Active Learning in UX Instruction

A Four-Step Approach for Teaching Budding UX-ers

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Active learning strategies are a prominent method of instruction designed to encourage learner engagement through concrete application of concepts and deep reflection to facilitate meaningful learning experiences for library professionals. Despite documented benefits, however, there is limited published literature on the implementation of active learning to user experience (UX) instruction. In this paper, we provide an example of our approach to active learning within the context of a guerrilla testing instructional workshop for library staff using a four-step lesson plan identifying tasks; writing scenarios; running tests; analyzing results). We focus attention on the importance of small group work, the role of facilitators in providing participant support, and the use of self-reflection as central aspects of the workshop design. Sample active learning strategies are highlighted throughout along with key lessons learned and recommended improvements for future workshops tailored to library contexts.

As the concept of user experience (UX) gained prominence in libraries over the past decade, the instruction of UX principles within a library context for library professionals has emerged as a critical area of focus. The existing literature on UX pedagogy is limited,[1] which may lead UX instructors to draw from a variety of instructional methods that are informed by the scholarship of teaching and learning more broadly. Active learning has been discussed in the teaching and learning literature as a method that instructors from all disciplines can employ in their teaching. It can be defined as "any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing."[2] Meaningful learning activities are those that are useful, engaging, and authentic. In the library context, they enable learners such as library professionals to take what they learned and apply it to a different purpose or in another context. In summary, active learning as a method consists of implementing a range of activities and interventions that are relevant, meaningful, and that provide the opportunity for reflection. It was first proposed by Arthur Chickering and Zelda Gamson, who postulated that for learners to have a significant learning experience, "they must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves."[3] Since then, evidence of the method's benefits has been described by multiple scholars who have studied it. Some of these benefits include increased knowledge of content taught as well as recall,[4] the development of higher-order thinking skills,[5] greater fostering of positive feelings toward the material learned,[6] and an increased interest in learning.[7] While these studies present both general and discipline-specific findings, the benefits within the field of UX have not been approached at length in the academic literature.
In this article, we discuss how we designed our active learning-based UX workshop. We describe the design and implementation of our teaching approach, as well as the appropriateness of the method in our particular context. Our examples demonstrate how active learning can be employed to maintain library professionals' engagement and prevent participation resistance. The use of

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active learning spaces and materials further support learner engagement. In addition, reference/information desk datasets can be successfully integrated into workshops to provide library staff with a "real-world" problem to solve and act as encouragement for them to explore similar UX analyses to datasets from their home institutions. We found that designing a highly structured session with some room for learner flexibility and autonomy was an effective way to keep them on task and motivated throughout. Our intention is to foster greater discussion around methods and strategies that UX instructors employ to actualize some of the active learning benefits discussed above.

Literature Overview

We conducted a comprehensive literature review to identify existing publications on the use of active learning strategies in UX instruction, particularly in relation to guerrilla usability testing. Guerrilla testing refers to "a quick and inexpensive way of testing . . . with real users. Instead of recruiting a specific targeted audience to take part in sessions, participants are approached in public places and asked to take part in research. These sessions normally last for only 10 to 15 minutes with a small incentive . . . offered."[8]

Databases pulled from several different disciplines, including education, library and information science, and computer science using the following search strategy:

> ("user experience" OR "usability test*" OR "guerrilla UX" OR "guerrilla usability" OR "guerrilla test*") AND ("active learning" OR "activity-based learning" OR "learning-by-doing" OR "learning activit*" OR "action learning" OR "hands-on learning" OR "participatory learning" OR "project method")

This yielded a total of 346 results (following de-duplication); however, a review of article titles, abstracts, and full-text found that much of the literature retrieved was irrelevant to our topic. To supplement this, we conducted a grey literature search in Google and Google Scholar, using various combinations of our keywords (e.g., active learning to teach UX, active learning UX instruction, conducting UX workshops, facilitating UX workshops, etc.). While results were still sparse, we did find that grey literature produced much more relevant results compared to academic databases. Several key findings emerged from the literature review.

When preparing to deliver UX instruction, it is important to first identify the training needs of your audience and utilize backward design principles to define your learning objectives.[9] These will be used to guide the types of active learning applied in the session and should also be made apparent to workshop participants so that they are aware of end goals for learning achievement.[10]

Several authors recommend a triad approach when teaching UX workshops, starting with an explanatory phase to introduce the activity, followed by conducting the activity, and ending with a reflective debrief upon the activity's conclusion.[11] Instructions should be simple and thorough, especially for library professionals who are new to UX,[12] and opportunity should be given to answer questions and provide clarification before moving into the active learning component. During the interactive portion, facilitators should take the back seat to allow library staff to work through the activity and should roam the room to observe and provide guidance as needed. Following the active learning component, workshop instructors can prompt participants with questions aimed to gauge key insights learned, sticking points, connections made, etc., and use these to transition into a concluding summary.

