Learnability in Complex System

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Abstract

This study analyses tutorial types in depth and considers the user's learning experience. Based on this, an embedded tutorial was designed for a complex system that focuses on image editing. **The step-by-step tutorial, which includes text, screenshots, and videos, provides a variety of learning styles.** Tool highlighting was added to address the complexity of the interface tools to provide better learning. Subsequently, experiments were designed to compare the learning features of photo editing software (e.g., Photoshop) with the design features. Experiments were then designed to verify whether the design was superior to the current system. The results of the experiment results showed that the design learning function option Y was superior to the original version. Despite the success of Option Y, there is still room for improvement, informing further optimisation.

Introduction & Background

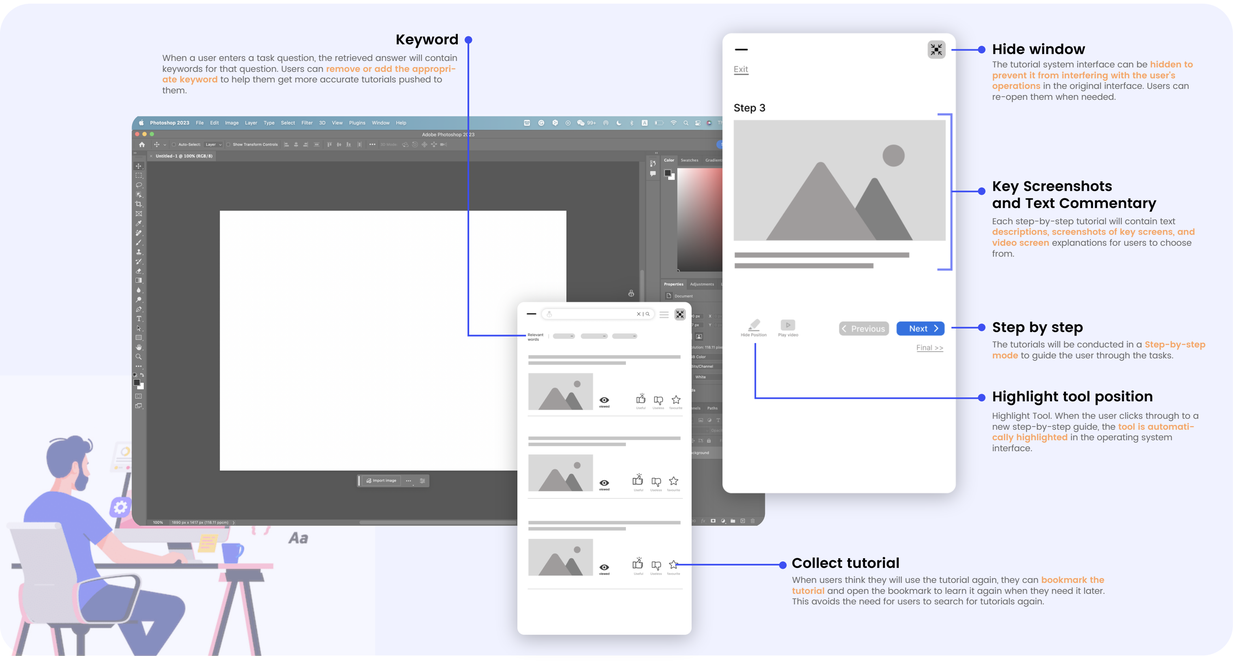
Given the increasing demands and technological complexity, **modern interactive systems present a learnability challenge that significantly influences user experience**. An effective tutorial is essential for users to swiftly grasp system functionalities, enhancing their confidence and overall experience. On the contrary, a difficult-to-learn system can lead to frustration, diminished confidence, and even user abandonment. Hence, the acceleration of user proficiency in utilizing system functions is imperative.

To tackle this challenge, designers have explored diverse tutorial modes, including tooltips, guides, Q&A, and videos. Nonetheless, current tutorials have certain limitations. **This study aims to summarize existing tutorial types. Regarding their limitations, I have developed a new learning function for desktop image and video editing software.** A series of experiments will be conducted to validate its superiority over the existing tutorials function.

