Research Project Proposal

"Are Screencasts Effective Tools to Supplement Text-Based, Technical Instruction?"

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Introduction

Background / Abstract

I provide text-based technical instruction to Michigan State University (MSU) faculty and staff who access and utilize business software applications, which were introduced in January, 2011. This software is referred to as Enterprise Business Systems, and abbreviated as EBS (I will use the EBS abbreviation in this document).

In May of 2012 I created a screencast on configuring and using Adobe Reader (which is software used to interact with EBS business applications). Multiple MSU technical teams are now considering the possibility of creating other screencasts covering other technical and procedural processes, as an additional form of instruction to MSU software users. Data from this study will be primarily used to identify topics and structure the content of future screencasts.

This research design is based on previously reviewed and critiqued practitioner and academic studies involving screencasts as an instructional delivery channel, and participant's computer (software) literacy, explained by Mehlenbacher (2010) as the "…ability, training, and general education that learners have with technology" (p. 225).

Focus

Based on what I've learned from other people's research and on my own thinking on this topic, the focus of my research has evolved. The changes and the reasons for the changes in what I'm going to study include:

1. ***My research question has shifted slightly***, from studying the general benefits of screencasts for technology instruction, to *understanding if screencasts are an effective supplement to text-based technical instruction*. In the Cast.org *Teaching Every Student* (2012), they note that: " …text-only instruction will give way to a more deliberate application of multimedia… reducing barriers and inefficiencies inherent in one-size-fits-all printed [text]." Narrowing the focus of my research question assists me in better targeting participants, and in the structuring of questionnaire prompts to obtain valid, desired data that can be used for my study.

2. ***My research method has changed*****,** from strictly Quantitative (negative correlational, looking at a relationship between the introduction of screencasts and a reduction in help desk calls related to the subject of screencast) to Mixed Methods, through the use of quantitative interviews and qualitative participant questionnaires, to support a quasi-experimental test. In their search for screencast weaknesses, the Palaigeorgiou (2010) study also used a mixed methods exploratory approach to gather insightful qualitative participant comments and quantitative measures on screencast use (which screencasts, how often viewed, average length of viewing session). Mixed Methods should better indicate the probabilistic trends and actions of my participants.

3. ***My targeted participant sampling has grown***, from the (limited) set of end users that had viewed the available screencast, to now all Michigan State EBS software users. The Pinder-Grover (2008) study found that only 72 students out of 144 enrolled in the class participated in a voluntary survey. My prime concern is getting sufficient participant questionnaire response to justify my data and any nomothetic inferences and conclusions I make.

Lessons Learned from Other People's Research

From their work, the most important lessons or ideas I've gained include:

1. Brecht's (2008) research used an anonymous participant survey to solicit unbiased responses, and found that "…27% of the responding students …did not use the [screencasts] at all and several important survey questions did not receive statistically significant…responses" (p.73). This information led me to incorporate two processes in my study, the first is to provide follow up questions on the questionnaire if a participant indicates they did not view the screencast (did they know about the screencast, did they assess that it wouldn't be helpful, etc.). The second is to group participants into control (no screencast viewed) and experimental (viewed screencast) groups.

2. Hickman's (2006) review on the challenges of online assessment and evaluation notes that "…self-assessment will reveal to both instructors and students how much the students have become self-directed learners" and that "…another helpful source is from a student's peers." This information helped me recognize the benefit of adding items to the questionnaires to gather participant's personal assessments; and to inquire as to where they go to get assistance (and if it comes from those that they work with, or the onsite technical support individuals that are available to answer technical questions and issues).

3. Results from the Oud (2009) study highlight the need to "know your students" and that it is "important to know students' level of pre-existing knowledge because different strategies are required for learners with different levels of expertise" (p. 172). Oehrli's (2011) research identified that a longitudinal study was needed that investigated whether students retain the concepts from screencasts and positively affect their academic work (p. 135). From these remarks I decided to issue a second student self-assessment questionnaire three months after the initial one to test knowledge retention, and ensure questions related to the ability of the screencast information to assist them in their daily interaction with EBS was included.

Lessons learned from my Quick Research Projects. In the QRP, we had a chance to try four major research methods: observation, survey, experiment, and interview. As I think about my own study, I feel the most appropriate method(s) would be: a Mixed Methods approach of:

1) *A Quasi-experimental study, using a nonequivalent groups design.*
2) *A voluntary, web-based, anonymous questionnaire* (pre- and post-experiment) to participants.
3) *Interactive interviews with the technical support (Help Desk) team, and with on-campus MSU support technicians.*

The base of this research is a quasi-experimental study, comparing MSU EBS software users that have viewed the screencast against those that have not viewed it. My independent variable is screencast review, and the dependent variable is whether this indicates a positive relationship in the use and technical debugging of EBS software.

