

**National Cancer Institute**

**U.S. Department of Health and Human services**

**National Institutes of Health**

# **Report on the Grid-Enabled Measures (GEM) Research Project**

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**Usability Evaluation**

**Conducted by User-Centered Design, Inc.**

**For the**

**National Cancer Institute's DCCPS Behavioral Research Program**

July 2012

User Centered Design Inc.  
20548 Deerwatch Place  
Ashburn, VA 20147  
(703) 729-0998

## Executive Summary

The Grid-Enabled Measures (GEM) website is a decision support tool developed by the National Cancer Institute (NCI) for members of the behavioral science community. It creates an online virtual community of health scientists using collaborative web technology, through which measures and constructs used in the domain are vetted, rated, and discussed. A usability evaluation was proposed in June 2011 for the GEM website to determine the needs and ensure it supports the program goals. The project included three phases: an expert review (to identify areas where the site did not meet best practices), comparative review of other relevant websites and tools (to qualitatively assess how similar websites and tools operate and collect lessons learned to be applied to the GEM site's functionality), and three rounds of usability testing with potential and current users of the site (to collect feedback on progressive changes made to the GEM site). The project was completed in July 2012.

The findings from the expert review included general recommendations for the whole site: consistent usage of color, standardizing pagination controls, and better use of affordances (an item which suggests interactivity to the user) to make the site more usable. The comparative review provided information used to inform the design of GEM functionality in the areas of wiki-platform, comments, ratings, data sharing, and connection/explanation of caBIG. Initial changes to the site were based on the recommendations in both of these reviews.

During usability testing, feedback from 28 individuals was collected and interpreted as possible recommendations for improvements to the site. Each round of testing provided feedback on the changes made to the site after the previous one. Upon completion of changes made after the final round of testing, the GEM website should provide a usable experience for users looking for information on behavioral science constructs, measures, and datasets.

This report documents all the activities of this project as described above. All documents used for testing are attached in the appendix following the report.

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## Introduction

The Grid-Enabled Measures (GEM) website is a decision support tool for members of the behavioral science community which is built upon the caBIG platform. It provides a unique perspective on scientific health measures and the constructs quantified by them by creating support for an online virtual community of health scientists using collaborative web technology. This community encourages the participation in vetting and creating consensus on materials used within the domain. The over-arching goals for the GEM website are two-fold: 1) Provide an interactive online system that enables users to search for, share, download, and rate validated behavioral research measures that are tied to theoretically-based constructs; and 2) facilitate the sharing of harmonized data, resulting from the use of shared measures, through features that allow users to search, preview, upload, download, and provide meta-data (e.g., data collection mode, collection period, availability) on data sets.

User Centered Design Inc. (UCD) was contracted to help assess the usability of the GEM website. This final report documents the methods and findings of all activities.

## Method

The project was conducted in three phases.

**Phase 1: Expert Review.** In August 2011, two UCD professionals conducted independent reviews of the GEM website. Afterwards, they consolidated their findings into a comprehensive review of the website.

**Phase 2: Comparative Review.** In September 2011, two UCD professionals examined several sites with similar functionality to GEM and reported their findings into a comprehensive review.

**Phase 3: Usability Testing.** Three rounds of usability testing were proposed for the GEM demo website. Round one occurred in December 2011; round two, in March 2012; and round three, in June 2012. The objective of testing was to explore:

- The beneficial functions of the website, such as data sharing, downloading, construct/measure database, and detailed metadata on constructs, measures, and datasets
- Whether the website successfully communicates the purpose and goals of the GEM website
- Users' ability to access and use the functions provided on the website, including downloading and submitting items and providing feedback on measures that they have experience with
- Users' ability to add or edit metadata relating to constructs, measures, and datasets
- If the website clearly communicates how users are able to share harmonized datasets and the rationale for doing so

- The extent to which users' research and information needs are being met by the GEM website, and if they are not, how they can be revised to better meet those needs.

# Findings

## Expert Review

The overall design of GEM appeared intuitive (see figure 1), with simple tab navigation and table display for constructs and measures. However, a few changes were proposed to improve the site's usability.

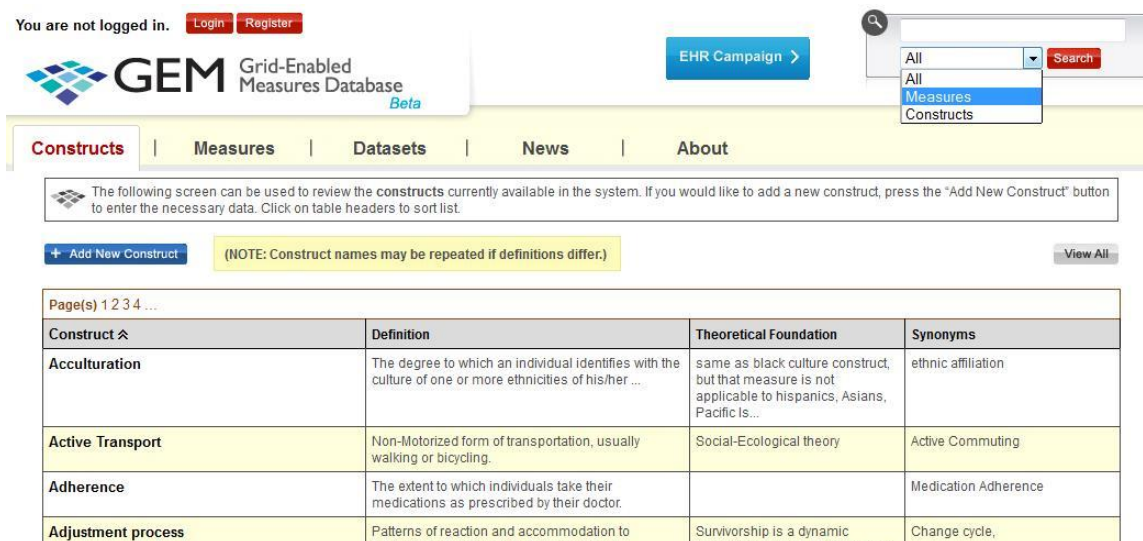


Figure 1: The Earliest GEM Page.

Redesigning the pagination controls was suggested to inform the user both about the number of constructs or measures and to improve navigation. Table formatting was also suggested to improve readability and emphasize the difference between links and titles. Comments and ratings were shown individually, so a summary of ratings was suggested. Search functions were recommended to be lightboxed and unassociated with the measures or constructs tab to avoid confusion in interpreting the results.

General recommendations for the whole site included consistent usage of color, standardizing pagination controls and better use of affordances to make the site more usable.

## Comparative Review

Several sites with similar functions to GEM were examined for the comparative review. These functions included the wiki-platform, comments, ratings, data sharing, and connection/explanation of caBIG. Exemplary websites were identified by individuals at NCI and reviewed by UCD. About three sites for each function were given, and approximately 2-4 issues or questions to be considered were focused on

for each site. For example, to address the wiki-platform functionality, the Wikipedia, Knol, and TermWiki sites were reviewed to gain insight on viewing an article's history and creating and editing articles. The comparative review process provided information used to inform the design of GEM functionality.

## Usability Testing

The usability tests performed were of within-subject designs, and used a mix of think aloud, exploratory, and interrupted task based protocols. For the first round of testing, participants saw the original GEM beta website; in subsequent rounds a demo site was shown. The demo sites included proposed changes that were to be made to the current GEM site and additionally provided a space for adding test content so that they would not affect the actual website. The demo site was accessed through a username and password given to the contractors before testing.

Participants were asked to perform several tasks as they examined the website. Participants were first shown the home page and asked about the purpose of GEM and what they would do first. Participants were then asked to review the pages shown in the top navigation and were specifically asked about the Workspaces tab. This process was both to identify the expected content based on the tab label and to explore the page's content. Participants explored the comment and rating systems and gave feedback on their perceived utility. Lastly, participants were asked which elements of the site design they liked or disliked and to explain why.

Findings from the usability tests are as follows:

## Round One Findings

This round of testing involved eight participants, five who were junior researchers and three more experienced researchers. These individuals were recruited from listservs, personal contacts, and convenience recruiting from an American Public Health Association (APHA) convention. The main goals of this test were to see if participants could navigate the site and obtain useful information from the constructs or measures sections, and to find out if the purpose and navigation of the site was understood. Participants who were more experienced were asked to comment on the use of terminology, the utility of the workspaces page, and the process by which a user adds a new measure or construct.

## Home Page

The participants were shown the GEM homepage (shown in figure 2) and asked to give their comments on the intro text, the purpose of GEM, and the navigation structure. The intro text was found to be appropriate, however there was some mention that the message could be clarified through word changes to avoid jargon. The purpose of the site was understood, although the buttons shown beneath this text were suggested to better reflect the functions mentioned in the text. Based on the input from this usability test, an alternative home page was designed by UCD (see figure 3).

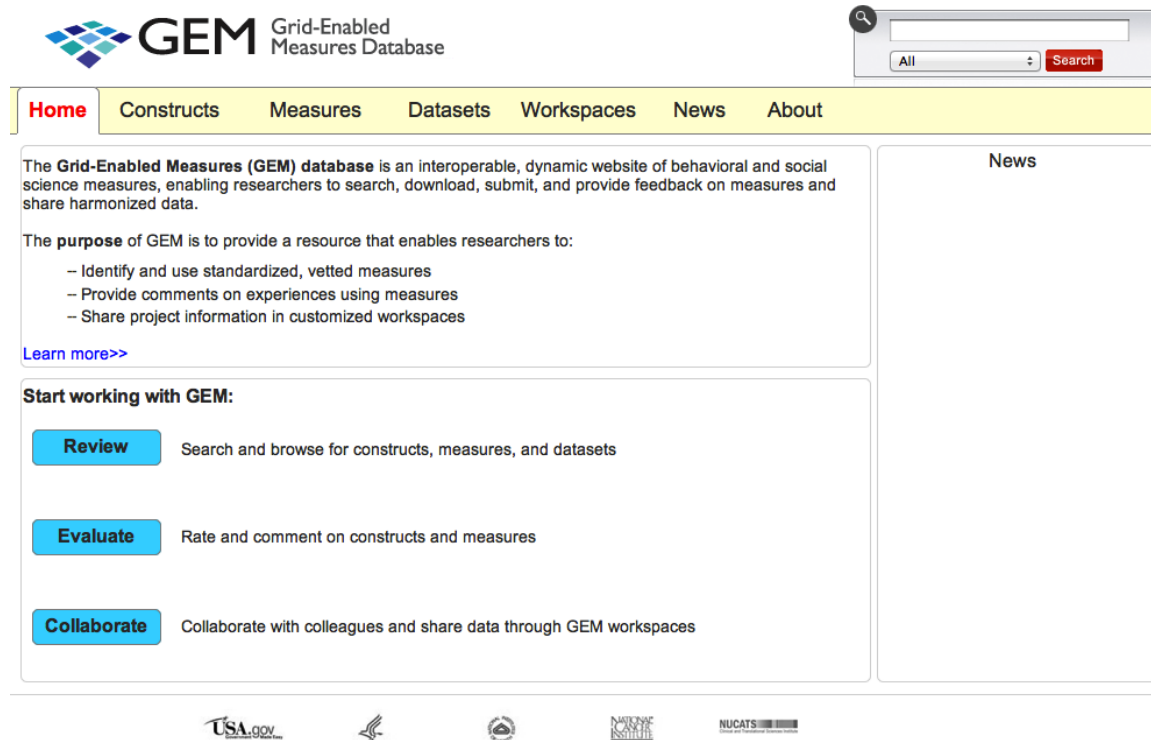


Figure 2: GEM Homepage During Round One.



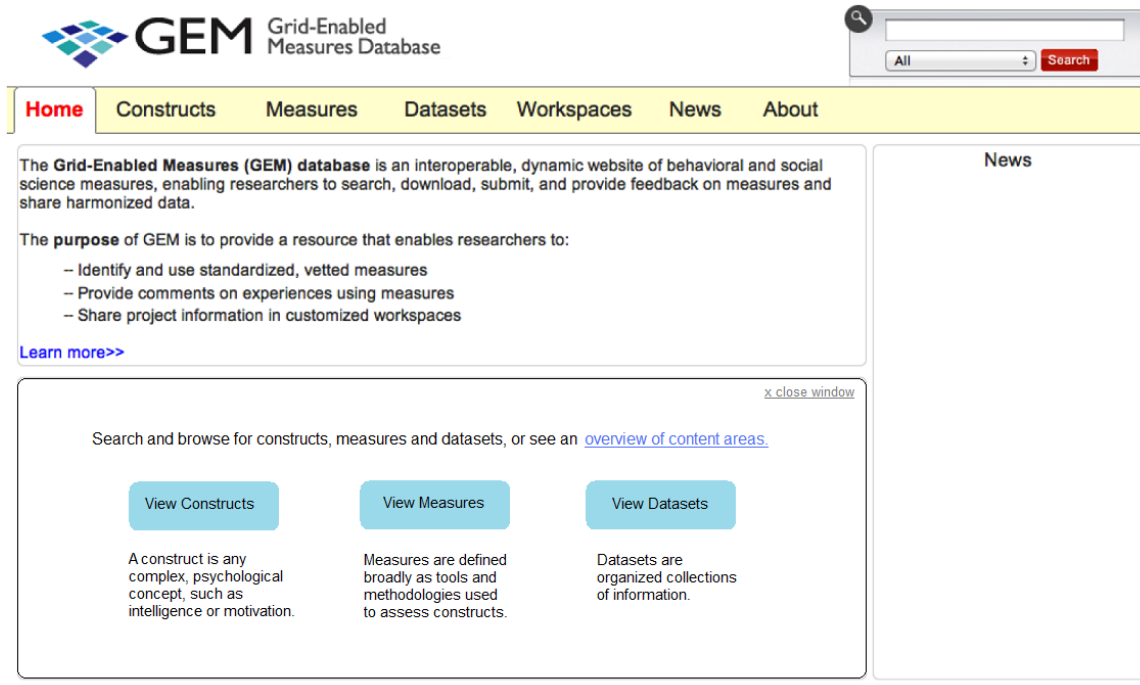


Figure 3: Suggested GEM Homepage Design.

