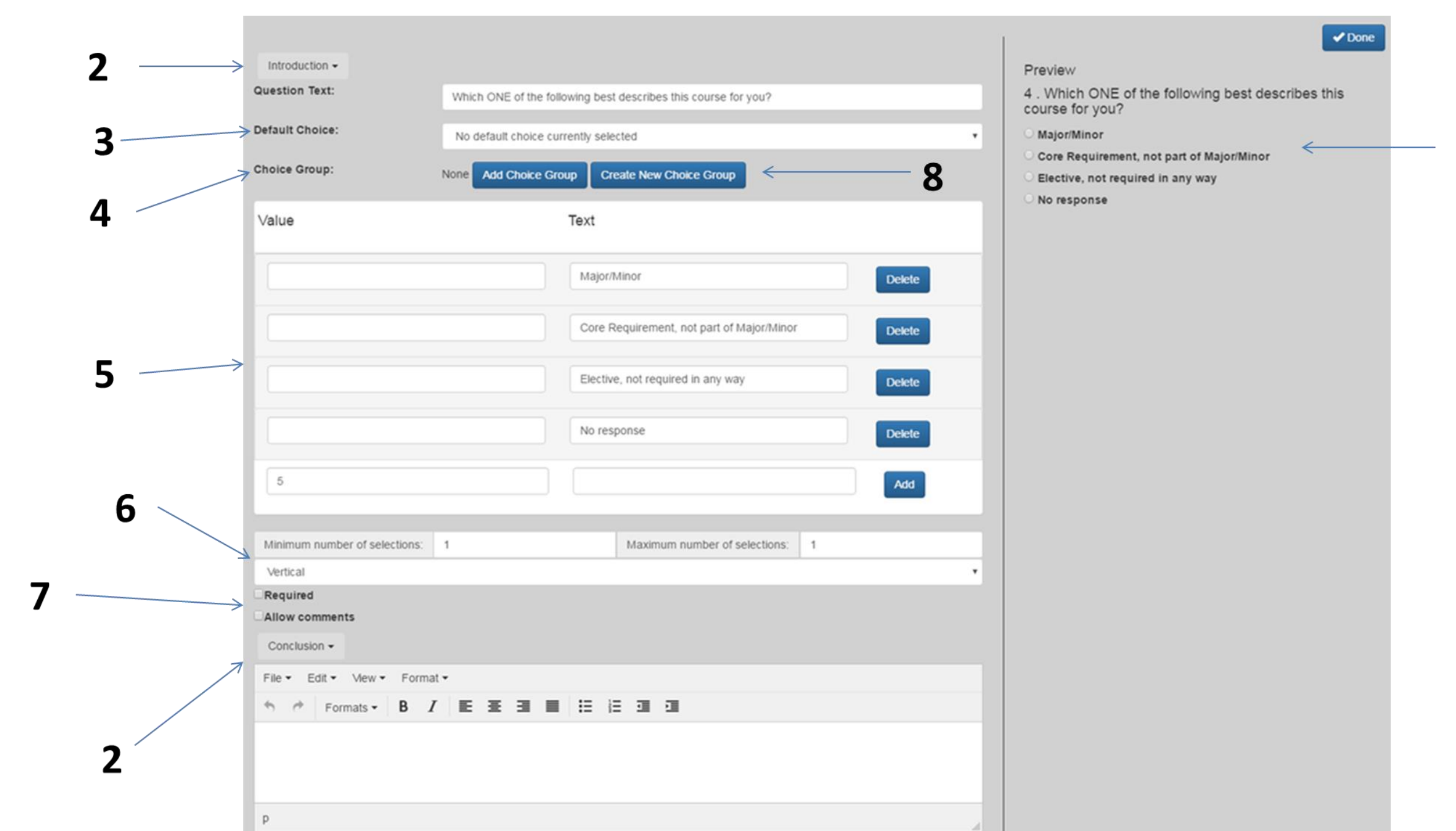


Free Response:

A question that allows the user to enter text. The text can be limited in length, and there is the option to allow for a rich text editor, where the user can style their response.



