HCD in UW ALACRITY research grant proposals: 7 tips for success

Authors: Tricia Aung, Sean Munson

Introduction
UW ALACRITY's Discover, Design/Build, and Test (DDBT) model provides a roadmap for designing and adapting innovative evidence-based psychosocial interventions (EBPIs) and implementation strategies. While the use of human-centered design (HCD) in EBPI research is growing, a challenge to seeking funding to conduct such research is clearly communicating HCD elements to an audience who may not be familiar with the field. Successful and competitive grant proposals must accurately demonstrate how proposed HCD methods are uniquely suited to produce innovative solutions and meet Funding Opportunity Announcements. **The purpose of this guide is to support UW ALACRITY researchers in HCD components of grant proposals and strengthening use of HCD in proposed research.**

1. Defining design problems and questions

Proposals with HCD must include thoughtful framing of both **design problems** and **design questions**.
- **Design problems** state **what problem your design is intended to solve for users**. In contrast, **research problems** state a broad issue or knowledge/scientific gap.
  - The purpose of defining a design problem is to set the stage for subsequent project scoping and refinement.
  - Good design problems:
    - Indicate the target audience and interested parties, problems they face, and and why the problem is important
    - Balance scope

- Not too specific and have room for iteration based on user research
- Not too broad that you are tackling too many problems
- **Design questions** state **what your design is trying to solve.** In HCD projects, **research questions** are used to identify what you need to know to answer your **design question**. The answers to **design questions** are *solutions* or *approaches*. The answers to **research questions** are *understanding or new knowledge*.
  - General format of **design questions**: How might we help [intended users / other affected people] when they [do or experience this thing]?
  - Never provide an answer
  - Can evolve over time
- For NIH grants, reviewers will likely be more interested in seeing specific research questions aligned with your design question. A design problem can be outlined as part of a grant literature review and it can also be based on any preliminary research you have done.

Comparison of design problems and design questions and research questions

Design Problem	Design Question	Research Question
Quality of evidence-based psychosocial interventions can vary based on clinician access to supervision and guidance.	How might we design virtual tools to help clinicians deliver quality evidence-based psychosocial interventions?	What types of supervision and guidance are available to help clinicians deliver quality evidence-based psychosocial interventions?

More resources:
[Problem Statements in UX Discovery](). Rosala, M. (2021, August 22). Nielsen Norman Group.

To plan for who will do the work, researchers should ask about the role of HCD in the proposed work. In some projects, there may be human centered design research questions (e.g., the field does not know the right methods or design approaches to achieve the desired goals, and so you expect to make contributions to the field of HCD in addition to health). These projects may have a high degree of uncertainty or design risk, and we discuss some techniques for managing that below. In other projects, the methods and design approaches used to achieve the project goals may be well-understood, and only need to be applied by skilled practitioners. We discuss implications of the type of the design questions for team formation and staffing below.

Also consider the match between the uncertainty and design risk and the funder and funding mechanism. Some funding mechanisms are meant for more exploratory or developmental risks, while others are meant to move designs with promising preliminary evidence closer to practice, with minor design refinements along the way.

2. Proposing appropriate HCD research methods to understand user needs and context

HCD proposals must include appropriate research strategies to understand user needs and context. Selecting the right methods is based on your research questions, what kind of data you need, timeline, and available resources. Design teams often adapt or mix and match different user research methods to engage different users and interested parties and different facets of a problem, and similarly, different ideation and design methods to develop a broad range of possible solutions. Proposals might point to papers or books about the design method(s) you will use or adapt, or they might reference other papers that applied similar methods with good results.

More resources:
- [*University of Washington ALACRITY Center - Videos: Methods & Examples*](#)
- [A glossary of user-centered design strategies for implementation experts](#). Dopp, A.R., Parisi, K.E., Munson, S.A. and Lyon, A.R., 2019. Translational behavioral medicine, 9(6), pp.1057-1064.
- [*When to Use Which User-Experience Research Methods*](#). Rohrer, C. (2022, July 17).

3. Creating a strong team

Grant proposals are expected to demonstrate the capacity of a proposed team to carry out a project. The general NIH application guidelines recommend considering what expertise is needed and outlining how collaboration among individuals and organizations can support project goals. For grants with HCD, think about what expertise you need to answer your design and research questions. Will you need individuals with qualitative and quantitative research skills? Designers to create low- and high-fidelity prototypes*? Who will provide project management support? Develop a clear sense of the roles for all individuals and level of effort based on the proposed project scope, complexity, and resources.