## Measures

The table view for measures caused some confusion for participants, since defining what goes into the content area and what into the construct columns was not clear (example in figure 4), and, for example, areas such as “Stress” may fall into both categories.

Hello alipps [Logout](#) [Why register?](#)

**GEM** Grid-Enabled Measures Database *Beta*

[Constructs](#) | [Measures](#) | [Datasets](#) | [News](#) | [About](#) | [Workspaces](#) | [My GEM](#)

The following screen can be used to review the **measures** currently available in the system. If you would like to add a new measure, press the "Add New Measure" button to enter the necessary data. Click on table headers to sort list.

[+ Add New Measure](#) [Quick Filter](#) [View Pages](#)

First Previous	1 2 3 4 Next Last	Showing 25 of 232			
Measure	Brief Description	Content Area	Construct	Submission Status	Avg Rating
<a href="#">Acceptability of Decision Aid Scale</a>	A 10 item questionnaire for patients and a 15 item scale for physicians to rate satisfaction with a ...	Risk and Decision Making	<a href="#">Patient Satisfaction with Decision Aid</a>	Publicly Available	
<a href="#">Adolescent Self-efficacy for Reducing Sedentary Behaviors</a>	A seven-item measure to assess confidence for reducing sedentary behaviors. Items address: 1) turnin...	Physical Activity Obesity	<a href="#">Self-Efficacy</a>	Ready for rating	
<a href="#">Adoption Emotional Readiness</a>	A 49-item, TTM scale that assesses stage, pros and cons, self-efficacy, and processes for taking...	Risk and Decision Making	<a href="#">Child Adoption</a>	Publicly Available	
<a href="#">ADVANCE Scale</a>	A set of measures that assesses the readiness of faculty to take action and adopt the four speci...	Education, Training, and Career Development	<a href="#">Advancing Women Scientists</a>	Publicly Available	

Figure 4: Measures View.

## Browsing the Site

Some participants mentioned that browsing the site for constructs or measures was difficult due to the display and pagination controls (see figure 5). Because of this difficulty, many participants browsing for a certain term would guess the number of the page it might be located in based on alphabetic order. Other participants used the search box to browse for a term of interest. An alternate set of pagination controls were recommended to facilitate browsing on the measures and constructs pages.

Hello alipps [Logout](#) [Why register?](#)

**GEM** Grid-Enabled Measures Database *Beta*

[Constructs](#) | [Measures](#) | [Datasets](#) | [News](#) | [About](#) | [Workspaces](#) | [My GEM](#)

The following screen can be used to review the **constructs** currently available in the system. If you would like to add a new construct, press the "Add New Construct" button to enter the necessary data. Click on table headers to sort list.

[+ Add New Construct](#) (NOTE: Construct names may be repeated if definitions differ.) [View Pages](#)

First Previous	1 2 3 4 Next Last	Showing 25 of 162		
Construct	Definition	Theoretical Foundation	Synonyms	
<a href="#">Acculturation</a>	The degree to which an individual identifies with the culture of one or more ethnicities of his/her ...	same as black culture construct, but that measure is not applicable to hispanics, Asians, Pacific Is...	ethnic affiliation	
<a href="#">Active Transport</a>	Non-Motorized form of transportation, usually walking or bicycling.	Social-Ecological theory	Active Commuting	
<a href="#">Adherence</a>	The extent to which individuals take their medications as prescribed by their doctor.		Medication Adherence	
<a href="#">Adjustment process</a>	Patterns of reaction and accommodation to diagnosis of cancer in patients over time. Survivorship pa...	Survivorship is a dynamic process and many factors seem to impact the outcomes. What are the key ste...	Change cycle,	
<a href="#">Advancing Women Scientists</a>	When faculty are prepared to create opportunities for	Transtheoretical Model		

Figure 5: Constructs Page, Highlighting the Alphabetical Ordering and Pagination Controls.

## Downloading Measures

Participants reported that it was important for them to see the actual measures if they were available to download directly from GEM. In the current control layout, the buttons to download, edit and view the history of the measure were grey and appeared disabled (especially next to the blue “Back” button), as seen in figure 6. It was recommended that the colors of the buttons be changed and an indicator (such as a PDF icon) be shown when the material could be downloaded.

The

**Constructs | Measures | Datasets | News | About | Workspaces | My GEM**

**Measure Details** ☐ Receive e-mail updates about this measure

**General Information**

Measure Name:	Patient Health Questionnaire (PHQ-9)
Measure Type:	Multi-item Scale
Construct:	Depression
Primary Content Area:	Mental Health
Secondary Content Area:	
Brief Description:	A 9-item scale using each of the 9 DSM-IV criteria with self-reported frequency of "0" (not at all) to "3" (nearly every day). One of the most widely used instruments to assess depression, PHQ-9 scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depression, respectively.
Keywords:	depression, mental health
Target Population:	adults; primary care patients
Mode of Administration:	Self-administered, Proxy, Face-to-face

Submission Status: Ready for rating    Download: 34    Average Rating: ★★★★★ (2 users)    [More details](#)

(Last Updated: 1/17/2011 11:11:39 PM by William Sieber)

**Comments & Ratings (2 comments)** [Add Comment](#)

★★★★★ Agree a useful construct, 3/27/2011 4:02:05 PM  
By Thomas Houston, UMass  
Measures suicidality, and can be used for targeted interventions.

★★★★★ tracking outcomes in primary care, 1/31/2011 11:06:05 AM  
By William Sieber, UC San Diego  
Used as our primary outcome for treatment of depression in our collaborative care program, it is well-accepted and understood by physicians.

Figure 6: Measures Detail Page.

## Adding A Measure/Construct

The process for adding a measure or construct appeared to be straightforward, however there were some comments that some fields (such as “Mode of Administration, seen in figure 7) may need clarification to ensure that users don’t misunderstand them (which would cause incorrect entries into the database).

General Information
Author Information
History
Measure Characteristics
References & Publications
Upload Measure

Use the fields below to provide information about the measure being submitted.

Measure Name\*

Measure Type

Select One

Construct\*

Select One
Acculturation
Active Transport
Adherence
Adjustment process

+ Add New Construct

Primary Content Area

Select One

Secondary Content Area

Select One

Brief Description

Keywords

Target Population

Mode of Administration:
(select all that apply)

☐ Self-Administered
☐ Biological
☐ Telephone
☐ Proxy
☐ Audio-CASI
☐ Fax
☐ Face-to-Face
☐ Web
☐ Observation
☐ Anthropometric

Save
Save & Continue
Review and Submit
Cancel

\* = required. \* = should be present before made publicly available

Figure 7: The Form To Add Measures to GEM.

## Ratings

At the time of this round of testing, ratings were shown individually as five-star ratings (see figure 8). Participants found the rating scale to be sufficient but thought that sub-categories could be added to provide more detail about the rating. The rater's affiliation was a special help to the experienced researchers who were evaluating the comments. Additionally, minor recommendations for labeling were provided to help clarify the process of adding a comment or rating.

Comments & Ratings (4 comments)
<p>★★★★★ <b>Smoking screen</b>, 4/4/2011 2:47:24 PM  <b>By Alex Krist</b>, Virginia Commonwealth University  Current smoking status is a key meaningful use measure for HIT. The initial screen is a use measure and this should be asked at every encounter. For patients who respond to readiness to quit, and barriers/facilitators to quitting would be valuable.</p>
<p>★★★★★ <b>Tobacco User I.D. System</b>, 4/4/2011 2:28:32 PM  <b>By suzette flores</b>, TJUH  Screening for tobacco use at every clinician visit regardless of the reason for the visit is a tobacco use. It may be helpful when screening for tobacco use to add if a current, former, or second hand smoke.</p>
<p>★★★★★ <b>Critical Measure</b>, 3/27/2011 2:50:34 PM  <b>By Thomas Houston</b>, UMass  I agree that more detail is valuable, but this is a critical measure. In the VA, we have (Health Factors). Dr. Steven Fu is using these in a current grant to proactively call on</p>

Figure 8: Comments and Ratings of a Measure.

## Search

When participants used the Search box, the ordering criteria for the results appeared unclear, and it was hard for participants to identify the type of content (ex. construct, measure, or other) to which each result belonged (see figure 9). Recommendations were given to label each search result and provide a drop-down menu to allow the user to organize the display of results.

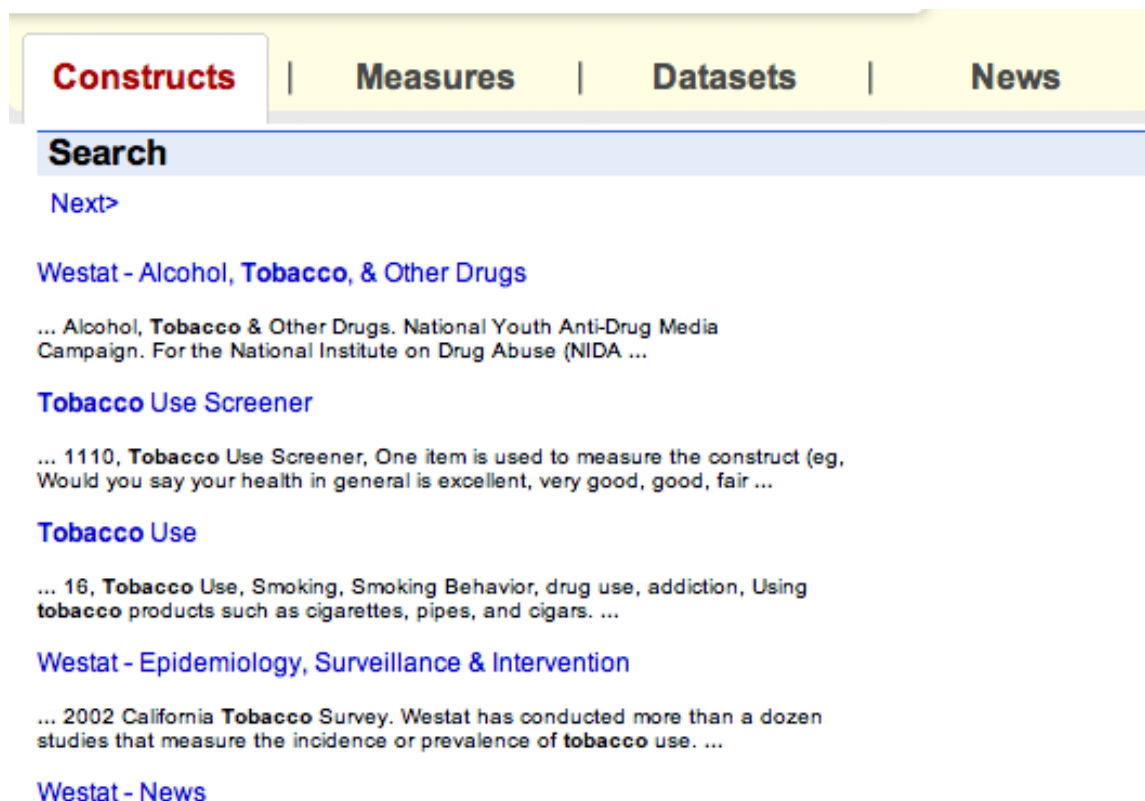


Figure 9: Example of a GEM Search Result Listing.

## Workspace Concept

A proposed mockup design for the Workspaces tab was shown to the experienced researcher participants, as seen in figure 10 below. One participant commented that it did not seem useful to use an external website to share documents and ideas, as this was already handled well for them via email.

Overview

Measures

Datasets

Discussion

### EHR Campaign (NCI/SBM) [Edit this workspace](#)

The HITECH Act and the Patient Protection and Affordable Care Act place new emphasis on the widespread and meaningful use of electronic health records (EHRs). This is an important advance, with one significant exception: Currently EHRs fail to capture data reflecting crucial health behaviors and psychosocial issues. Such patient-reported variables are both health outcomes themselves, and major determinants of other health outcomes. Capturing a standardized set of patient-reported variables in the EHR would lead to unprecedented data harmonization and opportunities to improve health care and health research.

Several institutes from the National Institutes of Health in collaboration with the Society of Behavioral Medicine are organizing an effort to evaluate and recommend actionable, patient-reported measures of health behaviors and psychosocial factors for use in primary care electronic health records (EHRs). In order to facilitate broad participation in the development of standard measures we are using a three-phase process of consensus building.

