A Critical Assessment of Online Survey Tools

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Abstract This paper provides an overview of the functionality of online assessment tools from a practitioner's standpoint. Basic services of these tools are described as well as a comparative review of several representative tools. We also provide the reader with a set of guidelines for making their own decisions about such tools as well as discuss the advantages and disadvantages of these tools in helping to facilitate high-quality assessment.

Introduction

In the climate of "No Child Left Behind", limited resources and the overall drive for accountability of all public programs the need for assessment has never been greater. Assessment refers to gathering data and/or information that measure the impact of a certain activity relative to its objectives (Scriven, 1991).

The purposes of assessment are varied and depend on one's perspective (Dietel, Herman and Knuth, 1991; Linn, 1993; Nitko, 2001; Scriven, 1991). Assessment takes many forms depending on the outcomes that one wishes to assess. For instance educational policymakers use assessment to set standards, monitor the quality of education, or formulate policies, while teachers may use assessment to perform individual diagnosis of performance problems, monitor overall student progress and to plan and improve curriculum and teaching. Administrators of pre-college and college level STEM (science, technology, engineering or mathematics) outreach programs may use assessment to measure whether activities meet stated goals, monitor the quality of programming, and to plan and improve continuing activities.

Undergraduate students in an engineering curriculum may be assessed on their ability to provide solutions to a design problem; high school students that participate in an orientation to STEM careers may complete pre and post self-report instruments designed to assess their motivation to pursue a STEM career and their knowledge of STEM careers. The latter example would likely be implemented via a participant self-report survey.

Although the assessment process has many components (e.g. defining the objectives of the activity / intervention to be assessed, developing assessment instrumentation in alignment with those objectives), developing, distributing and collecting those data are a significant portion of the process. The expense can be prohibitive for small programs or activities. The recent advent of online assessment survey tools can facilitate the data gathering aspects of the process.

A wide variety of these tools that vary significantly in terms of cost and functionality are currently available. The purpose of this paper is to

- Provide a review of a subset of representative tools based on key criteria such as cost and functionality;
- Recommend guidelines for selecting tools, and
- Discuss implications of using such tools for the assessment process.

We begin with pertinent background on (computer-based) and online assessment tools.

Background

Why should we be interested in online assessment tools? As already mentioned assessment and the overall need for accountability is on the rise. Use of assessment can provide a competitive edge in addition to measuring effectiveness, improving programming and informing future activities. Many programs are competing for limited resources and frequently this translates into a need to provide data that a program or activity is meeting its stated objectives. Although there are many ways of gathering the needed data, online assessment tools have the potential to aid in some aspects of the assessment process with the following benefits (Yun and Trumbo, 2000).

- Lower cost relative to other data collection methods
- A supportive environment for actual development of an instrument
- An online data collection product that for some populations may facilitate a better response rates
- Support for the data collection process; responses are automatically stored in the provider's database with the ability for you to download the results when you wish. This eliminates the need for manual data entry.

All of these topics will be explored further. Before proceeding with a comparative review of several online assessment tools, we explain the basic functionality that these online tools provide. In general these tools provide an online way to develop, deliver and collect data for assessments that use forced response[1] or short answer items. Tools can be either self-service or full-service and pricing structures vary depending on the level of service (NPowerNY, n.d.). Most tools require minimal technical ability to use them. One sets up an account with the tool provider and then proceeds to use the main tool functions – which are often accompanied with online help and other support systems.

[1] Forced response items ask respondents to choose from a predetermined set of choices; these can take the form of multiple-choice with one or multiple selections allowed, rating on a predetermined scale, or selecting a choice from a pull down menu.

