



# Communication Design Quarterly

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Communication Design Quarterly  
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# Communication Design Quarterly

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# Experience Report

## Using a Hybrid Card Sorting-Affinity Diagramming Method to Teach Content Analysis

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### ABSTRACT

In this teaching experience report, we describe a research experience for undergraduates (REUs) designed to cognitively support the work of two student research assistants (RAs) from a two-year college (2YC) on a funded project that involved analyzing user-generated content for an mHealth app. First, we suggest partnerships between two- and four-year institutions as a move toward REU equity because students from 2YCs are not typically afforded these opportunities. We then review the role of research in undergraduate learning and posit the importance of scaffolding to sequence cognitive leaps. Finally, we present the cognitive scaffolding we created and connect it to our hybrid card sorting-affinity diagramming content analysis method.

### CCS Concepts

CCS → Applied computing → Education

### Keywords

Research experiences for undergraduates (REUs), Cognitive scaffolding, Undergraduate research at two-year colleges, Content analysis

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### INTRODUCTION

This article uses a hybrid card sorting-affinity diagramming method to design cognitively scaffolded learning for undergraduate student researchers and address two-year college (2YC) research opportunity inequities. In Technical and Professional Communication (TPC), recent curricular and programmatic research demonstrates that research skills are crucial and desired. For example, Ford and Newmark (2011) included “effectively conduct and communicate research” as an additional component to senior capstone projects (p. 312), and Ilyasova and Bridgeford (2014) incorporated research as one of their five suggested programmatic outcome categories. Further, based on their identification of existing foundational (i.e., rhetoric, writing, technology, and design) and important, yet secondary (i.e., ethics, research, collaboration, and professionalization) undergraduate TPC programmatic learning outcomes for students, Clegg et al. (2020) recommended that TPC programmatic administrators emphasize these secondary areas, such as research, because they are “. . . necessary building blocks for students’ future success” (p. 27). In their explanation, they noted that “research allows students to locate and/or produce information, assess its relevance, and apply the information to address a problem or issue” (Clegg et al., 2020, p. 10). Such programmatic concerns remain important, while the more recent “social justice turn” in TPC (Walton et al., 2019), which advocates an active “social justice stance” (Jones, 2016; Jones et al., 2016, p. 211), presents the opportunity to consider how we might approach these curricular considerations in order to empower marginalized (and minoritized) groups (Jones & Walton, 2018) as well as more actively pursue equity (see Colton & Holmes, 2018).

In this teaching experience report,<sup>1</sup> we connect these two threads—TPC’s focus on undergraduate research as an important component of programmatic learning outcomes and the shift toward a social justice perspective in the field—by advocating that faculty from two- and four-year institutions work together to offer research experiences for undergraduates (REUs) specifically designed for two-year college students. Indeed, students at 2YCs are less likely than their counterparts at four-year institutions to have opportunities to participate in an REU, which are generally thought to be

valuable learning experiences (Dillon, 2020; Stanford et al., 2017). Historically, 2YCs are also more likely than four-year institutions to teach minority and generally underserved student populations. In fact, according to recent demographic data from the American Association of Community Colleges (AACC) (2020), for credit-earning students, 26% are Hispanic, 13% are Black, 6% are Asian/Pacific Islander, 1% are Native American, 4% are multiracial, 4% are other/unknown, and 2% are “nonresident alien” (n.p.). These demographics show that 56% of students at 2YCs are either Black, Indigenous, or people of color (BIPOC). To contextualize, according to the most recent (2019–2020) integrated postsecondary education data for the minority-serving and Hispanic-serving institution and 2YC where the first author, Bivens, is affiliated, 85% of students are BIPOC (U.S. Department of Education, 2021a and 2021b).

We suggest that this research opportunity inequity for REUs can be addressed through partnerships between two- and four-year institutions such as ours, which we discuss in this report, and can serve as socially just pedagogical action meant to provide momentum toward an enduring, racially equitable shift in REUs in TPC. To illustrate how such partnerships might be put into practice, we describe a funded research project<sup>2</sup> wherein we hired two undergraduate students from a 2YC institution as research assistants (RAs).<sup>3</sup> More specifically, this project focused on analyzing user-generated content (UGC) or review comments for a civilian first responder app (see Welhausen & Bivens, in press-a, in press-b) and also serves as an example of how *cognitive scaffolding*—or intentionally sequencing student learning activities to build upon previous learning and knowledge—can be used to support students in REUs in TPC.