#### Useful Links & Documentation

Name	Type	Posted By	Date Posted
<a href="#">Detailed instructions for how to participate</a>	PDF	Rick Moser	3/15/11
<a href="#">Register for the May workshop/town hall meeting.</a>	Web	Rick Moser	4/05/11
<a href="#">List of Health Policy Committee Members</a>	Word	Rick Moser	3/25/11

#### Participant Uploads

Name	Type	Posted By	Date Posted
<a href="#">Web Analytics Report for EHR Campaign</a>	PDF	Dave Garner	08/02/2011
<a href="#">EHR Sub-Committee Final Report</a>	PDF	Rick Moser	08/15/2011
<a href="#">Minnesota's 2015 Interoperable Electronic Health Record Mandate</a>	Web	Dr. John Doe	09/25/2011

Upload New Document

Add New Link

Workspace Administrator: Rick Moser ([moserr@mail.nih.gov](mailto:moserr@mail.nih.gov))

Figure 10: Proposed Design for the Workspaces Page.

## Round Two Findings

Months later, after changes were made to the GEM demo site, a second round of testing took place to test the new functionalities that had been added to the site. Among the goals of this test were usage of the redesigned homepage, updated navigation and new workspaces area, getting reactions to the translation indicator, and a proposed design for displaying search results. The GEM team recruited 10 participants for this round of testing. This number included seven experienced researchers in various domains and three researchers who utilize translated measures.

### Home Page

The design of the homepage had been updated after the previous round of testing; it included edited introductory text. The other areas of the site which were featured in this testing were: 1) the Workspaces area, 2) Measures at a Glance, 3) a GEM database snapshot, and 3) a listing of Content Areas to show users filtered categories of measures/constructs. This homepage is shown in figure 11.

Participants reported that the introductory text was lengthy and included unfamiliar and/or unclear terms. Participants suggested changing the format to streamline the message of the introduction. The new Content Areas section was seen as a way to portray the scope of GEM, but most participants were



unsure about how to interact with it (participants were often surprised by the pop-up menu after initially trying to click the name of the content area). As for the other sections of the homepage, some participants felt the “Measures at a Glance” and “GEM database snapshot” would be more appropriate on an “About GEM” page. Others felt the descriptions of the Workspaces should be longer and give more information about what they contain.

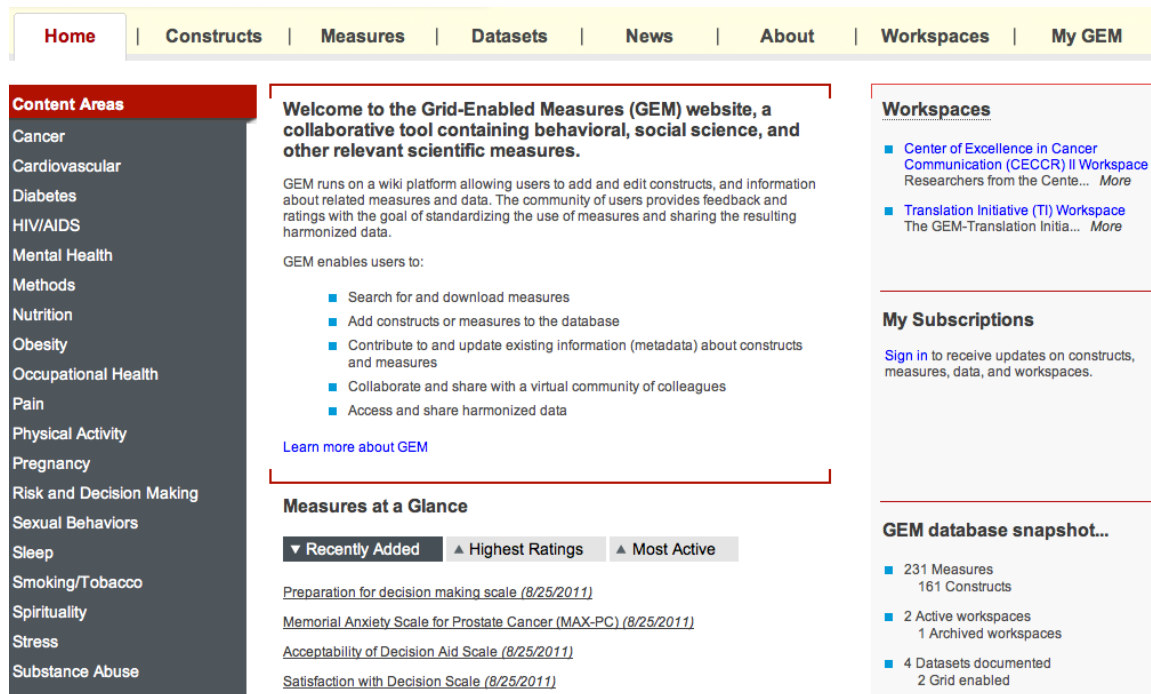


Figure 11: The Homepage Design for the Second Round of Testing.

## “Content Area” Navigation

Participants had some difficulty using the Content Area items, shown on the home page (see fig 11 above), for navigation. When the user places their mouse over a content area label, they can select either “Measures” or “Constructs” from the box that pops up on the left side of the homepage. This action serves as a filter since it results in a display of all constructs or all measures that have the selected content area as an attribute. However, participants did not appear to understand the filter behavior. They appeared to be trying to develop a hierarchical relationship between content areas, constructs, and measures that does not exist. This confusion was compounded by the nature of the Content Area labels which are separate labels in some cases (e.g., Cancer) but appear to be constructs or measures in other cases (e.g., Pain or Stress). It was also unclear how to display the entire list of constructs or measures after viewing a filtered list (see Figure 12).



Click on table headers to sort list alphabetically. To tailor the results below, use the "Quick Filter" button.

+ Add New Measure

Change Filter

View Pages



Measure	Brief Description	Content Area	Construct	Avg Rating	
<a href="#">Brief Fatigue Inventory</a>	The BFI has nine items, with the items measured on 0-10 numeric rating scales. Three items ask patie...	1. Cancer 2. Pain	<a href="#">Fatigue</a>	<a href="#">Add More Info</a>	
<a href="#">Functional Assessment of Cancer Therapy - Bone Marrow Transplant (FACT-BMT) scale</a>	Combines the general Functional Assessment of Cancer Therapy (FACT) measure with a 12-item bone marr...	1. Cancer 2. Transplant	<a href="#">Quality of Life</a>	<a href="#">Add More Info</a>	
<a href="#">Functional Assessment of Cancer Therapy - Breast Cancer (FACT-B), The</a>	This scale is designed to measure designed to measure multidimensional quality of life (QL) in patie...	1. Cancer	<a href="#">Quality of Life</a>	<a href="#">Add More Info</a>	
<a href="#">Functional Assessment of Cancer Therapy (FACT)</a>	The FACT-G forms the core component in a set of instruments originally developed for assessing QoL o...	1. Cancer	<a href="#">Quality of Life</a>	<a href="#">Add More Info</a>	
<a href="#">Illness Perception Questionnaire - Revised (IPQ-R)</a>	Systematically assesses illness representation attributes and emotional representations of illnesses...	1. Risk and Decision Making 2. Cancer	<a href="#">Illness Representations</a>	<a href="#">Rate This!</a>	
<a href="#">Mammogram</a>	This measure is a self-report of whether or not a woman has ever had a mammogram and how long it has...	1. Cancer	<a href="#">Health Behavior</a>	<a href="#">Add More Info</a>	

Figure 12: An Example of a Filtered List of Measures.

## Ratings

Ratings for measures were added to the table view of measures. There were several types of information in the Rating column: "Rate This!" link, "Add More Info" link, and a star rating (example in figure 13). Participants did not show any difficulty in understanding that "Rate This!" was conveying that the measure had not yet been rated but was available to be rated. However the "Add More Info" link caused confusion, as some participants interpreted it as requiring more information from them (and weren't sure why this would be located in a column labeled "Average Rating").

Many participants were hesitant and cited their inexperience level as a rationale for not personally rating a measure. Some participants thought that comments would be much more useful than an average rating (and they indicated that they could write about their experience in using it).



Avg Rating	
<a href="#">Rate This!</a>	
<a href="#">Add More Info</a>	
★★★★★	

Figure 13: The Average Rating Column.

## Downloading a Measure

Information about the status, average rating, and download function were added to the right side of the measures detail page (see figure 14). The PDF icon was added as suggested after the previous round of testing. However, participants often missed this information due to its placement on the right side of the page. Additionally, some participants misinterpreted the “N/A” for a measure without a download file to mean simply that nobody had downloaded the measure yet. It was recommended that this all this information be moved to another area of the page to increase visibility. The wording should be changed to make clear the meaning when a measure does not have a download file.

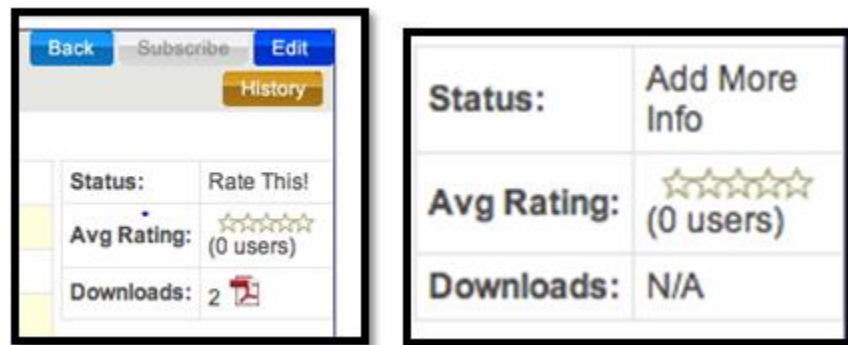


Figure 14: Examples of Download Availability on Two Different Measures.

## Translation

The three participants experienced with translated measures were asked to explore the features GEM offers in regards to translation. They were first shown the translation column on the measures table (figure 15), and although the icon was unfamiliar that was not seen as a major issue. They did comment however that they would want to know the language of the translated measure from this view.



Construct	Avg Rating		
Patient Satisfaction with Decision Aid	Rate This!		
Self-Efficacy	Rate This!		

Figure 15: The Translation Icon on the Measures Table.

When exploring the details page for a translated measure (shown in figure 16), participants found the categories clear, although they did not seem to think the dialect field was necessary. They did expect to see the title of the measure in the language of the translation. The source measure was confusing: when participants clicked the link to view the source measure, the details on that page indicated there was no source for that measure. The title of the source and translated measures were often different, creating further confusion between their relationships.

#### Language/Translations


Language:	French (fre)
Language Region/Dialect (optional):	
Source Measure:	<a href="#">Acceptability of Decision Aid Scale (M01242) [Levesque, English (eng)]</a>
Additional Translations:	No additional translations

**Figure 16: An Example of A Translated Measure's Details.**

## **Workspaces**

Most participants did not understand the purpose of Workspaces section prior to visiting the page. The introductory text on the landing page (figure 17) did not seem helpful, as most participants viewed it as a banner and reported that they would not read it if they visited the site outside of testing. Questions that participants raised after visiting the page included the benefits of joining, whether there was workspace moderation, the names of other group members, and whether or not a login was required to join. While exploring, most participants did not immediately see the sub-navigation located on a specific workspace's page and were confused when "Constructs" and "Measures" appeared on this navigation (since they were also part of the main navigation). The layout of related constructs and measures was also found to be difficult to navigate, and it was recommended that these areas be reformatted to emphasize the transition to another page.

[Home](#) | 
 [Constructs](#) | 
 [Measures](#) | 
 [Datasets](#) | 
 [News](#) | 
 [About](#) | 
 [Workspaces](#) | 
 [My GEM](#)



Welcome to **GEM Workspaces!** Discussion, debate, collaboration and mentoring are the heart of behavioral research community. The following workspaces were created so you and other researchers can continue the conversation about specific aspects/areas of the behavioral research. To enter a workspace simply click on the name!

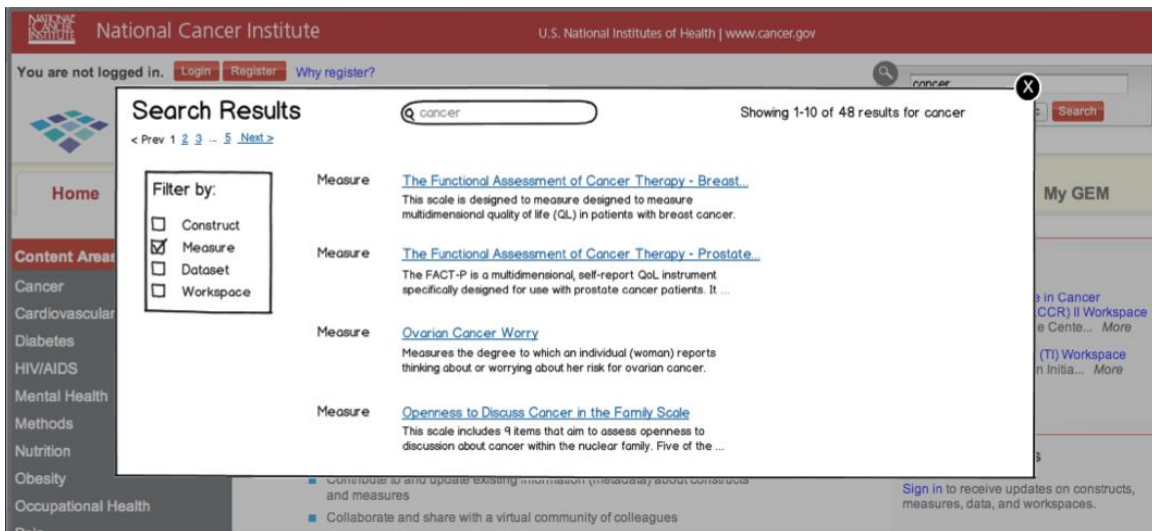
If you are interested in creating a workspace, please contact Rick Moser at [moserr@mail.nih.gov](mailto:moserr@mail.nih.gov).

