

Experiments and Web Development Correlation

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Abstract

User assessment is important for interactive computer system development including web development, and participation in experiments such as computer science or psychology is very similar to user assessment when developing web pages. In this report, I participated in two different types of experiments, in one of which I was a participant and the other was an experimenter. I try to learn from these experiments what may be relevant to what users say about the web system.

Introduction

When developing a website, it is important to do user evaluations for the system. When participating in some experiments, whether as participants who provide experimental data or as experimenters who collect data or make comparisons, their psychology, thinking, and behavior have strong similarities to website user assessments. I participated in two experiments. In the first experiment I took an online questionnaire aiming to develop a new questionnaire called the Self-Efficacy for Health Behaviours Scale (SEHBS). As the participant who provided information, I answered some questions about health behaviors [1]. In the second experiment, we as experimenters used a scenario-based approach to evaluate four e-readers. By reflecting on these two experiments, I learned a few things about user evaluation of websites.

First Experiment

Experiment Summary

The goal of this experiment is to develop a new questionnaire called the Self-Efficacy for Health Behaviours Scale (SEHBS). I was invited to complete a Qualtrics survey that includes a series of questions about confidence to engage in various health behaviors, health-related quality of life, social support, and general self-efficacy.

Experimental Experience

The survey took about 20 minutes and consists of sets of questions, divided into chapters, with the questions in each chapter grouped by topic. I need to look at the questions and choose the option that works for me based on my situation. None of these questions are yes or no questions, but several options are given in the interval from "completely suitable" to "completely unsuitable" or "completely agree" to "completely disagree", and I need to choose the closest degree according to the problem and how applicable this question is to my own situation. It is not difficult to complete this experiment. Most of these

questions are closely related to health topics, which are clear and very close to reality. I can almost always find the right option based on myself, with only a few questions I chose "not applicable".

It is worth noting that questions such as "To complete this question, please select 'slightly applies'" are lightly mixed with questions in the late stage of the experiment, which have nothing to do with the subject of the experiment, "health". I'm guessing this was to verify that the participant was answering the questions seriously, since the experiment did not show the progress and the participant had no way of knowing how many questions were left to answer. In addition, I was asked at the end of the experiment whether I had actually answered the previous questions and whether my results should, frankly, be used as collected data.

Evaluation

I think this experiment has largely served its purpose. The questions were well grouped and clear, and I was able to answer them smoothly. A small number of questions to detect participants' attentiveness and the final questions about the authenticity of the data ensure the reliability of the data to a certain extent. However, some questions were similar, which to some extent increased the number of questions that participants needed to answer. At the same time, participants might lose patience in the later stages of the experiment because they had no way to know how many questions remained to be answered, and the number of questions was not small.

Second Experiment

Experiment Summary

In this experiment, we evaluate 4 e-book readers using a scenario-based approach. We purchased 4 e-book readers within a certain budget, and built a usage scenario that is close to life, that is, a busy person who is unwilling to bother to read the manual. We found 12 people to participate in this experiment and drawn conclusions through multiple evaluations of multiple aspects of the devices.

Experimental Experience

We selected new or used e-reading readers in the \$50 to \$75 range, with used products purchased from eBay. The 4 devices that finally arrived are Barnes & Noble Nook 1st E (device A), Kobo Touch (device B), Amazon Kindle 4G (device C) and Sony PRS-600 (device D), the prices are in order from high to low. These devices all use eInk screens, and we pre-downloaded over 70 books. Our hypothetical scenario is that you received an e-reader as a gift but never turned it on. Now you need to register before the specified date without a user manual. The registration process requires finding the device model in some user guide and then find the device in the "Dates2013" document, which is designed to let users do a quick and superficial evaluation. We found 12 people who participated in the experiment with an average age of 24.8 years. The evaluation task was done in pairs, and each device was evaluated 3 times by different people. The result shows that device A is the worst, devices B and C are similar, and device D is between the best and the worst. Also, we found that the task of navigating to a specific area is very important, which largely affects the experimental results.

Evaluation

I think this experiment did not fully achieve the purpose of the experiment. The experiment has a nice set of scenarios and task assumptions to simulate real-world situations, e-readers purchased at similar prices and both new and used. The data collected can be considered authentic, but because there are too few people taking the test, and they are all students of the same major, they cannot represent the wider consumer group. It is worth to find more people of different ages and different industries to test.

Comparison

The types of these two experiments are not the same, the first experiment is to understand a person's health status through an online questionnaire, and then develop a new SEHBS questionnaire, while the second experiment is to ask different people to rate some real devices. They are similar in that the participants in the experiments are directed to almost everyone so that to gather objective, general information. When I participated in the first experiment, I basically felt good, and participating in the experiment also gave me a better understanding of my health. In the second experiment, I felt that the experiment was well organized, but there were fewer people participating in the experiment. In contrast, I think the first experiment performed better because its results were more representative.

Relevance of the experiments to web design and development

Experimentation is often used as a means to continuously validate user requirements and help make software development decisions. Involving users in the development of web products benefits both users and developers [3]. By participating in the above experiments, I have gained a deeper understanding of web design and how to involve users in evaluating web products.

First of all, in website design, it is important to let users know exactly what they are doing or trying to do. This will affect the user's evaluation of the web system to a certain extent. In both experiments, I knew exactly what I was doing and why, which gave me a better experience. In network design, if users are required to complete a task, proper prompts and explanations are necessary, which can allow users to clearly understand their tasks.

Second, it is best to involve users in the evaluation as early as possible [4], which can lead to better products for users, more efficient development, easier accessibility [3], and other benefits for project stakeholders. Target users often have more hands-on experience and experience than developers, and involving them in the design and development of web products can better guide developers' work with their needs, while avoiding bad designs for users. Involving users as early as possible can identify problems earlier and avoid greater losses.

In addition, if users need to participate in the evaluation of web products, it is necessary to collect information from as many and diverse users as possible to obtain more objective and general feedback. In addition, the feedback information should also be screened to avoid the impact of invalid feedback on the results as much as possible.

References

- [1] SONA, “Boosting our confidence to have a healthier lifestyle”, online: https://anupsysch.sona-systems.com/exp_info_participant.aspx?experiment_id=976, [Accessed 30/10/2022], 2022.
- [2] Tom D. Gedeon, and Ujala Rampaul, “Popular eReaders”, online: <https://wattlecourses.anu.edu.au/mod/resource/view.php?id=2721959>, [Accessed 30/10/2022], 2014.
- [3] Sezin Yaman, Fabian Fagerholm, Myriam Munezero, Tomi Männistö, and Tommi Mikkonen, “Patterns of user involvement in experiment-driven software development”, online: <https://www.sciencedirect.com/science/article/pii/S0950584919302629>, [Accessed 30/10/2022], 2020.
- [4] Shawn Lawton Henry, Shadi Abou-Zahra, and Andrew Arch, “Involving Users in Web Projects for Better, Easier Accessibility”, online: <https://www.w3.org/WAI/planning/involving-users/>, [Accessed 30/10/2022], 2019.