Editing A Survey



The Question Editing Interface

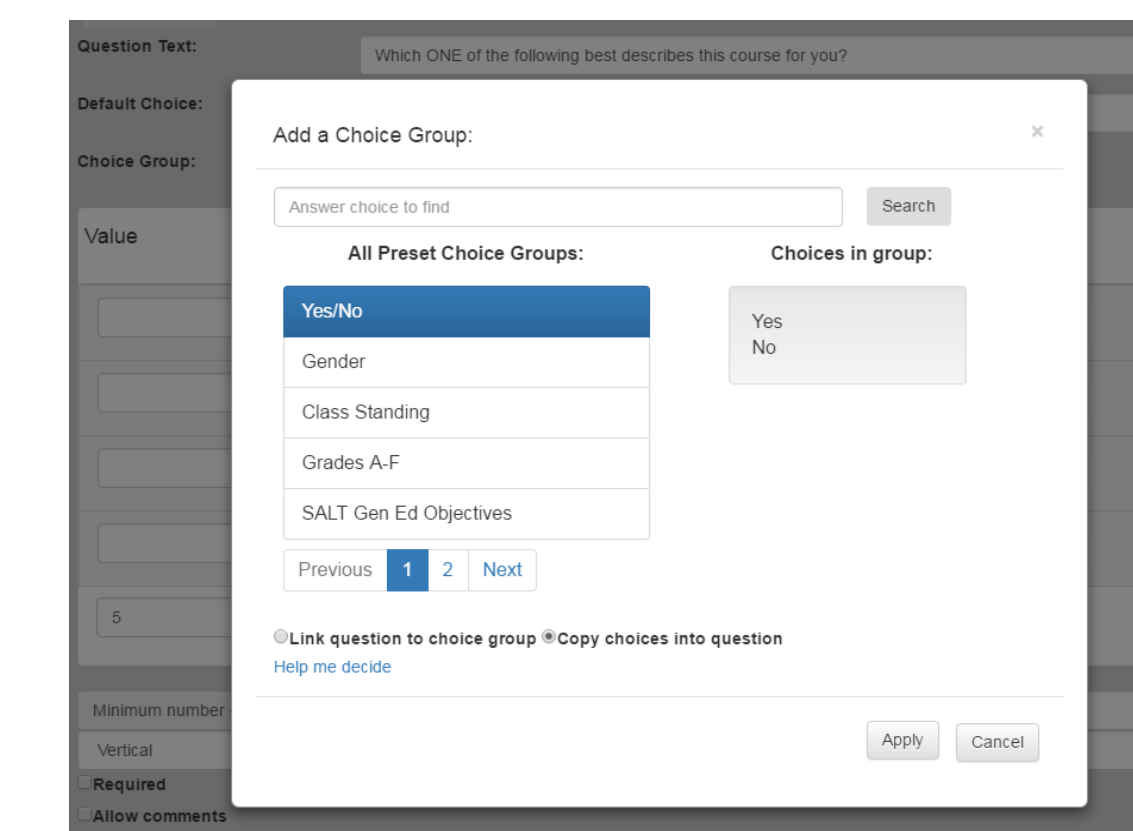


Figure 1. Add New Choice Group Popup

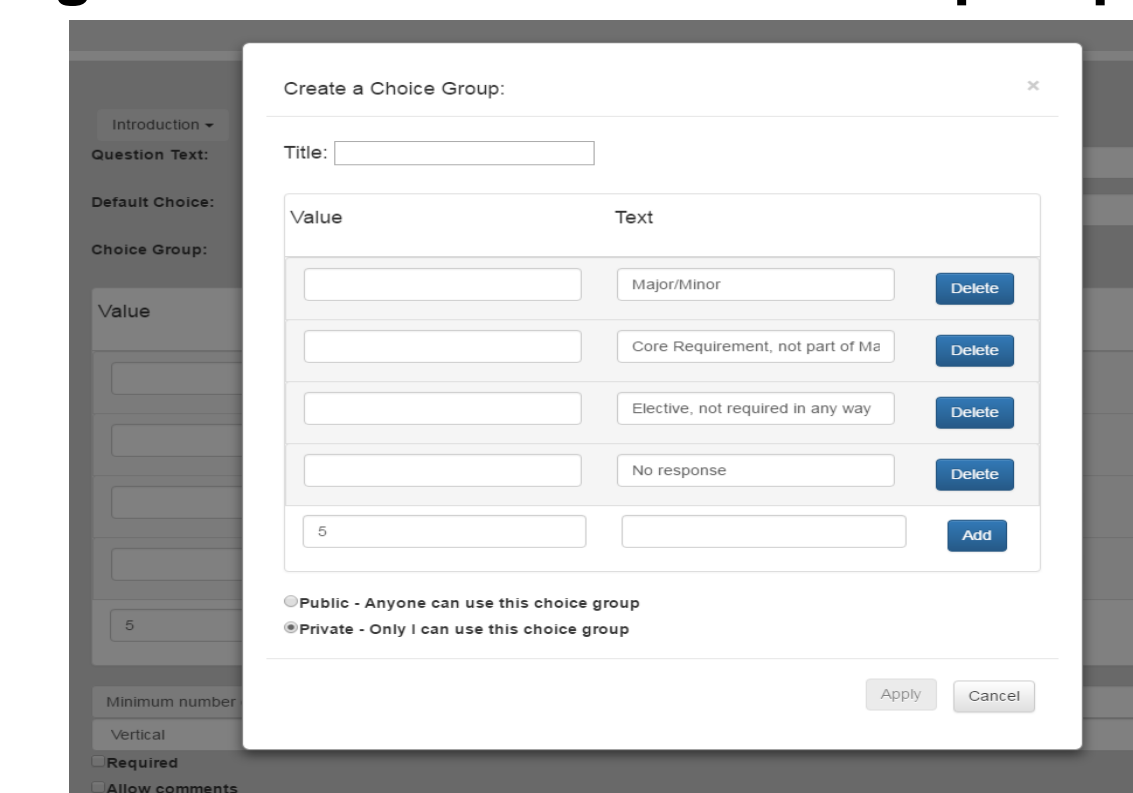


Figure 2. Create New Choice Group Popup

A major goal of this project was to add an editing interface to allow survey owners to change the content of their surveys quickly and easily. When the user opens a survey in "Management" mode, each question now has an edit button which allows them to make changes to the question's data.

1. **Preview** - A live preview of the question as it will appear when the user takes the survey is shown to the right of the editing controls, and any changes made to the question are updated dynamically in this preview display.
2. **Introductory/Closing Paragraphs** - In each question the user can edit the introductory and closing paragraphs for that question, with the option to add HTML styling to these paragraphs.
3. **Default Choice** - The user can specify a default choice that will be preselected when a survey-taker first logs in to the survey.
4. **Choice Groups** - Each question can use a "choice group" instead of the choices entered individually by the survey's owner. A choice group is a collection of commonly used choices such as "Strongly Agree, Agree, Neither, Disagree, Strongly Disagree." Choice groups are stored in the system's database, enabling users to save time by applying a group instead of entering choices themselves.
5. **Choice List** - The question's answer choices can be added, deleted, and reordered using a drag-and-drop list interface. Each choice can also take a numeric value specified by the user. This value can be used if the survey administrator wants to weight answer choices when calculating an average response for the question.
6. **Question customization** - Below the choice-editing interface are a series of controls specific to the question. For example, for a multiple choice question the user can choose the minimum and maximum number of selections required for the question to be complete and pick from between two different versions of the multiple choice question, one which uses radio buttons and one which uses a drop-down menu.
7. **Requirement and Comments** - Finally, the user can then choose whether the question is required and if it allows comments.

Clicking the "Add Choice Group Button" displays the view shown in Figure 1, allowing the user to browse all public choice groups as well as private choice groups of which they are an owner. Once the user has selected a choice group, they have two options for its application- it can be linked into the question, meaning it is tied to the group in the database or it can be copied into the question, meaning the choices are inserted into the question's list of choices with no connection to the database.