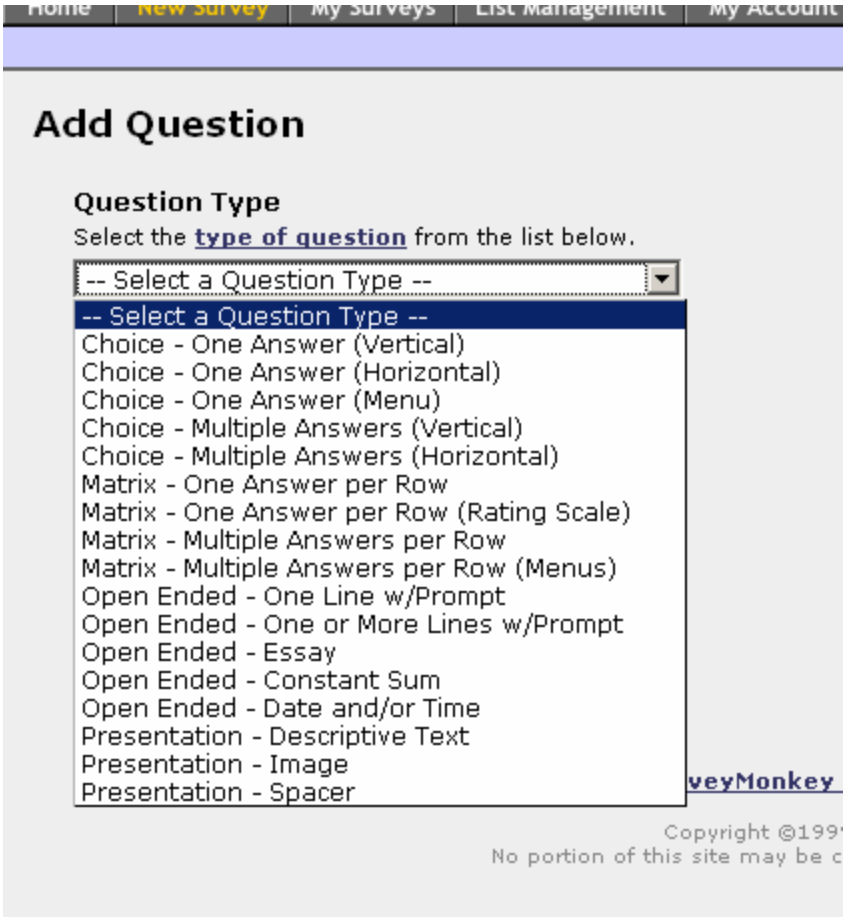

Figure 1. Screen Snapshot of Survey Monkey Tool Illustrating Question Types

Developing instruments. These tools offer fairly extensive functionality to support the development of the online assessment instrument. Note that in most cases these activities are conducted directly using the tool web site, but for some tools (see Inquisite below) one develops the instrument off-line and then loads the instrument to the online site. During instrument development the following functions/ features are typically supported.

- *Support for instrument item development.* While the designer-practitioners certainly must still write their own items that gather data on the objectives that are of interest, these tools do – via their menu of predefined item types – provide easy ways of implementing items in an online environment. For instance, in Figure 1, when a user selects "choice – one answer" the tool creates an item that only allows users to check one of the choices and further displays the item using "radio buttons" which are the standard for a set of buttons that allow only one choice. Users do not have to program any of that functionality; it comes with the selection of the item type.
- *Providing spaces for instructions and other pure text material*. In addition to supporting the creation of instrument items, tools allow the user to insert blocks of text for instructions or other messages.
- *Instrument formatting*. The tools arrange the items on the page (in the order defined by the user) setting up appropriate margins, item and choice spacing.
- *Implementing instrument logic.* Some tools offer the ability for the user to selectively offer items or pages of items based on responses to previous items. This may be called "logic" or "skipping" functionality.
- *Ability to preview instruments and test data collection processes.* While instruments are under development and before users have made them available to targeted respondents they can preview the finished product and *test* its functionality. This test process is an important step in the development of the survey tool. Does the logic work the way intended? Does the downloaded data meet expectations? Note that once the user tests the

instrument and checks the "test" data, she or he will want to clear out these test data before proceeding to real data collection.

Implementing Instruments. Once the instrument is developed and tested, tools provide a means for gathering data from respondents. Typical functionality for this part of the assessment process includes the following.

- Allowing users to "open" the instrument for data collection. Once this has been done, further edits to the instrument are not allowed without potentially losing data.
- Making the URL for the tool available for inclusion in an email to respondents or as a link from a web site.
- Monitoring responses. Most tools allow users to see how many instruments have been submitted. Users can also download interim data sets if they need to track particular respondents. These functions provide users with information that can help increase response rates and thus provide better overall assessment data.

Data Access / Download. Once you have collected data, online assessment tools provide both a place to store data, and a means to download it for analysis. The options for data download vary from tool to tool and will be discussed in the next section.