Another key consideration when designing UX workshops involves planning for the physical space and learning environment. Instructors should work to ensure a relaxed, nonjudgmental atmosphere,

and where possible, attendees should easily be able to divide into small groups during hands-on active learning components.[13]

Classrooms or learning spaces can enable movement and facilitate interactivity (e.g., through the availability of movable tables/chairs, whiteboards, hands-on technology, etc.) and encourage participants to be engaged throughout the session.[14] Based on existing gaps in academic literature and the identified need to design an active learning-based workshop, we wrote a lesson plan containing meaningful, hands-on activities, with opportunities for self-reflection and sharing amongst participants.

Four Steps to Knowing Your Users: Guerrilla Testing for Budding UXers

Workshop Overview

The workshop described herein was delivered in Toronto, Canada, at the Ontario Library Association's Superconference, in January 2020. The purpose of the workshop was to demonstrate how to gather the information needed to embark on guerrilla testing. We aimed to teach the attendees how to test users with this method and perform basic analysis of the results. We did this by engaging in active learning activities and by providing templates that can be adapted to the needs of different libraries. Below is a break-down of the session.

After briefly introducing ourselves, we outlined the workshop's learning objectives for the attendees:

- to gather the information required to embark on guerrilla usability testing
- to understand how to test users using the guerrilla method
- to perform basic analysis of testing results

We started by presenting the concept of guerrilla testing as a quick, inexpensive method of gathering user experience feedback. We highlighted for participants the reasons for using this method, such as low cost, and ease of planning and recruitment. We then outlined four crucial steps to conducting guerrilla testing: identifying tasks; writing scenarios; running tests; and analyzing results. The remainder of our workshop was organized around these steps.

Step 1: Identifying Tasks

In the identifying tasks section, we described the importance of identifying and prioritizing the right tasks for analysis. This process is further described in the "Data" section of this paper, where we discuss how we used an evidence-based approach to selecting tasks for our own guerrilla testing, employing our library's user data, which we also adapted into activity materials for this workshop.

Using the data we provided, participants were invited to take part in a task ranking activity. In groups of four, they were given five minutes to identify three to five key tasks that would be suitable candidates for guerrilla testing. During this time, we moved around the room, answered questions, and redirected participants to the activity at hand when needed.

In line with active learning principles, we led participants through a guided small-group reflection and sharing activity, where they were given prompts to reflect on their task selection and prioritization process. The discussion prompts were:

1. Which tasks did you select?
2. How did your team prioritize?
3. What other information sources could be used to identify key user tasks?

Once the small group reflection was complete, group members shared their approach with the larger group, as well as any challenges encountered with the ranking process. This concluded the first section of our workshop.

Step 2: Writing Scenarios

We then moved on to writing scenarios. We discussed the importance of having users identify with scenarios presented, and how that translates to the writing process. Writing guidelines presented include writing scenarios based on representative tasks, being jargon-free, presenting opportunities for users to solve a problem, and determining the right difficulty level for tasks. Examples from our own guerrilla testing were given to illustrate what a good scenario would look like.

Next, participants engaged in a scenario-writing activity. Using the data that was shared in the previous activity, or using their best judgement as to what their local library evidence might point to in terms of suitable tasks, each group of four broke into pairs. Both members of each pair took five minutes to write a scenario using the scenario writing guidelines. Then, taking turns, they shared their feedback on the written scenario with their partner. As before, small groups were given an opportunity to share back with the larger group on lessons learned, and successes and challenges encountered.

Step 3: Running Tests

The third part of the workshop was on running tests. We described how to run guerrilla testing, and the possibility of including a demographics question in the study agreement signature form to allow for later analysis against specific demographic characteristics. We also covered concepts such as the think-aloud protocol and technology use.

Participants applied what they learned via a preparatory guerrilla testing activity. They were prompted to think of a project in their own library or place of work that may benefit from guerrilla testing, and to articulate why testing would be beneficial. Next, they identified resources needed such as testers and technology, as well as logistical requirements. In pairs or small groups, they then devised a plan and/or a script that testers could employ to approach users with the testing request. In the interest of time, this part of the workshop included a small-group reflection on the plan and script, but impressions were not shared with the larger group.