Name	Keyword	Description	Status
<a href="#">Center of Excellence in Cancer Communication (CECCR) II Workspace</a>	CECCR	Researchers from the Centers of Excellence in Cancer Communication (CECCR) II, part of NCI's Extraordinary Opportunity in Cancer Communication initiative, will collaborate to vet and share measures and facilitate analyses using harmonized data.	Active (2/27/2012)
<a href="#">Translation Initiative (TI) Workspace</a>	TI-BP	The GEM-Translation Initiative (GEM-TI) aims to facilitate the use of standardized measures and global data sharing among researchers by crowdsourcing consensus building and translation of measures into multiple languages.	Active (2/27/2012)
<a href="#">Electronic Health Record (EHR) Campaign</a>	EHR candidate	Several institutes within the National Institutes of Health in collaboration with the Society of Behavioral Medicine are coordinating an effort to identify a core set of brief, practical measures to be recommended for use in electronic health records (EHRs).	Archived (2/27/2012)

Figure 17: The Workspaces Landing Page for CECCR.

## Search

A mockup of a proposed design for search results was shown to participants (figure 18), which elicited a positive reaction. Some suggestions for improving the design included different ways to sort search results and a function that allows the user to print or save a copy of the listing.



The mockup shows a search results page for the National Cancer Institute. The search bar contains the word "cancer", and the results show 1-10 of 48 results. The results are filtered by "Measure". The list of results includes:

- The Functional Assessment of Cancer Therapy - Breast...**: This scale is designed to measure designed to measure multidimensional quality of life (QL) in patients with breast cancer.
- The Functional Assessment of Cancer Therapy - Prostate...**: The FACT-P is a multidimensional, self-report QoL instrument specifically designed for use with prostate cancer patients. It ...
- Ovarian Cancer Worry**: Measures the degree to which an individual (woman) reports thinking about or worrying about her risk for ovarian cancer.
- Openness to Discuss Cancer in the Family Scale**: This scale includes 9 items that aim to assess openness to discussion about cancer within the nuclear family. Five of the ...

The sidebar on the left shows a "Filter by:" section with checkboxes for Construct, Measure (checked), Dataset, and Workspace. The footer includes a sign-in prompt and a list of user goals:

- Contribute to and update existing information (measures, datasets, and workspaces)
- Collaborate and share with a virtual community of colleagues

Figure 18: The Proposed Redesign for the Search Function.

## Round Three Findings

The final round of testing focused on obtaining additional feedback on the visual design, data display and data manipulation as well as discussing issues and ideas about ratings/comments. Ten people with

varying experience with GEM participated in this round. Some had only heard of GEM at a conference, while others were involved with the planning/conceptualization of the website. However, all were familiar with the subject matter of the behavioral science domain.

## Conceptual Model

Participants reported understanding the relationship between constructs and measures, however the transition between the constructs and measures tabs did not seem apparent to some (see figure 19). Constructs and measures are cross-linked and their pages are formatted in a similar way. This might be confusing, especially for people who have not used the site before. More distinction between the two page layouts was recommended, as well as reformatting the constructs/measures detail pages to show cross-references in a separate table.

Home | **Constructs** | Measures | Datasets | About | Workspaces | My GEM

Click on table headers to sort list alphabetically. To tailor the results below, use the "Quick Filter" button.

+ Add New Construct (NOTE: Construct names may be repeated if definitions differ.) Quick Filter View Pages

First Previous 1 2 3 4 ... 10 Next Last Showing 25 of 232

Construct	Definition	Theoretical Foundation	Synonyms
Acceptability	"Perception among implementation stakeholders that a given treatment, service, practice or innovatio...	Rogers, E.M. (1995). Diffusion of innovations (4th ed.). New York: The Free Press.	
Acculturation	The degree to which an individual identifies with the culture of one or more ethnicities of his/her ...	same as black culture construct, but that measure is not applicable to hispanics, Asians, Pacific Is...	ethnic affiliation
Active Transport	Non-Motorized form of transportation, usually walking or bicycling.	Social-Ecological theory	Active Commuting
Adherence	The extent to which individuals take their medications as prescribed by their doctor.		Medication Adherence
Adjustment process	Patterns of reaction and accommodation to diagnosis of cancer in patients over time. Survivorship pa...	Survivorship is a dynamic process and many factors seem to impact the outcomes. What are the key sbs...	Change cycle,

Home | **Measures** | Constructs | Datasets | About | Workspaces | My GEM

Click on table headers to sort list alphabetically. To tailor the results below, use the "Quick Filter" button.

+ Add New Measure Quick Filter View Pages

First Previous 1 2 3 4 ... 18 Next Last Showing 25 of 443

Measure	Brief Description	Content Area	Construct	Avg Rating	
6 Minute Walk	Assesses amount of mobility and physical function in adults	1. Physical Activity 2. Cancer	Functioning	★★★★☆	
Acceptability of Decision Aid Scale	A 10 item questionnaire for patients and a 15 item scale for physicians to rate satisfaction with 8 ...	1. Risk and Decision Making	Patient Satisfaction with Decision Aid	Rate This!	
ACE EBP Readiness Inventory	Self efficacy of one's confidence to perform EBP competencies identified in the national consensus o...	1. Health service delivery 2. Education, Training, and or Career Development	Evidence based quality improvement	Rate This!	
Adolescent Self-efficacy for Reducing Sedentary Behaviors	A seven-item measure to assess confidence for reducing sedentary behaviors. Items address: 1) turnin...	1. Physical Activity 2. Obesity	Self-Efficacy	★★★★☆	
Adoption Emotional Readiness	A 49-item, TTM scale that assesses stage, pros and cons, self-efficacy, and processes for taking...	1. Risk and Decision Making	Child Adoption	Rate This!	

Figure 19: The Contrast Between the Constructs (top) and Measures (bottom) Pages.

Participants correctly presumed the relationship between constructs/measures and the content areas listed on the side of the page, but there were some questions about the items listed in the content area section. Some were unsure if the listings were accurate (since users self-tag items they upload, which

may be inconsistent between users), complete, or up to date. Some participants stated that a few of the areas (ex. Stress) appeared to be constructs rather than content areas. Finally, some participants assumed the categories were inclusive, while others assumed them to be exclusive.

Inclusion of explanatory text was also recommended as a way to correctly build a user's conceptual model of the navigation within the site. Various pages, such as measures within a workspace, would benefit from additional descriptions. As seen in figure 20, it may be hard for a user to infer that the measure (i.e., Acceptability of Decision Aid Scale) is being discussed in the workspaces listed beneath the title.

The screenshot shows the 'Measures' section of a website. The breadcrumb trail is 'GEM > Measures > Measure Detail'. The page title is 'Acceptability of Decision Aid Scale'. Below the title, there is a section titled 'Workspaces' which contains a table with three columns: 'Workspaces', 'Description', and 'Administrator'.

Workspaces	Description	Administrator
Center of Excellence in Cancer Communication (CECCR) II Workspace	Researchers from the Centers of Excellence in Cancer Communication (CECCR) II, part of NCI's Extraordinary Opportunity in Cancer Communication initiative, will collaborate to vet and share measures and facilitate analyses using harmonized data.	Rick Moser
Translation Initiative (TI) Workspace	The GEM-Translation Initiative (GEM-TI) aims to facilitate the use of standardized measures and global data sharing among researchers by crowdsourcing consensus building and translation of measures into multiple languages.	Energia Naranjo-Rivera
Electronic Health Record (EHR) Campaign	Several institutes within the National Institutes of Health in collaboration with the Society of Behavioral Medicine are coordinating an effort to identify a core set of brief, practical measures to be recommended for use in electronic health records (EHRs).	Rick Moser

Below the table, it says '(Last Updated: 4/9/2012 11:19:25 AM by Sana Naveed)'.

Figure 20: Measures Detail Page Listing Workspaces The Measure Is Associated With.

The homepage features a section on the Workspaces (see figure 21), but it does not imply that there are more workspaces than the ones listed. This omission could lead users to believe there are only a few workspaces and they may not explore the Workplaces section of the site to find others. Therefore, it was recommended that the text explain that the workspaces featured on the homepage were examples of workspaces found on the site.



Figure 21: The Workspaces Section on the GEM Homepage.

## Navigation and Sequence Control:

## 1. Measures Detail:

On the Measures Detail page (figure 22), there are several formatting issues that may cause problems in navigation the section. Sections of measures' detail are viewed by using a left navigation within the page. The solid blue line, which separates the navigation from the page content, may have caused participants to focus on the page content and lose sight of navigation options. It was recommended that the separating line be removed and the active tab highlighted to tie into the background of the content area. An alternative suggestion would be to implement an accordion design to show each section of measure details.

The screenshot shows the National Cancer Institute's GEM (Grid-Enabled Measures Database) interface. The header includes the National Cancer Institute logo, the text 'U.S. National Institutes of Health | www.cancer.gov', and a search bar. Below the header is a navigation bar with tabs: Home, Constructs, Measures (active), Datasets, Workspaces, About, and My GEM. The main content area is titled 'Acceptability of Decision Aid Scale' and includes a 'General Information' section with a table of details. A sidebar on the left contains a list of navigation options: General, Author, Workspaces, History, Measure Characteristics, Language/Translations, References, Upload, Datasets, and Comments/ Ratings. On the right side of the main content area, there are buttons for Back, Subscribe, Edit, and History, along with a status box showing 'Status: Rate This!', 'Avg Rating: (0 users)', and 'Downloads: Not yet available'.

General Information	
Measure Name:	Acceptability of Decision Aid Scale
Measure Type:	Scale
Construct:	Patient Satisfaction with Decision Aid
Primary Content Area:	Risk and Decision Making
Secondary Content Area:	
Brief Description:	A 10 item questionnaire for patients and a 15 item scale for physicians to rate satisfaction with a decision aid used by patients.
Keywords:	
Target Population:	HRT patients and physicians
Mode of Administration:	Who Administered: Self-Administered How Administered: Other/Uncategorized/To-be-decided

(Last Updated: 4/9/2012 11:19:25 AM by Sana Naveed)

Figure 22: The Measures Detail Page.

The breadcrumbs were also ignored in the measures detail section (see figure 23), possibly because they did not suggest the affordance of a link. Additionally, the inclusion of “GEM” in the breadcrumbs was confusing, as it suggested a page at a higher level than the homepage. The following suggestions should help the site functionality beyond the testing domain: underline the links and remove the “GEM” link to the GEM splash page in the breadcrumbs.



Figure 23: GEM Breadcrumbs.



## 2. Search:

Participants did not notice the search box immediately; this was probably because it was located at the top of the page with the GEM banner and not within their workspace, the tab they were working within (see figure 24). When participants did locate the search, they were uncertain of its scope (some sites have a site-wide search, while others search the entire web). Other problems with the Search were that pressing the return key did not activate the search and the search term disappeared from the box after the results were displayed.

Recommendations for the search box included relocating it within the constructs or measures area. The option to search for other types of results (ex. search for a measure on the constructs page) would be retained through the drop-down menu, however the default selection for the drop-down measure would be associated with the page. For example, the search on the Measures page would have “Measures” pre-selected in the drop-down menu. Other recommendations were to activate the search when the return key is pressed and retaining the search term in the box so that users can modify or add to the original term for their next search.



**Figure 24: The Search Box and its Suggested New Location.**

The redesigned search result view tested in the second round had not been implemented for this round of testing; therefore it was not explored during testing. A few participants used the search feature on their own, and many of the original issues with the search results display (results not labeled as measures/constructs etc. and sorting capabilities) were noted.

The Quick Filter (see figure 25) was another search feature that was not to be explored in testing; however one participant found the option when searching for measures. It is unclear whether or not this feature will be necessary if the site's search and browsing methods are improved.

GEM > Constructs

Click on table headers to sort list alphabetically. To tailor the results below, use the "Quick Filter" button.

[+ Add New Construct](#) (NOTE: Construct names may be repeated if definitions differ.) [Quick Filter](#) [View Pages](#)

First Previous 1 2 3 4 ... 9 Next Last Showing 25 of 212

Construct	Definition	Theoretical Foundation	Synonyms
Acculturation	The degree to which an individual identifies with the culture of one or more ethnicities of his/her ...	same as black culture construct, but that measure is not applicable to hispanics, Asians, Pacific Is...	ethnic affiliation

Figure 25: The Quick Filter Option.

### 3. Log In/Out

Upon registration, the user is automatically logged in to the GEM site. This could be problematic, since there is no transition or feedback for a successful registration. It was recommended that a successful registration should take the user to a login screen where they must press the login button to enter the site.

Once the logged in user clicks the logout button, they are taken to the GEM splash page (see figure 26). It is recommended that the user remain on the GEM homepage instead.



Figure 26: Illustrating the Transition to the Splash Page Upon Logout.

#### 4. Active and Inactive Buttons:

There is inconsistent behavior for some buttons on the GEM site related to a user who is logged in and not logged in (shown in figure 27). For example, the Edit button on the Measures Detail page always appears active despite the user's login status. If users are not logged in and click the button, it will prompt users to log in. However, the subscribe button located next to it only appears active if the user is logged in. It is recommended that this behavior be made consistent with all buttons on the site.