To address REU access equity, we designed this portion<sup>4</sup> of our research project specifically so that we could work with 2YC students. Furthermore, because our project was funded, we hired and paid the two RAs for their labor. The cognitively scaffolded instructional approach we employed showed the project RAs one method for conducting content analysis. Whether in the classroom or workplace, this communication design method could be used as an example for conducting content analysis or as a model in any learning or training context. To prepare the project RAs for this research experience, our process included a hybrid research method of (1) open<sup>5</sup> card sorting and (2) affinity diagramming as a pedagogical approach to cognitively sequence the steps in analyzing the review comments we collected. Our full methodological approach is outlined in detail in a forthcoming publication (see Welhausen & Bivens, in press-b).

Framed in the value of REUs in TPC and as part of a research experience at a 2YC, in what follows, we explain the scholarship that informed our cognitive scaffolding instructional approach, track that approach onto our hybrid research method, discuss the potential benefits of researching with undergraduates at 2YCs, and promote REUs at 2YCs as a move toward more equitably offering research experiences to undergraduates. First, we frame our experience report by briefly reviewing the role of research in undergraduate learning and the importance of scaffolding students’ learning to safely promote cognitive leaps. We then share the hybrid data analysis method we used. Next, we provide relevant context for our experience report before we share our pedagogical approach. We suggest that our approach allowed us to more easily design sequenced activities to build toward the higher-order thinking skills (e.g., evaluating review comments and creating categories) that the RAs would need to conduct the content analysis

portion of the project. Finally, we discuss the pedagogical benefits of our approach for learners, and we conclude by arguing that these benefits can address the inequity in REU opportunities.

## RESEARCH IN UNDERGRADUATE LEARNING AND TWO-YEAR COLLEGE CONTEXTS

The academic and anticipated professional benefits of REUs in science, technology, engineering, and math are well established and widely known (see Bangera & Brownwell, 2014). In contrast, in the social sciences, REUs have been called research-based learning (RBL) and have been defined as “students conduct[ing] their own research with the help of a supervisor” (Wessels et al., 2020, p. 2) or simply described as undergraduate research (Haeger et al., 2020). Regardless of the term, it is likely that these research experiences vary in each disciplinary context. Yet they are similar in that students investigate some kind of empirical phenomenon with the primary objective being “to provide [them] with an opportunity to experience participation in research,” as Wessels et al. (2020) put it (p. 1).

Whether at a two- or four-year institution, REUs are valuable for learners (Dillon, 2020; Stanford et al., 2017) even if “community colleges [face] unique challenges” in implementing REUs (Bock & Hewlett, 2018), which, at least anecdotally, we know is the case. To address these unique challenges, Schuster (2018) provided a list of high-impact practices from the AACC (p. 276). Along with capstone courses or projects and common intellectual experiences like those experienced in learning communities, the list also included undergraduate research. Schuster’s (2018) motivation derived from his argument about “the importance of starting undergraduate research when students [who] are still within their first two-years [sic] of college in general and when they are at two-year colleges in particular” (p. 277). Although 2YCs “are not [traditionally] seen as institutions where faculty members and students are engaged in scholarly research and the production of knowledge . . . undergraduate research is being conducted in community colleges [2YC] across the nation” (Boggs, 2009, pp. v–vi). However, as Martin and Rose (2005) explained, “Context is important—not just for the texts we study but also for the research we undertake” (p. 251). We contend that the academic and professional value students derive from research-based learning experiences—funded or unfunded at two- or four-year institutions—depends wholly upon the careful pedagogical research experience design (e.g., cognitive scaffolding) and the actual real-world context (such as challenges brought on by the COVID-19 pandemic) of the research experiences themselves. These factors work in tandem either for or against the quality of the research experience and its value for students. As an example of an active contribution toward a socially just pedagogical practice in TPC (Jones, 2016) that encourages an equitable distribution of research opportunities, providing REUs for 2YC students through the type of partnership we propose is a move toward what we hope will be a pronounced and enduring equity shift in access to research opportunities for 2YC students.