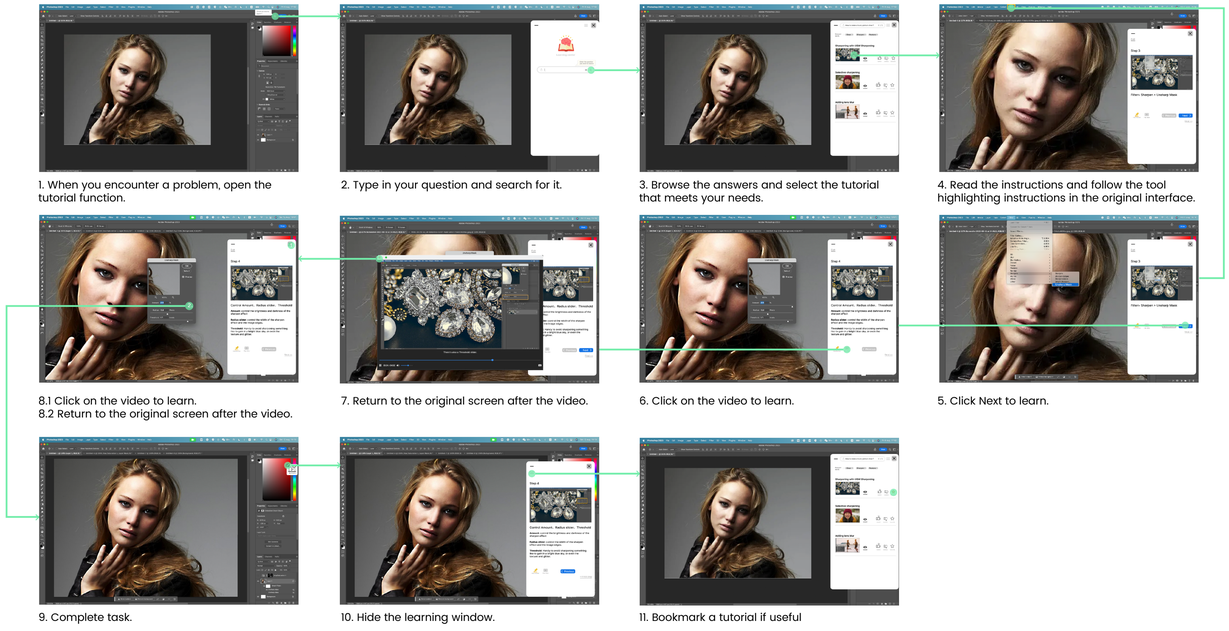
Study Methodology

Literatura review	Previous method Tutorial format	Explore previous studies on the learnability of complex software based on task-centred design, mining existing solutions and summarising them in terms of both the tutorial format of complex systems and the problem of user interaction experience throughout the learning process.
Proposal	Option X Option Y	Based on the pain points summarised in the literature review, I envisage two design solutions to respond to the above problems, Option X and Option Y respectively.
Test study 01	Usability testing Interview Data analysis	The aim of this experiment was to select the better of the two conceptual scenarios for development. Participants were required to complete the tasks provided by me and to fill in a usability questionnaire and interview at the end of the test. At the end of the test, I analysed and evaluated the results.
Development	Design	As a result of this first test, I chose to continue to develop Option Y. Further refinements were made to the functionality of Option Y and the design of the interactive interface.
Final design	Prototype User flow	Complete high fidelity user flow charts.
Test study 02	Measurement Data analysis	The test used the metrics of time to complete the task, error rate during task execution, and number of repetitions of learning to validate my design by comparing the learning system I designed with the learning system that comes with Photoshop.

Diagram / Design



User Flow



Testing & Evaluation

The purpose of the test is to compare Photoshop's original learning system with Option Y, which I designed, in order to verify whether Option Y's learning system is superior to the original system.

The experiment was structured as a within group and 8 participants were recruited.

The comparison method for this experiment will be a combination of measurement data and the results of the **User Experience Questionnaire (UEQ)** to compare the two versions. Specific **measurement** data metrics include the **time to complete the task, the error rate during task execution, and the number of repetitions of learning**.

Research Result

Chart of task completion time it took each participant to complete the task using the original learning system and the Option Y learning system respectively

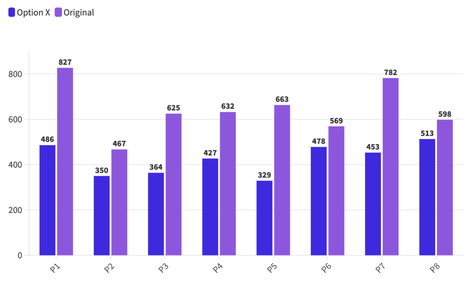
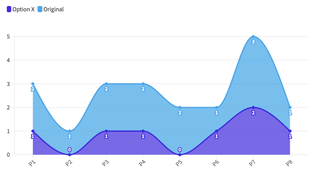


Chart of the number of error clicks during the participants' experiment



The table shows the number of attempts made by participants in the two versions of the experiment

	P1	P2	P3	P4	P5	P6	P7	P8
Option X	0	1	0	1	0	0	1	1
Orignial	1	1	2	4	0	2	1	2

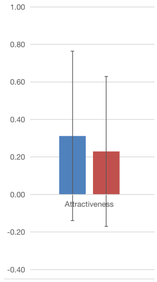


Table showing the results of the attractiveness indicators of the two versions of the UEQ questionnaire

Conclusions & Future Work

I used the T-test to examine the participants' task completion time, number of clicking errors, and number of repeated attempts using both versions, and the **results showed that the difference between Option X and the original learning system (PS version) was statistically significant.** The attractiveness scores on the UEQ scale, however, showed no significant difference between the two versions. Therefore, based on any of the above data analyses, it is easy to see that the Option Y version is overall superior to the original learning system and confirms the significance of this study.

However, from observations made during the experiment, it can also be found that the existing **Option Y version still has certain shortcomings.** For example, the tool highlighting feature is not conspicuous, and and there exists an issue concerning the clear determination of the completion status of tutorial steps. Furthermore, there is a potential bias in the results of the experiment because the Option Y version does not fully enable interaction. Moving forward, **I will continue to improve the design of Option Y based on my observations from this experiment.**