Figure 27: The Subscribe and Edit Buttons on the Measures Detail Page for a User Who is Not Logged In and Logged In, Respectively.

#### Data Display

## 1. Measure Rating Information

Information about ratings for the Measure, which is found in the Measures Detail view, is not visually integrated into the table of information for the measure on the left. Participants often missed it, particularly if they had their browser window maximized (see figure 28 for an example). This phenomenon may be caused by “banner blindness,” a concept that addresses the fact that users learn to ignore “banners” or advertisements that appear in pre-determined locations. The box is anchored to the right side of the page, so the issue is exacerbated as the width of the window increases.

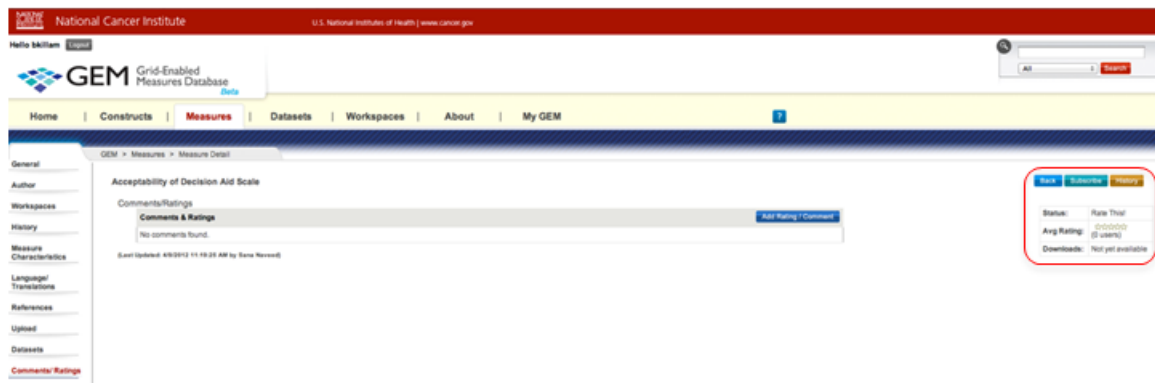
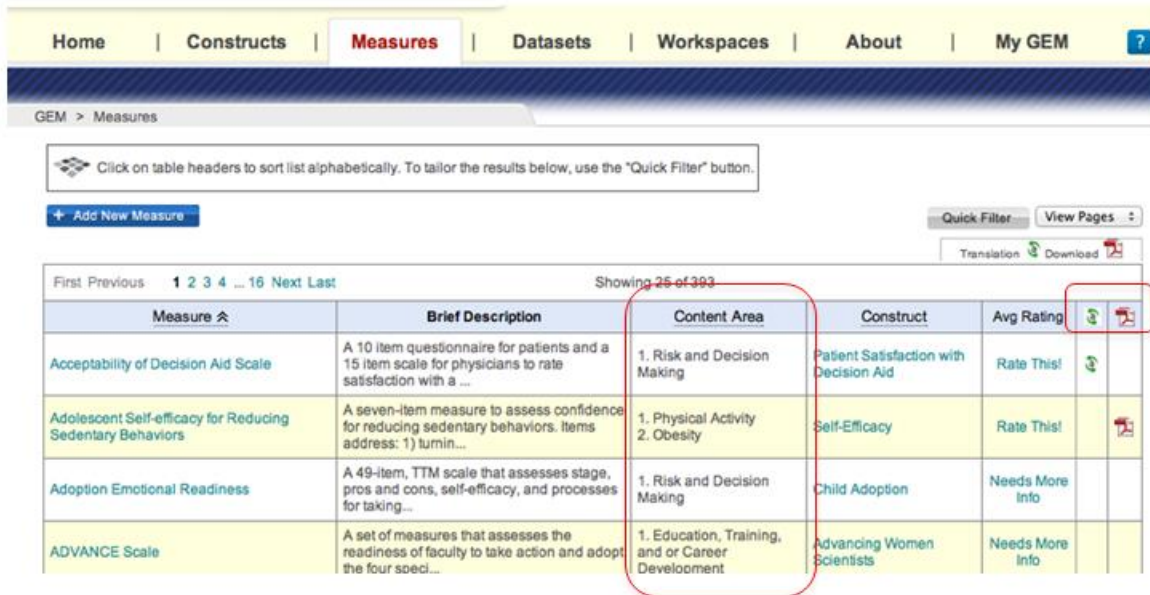


Figure 28: The Measures Detail Page in a Maximized Window View.

## 2. Measures Page, Table Format

The value of showing the content area on the listing of measures (figure 29) was unclear. Participants commented that the page had a lot of information and was hard to scan while browsing. The meaning of the numbers within the Content Area column was also unclear to participants. It is recommended that this column be removed from the Measures page, since the content area can be shown on the Measures Detail page.



Home | Constructs | **Measures** | Datasets | Workspaces | About | My GEM ?

GEM > Measures

Click on table headers to sort list alphabetically. To tailor the results below, use the "Quick Filter" button.

+ Add New Measure

Quick Filter View Pages

Translation Download

First Previous 1 2 3 4 ... 16 Next Last Showing 25 of 393

Measure	Brief Description	Content Area	Construct	Avg Rating	Translation	Download
Acceptability of Decision Aid Scale	A 10 item questionnaire for patients and a 15 item scale for physicians to rate satisfaction with a ...	1. Risk and Decision Making	Patient Satisfaction with Decision Aid	Rate This!		
Adolescent Self-efficacy for Reducing Sedentary Behaviors	A seven-item measure to assess confidence for reducing sedentary behaviors. Items address: 1) turnin...	1. Physical Activity 2. Obesity	Self-Efficacy	Rate This!		
Adoption Emotional Readiness	A 49-item, TTM scale that assesses stage, pros and cons, self-efficacy, and processes for taking...	1. Risk and Decision Making	Child Adoption	Needs More Info		
ADVANCE Scale	A set of measures that assesses the readiness of faculty to take action and adopt the four speci...	1. Education, Training, and or Career Development	Advancing Women Scientists	Needs More Info		

Figure 29: The Measures Tab, Showing the Content Area, Translation and Download Columns.

Another confusing part of the Measures table was the Translation and Download columns (also shown in figure 29). The icons were still reported to be unclear as in the previous round of testing (although the icons were added to the heading of the columns). It was recommended to use the additional space created from the removal of the content area column to clarify and textually label the last two columns.

## 3. Log In Positioning:

The login for GEM is not in a standard position on the webpage. It is unclear if participants noticed it in the upper left part of the page (figure 30). It is suggested that the login should be moved to the upper right side of the page instead.

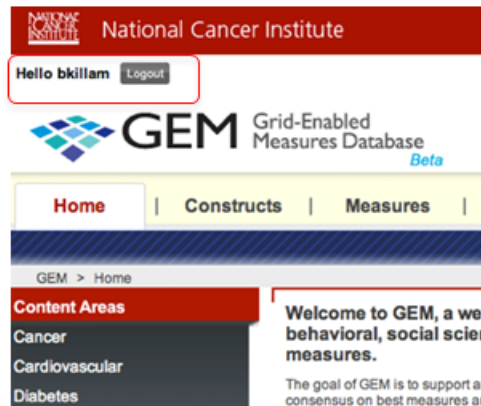


Figure 30: Location of the Log In Area.

#### 4. Button Placement and Shading

The order of buttons appears to be reversed from the web standard in certain popups (examples in figure 31) in GEM. These menus were either found to provide no visual assistance in selecting a button, or encouraging a negative action (such as clicking “cancel”). Reversing the order of buttons and adding visual coding to the positive action is recommended.

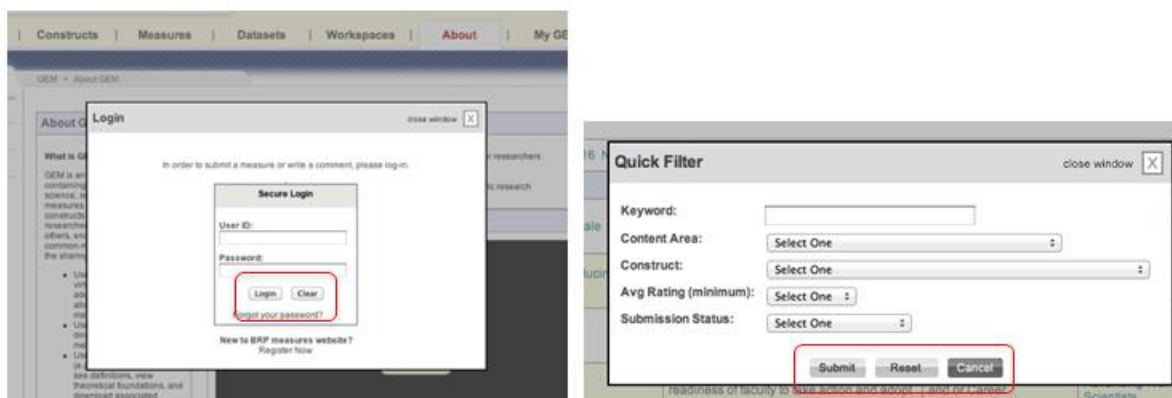


Figure 31: Two Examples of Popups With Non Standard Button Placement or Shading.

## Display Manipulation

#### 1. Pagination Controls

Although the pagination controls were reformatted from the last round of testing, participants still found them to be somewhat problematic (see figure 32). They wanted to browse for a topic of interest alphabetically; therefore it was recommended that the current pagination be supplemented with an alphabetic affordance (For example, provide a link “[A](#)” which filters

measures or constructs to show only those that begin with “A” and continue for each letter of the alphabet).

The other pagination control offered was the View Pages drop-down. Participants did not notice this control, most likely due to the fact that it is split across the screen from the other controls. It is also possible that they did not understand the label “View Pages.” The recommendation for addressing this issue is to move the page view control next to the other pagination controls on the left side of the screen.

It should also be noted that the search and page view options (which allow the entire listing of measures or constructs to be shown on one page) might suffice if they were in more obvious locations. In that case, alphabetic page controls may not be needed.

The screenshot shows the National Cancer Institute's GEM Grid-Enabled Measures Database Beta website. The header includes the NCI logo, "National Cancer Institute", and "U.S. National Institutes of Health | www.cancer.gov". Below the header, there is a navigation bar with links: Home, Constructs (active), Measures, Datasets, Workspaces, About, and My GEM. A search bar is located in the top right corner. The main content area displays a table of constructs. Above the table, there are instructions: "Click on table headers to sort list alphabetically. To tailor the results below, use the 'Quick Filter' button." and a note: "(NOTE: Construct names may be repeated if definitions differ.)". The table has four columns: Construct, Definition, Theoretical Foundation, and Synonyms. The first row of the table is highlighted in yellow. The pagination controls at the bottom of the table show "Showing 25 of 212" and a set of page numbers: 1, 2, 3, 4, ..., 9, Next, Last. The "View Pages" button is also visible.

Construct	Definition	Theoretical Foundation	Synonyms
Acculturation	The degree to which an individual identifies with the culture of one or more ethnicities of his/her ...	same as black culture construct, but that measure is not applicable to hispanics, Asians, Pacific Is...	ethnic affiliation
Active Transport	Non-Motorized form of transportation, usually walking or bicycling.	Social-Ecological theory	Active Commuting
Adherence	The extent to which individuals take their medications as prescribed by their doctor.		Medication Adherence
Adjustment process	Patterns of reaction and accommodation to diagnosis of cancer in patients over time. Survivorship pa...	Survivorship is a dynamic process and many factors seem to impact the outcomes. What are the key ste...	Change cycle,

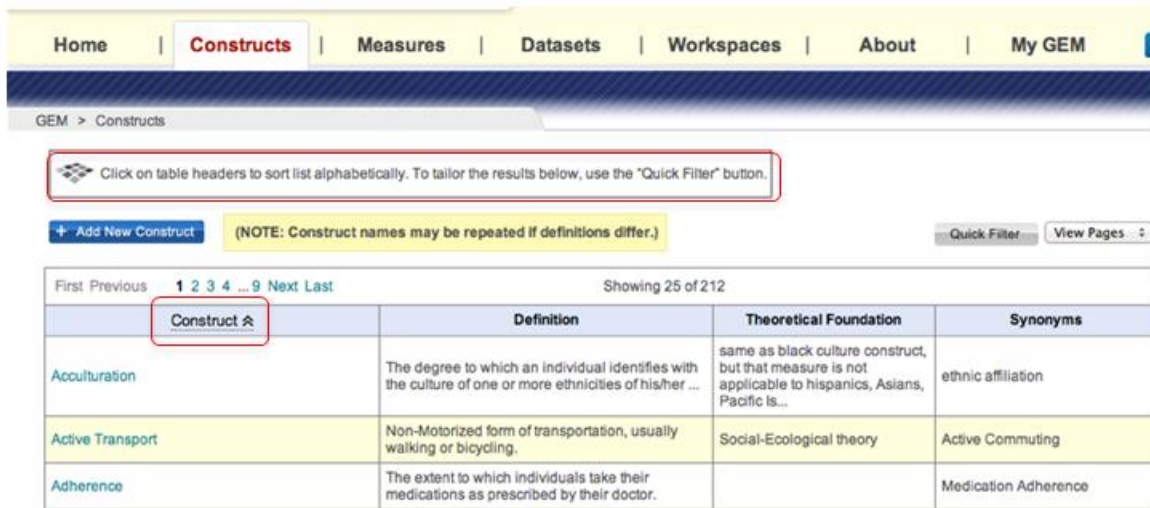
Figure 32: Pagination Controls on the Constructs Page.

