

Changes in study design

Operationalizing User Experience scale in a different way

O'Brien's user engagement scale (Long form) [2] was initially developed for shopping malls and websites which has a bit different use case than human computer interaction. Also, since we are asking user to complete this user experience scale four times in a study, using long version of user engagement scale might be seem tiring to user and it can lead into results which can be slightly deviated from our hypothesis. Hence O'Brien's another version of user engagement scale (Short Version) will be used to measure user experience which was derived from long form for Human Computer Interaction (HCI)

There are four sub-scales in O'Brien's short version of user engagement scale which are as follows [1]

1. Focused Attention (3): Focused Attention, feeling of completely occupied in the interaction and losing sense of time.
2. Perceived Usability (3): Perceived usability, negative experience because of interaction with interface and total effort invested
3. Search Effectiveness (5): Evaluating interface features, quality of search results
4. Reward (3): A potential signature of successful completion of task

We have slightly modified the above scale by adding Search Effectiveness (5) as one of the measures instead of Aesthetic Appeal. Since Aesthetic Appeal measurement is not completely relevant to our research questions, we have used search effectiveness instead. Search effectiveness is operationalised by 5 sub-points as below:

Following below method is used to measure overall engagement score of a user:

- Firstly, reverse code the 3 sub points Perceived Usability
- To calculate average score of each sub-scale, calculate the total score by adding numbers (1=Strongly disagree 5=Strongly agree) of each subpoint and dividing it with total number of subpoints. For example, for focused attention average score will be total score/3.
- Final score can be calculated by adding score of each subpoint divided by 14 (Since it is 14-point sub scale)

Updated Study Protocol:

Study Procedures:

- This section will provide you with information to make informed consent to consider your active participation in study.
- This consent form will be provided to you at the beginning of the study so that participants can read it carefully. You will be given opportunity to ask questions and this will ensure that you are provided with full disclosure before beginning the study. Note that it is emphasized that participant would denote approximately 90 minutes to complete information search task on both the interfaces.
- The study will be conducted online via Zoom meeting. Participants will be asked to share their screen while performing their information search tasks. You will not require to be on your video. You will be asked to change your name with participant id provided to you, so your data will not be linked with your personal information. Zoom session will be recorded to monitor your interaction with the interface.
- A video tutorial will be played which will allow participants to learn how to use both the interfaces to and to ensure that participants use all the features on experimental and baseline interface to complete the search task according to requirements. You will be given opportunity to make yourself comfortable with both the interfaces before actual start of information search task.
- We will proceed with the information search task once you are comfortable and confident about both the interfaces.
- At time stamp1, participant will be asked to complete one level of each task at both the interfaces one by one. Before beginning of the search task, you will be asked to complete domain knowledge questionnaire which will be used to test your prior knowledge of the search task assigned to you. Search task description and instructions will look like
“Please carefully follow the instructions before initiating search task. Your goal is to find the information that is mentioned in the task descriptions. You will need to save documents that you find relevant to information search task. Use the interface feature to save the documents and in case if interface do not provide feature to save document, just download those documents that you found relevant. Once you complete your task just type “complete” in zoom chat box.”
- After completing search task at each interface, you will be asked to complete a user experience questionnaire based on your experience with system

interface for given search task. This usually take around 10 minutes. You will be given a short 2-minute break between each task.

- At time stamp2, participant will be asked to complete another level of task at both the interfaces and same process will be repeated as in Time stamp1.
- At the end, after completing task and user experience questionnaire for both the interfaces, you will be moved on to last stage to fill out Exit Questionnaire form in which you will be asked about system preference.
- Please feel free to ask any questions regarding the procedures and goals of the study or your role.

References:

[1]. O'Brien, Heather & Cairns, Paul & Hall, Mark. (2018). A Practical Approach to Measuring User Engagement with the Refined User Engagement Scale (UES) and New UES Short Form. International Journal of Human-Computer Studies. 112. 10.1016/j.ijhcs.2018.01.004.

[2]. Arguello, Jaime & Wu, Wan-Ching & Kelly, Diane & Edwards, Ashlee. (2012). Task complexity, vertical display, and user interaction in aggregated search. SIGIR'12 - Proceedings of the International ACM SIGIR Conference on Research and Development in Information Retrieval. 10.1145/2348283.2348343.