## RESEARCH TEAM CONTEXT

Typically, the kinds of REUs in which Bivens has participated with students at a 2YC took place in independent study courses or National Science Foundation–funded science courses with communication components. However, at the RA’s institution, due

to budgetary restrictions, independent study opportunities—unless they directly result in or contribute to an academic credential (i.e., degree or certificate)—are not currently available for students. At the same time, with generous funding through an early career grant from the Special Interest Group on Design of Communication (SIGDOC), the portion of the research project described in this report included a team—comprised of two faculty members (Bivens and Welhausen) and two project RAs (both from a 2YC)—and provided compensation for the project RAs' labor. Previously, Bivens worked with the RAs<sup>6</sup> on another extended research project examining TPC curricula and programs at 2YCs<sup>7</sup> (see Bivens et al., 2020a, 2020b). For these reasons, the partnership we describe, including working with these RAs, was the most convenient research team configuration for this project.

In order to acquaint Welhausen with the RAs and vice versa, we convened in May 2019 (Meeting 1) in a conference room at the Newberry Library<sup>8</sup> in Chicago, Illinois,<sup>9</sup> to explain the scope of the research project and to field questions from the RAs. During this initial research team meeting, all research team members had the opportunity to talk informally and ask questions related to the project. For example, since the RAs were nearing graduation (Spring 2020), they were encouraged to ask questions about Welhausen's four-year institution. Then, later that year in November 2019 (Meeting 2), the entire research team met again at RA's institution for a day-long research meeting to discuss, define, and practice analyzing the project's dataset (see Welhausen & Bivens, in press-a); basically, this second meeting was a formal training session.

However, prior to Meeting 2, the RAs met separately with Bivens to receive hard copy printouts of the nearly 500 mHealth app review comments that comprised our UGC dataset for analysis and the open card sorting materials (e.g., notecards, markers, and envelopes). During this meeting, which was held in Bivens's office on a 2YC campus, Bivens asked the RAs about their current respective workloads (it was just past the midterm of the semester; both were employed part-time and enrolled in full-time studies) and briefly described card sorting and affinity diagramming. Later, the RAs were emailed instructions (Appendix A) regarding open card sorting and background readings about card sorting and affinity diagramming. The RAs were encouraged to report any issues related to understanding the card sorting and affinity diagramming content readings. Each research team member completed open card sorting with the comments to become familiar with their content and to independently create preliminary or practice codes prior to Meeting 2. Through the at-home independent card sorting and later through the affinity diagramming process, the RAs demonstrated their understanding of these usability research methods. The starting point of Meeting 2 was a full research team discussion about the preliminary coding from the independent open card sorting, which was one of the cognitively scaffolded learning activities we integrated into the research and analysis<sup>10</sup> process for the RAs.

## **SCAFFOLDING TO HELP STUDENT RESEARCHERS MAKE COGNITIVE LEAPS DURING MEETING 2**

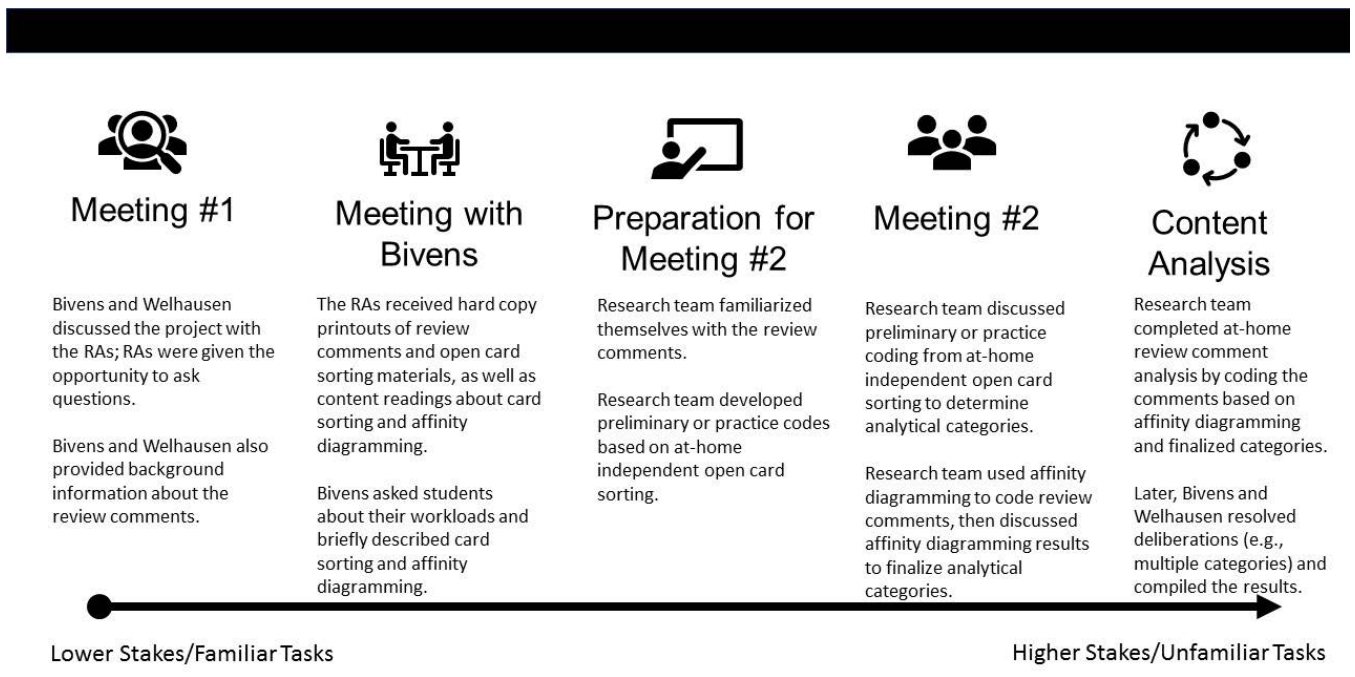
In her work examining an experienced writing tutor's verbal and nonverbal work with students in a university writing center, Thompson (2009) reviewed the pedagogical origin of the term