## 2. Column Sorting

Columns on the constructs and measures pages are sortable, however participants did not use this feature (even though there were instructions mentioning this capability at the top of the page). Perhaps participants did not understand the affordance used to show which column had been used as the basis for sorting (figure 33); this situation may be improved by using a more standard affordance than what is currently used. A more standard affordance (such as a solid, downward-pointing equilateral triangle) may also render the instructions unnecessary



(participants did not seem to read them, and previous testing sessions have reported their appearance to be similar to an ad on the site).



The screenshot shows the GEM Constructs page. At the top is a navigation bar with links: Home, **Constructs**, Measures, Datasets, Workspaces, About, and My GEM. Below the navigation bar is a breadcrumb trail: GEM > Constructs. A red box highlights a message: "Click on table headers to sort list alphabetically. To tailor the results below, use the 'Quick Filter' button." Below this message is a button "+ Add New Construct" and a note: "(NOTE: Construct names may be repeated if definitions differ.)". To the right of the note are buttons "Quick Filter" and "View Pages". Below these is a table with 4 columns: Construct, Definition, Theoretical Foundation, and Synonyms. The table has 3 rows of data. The first row is "Acculturation", the second is "Active Transport", and the third is "Adherence". The table is sorted by "Construct" (A-Z). The table is showing 25 of 212 results.

Construct	Definition	Theoretical Foundation	Synonyms
Acculturation	The degree to which an individual identifies with the culture of one or more ethnicities of his/her ...	same as black culture construct, but that measure is not applicable to hispanics, Asians, Pacific Is...	ethnic affiliation
Active Transport	Non-Motorized form of transportation, usually walking or bicycling.	Social-Ecological theory	Active Commuting
Adherence	The extent to which individuals take their medications as prescribed by their doctor.		Medication Adherence

Figure 33: Sorting and Sorting Instructions on the Constructs Page.

## Datasets

Most participants were unsure of the value in accessing content (such as measures) by dataset. It was found that having datasets available from the measure details page was useful, but few participants could think of a scenario where the datasets tab would be explored first (since the main purpose of GEM is to access measures and constructs). This point is reinforced by the option to select only Measures or Constructs from a Content Area on the homepage (shown in figure 34). It is recommended that the datasets tab be removed from the top navigation and available datasets be listed on the measures detail page.



**National Cancer Institute**  
U.S. National Institutes of Health | www.cancer.gov

You are not logged in. [Login](#) [Register](#) [Why register?](#)

**GEM** Grid-Enabled Measures Database *Beta*

[Home](#) | [Constructs](#) | [Measures](#) | [Datasets](#) | [Workspaces](#) | [About](#) | [My GEM](#)

GEM > Datasets

The following screen can be used to review the Datasets currently available in the system. If you would like to add a new Dataset, press the "Add New Dataset" button to enter the necessary data. Click on table headers to sort list.

[+ Add New Dataset](#) [View Pages](#)

Dataset Name &	Start	End	Organizational Home	Description	Measures
2010 LIVESTRONG Survey for People Affected by Cancer	2010	2011	LIVESTRONG	The 2010 survey instrument was divided into five sections. The first three sections focused on phys...	
Depression data from College Smoking Study	2009	2009	Fox Chase Cancer Center	Study surveyed a diverse population of Temple University undergraduate students (N=1200) to assess s...	Center for Epidemiologic Studies Depression Scale (CES-D)
Health Information National Trends Survey 2005 (HINTS 2005)	2005	2005	National Cancer Institute	HINTS, first conducted in 2003, collects nationally representative data routinely about the American...	HINTS Health Status Question , HINTS Psychological Distress Scale
Health Information National Trends Survey-Puerto Rico (HINTS Puerto Rico)	2009	2009	National Cancer Institute	HINTS, first conducted in 2003, collects nationally representative data routinely about the American...	HINTS Psychological Distress Scale
TEST DATASET WITH LONG DESCRIPTION			WESTAT	Survey Design and Characteristics The purpose of the 2006 survey was to assess the post-treatment e...	

[Questions or feedback?](#)

[Home](#) | [Constructs](#)

GEM > Home

**Content Areas**

Cancer

[Measures](#)

[Constructs](#)

Cardiovascular

Diabetes

Education, Training, and or Career Development

HIV/AIDS

Figure 34: The Datasets Tab and Lack of Datasets Mentioned in the Content Area from the Homepage.

## Ratings

## 1. Viewing Ratings

The 5-star rating is shown in a column in the table on the Measures page (see figure 35), which participants found useful. However, they were confused when clicking the stars did not take them to the ratings/comments for the measure, and they also noted that the number of ratings was not shown. Incorporating these things into the website is recommended to make the information more valuable.

Instruction	Avg Rating		
als	Needs More Info		
	Needs More Info		
Autonomy	★★★★★		
id barriers	Needs More Info		
orized	Rate This!		
Barriers to r Physical	★★★☆☆		

Figure 35: The Ratings Column on the Measures Page.

Participants also mentioned that the average rating may not be informative enough on it's own. A summary and a histogram were both suggested as ways to show the details of the measure (example in figure 36). It is recommended that a histogram of ratings be shown on the details page.

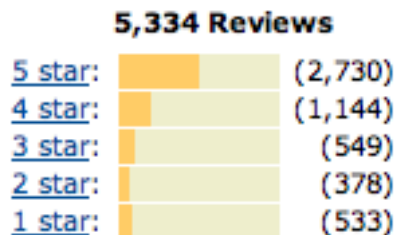


Figure 36: Example of a Rating Histogram from Amazon.com.

## 2. Adding a Rating

Some basic formatting issues were found on the page where users can add a comment or rating (figure 37). The heading, “Comments and Ratings” is shown twice, and the relationship between the “Add Rating/Comment” button and the Save & Cancel buttons appears unclear. The term “Save” may be misleading if users interpret it to mean they can save their comment/rating and return to it on the site later on. To clarify these issues, it is recommended that the redundant labels, “Add Rating/Comment,” be removed, the “Save” button be relabeled to “Submit” and moved (along with the cancel button) to the bottom of the form.

The screenshot shows the National Cancer Institute's GEM (Grid-Enabled Measures Database) interface. The header includes the NCI logo, the text "National Cancer Institute", and the URL "U.S. National Institutes of Health | www.cancer.gov". Below the header, there is a navigation bar with links: Home, Constructs, Measures, Datasets, Workspaces, About, and My GEM. The main content area is titled "GEM > Measures > Measure Detail". The measure being viewed is "Acceptability of Decision Aid Scale". The left sidebar contains a list of tabs: General, Author, Workspaces, History, Measure Characteristics, Language/Translations, References, Upload, Datasets, and Comments/Ratings. The "Comments/Ratings" tab is selected. The main content area shows the "Comments & Ratings" section with a heading "Comments & Ratings" and a button "Add Rating / Comment". Below the heading, there is a form for adding a comment, including a text input field for the comment title, a text area for the comment body, and a rating scale from 1 to 5 (weak to strong). The "Add Rating / Comment" button is highlighted with a red box. The "Save" and "Cancel" buttons are also highlighted with a red box. The right sidebar shows the status of the measure, including "Status: Rate This!", "Avg Rating: (0 users)", and "Downloads: Not yet available".

Figure 37: The Add Rating/Comment Form.

It was also discovered that users can enter a comment without rating the measure, but they cannot rate the measure without adding a comment. These required fields (and interactions) are unclear, and items that have comments only do not appear in the Ratings column from the measures page in the current design.

As for actually rating a measure, many participants mentioned the tradeoff between wanting a more detailed rating and not wanting to spend too much time providing more detail with the ratings that they give. It was proposed that a few key dimensions be suggested (ex. reliability, validity, and ease-of-use) to streamline the rating process. Instructions for raters to select the dimensions they considered while assigning their rating is recommended for resolving this issue, and an example form showing the new rating process was made (see figure 38).

How Would You Rate this Measure?

Weak \*                      Strong \*

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5

Your rating was based on\*  
(check all that apply)

☐ Ease of Use  
☐ Validity  
☐ Reliability

Explain your rating below

\* Required

Figure 38: A Proposed Example for a New Rating Form.

## Workspaces

Most participants were unfamiliar with the Workspaces tab on the GEM website (shown in figure 39), even if they had used it before (these participants had received an e-mail with a link directly to the workspace that they were supposed to visit). In describing what they believed the purpose of the tab to be, some participants thought it was a section to organize measures they had “bookmarked,” or thought it might be a section for specific interest groups. Once the tab was explored, many participants found the label of “Workspace” to be misleading. “Work Groups,” “Collaborative Workgroups,” “Community Workspaces,” or similar names were recommended for the tab.

**National Cancer Institute** U.S. National Institutes of Health | www.cancer.gov

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**GEM** Grid-Enabled Measures Database *Beta*

Home | Constructs | Measures | Datasets | **Workspaces** | About | My GEM ?

GEM > Workspaces

Welcome to **GEM Workspaces!** Workspaces were created so researchers can collaborate about specific areas of their research. Workspaces are open to all GEM users.

If you are interested in creating a workspace, please contact Rick Moser at [moserr@mail.nih.gov](mailto:moserr@mail.nih.gov).

Name	Keyword	Description	Status
Center of Excellence in Cancer Communication (CECCR) II Workspace	CECCR	Researchers from the Centers of Excellence in Cancer Communication (CECCR) II, part of NCI's Extraordinary Opportunity in Cancer Communication initiative, will collaborate to vet and share measures and facilitate analyses using harmonized data.	Active (2/27/2012)
Translation Initiative (TI) Workspace	TI-BP	The GEM-Translation Initiative (GEM-TI) aims to facilitate the use of standardized measures and global data sharing among researchers by crowdsourcing consensus building and translation of measures into multiple languages.	Active (2/27/2012)
The GEM-Care Planning Initiative (GEM-CP)	GEM-CP	Goal: To build consensus in the survivorship community around high-priority process and outcome measures for use in studies of survivorship care planning.	Active (2/28/2012)
Electronic Health Record (EHR) Campaign	EHR candidate	Several institutes within the National Institutes of Health in collaboration with the Society of Behavioral Medicine are coordinating an effort to identify a core set of brief, practical measures to be recommended for use in electronic health records (EHRs).	Archived (2/27/2012)

[Questions or feedback?](#)

Figure 39: The Workspaces Landing Page.

## Adding Measures

Participants were able to locate the “Add Measure” button on the Measures page. However, they were surprised that they could not add a measure from the construct section. Also, measures could not be added from the Draft Measures section of My GEM. It was recommended that an “Add Measures” button be added on the Construct detail page and the Draft Measures section of My GEM in the locations shown in the diagrams below in figure 40.

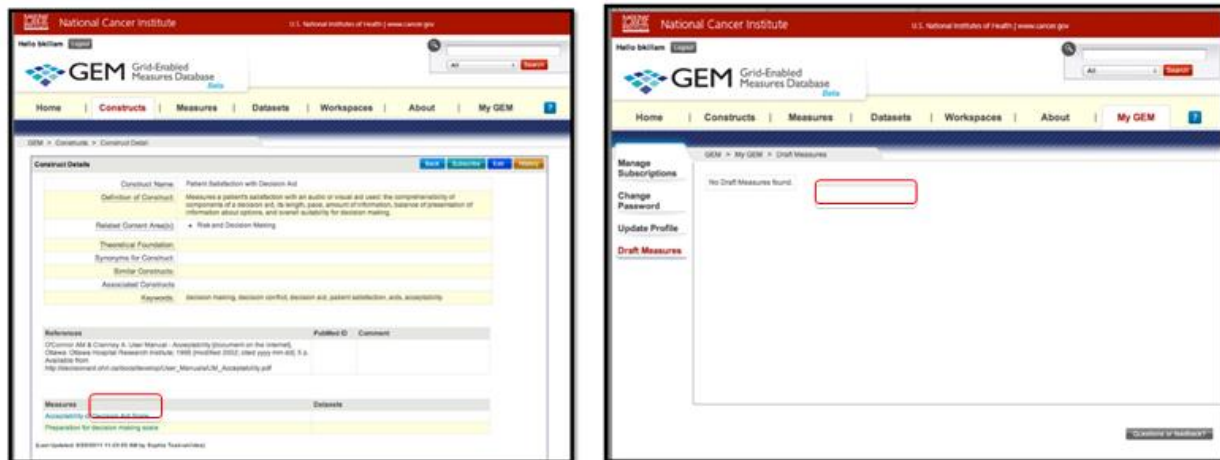


Figure 40: The Two Areas Where an "Add New Measure" Button May Be Useful.

An “Add New Measure” button was implemented late during testing in the Workspaces tab on the Measure page within it (shown in figure 41). The one participant who saw the button commented that they understood the newly created measure would be added to GEM proper and not be exclusive to that Workspace.

