Evaluation of the GovStat Statistical Interactive Glossary: Implications for Just-in-Time Help

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ABSTRACT
The GovStat Statistical Interactive Glossary (SIG) is intended to allow users of federal statistical agency websites to look up meanings of statistical terms they encounter on the websites without interrupting their tasks. This kind of just-in-time, just-in-place help is one approach to integrating help with users' tasks as seamlessly as possible. We discuss implications of an evaluation study of the SIG for the design and deployment of such help.

Categories and Subject Descriptors
H.5.1 [**Information Interfaces and Presentation (e.g., HCI)**]: Multimedia Information Systems – *animation, evaluation/methodology*

General Terms
Design, Experimentation, Human Factors,.

Keywords
Help, Glossary, Animation, Online help, Statistical terms, GovStat

1. INTRODUCTION
The NSF-funded GovStat Project (http://ils.unc.edu/govstat/) seeks to create an integrated model of user access to and use of statistical information from U. S. government statistical agencies. The project slogan captures the essence of our research goals: *Find what you need, understand what you find*.

The Statistical Interactive Glossary (SIG) is intended to help people understand the meaning of statistical terms they encounter when searching for or using statistical information [1],[3],[4],[5]. Because people are notoriously reluctant to use online help, several characteristics of SIG design were aimed at making the presentations attractive. The idea of just-in-time help is to be sure that help is available when the user realizes it is needed. The brief SIG definitions are intended to be linked to the occurrences of the

terms they define, so that people do not need to interrupt their task to search for them. Definitions are in a variety of forms, including text, still graphics, and animation, to accommodate users' preferences for mode of presentation.

Research on the effectiveness of multimedia, including animation, in help systems describes mixed results. Learning style, personal preference, experience, and novelty may all play a role. Multimedia may sometimes distract users from attending to the content. In addition, there may be an interaction between the type of content and the presentation format, implying that forcing content into inappropriate formats may lessen its impact.

2. GOALS OF THE STUDY
We evaluated the SIG in order to determine its effectiveness. "Effectiveness" is a difficult term to define in any system; we focused on three criteria. An effective SIG presentation should:

- help a person understand what a statistical term or concept means,

- increase a person's confidence in their understanding of the term or concept, and

- be perceived as effective, as well as helpful, informative, attractive, (and other subjective qualities).

We therefore investigated two main research questions.

1. Does viewing a SIG explanation help people understand statistical terms?

2. Does the format in which the explanation is presented affect whether it helps people understand statistical terms?

We looked at the number of questions people could answer correctly and their confidence that they had chosen the correct answer.

3. OVERVIEW OF RESULTS AND IMPLICATIONS FOR AGENCIES
Nineteen people completed the study. (Complete results of this study may be found in [2].) There was no difference between participants' results based on their previous statistical experience. Participants answered 73% of questions correctly before viewing the presentations and 86% post-presentation, with little difference among presentation formats. On a 5-point scale, participants' confidence that they had chosen the correct answers increased

from an average of 3.38 pre-presentation to 4.36 post-presentation, regardless of whether the answers were correct

In post-test interviews, some participants expressed preference for a particular format. To some, the type of term being explained made a difference. The idea that graphics and animations are especially useful when there is an action or process involved is consistent with research suggesting that animation can be unnecessary or annoying unless there is a movement or process to be expressed. Speed of presentation was also mentioned, especially for animations. One thought the animation went by too quickly, others thought that it took too long for the amount of information delivered. Text was seen as being faster, and perhaps more efficient. Many people commented that the graphics or animations grabbed their attention, whereas text was "simple and basic".

Most participants found the presentations helpful, and their confidence either stayed the same or increased. However, viewing a SIG presentation is not a guarantee that people will then understand the term. If people believe that they know what the term means, then it may take more than a brief explanation to change their minds. In actual use, they are unlikely to look at the presentation at all. People who are uncertain about their understanding are probably more likely to view help, and whether their initial understanding is confirmed, or they learn something different, their post-presentation confidence may increase. A crucial issue is how to motivate people who need help to view it.

The third criterion was that the presentations should be perceived as being effective, helpful, informative, attractive, etc. Positive comments outweighed the negative on all aspects, and provide guidance for presentation design. For example, people often claim to want control over the operation of animated presentations. A related study [6] that examined the animated presentations with various controls found little actual difference in effectiveness or use of the controls. This is likely to be attributable in part to the brevity (30-60 seconds) of the presentations; controls may be more important in longer animations.

The dynamics between semantic characteristics of the term being explained, the format in which it is explained, and individual preferences are difficult to tease apart. One factor seems to be the efficiency with which people perceive the information is communicated. But perceived efficiency is not just a matter of the length of the explanation takes; it is affected by the nature of the information. The cognitive effort of understanding a textual description of a procedure may be greater than viewing an illustrative animation, and thus the text may feel more inefficient.

If a term can be explained with a relatively straight-forward definition, even those who claim to prefer graphics or animation may find that a text explanation is sufficient and feels most efficient. If the term's meaning contains active or procedural elements, graphics or animation may represent them more clearly, thus trumping expressed preferences for text; the animation seems more integral to expressing the term's meaning. Members of our research team echo this notion, finding it difficult to "add" motion to the definition of some terms (e.g., race and ethnicity).

The import of these findings for content providers such as the federal statistical agencies is significant, because of the issues involved in providing animated glossary definitions. The design effort is greater for animations than for graphics, and greater for either than for text definitions. Agencies prefer to minimize hardware and software requirements for their users. Our findings suggest they could reserve animated explanations for those terms that contain elements of action, activity or process and thus will really benefit from animated explanations. Criteria for identifying such terms would be valuable.

There is another dimension to this discussion, however; the best help in the world is useless if people don't use it. Participants indicated that they found the animations attractive: "really cool, visually stimulating", "more cheerful". Understanding the factors that determine the interplay between attraction and perceived efficiency requires more research.

We want to emphasize the effectiveness of the SIG presentations. Users can learn enough about a term or concept to proceed with their task without having to shift their attention from their task. "Just-in-time" help such as the SIG presentations deliver a brief, focused nugget of help at the time and place when it is needed, reducing the gap (perceived and actual) between users' tasks, the information they need, and information that will help them complete their tasks. Closer integration between information and help should increase people's benefit from help.

4. ACKNOWLEDGMENTS

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