Sample Tool Review

We conducted a review of online assessment tools for use in developing online surveys for both indepth longitudinal collection and for annual and event type evaluation and assessment. During our review we did an initial screening examination of approximately 25 online tools (see Table 1 for a list). During our initial review we:

- Read the documentation on the tool website to begin to understand basic functions and pricing.
- Examined product demonstrations available through the tool web site.
- Created "test" surveys or sets of items using the demonstration or trial functions that are generally available for no charge via the product web site.
- Tested surveys with both users who had never set up an online, commercial survey before and with experienced users.
- And in some cases, contacted the product's customer service representatives to gather more information about the product.

Space limitations do not permit us to discuss all of them so we have chosen four different tools to compare[2]. We chose these tools because they represent different levels of service for several features and rose to the top of the tools surveyed in terms of usability and functionality and thus provide the reader with a sense of the differences among tools. We begin with a brief textual overview and then refer to Table 2, which compares the products by several features.

[2] For more information refer to each tool's web site; additionally refer to NPowerNY (n.d.) for more online assessment tool resources.

Table 1. Tools Reviewed (* All URLs were current as of this writing)

Survey Tools	**URL***
Advanced-Surveys-Online	http://advancedsurvey.com/
CoolSurveys.com	http://www.coolsurveys.com/
CustomInsight.com	http://www.custominsight.com/
Hosted Survey	http://www.hostedsurvey.com/home.html
Inquisite	http://www.inquisite.com/
Nooro Online Survey	https://www.nooro.com/w1/pricing.php
Perseus SurveySolutions	http://www.perseus.com/fromsurv.htm
QuestionBuilder	http://www.questionbuilder.com/
QuickSense/Stat Survey	http://www.quicksense.com/
Survey Connect	http://www.surveyconnect.com/
Survey Monkey	http://www.surveymonkey.com/
SurveyAnywhere	http://www.surveyanywhere.com/
SurveyGold.com	http://surveygold.com/
SurveyHeaven.com*	http://www.surveyheaven.com/
SurveyPro	http://www.surveypro.com/
SurveySite.com	http://www.surveysite.com/
SurveySystem.com	http://www.surveysystem.com/
SurveyTracker.com	http://www.surveytracker.com/
SurveyView.com	http://www.surveyview.com/
SurveyWriter	http://www.surveywriter.com/site/index.html
SurveyZ.com	http://www.surveyz.com/
WebSurveyor.com	http://www.websurveyor.com/gateway.asp

* All URLs were current as of this writing.

Hosted Survey (www.hostedsurvey.com) is both a self-service and full-service tool. This means you can create instruments yourself, or you can pay their staff to create and maintain your instruments. Hosted survey markets itself as being appropriate for both business, and academic applications – however their pricing structure (see Table 2) favors organizations with fairly liberal budgets. Just recently, however, they have added the availability of special "higher education" pricing – although their web site does not specify those prices. According to NPowerNY (n.d.) one of Hosted Survey's strengths is its automated email invitation and respondent tracking system which enables respondent tracking, reminders and potentially increased response rates.

Although our users noted many positives about this package, we found it lacking in some areas – especially when we considered its relatively high price. For instance, we found that the site could be quite slow; the tool would not allow for a text box to be associated with an "other" response, and the formatting of some question types seemed crowded.

The next two packages both allow users to self-create surveys

Survey Monkey (www.surveymonkey.com) is a popular online survey tool that comes with relatively large set of features considering the pricing structure. It is designed to be easy to use but at the same time does not provide the high degree of customization that products such as Inquisite (see below) does. Its ease of use may account for its relative popularity.

SurveyZ (http://surveyz.com/) is also an online service that enables you to create and analyze surveys online. Our users noted that they liked the step-by-step process for creating questions and its ability to preview the question before completing it. Mainly large academic institutions and corporations use Survey Z (NPowerNY, n.d.).

Inquisite (www.inquisite.com) is a different type of assessment instrument tool. Rather than providing an online interface for creating and managing assessment instruments, Inquisite is a software package that you purchase and use to create your own instruments. It then allows you to publish your instrument to their website for collecting data. It offers a wide array of features oriented towards marketing research including extensive survey customization, track responses and respondents, Inquisite's web site says "only surveys show what customers really think" and the overall site markets itself as being predominantly for corporate customers.

The needs of our project, which is typical of many WIE/WISE activity assessment needs, dictated that the following criteria in particular be strongly considered during our tool selection: cost, item type flexibility, item logic, robust and secure data storage and download, and easy-to-use user interface for developing items and instruments.