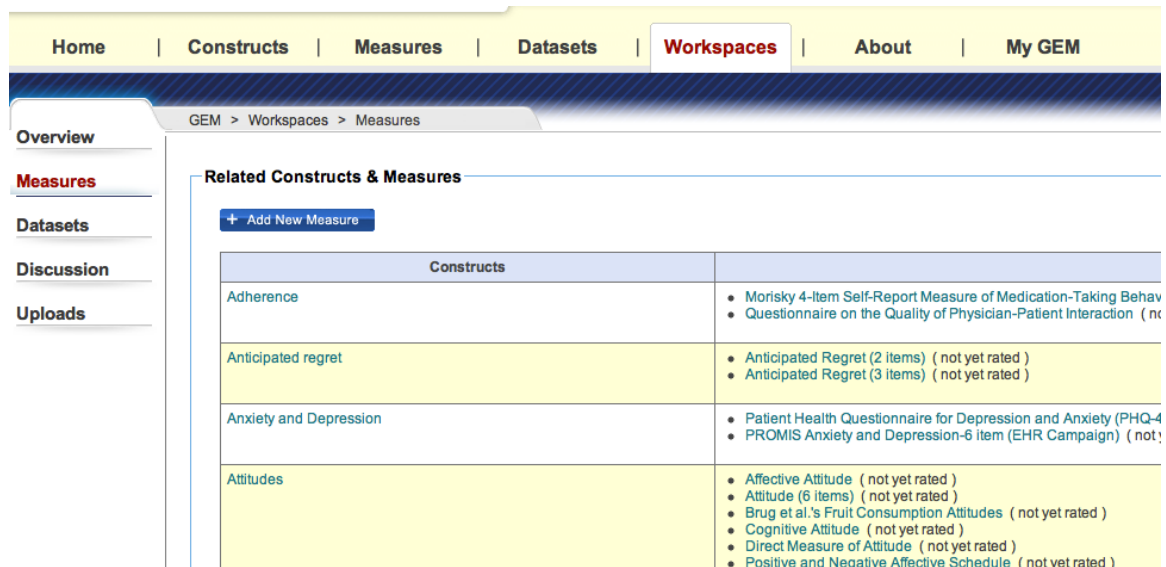


Figure 41: The “Add New Measure” in a Workspace’s Page.

## My GEM

## 1. My GEM Options

Participants thought that the Draft Measures tab was a place where they could work on adding measures to GEM. This section and the Manage Subscriptions section (figure 42) are related to each other but are separate areas from the user's profile and password (which manage the user's GEM account, and not the materials found on the site). It is recommended that these tabs be placed next to each other, or combined as one section on the page to group associated areas of My GEM together.

The screenshot shows the National Cancer Institute's GEM (Grid-Enabled Measures Database) interface. The header includes the NCI logo, the text 'National Cancer Institute', and the URL 'U.S. National Institutes of Health | www.cancer.gov'. Below the header, a user is logged in as 'Hello bkillam' with a 'Logout' button. A search bar is located in the top right corner. The main navigation bar includes links for 'Home', 'Constructs', 'Measures', 'Datasets', 'Workspaces', 'About', and 'My GEM'. The 'My GEM' section is active, showing a breadcrumb trail: 'GEM > My GEM > Manage Subscriptions'. On the left side, there is a sidebar with links: 'Manage Subscriptions' (highlighted), 'Change Password', 'Update Profile', and 'Draft Measures'. The main content area is titled 'Subscription Type' and lists two items: 'MEASURE: Adoption Emotional Readiness' and 'MEASURE: Attitude (6 items)', both with checked checkboxes. Below this list is an 'Update Subscription' button. At the bottom, there is a 'Subscription Frequency' section with three radio button options: 'Daily', 'Weekly' (selected), and 'Monthly'.

Figure 42: The Manage Subscriptions and Draft Measures Options in My GEM.



## 2. Subscriptions

The term “subscription” confused some participants when encountered on the site (see figure 43), as they weren’t sure whether they would receive e-mail updates or have the measure “bookmarked” in My GEM. It is recommended that the “Subscribe” button be relabeled to “Bookmark” to clarify its function.

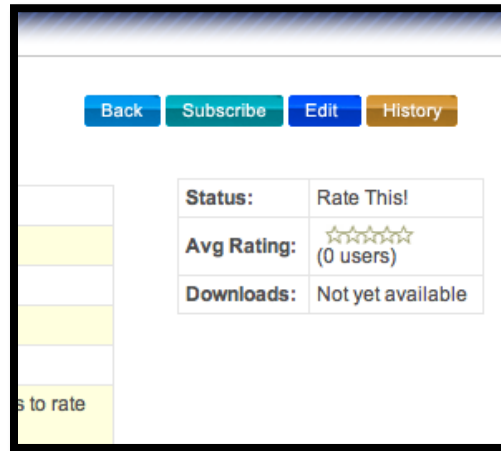


Figure 43: The Subscribe Button on the Measures Detail Page.

While viewing the Manage Subscriptions area on the My GEM page (figure 44), participants indicated that they may not want to receive e-mail updates, but still wanted to “bookmark” a measure for their convenience. With the current controls, it seems as if they have no choice but to get e-mails. It is recommended that a “none” option be added to the subscription frequency section, or other frequencies, such as quarterly, could be considered as well. However this change would modify the current conceptual model the site to the tracking/bookmarking model proposed earlier.

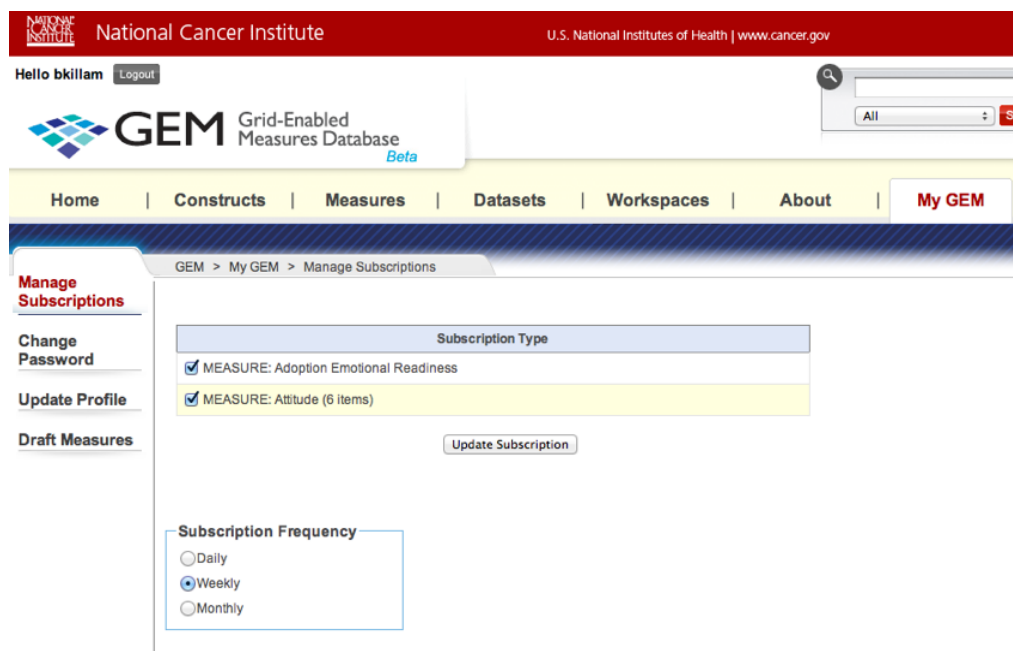


Figure 44: Manage Subscriptions on the My GEM Page.

The Update Subscription button on this page confused participants; since its position implies that it does not change the subscription frequency (it was thought to only remove selected measures from the list above it). Participants also noted that the items they subscribed to were not hyperlinked; hyperlinking was seen as useful for their purpose of bookmarking a measure (and visiting it quickly). Adding hyperlinks and moving the Update Subscription button to the bottom of the page is recommended.

## 2. Additional Functions Suggested for My GEM

Some participants expected the My GEM page to track their actions on the site, for example, if they commented on or rated a particular measure. They also mentioned that it would be useful if the profile listing contained more detailed information about other users (beyond their name and affiliation which shows up on comments currently). These suggestions are recommended, as they would be great improvements to the site for encouraging participation.

## Conclusion

Overall, each revision of the GEM site has improved its usability. To summarize the results of UCD's involvement in the usability testing:

- The concept of Constructs, Measures, Datasets and Content Areas were independently understood by users, however how to navigate to them within the site was not yet clear.
- Ratings would provide more helpful information if
  - They didn't consume too much time to read or rate
  - A histogram of individual ratings was shown, instead of only an average
  - Dimensions which each rater considered when making their rating were offered
- Workspaces may need to be relabeled to communicate their purpose and functions more clearly.
- The GEM site has a good potential to engage users through expansion of social features on the site.

## Appendix A- Facilitator's Guide for Round One Usability Tests

[Note: The purpose of this document is to guide the moderator. The questions and tasks contained herein may not be asked as written. The facilitator often draws on participant comments and the natural flow of the testing process to determine the flow of the session. While the facilitator will try to follow the order of the guide, many times tasks will come up ahead of time or in different order. The facilitator may allow the order of the tasks to change in order to let the process flow naturally.]

---

### Pre-Test

[Administer the informed consent.]

### Introduction

Thank you for agreeing to participate in this study.

NCI'S Department of Cancer Control and Population Studies (DCCPS) has been working to develop the Grid Enabled Measures (GEM) Website as a decision support tool. To help develop this resource, we are conducting a usability test of the design. As a participant, you will be given a set of information-gathering tasks and I will watch to see how easy or difficult it is for you to find the information.

As we go through the tasks, feel free to offer any comments or suggestions that occur to you. We are looking for things about the design that are working well as well as things that could be improved. There are two important things you should keep in mind while you work with the website:

- First, I did not create the design so you can't hurt my feelings with any criticisms you might have. If there are problems with the design I would like to discuss them with you to see if we can find a way to improve the design.
- Second, we are evaluating the website and not you, so you cannot make any mistakes. The site is supposed to be intuitive and easy to use. If it isn't, that's a problem with the website – not with you.

I'd like you to know that there are some observers with us today helping me by taking notes, but don't worry about them. You and I will work on this together and they'll just watch and listen.

Do you have any questions for me before we get started?

### Background

We have invited persons with a variety of backgrounds to participate in this activity so I'd like you to tell me:

1. Where do you work and what is your role there?
2. What type of research do you do? Do you sometimes use measures that have been developed by others?
3. How long have you done this kind of research?
4. Have you seen the GEM website before today? If so, what have you done on the site (e.g., minimal exploration, browsed contents, entered measures or constructs)?

5. Where have you looked for measures that others have developed that you might use in your work?

## Tasks

1. [\[Starting on "Home" page mockup\]](#) Take a few minutes to look around this page to see what is there and how it is organized. [Note where P goes on site, main interests, comments, etc.]
  - a. Tell me what you know so far about what GEM is and who it is for.
  - b. Do you expect the site to be a repository of data elements or a collection of measures about data elements? Why?
  - c. What else would you want to know about GEM before you going further? Where would you expect to find that information? Go ahead and see if you can find it.
  - d. What are your first impressions of the site?
2. How would you start out using this tool (e.g., view About; select Review, Evaluate, or Collaborate)?
  - a. Tell me what each of the 3 main options are on the Homepage.
  - b. Go ahead and start using the tool.
3. [\[From GEM:\]](#) **[Review]** Would you choose to browse or search first? On Constructs, Measures, Datasets, or Workspaces?
  - a. [Related to browsing behavior]
    - i. What is something you might want to look for in GEM? Show me how you might start browsing.
    - ii. [Ask P to explain expectations for headers, links, icons, etc.]
  - b. [Related to searching behavior]
    - i. What might be some keywords that you would use to search for measures that would be applicable to your work? Go ahead and try those now. [Note which search they use – global search at top, Quick filter on Measures tab.]
    - ii. [When they find a measure or construct of interest] How would you find more information about this measure/construct? Is this the information you would want to see? Is there anything missing? What would you do next in order to further investigate this item?
    - iii. Look at the comments/ratings for this measure (bring up a measure if P was searching constructs).
      1. What has been researcher reaction to this measure? Do you find this information useful?
      2. Add your own comment and rating to this measure.
    - iv. Let's say that you wanted to find measures related to anxiety. How would you do that?

1. [If P uses global search (“anxiety”), get reaction to search results page.]
2. [If P uses Quick Filter (if not, suggest this option), get reaction to filter control.]
4. Let’s say that you have a measure that you want to enter into GEM. Show me how you would do this.
  - a. [P will need to register to create an account; note any issues in this process, e.g., understanding fields, using controls, understanding icons]
  - b. [P enters data associated with a measure. May need to supply sample data. P should go through all entry fields. Explore understanding of status field. Note any confusions or issues.]
  - c. [From Main Measures display] If you wanted to go back to the new measure you just created and edit it or add some additional information, how would you do that?
  - d. How would you change the status of the measure so that it could be rated by others?

*Note: the following will be presented if there is sufficient time:*

5. Exploring the Datasets tab
  - a. Ask participant to choose a dataset and get details about it. What GEM measures are found in this dataset?
  - b. Considering the metadata provided for this dataset, are the right pieces of information included? Any others you would want to add?
  - c. Do you think the Datasets section would be helpful to you in your work? Why or why not?
  - d. If you had a dataset that you wanted to contribute to GEM, how would you do this?
  - e. Do you feel GEM encourages you to share data with your colleagues? Why or why not?
  - f. If not, what would make you more willing to share data?
6. Exploring the Workspaces tab
  - a. What do you think the Workspaces tab is? (If P doesn’t know, explain this is a collaborative workspace area for colleagues to create and administer their own custom initiative.)
  - b. Take a look at one of the initiatives in this section. The content areas can be customized based on the needs of the project team. What might you use this workspace for in your work? What other features might make this more useful?
  - c. What collaboration tools have you used when working with others on a project? What features of those tools were particularly useful? What things made their use difficult?