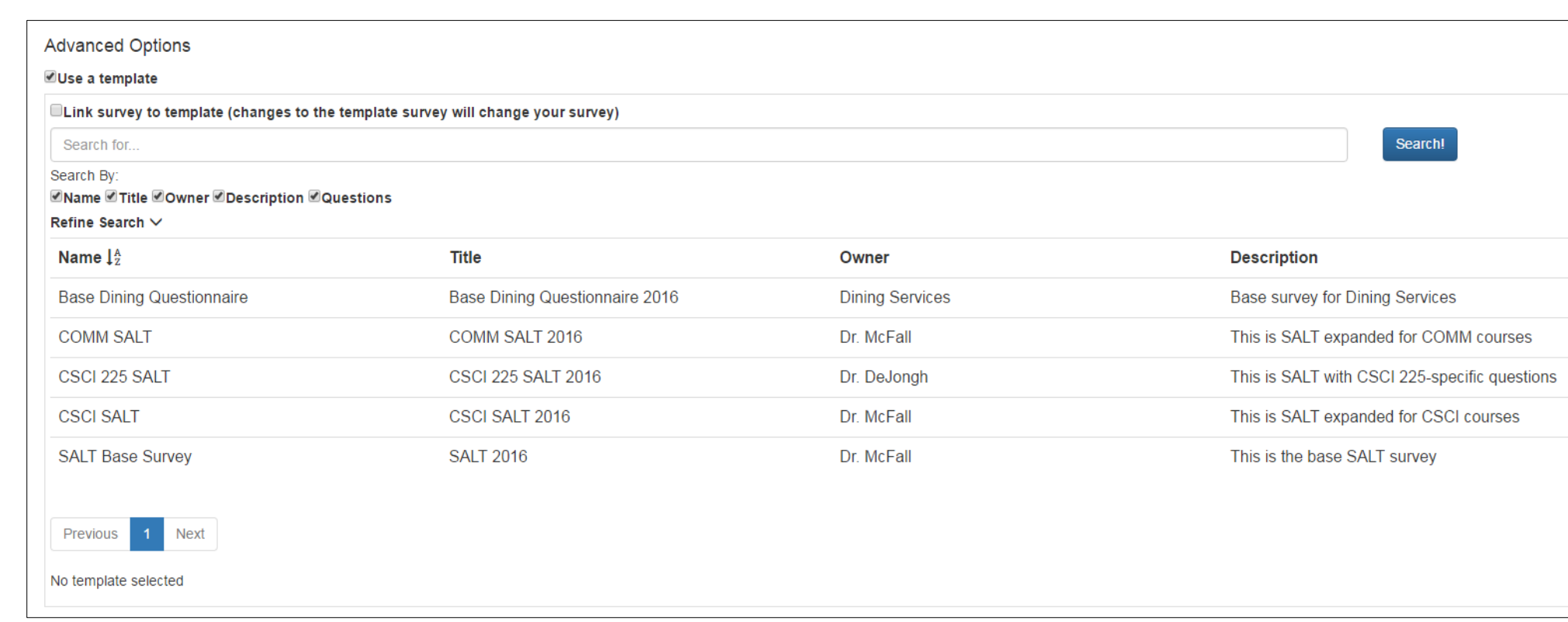
If the user wants to create a new choice group, they can click the "Create New Choice Group" button, which brings up the display shown in Figure 2. This interface allows them to add new choices to a group, give it a title, a set its privacy. It can then be easily applied to any questions in their own survey.

Survey Creation Wizard

In past iterations of JanDY, there was no interface for creating a new survey. This summer, we created a wizard to walk users through the survey creation process.

Steps of the wizard include:

- Choosing a template survey to base the new survey on
- Setting basic information about the survey, such as its name, description, start and end dates, and whether or not users' responses are anonymous
- Setting messages that are displayed to the user, such as the login prompt and the message displayed upon completion of the survey
- Specifying who can take the survey and how they should log in



The template selection screen of the survey creation wizard

Future Work

- Finishing survey creation and editing
- Making the system more accessible with screen reader compatibility
- User testing to ensure ease of use
- Improving the experience of mobile survey completion

Acknowledgements

- Howard Hughes Medical Institute for generous funding
- Hope College for providing facilities and resources, as well as the opportunity to perform undergraduate research
- Dr. Ryan McFall for his mentorship
- Past students involved in the JanDY project

