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Building Better Help: User Characteristics' Effect on Library Help Design

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Abstract

The goal of this study is to examine the effect of user help seeking characteristics on their perception of library help design principles, formats and tools. Structural equation modeling (SEM) of a questionnaire survey results showed a number of significant regression relationships. Analysis of open-ended survey questions revealed existing user behaviors such as preferred help formats and gave insights into the likelihood of using a help system.

Introduction

Online user help has become an important part of a library's service for effective information access. There are help design principles and various help formats and tools available (Purchase & Worrill, 2002); however, they are not linked with user characteristics and help seeking preferences (Bartholomé, Stahl, Pieschl, & Bromme, 2006), especially in the library context. In this study, we have identified characteristics that influence users' help seeking and impact the effectiveness of library help design. Those characteristics

include: library familiarity, perceived competence, work avoidance, and task orientation (learning- vs. performance-oriented). There is a need to examine how these user characteristics affect the perception of library help design, in order to create library help that is tailored to the users' individual characteristics and needs.

Method

Thirty-six student participants (15 females and 21 males, mean age = 21.5 years and SD = 3.5 years) were recruited for a 30-minute questionnaire survey about user characteristics and library help. Participants provided five-point Likert scale ratings for questions regarding familiarity of libraries, perceived competence, work avoidance, and task orientations. They ranked help design principles, formats of help documentation (e.g., index, videos, and screenshots), and tools available in help systems (e.g., search, top questions, and expert chat). Participants also answered open-ended questions regarding their current experiences, preferences, and expectations of library help.

We used IBM SPSS Amos 21 to construct three structural equation models. The models included five exogenous variables: library familiarity, perceived competence, work avoidance, learning orientation, and performance orientation. The first model had ten endogenous variables (rankings of the ten help design principles); the second model had seven endogenous variables (rankings of the seven help formats); and the third model had ten endogenous variables (rankings of the ten help tools or features). The Cronbach's α values for variables ranged from 0.8 to 0.9, in support of good construct reliability (Nunnally & Bernstein, 1994). We used maximum likelihood method to estimate the regression weights and we excluded any variables with non-significant regressions or with absolute regression weights less than 0.3. The final models achieved an acceptable fit ($\chi^2/df < 5$; CFI, IFI, NFI, and NNFI > 0.9 ; GFI and AGFI > 0.8 ; PGFI > 0.5 ; RMSEA < 0.08) (Hooper, Coughlan, & Mullen, 2008).

Results

Structural Equation Modeling

The structural equation models between user characteristics and rankings of help design principles, help formats and tools showed a number of significant relationships between user characteristics and rankings. For example, the regression weight between perceived competence and Principle 3 (help should be conceptual) is 0.358, suggesting that users with more experience of libraries are willing to learn conceptual information. Similarly, the regression weight between library familiarity and screenshots is -0.377, indicating users familiar with libraries do not have a strong need for information represented by screenshots. The complete modeling results are presented in the poster. Note that the structural equation models were based on only 36 participants' responses, making the specific regression weights less reliable than what we would have if we had a larger sample of users. Therefore, the modeling results suggest possible significant relationships but additional data are needed for further validation of the models.

Open-Ended Questions

Open-ended questions were coded into groups of responses and revealed aspects of user help seeking habits not fully explored in the SEM that are valuable for library help design. The open-ended questions covered help seeking process, accomplishment motivation, and the preferences in help features, information formats and tools.

When students were asked about the usual ways they seek help when using library resources, they majority accepted the premise that they would ask for help if in need. Primary sources participants listed include the library front desk, a professor, or another student. The responses, however, divided into two. One half of the students reported clear preference to experiment first on their own, and to only ask for help when it was an option of last resort. These respondents seem to prefer to figure things out by themselves, e.g. *"I like to teach myself"*, *"I tend to mess around on my own until I find what I need."* Also, search functionality is frequently mentioned as the primary tool they use to access the library

database, e.g. *"To browse for relevant information"* and *"Find articles and journals"*. The other half of respondents had a preference to ask for help immediately in order to save valuable time. Front desk is the primary help point for these students and is especially preferred, when the issue at hand is technical or systemic (e.g. downloading a PDF file and a misplaced book), or when reference-related advice is sought (e.g. what and how to search and what are reliable sources). Besides independent experimentation and front desk help, responders also consider professors and other students as helpful sources for help. Professors are generally consulted before or after coming to the library and, especially, when students need to verify the relevance of a particular source. If the help sought is procedural rather than conceptual, other students tend to be the primary source of help. This is due to the easy access of other students due to proximity (e.g. in the library sitting next to each other, in the halls of residence they are living together) as well as likely prior experience (other students are assumed to have faced this issue already and to have a quick solution as a result).