## Follow-up Questions

1. Administer the System Usability Scale (SUS) evaluation (standardized measure of website usability).
2. How easy or difficult was it for you to find the information on measures and constructs?
3. Was there anything missing – any information that you expected to see but didn’t?

4. Is there anything about the organization of the web pages that you would change?

## Wrap up

OK, we're done. Do you have any further questions or comments?

Thanks again for your participation.

## Appendix B - Facilitator's Guide for Round Two Usability Tests

[Note: The purpose of this document is to guide the moderator. The questions and tasks contained herein may not be asked as written. The facilitator often draws on participant comments and the natural flow of the testing process to determine the flow of the session. While the facilitator will try to follow the order of the guide, many times tasks will come up ahead of time or in different order. The facilitator may allow the order of the tasks to change in order to let the process flow naturally.]

---

### Pre-Test

[Administer the informed consent.]

### Introduction

Thank you for agreeing to participate in this study.

NCI'S Department of Cancer Control and Population Studies (DCCPS) has been working to develop the Grid Enabled Measures (GEM) Website as a decision support tool. To help develop this resource, we are conducting a usability test of the design. As a participant, you will be given a set of information-gathering tasks and I will watch to see how easy or difficult it is for you to find the information.

As we go through the tasks, feel free to offer any comments or suggestions that occur to you. We are looking for things about the design that are working well as well as things that could be improved. There are two important things you should keep in mind while you work with the website:

- First, I did not create the design so you can't hurt my feelings with any criticisms you might have. If there are problems with the design I would like to discuss them with you to see if we can find a way to improve the design.
- Second, we are evaluating the website and not you, so you cannot make any mistakes. The site is supposed to be intuitive and easy to use. If it isn't, that's a problem with the website – not with you.

I'd like you to know that there are some observers with us today helping me by taking notes, but don't worry about them. You and I will work on this together and they'll just watch and listen.

Do you have any questions for me before we get started?

### Background

We have invited persons with a variety of backgrounds to participate in this activity so I'd like you to tell me:

6. Where do you work and what is your role there?
7. What type of research do you do? Do you sometimes use measures that have been developed by others?
8. How long have you done this kind of research?
9. Have you seen the GEM website before today? If so, what have you done on the site (e.g., minimal exploration, browsed contents, entered measures or constructs)?



## Tasks

7. [\[Overview:\]](#) Take a few minutes to look around this page to see what is there and how it is organized. [Note where P goes on site, main interests, comments, etc.]
  - a. What are your first impressions of the site?
  - b. Tell me what you know so far about what GEM is and whom it is for. What are the main goals for GEM? Did you learn this from the website or from another source? [Clarify any misunderstandings.]
8. [\[Homepage:\]](#) If you came across the GEM homepage, where would you start first? [Note if P selects content areas, top nav bar, about section, etc]
  - a. What do you expect to see when you click on an item in the “Content Areas?” Are there any content areas that seem to be missing?
  - b. Does the welcome message shown on the homepage convey the purpose of GEM? What (if anything) needs to be changed here?
  - c. What does the “Measures at a Glance” section tell you? Would you find this section helpful when looking for measures on GEM or just getting to know the site?
  - d. What are your thoughts on the GEM Snapshot section? Do you find this information useful?
  - e. Take a look at My Subscriptions. What do you think this section is for?
  - f. What is the Workspaces section about?
  - g. Do you expect to have to register/log in in order to see content in GEM? [No]
  - h. Where do you think each tab in the menu will take you? What information would you expect to find there? [If limited time, just ask if there's anything confusing on the main menu bar.]
9. [\[Entering the site:\]](#) Let's find some information that interests you or is related to your work.
  - a. What is something you might want to do in GEM? Show me how you might start. [Note if P goes to a content area, menu bar or search box]
  - b. [from Measure Detail page] Now that you've found a measure that interests you, how would you get a copy of this measure? [Note expectations for downloading, how to find author contact info, etc]
  - c. [from Measures landing page] Take a look at the Avg Rating column. Tell me what you think the entries mean.
  - d. What would motivate you to rate a measure? [If time: How would you rate a measure?]
  - e. GEM offers the option to receive notice of any updates to specific measures, constructs, etc.
    - i. How would you sign up for notifications for this measure?
    - ii. How frequently would you like to be notified about the measures in your subscriptions?

- f. *[For translation Ps only:]* GEM will contain measures that have been translated into other languages.
  - i. [from Measures landing page] How can you tell if a measure is translated?
  - ii. Would you expect to be able to look specifically for measures that have been translated? [functionality not currently available]
  - iii. [Bring up a translated measure] Here is the meta-data related to Language/Translation. Please comment.
  - iv. What other information about a translated measure should be included?
  - v. If you wanted to enter a translated measure into GEM, how would you initiate this?
10. *[Workspaces:]* Now that we've explored the Measures section of GEM, let's look at Workspaces.
  - a. [click Workspaces tab] Take a minute to look around this section and tell me what you think the purpose of this section is.
    - i. [If needed: The Workspaces section is a shared workspace for researchers interested in a specific topic, such as electronic medical records. In the workspace, researchers can share documents, identify relevant constructs and measures, and hold discussions.]
  - b. Click into one of the workspaces and review the resources that are available.
    - i. Are there any other resources or functionality that you think would be useful to have in a topic-oriented workspace?
  - c. How might you use the Workspaces section for your own work?
  - d. Go back to the Workspaces landing page and consider the table of information about existing workspaces.
    - i. What information in this table do you think is most helpful if you were trying to get a feeling for what workspaces exist?
    - ii. Do you suggest any changes to what's presented on this page?
11. *[Search:]* The global search is a way to quickly locate content of interest. We are considering the best way to present search results, so I'd like to show you a mockup.
  - a. [Walk-through of the mockup:] We'll start with a basic search from the search bar in the top right corner of the page. In this example, you are interested in finding information about cancer. Click the search button to perform the search.  
  
 Here are the results for "cancer." This time, you are interested in finding measures about cancer. Filter the results so you can see only measures displayed.  
  
 Now you can browse the measures to see if they are of interest to you. Try clicking on the first item to see its details.
  - b. Please comment on how the search results display works. What are the things you like? What are the things that seem confusing? What would you change or add to make the search better for you?

## Follow-up Questions

5. Administer the System Usability Scale (SUS) evaluation (standardized measure of website usability).
6. How easy or difficult was it for you to find the information on measures and constructs?
7. Was there anything missing – any information that you expected to see but didn't?
8. Is there anything about the organization of the web pages that you would change?

## Wrap up

OK, we're done. Do you have any further questions or comments?

Thanks again for your participation.

## Appendix C - Facilitator's Guide for Round Three Usability Test

[Note: The purpose of this document is to guide the moderator. The questions and tasks contained herein may not be asked as written. The facilitator often draws on participant comments and the natural flow of the testing process to determine the flow of the session. While the facilitator will try to follow the order of the guide, many times tasks will come up ahead of time or in different order. The facilitator may allow the order of the tasks to change in order to let the process flow naturally.]

---

### Pre-Test

[Administer the informed consent.]

### Introduction

Thank you for agreeing to participate in this study.

NCI'S Division of Cancer Control and Population Studies (DCCPS) has been working to develop the Grid Enabled Measures (GEM) Website as a decision support tool which solicits community participation to vet and create consensus on the use of scientific health measures.. To help develop this resource, we are conducting a usability test of the design. As a participant, you will be given a set of information-gathering tasks and I will watch to see how easy or difficult it is for you to find the information.

As we go through the tasks, feel free to offer any comments or suggestions that occur to you. We are looking for things about the design that are working well as well as things that could be improved. There are two important things you should keep in mind while you work with the website:

- First, I did not create the design so you can't hurt my feelings with any criticisms you might have. If there are problems with the design I would like to discuss them with you to see if we can find a way to improve the design.
- Second, we are evaluating the website and not you, so you cannot make any mistakes. The site is supposed to be intuitive and easy to use. If it isn't, that's a problem with the website – not with you.

I'd like you to know that there are some observers with us today helping me by taking notes, but don't worry about them. You and I will work on this together and they'll just watch and listen.

Do you have any questions for me before we get started?

### Background

We have invited persons with a variety of backgrounds to participate in this activity so I'd like you to tell me:

10. Where do you work and what is your role there?
11. What type of research do you do? Do you sometimes use measures that have been developed by others?
12. How long have you done this kind of research?
13. Have you seen the GEM website before today? If so, what have you done on the site (e.g., minimal exploration, browsed contents, entered measures or constructs)?

## Tasks

<https://brpdemo.westat.com/public/Home.aspx?cat=0>

Username: brpdemouser

Password: brpdemo#1

12. Take a few minutes to look around this page to see what is there and how it is organized. [Note where P goes on site, main interests, comments, etc.]
  - a. What are your first impressions of the site?
  - b. Tell me what you know so far about what GEM is and who it is for. What are the main goals for GEM? Did you learn this from the website or from another source? [Clarify any misunderstandings.]
13. Finding a measure.
  - a. What is a topic or area of interest you might look for in GEM? How would you start to look for measures within that topic or area of interest? [Note if P goes to a content area, menu bar or search box. Let them continue until they have found a measure of interest.]
  - b. Please find the following information about this measure. [Note whether users notice the left nav on the measure detail page? Do they understand how to use it.]
    - Downloadable version [If they locate this on the measures detail page, also ask if they can do so from the measures landing page.]
    - Any workspaces that are using this measure
    - Reliability and Validity statistics
    - Intended audience
    - Whether measure is available in other languages
    - Average rating
      - Enter a rating for this measure (Make sure measure is "Rate This!" status, note where they go to rate- either stars at top right of screen or Comments/Ratings tab on left nav)
      - Current system uses 5 stars. Would you prefer to rate the measure using an open-ended pro/con list? Would you want both?
      - If you were familiar with this measure how likely would you be to enter a rating and a comment? If not likely, why not? (assess for barriers) What would motivate you to rate a measure?
      - How did you decide what rating to give? What information from GEM would you use to rate?
  - c. How would you change the author's contact info for this measure? [navigate to author tab on left nav and click Edit button on right side]
14. How would you submit a new measure to GEM?

15. Discuss the different statuses for measures in GEM. [These are the phrases that appear on the measures landing page. Not sure what users see when entering a new measure. Part of the problem is that terms may mean different things for those entering measures and those reviewing measures.]
  - a. Draft
  - b. Needs more info
  - c. Rate this!
16. Take a look at these two report formats [to be supplied by GEM] and tell me what about each one you would find useful. What additional metrics would you like to see generated from the report?
  - a. How might you use this information for your own work?
17. Now that we've explored the Measures section of GEM, let's look at [Workspaces].
  - a. Where would you find [Workspaces] on GEM?
  - b. Take a minute to look around this section and tell me what you think the purpose of this section is.
    - [If needed: The Workspaces section is a shared workspace for researchers interested in a specific topic, such as electronic medical records. In the workspace, researchers can share documents, identify relevant constructs and measures, and hold discussions.]
  - c. Click into one of the workspaces and review the resources that are available.
    - Are there any other resources or functionality that you think would be useful to have in a topic-oriented workspace?
  - d. Find the "Add New Measure" button. What do you think this will do? [Do they think the new measure will be entered into GEM-proper, or just this workspace? (GEM-proper) Do they expect the Workspaces field in the measure form to be pre-populated? (it is)]
  - e. [Sr. users only] How might you use the Workspaces section for your own work? Would you be inclined to create your own workspace?
  - f. Brian—did we ever test on the vertical navigation tabs in the Workspaces? If not, seems like it would be useful to make sure people know how to navigate around.
18. [If functionality is available] Please use the search box to search on a topic of interest to you.
  - a. Filter the results. [Any issues with using filters?]
  - b. Access one of the results. [Any problems getting to and from GEM content pages?]
  - c. Comment on presentation format on results page.

## Follow-up Questions

9. Administer the System Usability Scale (SUS) evaluation (standardized measure of website usability).
10. How easy or difficult was it for you to find the information on measures?

11. Was there anything missing – any information that you expected to see but didn't?

12. Is there anything about the organization of the web pages that you would change?

## Wrap up

OK, we're done. Do you have any further questions or comments?

Thanks again for your participation.

## **Appendix D - Verbal Informed Consent Form for the Grid-Enabled Measures Usability Test**

As part of this research, I need to ask you to formally agree to this usability test and interview.

As part of a research project for the National Cancer Institute's Grid-Enabled Measures (GEM) website, we are seeking to evaluate the appropriateness and usability of a new design. We are asking a total of about 14 individuals such as yourself to participate in a test of the NCI GEM website. We are asking you for about 40 minutes of your time today plus the time you've already spent responding to phone calls and/or emails.

We won't be asking anything personal and identifying information will not be shared. Any findings will be reported in aggregated form.

Your participation is voluntary, and if you choose not to participate it will not affect your relationship with the National Cancer Institute. You may ask questions at any time during the interview. You are also free to stop the interview at any time without penalty and without any questions being asked of you. Do you have any questions about the process of the interview/usability test?

If you agree to participate, you are saying that you understand what I've told you and that any questions you have were satisfactorily answered. You are also saying that you are at least 18 years old, and that you voluntarily agree to participate. Do you agree to participate in this usability test and interview?