*scaffolding*, noting that it was initially used in the 1970s by Bruner and colleagues; then it was taken up by Vygotsky regarding infant language acquisition (p. 418). *Cognitive scaffolding* (see also Cromley & Azevedo, 2005) is a pedagogical concept or learning practice that encompasses different kinds of instructional moves made to help a student or any learner solve a problem on their own. Thompson defined *cognitive scaffolding* as “lead[ing] and support[ing] the student in making correct and useful responses” and *motivational scaffolding* as “provid[ing] feedback and help[ing] maintain focus on the task and motivation” (p. 417). Although the distinctions between these kinds of scaffolding are useful, this teaching experience report focuses on the method we used to cognitively sequence learning activities. To do so, we used open card sorting and affinity diagramming as a hybrid method composed of two learning activities. These learning activities broke down the content analysis into two parts that first allowed the RAs to get to know the reviewer content, then to evaluate it. By doing this, we sequenced opportunities for knowledge building through the learning activities (i.e., open card sorting and affinity diagramming) during the learning process to prepare for content analysis. For example, the cognitive scaffolding we designed presented an opportunity to blend two methods commonly used in usability research—open card sorting and affinity diagramming—to gently lead and support the RAs in the cognitive work required to analyze the dataset.

Grady (2006) discussed *scaffolding* within the context of online pedagogy as a strategy used to “help learners span a cognitive gap or leap a learning hurdle” (p. 148; see also Grady & Davis, 2005/2017). Meeting 2 was designed as a training workshop (with breakfast and lunch served). Our intention for the tasks assigned prior to Meeting 2 was two-fold: to introduce card sorting and affinity diagramming via content readings and to provide a low-stakes at-home learning activity to practice open card sorting. We reasoned that the open card sorting would prepare the RAs for affinity diagramming (the major task of Meeting 2), which was the preparatory learning activity preceding the independent content analysis aimed at evaluating the review comments in order to create categories. In this way, we wanted to lead and support (Thompson, 2009, p. 417) the RAs as they became acquainted with and understood the content of the review comments. Then, as they engaged in this process, they also practiced the skills needed to evaluate and analyze that content. In this way, and as shown in Figure 1, the RA's learning process was supported via the cognitive scaffolding through card sorting and affinity diagramming content readings, the low-stakes open card sorting learning activity, and the discussions during Meetings 1 and 2. Furthermore, we certainly used motivational scaffolding by providing encouragement and guidance, supportive feedback, and training during each meeting.

## **BUILDING CONTENT ANALYSIS SKILLS THROUGH OPEN CARD SORTING AND AFFINITY DIAGRAMMING**

In TPC, content analysis can either be qualitative (e.g., Geisler, 2018) or quantitative (e.g., Brumberger & Lauer, 2015) and requires familiarity with the text in order to identify and define analytical categories before developing the conditions or rules that dictate how to code content. Essentially, content analysis requires making decisions about the level of analysis and how many categories to code for, as well as how to value the occurrence of a code and its frequency. Without making these decisions, content analysis can



**Figure 1 : Research Team Scaffolding Milestones and Lower/Familiar–Higher/Unfamiliar Stakes Range**

be difficult and overwhelming, especially for novice researchers or practitioners in any kind of learning or training context.