I have selected participant questionnaires (surveys) primarily due to the fact that I am remotely located from participants. There isn't any dedicated onsite resources to administer an interactive experiment and be available to observe the results; thus it would be difficult to defend questions related to the validity of any related participant data. The decision for anonymous questionnaire is due to some sensitive data that will be gathered (gender, age, English as a first language), and to improve the likelihood for unbiased participant self-assessments on their technical skills.

I am using interactive interviews with the Help Desk team because they are funded by the same Unit that my team is, and are located in the building adjacent to mine. I have worked with this team in 2011 when our EBS software was released to MSU, and I trust the validity of both their comments and support call analysis in relation to EBS issues. This group will also be used to analyze the experiment's data, and look for a reduction (negative correlational effects) on the number and types of EBS support calls received.

MSU onsite technicians will be asked to provide general technical assessments for the team(s) they support, in regards to their ability to use EBS software and supporting software.

Designing a Feasible Study

It is important that I design a study that is feasible - a study that could happen in the particular constraints of my work setting. When I think of some of the studies I've read, I realize that the constraints of investigating this topic in my work setting include:

1) *Unknown counts and percentages of EBS software users*; their breakdown by gender, race, or technical backgrounds/experience. This information will be paramount to the resulting inferences and conclusions made. Due to its importance and sensitivity both for this and for future studies, I have decided on an anonymous participant questionnaire to obtain this data.

2) *Currently there is only one screencast for participants to view*. While this can be a benefit from the perspective that participant feedback can be tied directly to one viewed screencast module, the negative aspect is that it may limit the number of participants with actual experience viewing a screencast. To adapt for this constraint, I decided to increase the number of invited participants to all MSU EBS software users. I should now be able to make some stronger related inferences regarding the control group (non-screencast viewers).

3) *I am not physically located on MSU's campus*. This (coupled with the fact that EBS software users are located across MSU and at satellite offices around both Michigan and the globe) prevents convenient onsite observation, and was a secondary condition that necessitated the use of online questionnaires. I will also interview technical teams and individuals that support the EBS end users with the use and configuring of their computer software.

Study Design (Methods) & Rationale

Participants

I will choose participants with the following qualities:

- Adults, age 25 or older.
- Full time employees of Michigan State University (only), located on MSU's campus or at a satellite (extension) office.
- Both males and females.
- Ethnically- diverse, including those where English is not their primary language.
- Technically-diverse, from those with little or no technical skills/experience, up to and including those that use and evaluate technology on a daily basis (based on participant self-assessment).

These qualities are important to my study because:

1. Participants are part of the overall group being studied (MSU employees). Data is based on the actual audience, not a representative sampling that has to be connected to my end users in some manner.
2. All MSU employees have access to software technical support website (where instructional text-based documents and screencasts are located).
3. By excluding adults under the age of 25, I remove an attribute that could skew the data [MSU student workers that don't work year round or are not full time users of the EBS software].
4. With participants that indicate English is not their first language, provide question(s) to determine if current text-based instruction is clear (no acronyms, slang, or other terminology that could be confusing). Also check to see if visual qualities of screencasts remove these barriers.
5. Data from this study can be analyzed and used in other related research studies.

Instruments

The source(s) of my data will be:

1) *Voluntary participant surveys;* an entrance questionnaire, to set a baseline on my participants self-assessment of their technical skills; and a follow up questionnaire to be completed three months later to track changes to these same participants (assessment and screencast use).

2) *An interactive, in-depth interview with the (technical) Help Desk team*, which receives provides phone support and opens tickets to engage other support areas (as needed). Data on the types and volumes of technical calls from participants can be tracked and analyzed for patterns against technical topics that have been covered in a screencast. This team will also assist in evaluating the questionnaire data I receive from the EBS participants.

3) *Interactive interviews with technical support individuals,* who provide onsite technical assistance to EBS software users. Interviews will primarily focus on their assessment of technical proficiency that their supported EBS users possess.

A few details of my data sources include:

Initial Participant Questionnaire ("EBS Instruction and Support"):

1. How often do you review the EBS documents located on the EBS Website? (once a week or more; once a month or more; less than once a month; never).