The majority of students felt favorably about an online help from the library website. Easy, effortless and time saving design features were stated as crucial for such interest, e.g. *"The more efficient/convenient the help is the more I'll use it"*. Approximately 15% of the students were negligent to use the library help, even if it would allow them to learn to use the library website efficiently. Most of these students prefer *"personal help by a real person"*. They perceive interactions with real people, e.g. librarians, as more speedy and thorough. A handful of respondents do not want to learn the library system at all. Most of them do not think they need to use it, e.g. *"I don't write many research papers"*, or they already use Google or the Internet for doing their resource searches.

Participants were asked to explain whether they like procedural (step-by-step) or conceptual (diagrams, concept maps) help materials. The respondents are divided relatively equally on this matter. One half of the respondents prefer step-by-step guide, while the other half find the visual conceptual material, such as diagrams and concept maps, easier to follow. Procedural help is usually preferred when issues are immediate and solutions are wanted quickly, such as with technical issues. Step-by-step

guidance is also more beneficial when respondents feel they are under time pressure but need to avoid further errors. The desire to *"know I'm doing it right"* is common among the insecure students. While respondents tend to prefer procedural help when they face a complex technical or rare issue, conceptual help is perceived as better when the issue is considered frequent and systematic. Overall, the students do not have a strong preference for one over the other. It tends to be a matter of personal preference based on perceived efficiency and the problem at hand. A quarter of respondents acknowledged how the two perspectives complement each other. In any case, visual material is strongly preferred over any textual format. It was commonly accepted across the respondents that visual material is easier to comprehend than textual, e.g. *"I look for videos, snaps," "I don't have time to read long paragraphs,"* and it was claimed to be more engaging compared to its textual counterpart.

To get an insight into the kind of format users would like to receive information in, students were asked about the ways they would prefer to get the help advice. More than half of the respondents indicated preference towards chat or some other talk function, whereas a third would prefer something static, such as a web page. Of those who preferred a chat function, a quarter would like to have it online. This was reasoned for its instantaneous and interactive qualities, e.g. *"keeps me less frustrated"* and *"can share screenshots."* A number of students emphasized the fact that it leaves a printable text copy of the discussion behind for a possible later need. Others had a preference towards person-to-person help. In-person help seeking is complimented for clearer problem solving advice (e.g. *"explain better"*) and faster response time. As a result it is perceived to offer speedy problem-resolution, e.g. *"faster than email."* About one third of the respondents prefer to use something static as a help source. This static guide is conditioned as a comprehensive and dynamic website that is fast and easy to use. Frequently, this static page is mentioned as the preferred option after help is sought from *'too busy'* library personnel or the problem is too complex to resolve with quick step-by-step guide or by other means. Some respondents are explicit about their primary preference *"to solve [his/her] problems without the involvement of people,"* no matter the particular design or format of information

provision. One quarter of students acknowledge the pros and cons of both formats and offer a more nuanced preference that includes both, depending on their issue at hand. They acknowledge that different contexts could lead them to have different preferences, e.g. *“In order of increasing complication of the problem, I prefer web page, chat, and then email.”* Furthermore, they admit that *“limiting to one resource is low quality help.”*

Discussion and Conclusion

We examined the relationship between user characteristics ratings and open-ended question responses. There is a strong correlation between perceived competence and type of help (procedural vs. conceptual). We found that participants with high perceived competence and library familiarity tend to experiment first and want procedural help, while participants with low perceived competence and library familiarity tend to seek help online and prefer conceptual information. Work avoidance, learning and performance orientation affect participants' help seeking preferences. Participants with high work avoidance prefer person-to-person help and ask whoever expert they can find at the moment they need help; and participants with low work avoidance prefer easy to follow procedural help online. If learning or performance orientation is high, participants tend to first experiment on their own and like online help to be able to think and digest the information at their pace. However, participants with low learning orientation would ask experts and seek online procedural help, and participants with low performance orientation still prefer to figure it out themselves and prefer help materials that are visual and conceptual.

The relationships above are similar to what the structural equation models suggest. Therefore, both the structural equation models and open-ended questions reveal some common themes and empirical guidance for prioritizing library help design principles, formats, and tools.

In addition, the user characteristics measured in this study could be useful for user segmentation and personas creation as part of a user-centered design process for library help systems. The SEM

methodology complemented by open-ended questions could be extended to similar efforts of linking user characteristics to help design. Future studies could first employ a large sample questionnaire survey to help construct reliable structural equation models, and then conduct one-to-one targeted user interviews based on the modeling results.

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Introduction

Online user help has become an important part of a library's service for effective information access. Currently, help information is being disseminated through a number of channels which often utilize various formats and features to present the help information. While effective for users familiar with libraries, library help design often lacks the consideration of specific user characteristics of help seeking. There is a need to examine how user characteristics affect the perception and use of library help systems. Such understanding can help design library help formats and features that are tailored better to the characteristics and needs of individual users.