It is critical to define and consider the needs of a specific project on the needs of that project.. Questions to ask in the decision making process are:

- Who are your user/implementers? (e.g., those who will be manipulating the survey tool to develop surveys) What skill level do they have relative to assessment?
- What are they trying to accomplish?
- What types of assessment objectives do they need to address? (attitudinal, application, knowledge, analysis).
- In what format should the end data be available?
- Who are the end users? Do they have a level of sophistication that matches the tool under consideration? Do they have easy access to computers?

Draft your assessment ahead of time before you begin to try out different tools. This will help determine the types of items you need and other functionality.

As you review and test out different tools, we recommend you consider the following:

- How easy is it to use? Have several potential users in your organization "test drive" the tool. Most sites offer a free download for a trial period, a demonstration, or some combination.
- Verify that the tool provides a secure server where responses are stored. The writers assume that users will want their data to be both confidentially and privately stored to protect their respondents, but also will want their data to be rigorously protected from

technical errors that could result in data loss. If this level of information is not readily available on the tool website, contact the technical support or sales consultant.

- Does it offer the types of items that you need? (e.g. Does it provide the possibility of open-ended questions, forced-answer questions, etc.)
- Does it offer other special features you may require?
    - Graphics?
    - Ability to insert HTML coding?
    - Ability to skip pages or items?
    - Item numbering?

Lastly, it is important to note that commercial delivery of online surveys is dynamic and highly competitive, so check for changes in basic services, format, etc., before a final decision.

Discussion, Implications and Summary

There is little doubt that online assessment tools can impact our ability to more *easily* create assessment instruments, distribute to potential respondents, gather and have access to the resulting data. However it is important to understand the impact of using online assessment tools on factors that go beyond simply the ease of instrument creation. The following discussion draws both on literature concerning online assessment tools in particular as well as email survey assessments. An "email" survey would have the instrument directly included in the email message as compared to a web-based or online assessment where the assessment is located on a web page. Although we recognize that email and online assessments do differ, many of the issues raised concern email assessments are also relevant to online assessments.

Perhaps the most basic concern is knowing whether the respondent population has access to the Internet – or the type of access necessary to reasonably complete an online instrument. There has been considerable research on the "digital divide" – the differences in Internet access and access quality (e.g. high speed versus dial-up) amongst different communities of users (US Department of Commerce, 2004).

	Hosted Survey	Inquisite	SurveyZ	Survey Monkey
Survey Customization	Presentation, layout, graphics. Can also save text-based questions in Likert scale as numbers without including numeric scale in question.	Highly customizable surveys are possible. Presentation, particularly color, theme, and graphics.	Uses templates that can be customized with html; also uses question libraries.	Allows customized layout, and welcome pages
Logic/Branching/ Numbering Order	Yes to logic and branching, no to numbering. (They recommended dividing the survey into sections and starting each over with #1)	Yes to logic and branching, and to correct numbering.	Yes to logic and branching.	Yes to question & page skip logic; no to numbering.
Saving text answers, such as 'very important' as a numerical number, such as '4'	Yes, can download, but only as an XML file.	Will save results this way and we can also have them in that format, but see below.	Yes	Yes
Price	Based on # of responses (e.g. 10,000> responses, $.50/response -100-299 responses, $3.00/response).	Educational discount, $10,000/year for 2 user licenses and for user support.	Academic price is $199/year for Research package; Departmental package is $5,000.	$19.95 – 29.95 / month
# of Surveys	Unlimited	Unlimited	2 concurrent surveys for Research package; unlimited for Departmental package	Unlimited
# of Responses	Unlimited; pay by number of responses.	Unlimited	2000 for Research package; 30,000 for Departmental package	1,000 responses; $.05/response over 1,000
Data Storage	Data is stored indefinitely on Hosted Survey's server.	Data stored on their servers during subscription period.	Stored on their server.	Survey results are held indefinitely..
Graphing/ Data Export Capabilities	Supports graphs, diagrams, tables, and reports; can download data and export results into Excel, Access, or other statistics applications.	Yes--lots of flexibility	Survey reports include not only raw data in an Excel Spreadsheet; also exportable to SPSS.	Different graphs and charts; you can download survey data onto your computer and export it into Excel for further analysis

Table 2. Product Feature Comparison of a Sampling of Online Assessment Tools

Although this may not be a concern when the assessment population is *residential* college students – where high speed Internet access is generally readily available – it could be of concern for many other respondent groups. For instance, in the Assessing Women in Engineering (AWE) project (aweonline.org), we intentionally decided to design our pre-college instruments as paper-based because we knew that we couldn't know for sure that most of the middle and high school respondents (many in rural communities in Pennsylvania) would have access to a high speed internet connection – or even one at all.