Step 4: Analyzing Results

The last major component of the workshop was analyzing results. We dedicated this part to identifying themes, with a recommendation to use qualitative data analysis software to code speech text and quantitative data analysis software to analyze response time and number of errors. We also covered how to rank testing results based on how critical and frequent each task was, and the impact of not dealing with identified issues.

The workshop concluded with a review of the four steps covered, as described above. In addition, participants were invited to access a shared online folder containing the presentation slides, references, handouts, and a guerrilla testing interview analysis template to be adapted as required.

Materials

For the workshop, we used Apple Keynote to design a slide deck that we used as our main teaching material. To keep our participants' interest throughout the workshop, we incorporated a decent number of graphical enhancements throughout the slides, avoided putting too much text in a slide, added a couple of memes to lighten the mood, and used bullet points to organize and succinctly present information. Additionally, we designed a hands-on activity for each step we taught so our participants had an opportunity to utilize what they just learned. Activities were done using the handouts and flip chart paper provided. The workshop room had a round table setup, so participants were able to communicate with each other and discuss the activities and their thoughts. We also distributed handouts for increased accessibility to the information we were presenting on our slides.

Data

Throughout the workshop, we referenced a constant dataset upon which participants could make observations. The purpose of the dataset was to reiterate the evidence-based approach we described in the session. Furthermore, by using a real dataset we hoped to demonstrate how analyzing data can lead to solving real UX problems that are relevant to the user population being studied.

The dataset we provided was extracted from the Information and Reference Desk Statistics file, which is a compilation of all reference questions addressed to the University of Toronto Scarborough–The BRIDGE Library. This form is inherently anonymous, and responses cannot be linked back to a specific individual. Library staff wanting to implement this approach in their local context should ensure that their unit's reference statistics form is anonymous or, if there is identifying information (e.g., name, email, department, etc.), it should be stripped from the downloaded data set before it is used for UX analysis.

The questions were categorized by type, topic, and audience (student, faculty, staff, or external partner). The dataset also captured detailed information about the questions themselves, for example:

- student inquiry on how the library space and technology may be used or reserved
- student inquiry on finding scholarly sources
- help needed accessing the Bloomberg database and finding company balance sheets
- inquiry on locating events on the library website
- inquiry on joining a student group

Using the dataset, workshop participants selected tasks for guerrilla testing, completed the ranking activity, and wrote user scenarios.

While this session was carried out in the context of a one-shot conference workshop, this approach can be applied and adapted to many instructional contexts, such as undergraduate and graduate courses and employee training, to name a few.

Conclusions

While we do not have permission to share exact participant feedback obtained by conference organizers for this session, results indicated that attendees in our library conference workshop

found it highly informative and demonstrated the success of our active learning-based approach. These findings are consistent with best practices and results reported by other relevant literature.

In accordance with the findings of Kalaian, Kasim, and Nims,[15] collaborative, problem-based tasks were performed within small groups, which have been shown to be more effective than lectures in the context of technology education. The scenario writing activity further subdivided small groups into pairs to allow for a more detailed and thorough discussion of this task. Facilitators explained all activities, such as scenario writing and task-ranking, in a clear and concise manner, then roamed around the room helping groups as recommended in Gibbons.[16] To align with pedagogical best practices,[17] activities presented opportunities for participant self-reflection, culminating in a final group reflection on potential approaches to implementation in their own libraries to focus on the learning that has taken place as well as to identify knowledge gaps.

Though we found that our workshop was highly successful, there were some unanticipated limitations discovered during the session that could lead to improvements for similar instruction in the future. For instance, in the case of workshops within a conference, such as ours, it is recommended to consult with event organizers and pre-arrange for the ability to access and share survey results. This ensures that researchers-instructors can gain participant consent, and that assessment can take place accordingly. In situations where instructors have greater control over the event, setting up a research project with the appropriate ethics protocols in place also allows for greater flexibility in regard to potential research activities. Another improvement would be to enhance the visibility of activity instructions by including them on the activity handouts themselves. While we did seek to follow instructional best practices by presenting materials in multiple ways, such as conveying instructions via slides and verbally, we believe this aspect of the design could be improved. Given the limited published literature on the application of active learning principles to user experience instruction, there is ample opportunity for further research in this area. Our session only focused on guerrilla testing specifically, so future studies might explore active learning in the context of other user experience methodologies. Moreover, a study featuring a comparative analysis of the efficacy of specific strategies on learning outcomes would be beneficial to the field.