We designed the learning activities (e.g., content readings and open card sorting) to achieve the ultimate goal of our research project: to analyze the review comments. Moving backwards from that goal, we cognitively scaffolded each learning activity by using the revised version of Bloom’s taxonomy of learning (see Figure 2). By doing so, we sequenced each activity, such as the assigned content readings about card sorting and the at-home independent open card sorting, to provide a learning opportunity for the RAs to move from one revised Bloom’s taxonomy level to the next, which provided an opportunity for the RAs to practice the skills that make up content analysis (i.e., coding, categorizing, and evaluating). To illustrate, by first *understanding* open card sorting, the RAs could then progress to the next level of *applying* this understanding by completing the at-home independent open card sorting of the review comments. In other words, the card sorting content readings prepared the RAs to move from *understanding* card sorting to *applying* or duplicating that understanding to then open card sorting the review comments.

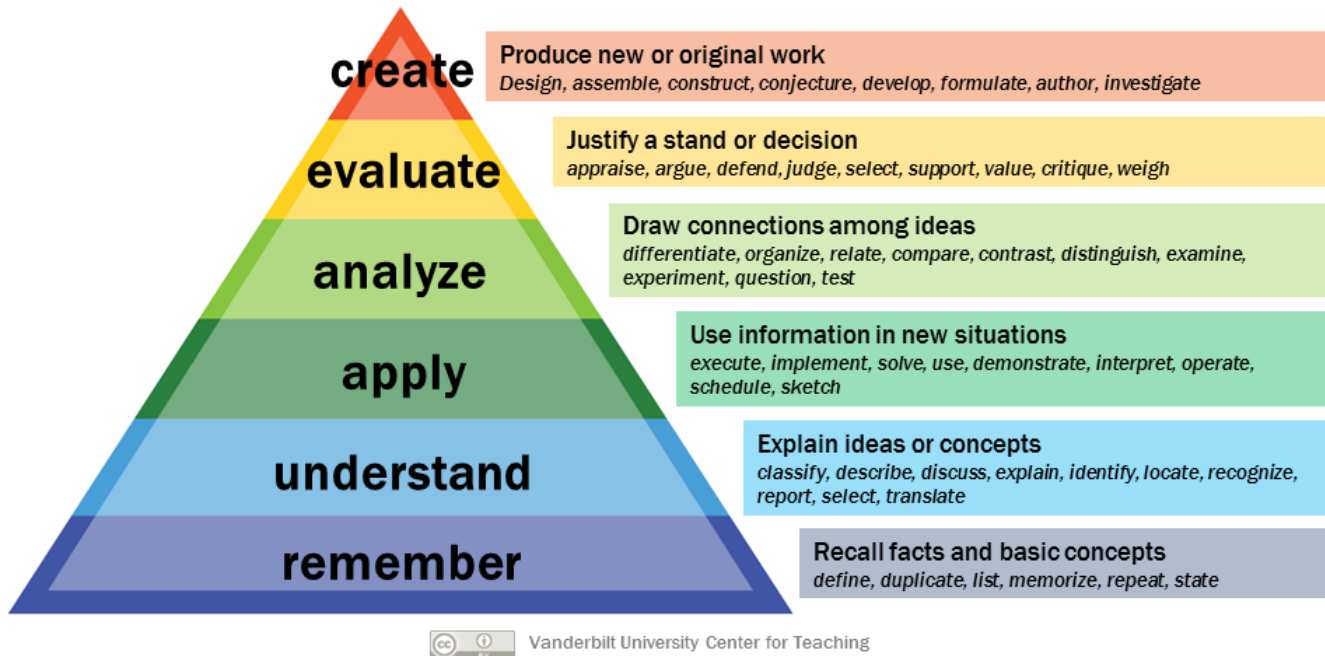
From understanding the review comments before Meeting 2 through independent open card sorting to eventually practicing evaluating the review comments to creating categories via affinity diagramming during Meeting 2, we worked to cognitively sequence these learning activities to encourage achieving a specific outcome: the content analysis (as shown in Table 1). For example, meeting with the RAs gave Bivens the opportunity to share the card sorting and affinity diagramming content readings and review comments so that the RAs could prepare to *remember*, *understand*, *analyze*, and *evaluate* the review comments via independent card sorting. The entire research team used their at-home independent open card sorting experience and practice to later prompt discussion during Meeting 2 that then led the team to formally *analyze* and *evaluate* the review comments. Also during Meeting 2, after we discussed the at-home independent open card sorting results, described those

results, talked through any coding discrepancies, and created and defined categories, we then conducted a silent affinity diagramming session with our preliminary categories for about 2 hours.

