Tutorial 2: Task Design

Human Computer Interaction
Dr Kami Vaniea

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1 Introduction: Research Questions and Tasks

There are many different ways to test research questions in a lab study, but a common one involves asking participants to engage in *tasks* that have been designed to balance participant free will against giving them enough instructions to ensure that they engage in the activities researchers are interested in. The idea of task-based lab studies is fairly simple. The participant comes into a lab, or joins a video call, and is then asked to use some software to accomplish a set of provided tasks while the researchers watch. Because the participant has likely never worked with this exact software before, having the tasks helps them know what to do. During normal usage, a user will form their own tasks such as "find the link to join my tutorial". But if they are in a lab setting and unfamiliar with the software, they will likely struggle to form their own tasks without guidance. But any guidance that they are given will bias how they use the technology, sometimes in ways that help researchers' ability to answer their questions, and sometimes in ways that hurts their ability to do so.

In this tutorial, we are going to be discussing how task wording can impact participant behavior, which in turn impacts what you can and cannot learn from watching the participant use the system. In other words, we are going to be looking at how tasks and research questions relate to each other.

2 A simple user study with a simple task

To help you get a sense of what a user study looks like and how task wording can effect what people do; we have recorded three people completing the same task. Before recording, the researcher first helped each participant open OneDrive and create a blank folder, so that none of their personal files would be recorded. The participants therefore started the task with OneDrive open in their browser. They were asked to read the task aloud, complete it, and then say when they thought they were done.

The main **research question** was:

> When trying to share a Microsoft Word document, what challenges to users experience when trying to find the "share" option and using it to allow another named person to be able to read the document?

The **task** was:

> Create a new Microsoft Word document through the OneDrive on-line interface. Change the file name to "HCI Test" and then share it with the course instructor Kami Vaniea.

2.0.1   Activity 1: Watch the studies

Everyone in your group should watch:

"HCI Tutorial 2: Task Examples" on Media Hopper

While watching the three users, think about the following questions.

- **Challenges the users had when trying to find the share option and make the document visible to Kami Vaniea.** Focus on the parts where they were trying to share. List the problems they experienced. *Fairly obvious. All were able to do the task ok. User 2 couldn't find the button on the upper right, but was able to find it through the file drop down.*

- **Other blockers they experienced.** Any situation where they experienced minor challenges that had to be resolved before continuing with the task.

  User 1 had a plugin that was blocking Word from loading. She had to turn it off first. She also had a drink of water because the file was taking so long to load. User 2 did not see the options to rename or share, so he had to go find them in the file menu. He was also briefly confused about the file name extension being some space from the file name. User 3 tried to type in the filename box but failed on the first two attempts and had to click elsewhere on the page and then try and edit the file name again.

- **How they interpreted the task.** In what ways did they interpret the task differently from each other?

  User 1 assumed that she needed to give Kami edit rights, so she first changed the permissions then shared the file. User 3 decided to type the file name into the document first.
  There are two "Kami Vaniea" on the sharing interface, yet all three users selected the first one, likely because they assumed the one with the icon picture was the correct one to share with.

2.1   Task wording constrains participant actions

Task wording helps a participant know what to do, but it can also constrain their choices or cause them to take actions that they might normally not do. For example, some users likely never create Word documents in online OneDrive website, instead they may create them using the Word program installed on their Windows computers and then save the document to a OneDrive folder.

In some ways imposing these constraints is good, maybe we want to test if the OneDrive website is usable by everyone, including people who use it rarely. In this case, we need to tell the user that they must use the OneDrive website, or we will not be able to test what we want to test. However, constraints can

also limit what we can measure. If we tell someone to do something in the task wording then we loose the ability to measure it. For example, the earlier task told users to name the document "HCI Test" so we cannot use this task to measure what names people might choose for the file. Because they are not choosing the name, they are following our instructions. Similarly, we cannot use the task to measure if people like to use capitalization in file names, because the participants were shown the task written down, so they naturally used the capitalization written in the task.

2.1.1   Activity 2: what questions can this task answer?

Imagine that the researcher running this study was interested in the following questions. As a group, read each of the questions below and discuss if the researcher can or cannot use the above OneDrive task to answer their questions.

1. Are people able to easily find the "Share" button in the upper right side of the screen?

   Can be answered. The task tells the user to share the file, but does not tell them how to go about sharing it. So the task does allow the researcher to learn if people can find the button. However, the task itself uses the word "share" so users are primed to look for that word in the interface. It is possible that users would have chosen a different approach if the task had used a different word like "send".

2. Is it clear that the file name can be edited by clicking on it?

   Cannot be answered. This one is tricky though. For participants who notice that the file name is editable, we can easily see the answer to the question, because they click and edit it. But for participants who first look at the File menu, the researcher cannot know why they looked there instead of the file name. It could be that they never even looked at the file name, or it could be that they looked but assumed that they cannot edit.

3. Are people able to easily create a Word Document starting from the main OneDrive page?

   Can be answered. Though similar to finding the share button, the use of the word "new" in the task may prime participants to look for that word in the user interface. A better task might have said "Create a Microsoft Word..." to prevent bias from the word "new".

4. Are people able to easily determine who already had the ability to view the file?

   Cannot be answered. This task will require the user to open the interface that shows them information about who has access to the file. But the task does not require them to engage with the information. So the researcher cannot tell if the participant has read and understood the information or not.