2. Likert ratings (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) for the following EBS text document questions:

    a. EBS documents (located on the EBS Website) effectively communicate the subject matter.
    b. I am satisfied with the content contained within the EBS website documents.
    c. After reading EBS documentation I better understand the subject (can apply what I have learned).

3. Participant suggestions for improving the EBS instructional docs**:** [freeform entry]

4. How often do you review the EBS screencast located on the EBS Website? (once a week or more; once a month or more; less than once a month; never).

5. Likert ratings (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) for the following EBS screencast questions:

    a. The screencast effectively communicated the subject matter.
    b. I was satisfied with the content contained within this screencast.
    c. I was satisfied with the speed/pace at which information was presented.
    d. After watching the screencast I better understand the subject (can apply what I have learned).

6. Participant suggestions for improving the screencast: [freeform entry]

7. I find the most effective, self-directed way to learn how to use and configure EBS software is: (a) Text-Based Documents (b) Screencasts (c) Both 'a' and 'b' (d) Other

8. Additionally I trust the following sources to provide dependable and easy-to-follow EBS instructions [select all that apply]: (a) My team/coworkers (b) My local technical support (c) Help Desk (d) Pathways (e) Other Source (f) None

9. For classification purposes, please provide the following information:

    a. *Gender*: Male; Female; Prefer Not to answer
    b. *What is your age range?* Under 25; 25-40; 41-55; 55-70; over 70
    c. *Select the MSU group you belong to*: Faculty; Staff; Other
    d. *How many years have you worked for MSU*? Less than 5; 5-14; 15-25, 26+
    e. *Do you consider English to be your primary (first) language?* Yes/No *(If yes, ask follow up question(s rating current text*-based and screencast instruction, to identify if the content is clear and understandable)
    f. *How would you rate your current knowledge/use of EBS?* Beginner; Intermediate; Advanced; Expert
    g. How would you rate your overall knowledge and general use of technology? Beginner; Intermediate; Advanced; Expert

Follow up Participant Questionnaire ("EBS Instruction and Support – Part 2"):

Provide same questions as initial questionnaire above (for compare/contrast efforts in the study), but also ask question if participant completed the first questionnaire on EBS Instruction and Support, so data can be used to compare against data collected from pre-experiment.

Interview with Onsite Technical Resources

- Ask a short list of questions to obtain their assessment of technical capabilities within the departments and groups they support.
- Gather length of MSU employment, to be used to evaluate/weigh and validate their responses; that is, resources that have worked for MSU for a short period of time may not yet be able to accurately assess the technical skills of their supported individuals.

In-depth Interview with Help Desk Team:

- Ask a short list of questions to obtain their assessment of perceived technical capabilities within the MSU departments and groups they support. Investigate whether this team believes EBS end use technical skills are advancing or not.
- Engage senior members of this team to assist me with data collection and analysis.

Procedure

The procedure steps for my study are:

1. Create a questionnaire in Survey Monkey to gather participant's technology self-assessment and related demographics.
2. Send a web link to the initial questionnaire via the weekly Pathways (an electronic journal issued to MSU employees), explaining the purpose (to understand the participant's desired ways of learning technology), and to gather basic participant demographic information (age range, gender, length of MSU employment). Clearly state the questionnaire is anonymous and will be used to review the effectiveness of current technical information/support methods. Also add questionnaire web link to EBS support website, along with same information outlined in Pathways article.
3. All current methods of technical support (phone, web links, screencasts, textual, onsite personnel) will be covered on the questionnaire, although the focus of this study will specifically analyze screencasts and text-based support documents.
4. Five-point Likert rating items will be used and summed to provide a scale model on average response. Questions will offer a format of "strongly disagree, disagree, neutral, agree, strongly agree" to gather and measure response.
5. Collect participant responses for two weeks. Continual notices of this questionnaire's availability will be provided to EBS users over this two week "open participation" period via Pathway articles and other electronic correspondence.
6. Divide responses into two groups, based on whether participant indicates they have viewed the EBS screencast or not.
7. Approximately 90 days after the first questionnaire collection period ends, issue the follow up questionnaire and notification of its ability to EBS end users. Same questions and rating scales as initial questionnaire, with additional question(s) related to retention of accumulated technical skills and use of EBS software.
8. Interactive, unstructured interviews (in person or over the phone) with Help Desk and onsite technical support individuals to inquire and assess end user's current technical skills, and follow up to see if any perceived changes three months later (after 2nd questionnaire).

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