If the design work involves investigating design research questions, it can be important to involve potential HCD researchers early in the problem definition process, as they will bring their own research questions and agenda to the topic, and potential collaborators should plan on several conversations to check alignment of both research interests and logistics for how the work would get done. When it comes to actually planning effort, many HCD and technology faculty are on 9-month appointments and will look for effort to align with either summer effort (even though they may contribute to the project throughout the year) or funds that help them secure a course buyout from their teaching (thus making more time to work on the effort). These faculty often work closely with doctoral students in an apprentice model, and so may need relatively little FTE, instead favoring research assistant support (which may include salary, benefits, and tuition) for their doctoral students who will also engage in the work.

If the design work is more about the application of existing design methods and approaches, then faculty and doctoral students may not be the best way to get the work done. It may still

work out – with little or no HCD faculty effort, and in which the research assistantship is more of a job for doctoral student skilled in user research and/or design, rather than directly aligned with the student's research – but you should also consider other staffing models, especially for projects with either lots of design work or small, well-scoped design work. If there is enough design work to support a full time user researcher or designer, this can help projects move forward quickly. At times, that team member may even be able to fulfill some project management roles.

For projects with small and well-scoped design work, teams might also look to undergraduate or master's students. This work could be through a class project (e.g., a capstone project, or a usability study in a usability course) or an independent study. However, in these arrangements, the students' learning goals must come before the project goals, and so this can add some uncertainty: they may produce something that exceeds all expectations, but they may also not deliver something that meets project goals. Consequently, this model is often best for "nice to do" work rather than work on the project's critical path. Another model can be to hire a senior undergraduate or a professional master's student

More resources:
- [Building A UX Team](). *Smashing Magazine*. Murphy, C. (2018, March 28).

*Note that *fidelity* has a different meaning in design than may be familiar to health researchers. Here, fidelity means the degree of finish and polish to a prototype, where a prototype might be "low fidelity" in all respects (a wireframe or sketch, perhaps even on paper, or a storyboard of the intended interaction) to "high fidelity" in all respects (e.g., a system that is visually, technically, and interactionally ready to deploy). It also can vary in fidelity in different ways: for example, a prototype might include all of the technical and interaction functionality if the intended system, but be only a wireframe with respect to aesthetics or visuals. Or, in a style of prototyping known as "Wizard of Oz", the prototype could appear to the user to be fully functional while relying on a member of the study team to do key functions that an algorithm would later achieve.

More resources:
- *[UX Prototypes: Low Fidelity vs. High Fidelity.]* Pernice, K. (2016, December 18). Nielsen Norman Group.
- *[Just-Enough Prototypes Make Communicating Specs More Successful (Video)]*. Salazar, K. (2017, October 27). Nielsen Norman Group.

4. Planning for engaging with interested parties and managing expectations

Users are the heart of HCD, and you must outline a plan for identifying users and other interested parties, the extent to which you will engage with them, and how you plan to incorporate feedback to answer your design questions. Interested parties in EBPIs and

implementation strategies may include potential patients, primary care providers, behavioral health providers, community partners, case managers, teachers, or facilities. These interested parties have differing values, preferences, and (logistically) availability. How will these individuals be recruited and when in the research process will they be engaged? What HCD methods will be used to understand their needs? Where will you engage with different interested parties and what will you do if you cannot engage in-person? How will you maintain their confidentiality and account for varying power dynamics?

More resources:
- [Usability Evaluation for Evidence-Based Psychosocial Interventions (USE-EBPI): A methodology for assessing complex intervention implementability](). Lyon, A. R., Koerner, K., & Chung, J. (2020).

5. Framing uncertainty

A common challenge in any grant proposals is defining a reasonable scope and avoiding overpromising. HCD proposals that include work to identify the needs of users and other interested parties, as well as the destination context, should avoid promising a particular solution design until that understanding has been developed. Predefining the outcome goes against the intention of the HCD process of developing an understanding of user needs and constraints then iteratively designing and refining designs based on that understanding, but it can make proposals more concrete to reviewers.