5. How fast can people complete the task?

   Can be answered, but with limitations. Because the participant is just doing the task the way they normally would, we can measure how long it

takes them. However, some of these participants rarely use online Microsoft products and are therefore likely slower than they might be if they got more practice.

6. Why do some people choose to first look under the file menu?

   Cannot be answered. In this type of study the participant does the task, but they do not explain why they are doing what they are doing. Therefore, most "why" type questions will be challenging to answer using this design. Additionally, the researcher cannot actually tell where the user is looking, only where their mouse moves to and what they click on. So the users may be first looking at UI elements other than the file menu and the researcher would not know.

3 Slightly more complex Path example

In this section we are going to switch to looking at the Path website used by the University of Edinburgh. Path is intended to be a more friendly version of DRPS, which is the official source of all information regarding degrees and programs of study.

3.1 Task specificity

In Section 2.1 we talked about how task wording both guides the participant while also constraining their actions. One way we can control the balance between guidance and constraint is by controlling how specific the task is. Tasks with more specifics, particularly specifics about what to look for or what buttons to press, are better for measuring the usability of specific features or issues. While tasks that are more broad and contain less specifics about what to do are better at testing questions about what a user would normally do on their own or how the user themselves forms goals.

3.1.1 Activity 3: match tasks and research questions

Table 1 on the next page contains a list of research questions (rows) and tasks (columns). For each combination of task and research question put one of the three marks below:

- ✓ If the task *can* be used to answer the research question.
- O If the task *can* be used to answer the question, but some participants may choose a completion route that bypasses the object of study.
- ✗ If the task *cannot* be used to answer the research question.

4 Write your own tasks for Learn usage (optional)

Imagine that you wanted to test the usability of a Learn course. Think back to some of the interviews last week where people discussed the types of things they do with Learn. Try and use the activities they described to

Research Questions	Tasks				
	T1. Find out if first year Law and Economics students at the University of Edinburgh are required to take the class 'Scottish Legal System'.	**T2.** Use Path to find out if Law and Economics students are required to take the class 'Scottish Legal System' in their first year.	**T3.** Use the degrees feature on Path (https://path.is.ed.ac.uk/) to find out if first year Law and Economics students are required to take the class 'Scottish Legal System'.	**T4.** Open the Path website (https://path.is.ed.ac.uk/). Login if needed. Click on the "Degrees" link then click on "School of Law" and finally "Law and Economics (LLB Hons)". Answer the question: "Are the first year Law and Economics students required to take the class 'Scottish Legal System'?"	**T5.** Open the Path website (https://path.is.ed.ac.uk/) using your mobile phone's web browser. Login if needed. Click on "Degrees" then click on "School of Law" and finally "Law and Economics (LLB Hons)". Answer the question: "Are the first year Law and Economics students required to take the class 'Scottish Legal System'?"
RQ1. How well are users able to interact with the Path UI elements? Do UI elements render properly and are buttons large enough to be easily pressed?	*O – Task does not specify that Path should be used. Participant could use DRPS.*	*✓ – The task specifies that participants use Path so the researcher can observe how the UI is rendering and working.*	✓	✓	*✓ – This task will give us added information about mobile users specifically.*
RQ2. Are users able to find the "Degrees" section of Path without making mistakes?	*O – Task does not specify that Path should be used. Participant could use DRPS.*	*O – Task does not specify that the user use the "degrees" section. They might instead try searching for the course.*	*✓ – Task hints that there is a "degree" feature, so user will likely try and find it, which will tell us if they are able to locate it.*	*✓ – User is explicitly directed to click a "Degrees" link, so we can learn if they are able to find it.*	✓
RQ3. When trying to learn about degree program requirements, do users voluntarily use Path?	*✓ – The task does not specify what tool to use, so we can learn what tools users will try on their own.*	*✗ – The task specifies that Path should be used. So we cannot determine if the user would have selected Path on their own.*	✗	✗	✗
RQ4. When looking for requirements about programs of study, what keywords, terms, or link text do users engage with?	*✓ – Researcher can observe keywords from search, as well as any link text they click on even if they never visit Path.*	*✓ – Researcher can observe what link text they try and what search terms they use. Even though they are directed to Path, these terms will still be formed by the user.*	*O or ✗ – The task specifies looking for a degrees feature, so the participants are primed to look for that word. We may still be able to learn what other words they look for though.*	*✗ – The task directly specifies clicking on "degrees", so we cannot measure what terms the user might look for.*	✗
RQ5. How many times do users return to prior pages when trying to find if a class is required by a degree program?	*✓ – We can measure back tracking, but the measures may be inconsistent because the user can use any tool.*	*✓ – Best task for this question, since participants are directed to use Path but must decide how to use it on their own.*	*✓ or O – We can still measure back tracking, but users are going to be specifically looking for "degree" information, so they will behave different than they normally would.*	*✗ – The task tells the user where to look, so they are unlikely to try and visit another page, because they believe that the answer is here.*	✗

Table 1: Fill in the above table. Use a ✓ if the research question can be answered by the task, a ✗ if it cannot be answered, and an **O** if it can mostly be answered but some participants may choose to bypass the necessary part of the UI.

5 Final discussion (10 minutes)

Your tutor will lead you in a final overall discussion of what you learned today. You should write down questions to ask them while you are doing the activities above. Potential topics of discussion are:

- When watching the videos of people using OneDrive, was there any behavior you found to be unexpected? How did the task wording both create a clear goal while also giving space for unexpected behavior?

- Task writing and research goals are often linked together. Has this tutorial helped you think more about the problem description in your coursework and how it might impact how your designs are tested?