Tips for Usability Practitioners

- Prior to designing your workshop, assess the features of the space where the session will be held to determine how the space may best be utilized in support of active learning activities.
- For consistency and to reduce confusion, work from the same dataset throughout the entirety of the workshop, ensuring that the data is appropriate for the audience. For example, if your audience consists of academic librarians, include data relevant to academic libraries.
- Anticipate potential sources of participation resistance and design with those in mind to help keep workshop attendees engaged. This could include things like including collaborative activities throughout the session, having multiple facilitator check-ins during the workshop, etc.
- When designing your workshop, it is important to always have a clear focus on what the desired outcome of the workshop is—keep in mind what your target audience might want to take away from the workshop, and design activities and opportunities for feedback accordingly.

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References

4. Elizabeth A. Rodwell, "A Pedagogy of Its Own: Building A UX Research Program," *Practicing Anthropology* 43, no. 2 (March 2021): 17–21, https://doi.org/10.17730/0888-4552.43.2.17.
5. Michael Prince, "Does Active Learning Work? A Review of the Research," *Journal of Engineering Education* 93, no. 3 (July 2004): 223, https://doi.org/10.1002/j.2168-9830.2004.tb00809.x.
6. Arthur W. Chickering and Zelda F. Gamson, "Seven Principles for Good Practice in Undergraduate Education," *AAHE Bulletin* (March 1987): 4.
7. Isabelle D. Cherney, "The Effects of Active Learning on Students' Memories for Course Content," *Active Learning in Higher Education* 9, no. 2 (July 1, 2008): 152–71, https://doi.org/10.1177/1469787408090841.
8. David Gosser and Mark Cracolice, *Peer-Led Team Learning: General Chemistry*, 2nd ed. (London: Pearson, 2005).
9. Leonard Springer, Mary Elizabeth Stanne, and Samuel S. Donovan, "Effects of Small-Group Learning on Undergraduates in Science, Mathematics, Engineering, and Technology: A Meta-Analysis," *Review of Educational Research* 69, no. 1 (Spring 1999): 21–51, https://doi.org/10.3102/00346543069001021.
10. Monica C. Diochon and Ann Frances Cameron, "Technology-Based Interactive Learning: Designing an International Student Research Project," *Active Learning in Higher Education* 2, no. 2 (December 1, 2001): 114–27, https://doi.org/10.1177/1469787401002002003.
11. "What is Guerrilla Usability Testing? (Short Answer)," Experience UX, https://www.experienceux.co.uk/faqs/guerrilla-usability-testing/.
12. H. Frank Cervone, "Usability Training: An Overlooked Component in an On-Going Program of Web Assessment and Development," *OCLC Systems & Services* 21, no. 3 (September 2005): 244–51, https://doi.org/10.1108/10650750510612434.
13. Anders Toxboe, "How to Facilitate and Plan a UX Workshop," Last modified January 11, 2016, http://ui-patterns.com/blog/how-to-facilitate-and-plan-a-ux-workshop.
14. Sarah Gibbons, "A Model for Conducting UX Workshops and Exercises." Nielsen Norman Group, July 22, 2018, https://www.nngroup.com/articles/ux-workshop-exercises/; Toxboe, "How to Facilitate and Plan a UX Workshop."
15. Cat Lewis, "5 Things I Learned Teaching UX Design to Non-Designers," Medium, July 23, 2019, https://medium.com/swlh/5-things-i-learned-teaching-ux-design-to-non-designers-6c7f5d393530.
16. Sema A. Kalaian, Rafa M. Kasim, and Julia K. Nims, "Effectiveness of Small-Group Learning Pedagogies in Engineering and Technology Education: A Meta-Analysis," *Journal of Technology Education* 29, no. 2 (Spring 2018): 20–35, https://doi.org/10.21061/jte.v29i2.a.2.
17. Anna Aksenovich, "Designing Active Learning," last modified February 25, 2020, https://rethink.utoronto.ca/designing-active-learning/; Carol Rolheiser et al., eds., "The Scholarship of Leading: Mini-cases of Educational Leadership in Action," Centre for Teaching Support & Innovation, University of Toronto, 2019, http://aautn.org/wp/wp-content/uploads/2019/11/Scholarship-of-Leading-Mini-Cases_Revised-Nov.-1.pdf.
18. Kalaian, Kasim, and Nims, "Effectiveness of Small-Group Learning Pedagogies," 20–35.
19. Gibbons, "A Model for Conducting UX Workshops and Exercises."
20. Chickering and Gamson, "Seven Principles for Good Practice in Undergraduate Education," 3–7; Gibbons, "A Model for Conducting UX Workshops and Exercises."