Another point of interest is that prior research has shown that using different assessment media can impact response rates. There can be differences in response rates depending on the mode one uses for gathering data. For instance depending on the population being sampled, email surveys can have considerably lower response rates than paper and pencil surveys (Anderson, Gansneder, 1995 as cited in Yun and Trumbo, 2000).

One aspect of the impact on response rates is that assessments that occur immediately following a class or event can often be delivered in a face-to-face mode where one distributes a paper based instrument, provides time to complete it and then collects the responses. This "captive audience" mode of collecting data can produce a very high response rate as compared with sending out a follow-up email that respondents can more easily choose to ignore. The other side of this equation is the benefit of being able to a) have access to your respondent population *before* an event occurs to collect "pre-test" data, and b) having post-event access to respondents via email that allows for assessing long term impact of the event.

Research has shown that the quality of responses can also be impacted by the data collection mode – although the results from these studies are not in agreement. For instance there are mixed research results on whether you get more, about the same or fewer non-responses using an email survey (Bachmann & Elfrink, 1996; King & Miles, 1995; Scaefer & Dillman, 1998; Yun and Trumbo, 2000) versus a paper-pencil survey. However there is general agreement that e-mail surveys generate both lengthier and more self-disclosing comments on open-ended items than do paper and pencil based instruments (e.g. Bachmann & Elfrink, 1996).

Although respondents seem to feel comfortable providing "self-disclosing" information in e-mail based assessments, one needs to be aware of the potential security issues associated with collecting data either online or via email. We have all been made aware of the fact that internet connections and data can be monitored. When data is in fact very sensitive, or when university human subjects rules apply, survey designers may be required (either ethically or legally) to remind respondents of this risk. Figure 2 is an example of the language required from one large academic institution in a respondent's informed consent form for an online survey. Note that this is a different concern than ensuring that an online survey service provider offer a *secure server* where they store responses.

Transmission of data over the Internet cannot be guaranteed to be entirely secure. Respondents must be aware of this risk.

Figure 2. Informed consent language describing risks of submitting data over the Internet

We also offer the idea that making the collection of assessment data *easier* may not necessarily be a good thing for generating high-quality assessment results. In other words, it is pretty easy to write a survey, but it is *really difficult* to write survey questions that are high quality and will produce both reliable (items produce consistent results; all respondents interpret the item in the same way) and valid (that is the items actually provide data on the intended objective) results (Scriven, 1991). There are entire books on writing high quality items and the accompanying procedures for testing and validating items (e.g. Nitko, 2001). Even with the item type templates that many of these online assessment tools support, those writing the instruments must follow recommended procedures for ensuring that the items and overall instruments they create are both reliability and validity – otherwise the data one collects is not data that actually answers the questions of concern and thus can be not worth the investment of time and personnel or even misleading.

Lastly, remember that even though some of these tools offer limited versions free-of-charge, they are in the business to make money. They want to keep your business; they want you to be dependent on them. However, your needs may change. Thus you should take steps to make sure that you can switch providers (or stop altogether) if you desire. Tips for doing this include:

- Download your data frequently and store in safe and in multiple locations. Your access to your data may disappear quickly when you discontinue your service.
- Create off line copies of every online assessment that you generate so you can recreate the instrument in a paper and pencil, email or another online service.
- Update files frequently and obsessively. Although many of the assessment instruments we put online start off as a word processing document, they generally "morph" once online. You'll want to keep "off line" copies of *all versions* of your instrument for which you wish to analyze data. The online tool may not provide you a way to "download" an electronic copy of your instruments. Why should they? They want you to use their service. The authors have simply used cut and paste to copy instrument pages into a word processor file that we store on our own servers.

This paper has described the functionality of online assessment tools, compared the features of several representative types of tools and discussed the implications for using such tools for assessment. The authors acknowledge the power of these tools and how they can indeed help bring assessment activities more within the reach of organizations, however we also caution potential users to understand that good assessment – even when using such tools – requires careful definition of objectives and likewise careful development of reliable and valid items to measure those objectives. These tools are not designed to substitute for those critical steps in conducting high quality assessment.

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