Related Work

- An array of research has explored user preferences of different help formats. Purchase and Worrell [1], for example, empirically tested and ranked a set of on-line help features and design principles from existing systems and user feedback. They suggested that help features and design principles are open to individual interpretation.
- Pre-conceived beliefs affect task performance. Bartholomé et al. [2] showed that prior knowledge, self-estimated competence, and beliefs about the genesis of knowledge had impact on task performance in an interactive learning environment (ILE) for plant identification.
- Most notably, Aleven et al. [3] pointed out how help seekers can be classified as learners and learners with different profiles of help seeking activities can be described using a set of learner characteristics. They also pointed out that different types of help may cause different types of help seeking activities and result in different learning outcomes.
- User Characteristics and the specific help formats and features impact the outcome of help seeking. In order to offer effective and efficient help, library help should be designed to account for users' individual needs and characteristics.

Model

- We developed a structural equation model (Figure 1) between user characteristics and rankings of help design principles, help formats and features.
- We identified characteristics influencing users' help seeking and thus effectiveness of library help design: *library familiarity* [4], *perceived competence* (of seeking help), *work avoidance* (i.e., tendency to avoid effort), and task orientations (*learning- vs. performance oriented*; i.e., gaining more knowledge versus finishing the task) [5].

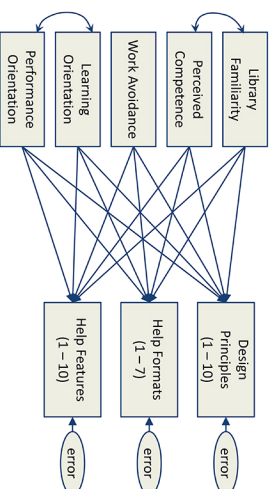


Figure 1. Research Model.

- The design principles [1] included:
 - Help should be/do:
 1. Easy to understand.
 2. Procedural.
 3. Conceptual.
 4. Unobtrusive.
 5. Accurate.
 7. Easy to access.
 8. Retain the user's current view and context.
 9. Relevant to the user's immediate situation.
 10. Offer multiple navigation methods.
- The help formats and features included:
 - Index, screenshots, table of contents, video tutorials, section headings, relevant information, images.
 - Search function, tooltip, ranking for helpful content, favorites, share on social network, expert contact information, chat with expert, glossary, top questions.

Method

- Thirty-six student participants (15 females and 21 males, mean age = 21.5 years and SD = 3.5 years) were recruited for a 30-minutes questionnaire survey.
- Participants provided five-point Likert scale ratings for questions regarding user characteristics and they ranked help design principles (from 1 to 10), help formats (1 to 7) and features (1 to 10).
- Participants answered open-ended questions regarding their experience, preferences, and expectations of library help.

Results

Structural Equation Modeling (SEM)

The SEM modeling results showed significant relationships between user characteristics and rankings. The diagrams (see Figure 2) in this poster shows coefficient values higher than 0.3.

Open-Ended Questions

- One half of respondents reported clear preference to experiment first and to only ask help when it was an option of last resort; the other half

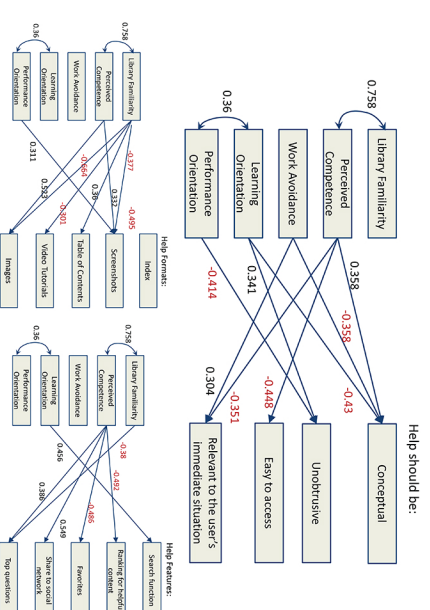


Figure 2. SEM Results.

had a preference to ask for help immediately through the library front desk, a professor, and other students.

- Participants expressed an expectation of the library website to offer an intuitive, easily accessible, and predictive central search across all resources. Help from librarians, either in-person or through online chat, is highly regarded.
- Visual material is strongly preferred over textual format. The preference of procedural vs. conceptual help, and read vs. chat is dependant on specific situations.

Conclusion

The modeling and qualitative results provide guidance for prioritizing design principles, formats, and features in library help implementation. It also helps user evaluation based on different help seeking characteristics and preferences. The user characteristics measured in this study could be useful for user segmentation. The SEM methodology complemented by open-ended questions could be extended to similar efforts of linking user characteristics to help design.

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