To address this, we recommend proposals emphasize iteration to better meet the needs of users and a standardized *design process* instead of a certain *design outcome*. Such proposals might include a decision tree–or examples of key decisions to be made–where the proposal describes if you find X while answering your research questions and conducting an artifact analysis, you may pursue Y solutions. For example, if you learn during user research that teens appreciate the privacy of connecting with mental health providers using their smartphones, you may pursue developing an EBPI app prototype. Similarly, if you learn that teens are uncomfortable downloading an app and more comfortable with texts, you may pursue developing a text chatbot prototype. If mentioning prototypes, it's important to convey reasonable expectations for the fidelity of any prototypes.

An alternative approach is to propose the design that you think is most likely based on your current understanding, while highlighting open questions about user needs or the destination context, plans for investigating them, and alternate or contingency plans if the results differ from your expectations.

6. Measuring project performance and usability

Proposals are expected to always propose metrics for monitoring and evaluation. A project with a HCD component should include both a plan of how you plan to measure overall grant

performance and usability of the design solution. A usability study plan should be considered from the onset of the project. In HCD, usability is often defined through five quality components: 1) learnability, 2) efficiency, 3) memorability, 3) memorability, 4) errors, and 5) satisfaction. The goal of a usability study is to identify usability issues which drive subsequent iteration. During usability testing, a facilitator asks participants to perform tasks using the design solution. You can propose to prioritize changes to your design solution based on the frequency, severity, and feasibility of usability issues. Complementing usability testing, heuristic evaluations focus on evaluating a design solution based on established usability principles.

More resources:
- *Usability Testing 101*. Moran, K. (2019, December 1). Nielsen Norman Group.
- *How to Conduct a Heuristic Evaluation*. Nielsen, J. (1994, November 1). Nielsen Norman Group.
- *10 Usability Heuristics for User Interface Design*. Nielsen, J. (2020, November 15). Nielsen Norman Group.
- Usability Evaluation for Evidence-Based Psychosocial Interventions (USE-EBPI): A methodology for assessing complex intervention implementability. Lyon, A. R., Koerner, K., & Chung, J. (2020).
- Assessing the usability of complex psychosocial interventions: The Intervention Usability Scale. Lyon, A. R., Pullmann, M. D., Jacobson, J., Osterhage, K., Achkar, M. al, Renn, B. N., Munson, S. A., & Areán, P. A. (2021).
- The Cognitive Walkthrough for Implementation Strategies (CWIS): a pragmatic method for assessing implementation strategy usability. Lyon, A.R., Coifman, J., Cook, H., McRee, E., Liu, F.F., Ludwig, K., Dorsey, S., Koerner, K., Munson, S.A. and McCauley, E., 2021. *Implementation Science Communications*, 2(1), pp.1-16.
- Usability Issues in Evidence-Based Psychosocial Interventions and Implementation Strategies: Cross-project Analysis. Munson, S.A., Friedman, E.C., Osterhage, K., Allred, R., Pullmann, M.D., Areán, P.A. and Lyon, A.R., 2022. *Journal of Medical Internet Research*, 24(6), p.e37585.

7. Reflexivity and positionality

It is vital for you to consider the positionality of researchers that may be driving the design process and the positionality of users. While not yet a requirement for NIH proposals, reflecting on positionality of the research team is an important exercise to identify how research team members' identities potentially influence their relationship to the project. Furthermore, the positionality of users in the study may also influence user needs and preferences. For EBPIs in particular, there are many cultural norms and sensitivities to consider. How will you account for the different positionality dynamics when developing a design solution?

More resources:
- An exploration of the implementation of open disclosure of adverse events in the UK: a scoping review and qualitative exploration. Birks, Y., Harrison, R., Bosanquet, K., Hall, J.,

Harden, M., Entwistle, V., Watt, I., Walsh, P., Ronaldson, S., Roberts, D. and Adamson, J., 2014. *Health Services and Delivery Research.*
See Appendix 8 - Detailed statement for reflexivity

- [Embracing Four Tensions in Human-Computer Interaction Research with Marginalized People](). Liang, C. A., Munson, S. A., & Kientz, J. A. *ACM Transactions on Computer-Human Interaction*.
- [A Call to Action: Using and Extending Human-Centered Design Methodologies to Improve Mental and Behavioral Health Equity](). Stiles-Shields, C., Cummings, C., Montague, E., Plevinsky, J. M., Psihogios, A. M., & Williams, K. D. A. (2022). *Frontiers in Digital Health*, *4*, 62.