After the affinity diagramming, team members were able to question the valuation of other team members’ placements, defend their own valuations, and review comment placements within each category. From there, we worked with the RAs to *create* (the revised Bloom’s taxonomy of learning’s highest cognitive process) categories for the review comments as shown in Table 1 below. In the process, team members drew from their appraisals from their at-home independent card sorting categorization experiences. These experiences included noting the affinity diagramming similarities or differences. Ultimately, those similarities and differences indicated the categorization for the review comments.

Since content analysis also requires making decisions about how categories will be defined or described (see *evaluate* and *create* in the revised Bloom’s taxonomic terms from Figure 2) so they reliably suit the content’s codes, an additional motivation for the at-home independent open card sorting was the lower-stakes experience of practicing grouping the review comments and defining categories in different ways prior to sharing the open card sorting results at Meeting 2. For example, both RAs were allocated at least 10 days to become familiar with the review comments and *create* and *define* preliminary categories prior to Meeting 2. To show the value of their labor and this process, they tracked their RA hours and were paid for their work, which we think also offered an additional motivation. For their at-home independent open card sorting, they had to develop rules for coding content in order to make decisions about what to do with nonsubstantive, unactionable, or otherwise unusable review comments. This work became the starting place for Meeting 2. The above-mentioned at-home independent open card sorting groundwork and the affinity diagramming during Meeting 2 were necessities prior to the RAs independently coding the review comments at home after Meeting 2. The low-stakes

# Bloom's Taxonomy



**Figure 2 : Revised Bloom's Taxonomy of Learning: Building the Most Foundational Learning Skills from the Bottom to the Top** (Note. From Bloom's Taxonomy [Graphic], by Center for Teaching, Vanderbilt University, 2016, Flickr. [<https://www.flickr.com/photos/vandyuft/29428436431>]). CC BY 2.0.]

at-home independent open card sorting was a precursor to and practice for both the affinity diagramming during Meeting 2 and the formal at-home independent content analysis after Meeting 2. In other words, the low-stakes at-home open card sorting when coupled with the affinity diagramming were prerequisite learning activities. In fact, the affinity diagramming process was informal content analysis practice, which the RAs eventually repeated at home, post-Meeting 2. By completing these learning activities, we cognitively scaffolded the RA's learning from review comment familiarity to *understand* to eventually *analyze* and then to formally *evaluate* the review comments.

The purpose of the affinity diagramming was to visualize the categorization of each review comment, ensuring a supportive environment where we could eventually discuss problematic or confounding comments from the dataset. After our preliminary coding of the comments during affinity diagramming, we talked about the emerging preliminary categories, collapsing some narrower categories into broader ones and deciding what to do if a research team member was unsure where a comment belonged. In addition to visualizing the content analysis process through affinity diagramming, the aim was to address any potential kerfuffle, discuss the remedy, and code the comments consistently. Furthermore, the affinity diagramming was the last in-person supportive training prior to the RA's analysis of the review comments at home. In other words, in our REU design, Meeting 2 was the final formal, cognitively scaffolded learning activity, training session, and preparatory step before the RAs independently conducted the content analysis. Prior to closing Meeting 2, the categories were finalized and recorded, and we were confident that we had guided the RAs through the cognitive sequencing necessary to independently analyze the review comments. Based on the progress

made in Meeting 2, including the affinity diagramming process, results, and discussions, we then shared data coding instructions (Appendix B) via email, described the content analysis process as a reminder, and disseminated the agreed-upon categories and example codes created during Meeting 2.

## PEDAGOGICAL BENEFITS OF RESEARCHING WITH UNDERGRADUATES AT TWO-YEAR COLLEGES

Recently, a tweet by professor and writer David Bowles (2020) reminded readers that historically, education—from Aristotle through the next 2,500 years or so—was intended for the elite, and only in the last 150 years has education been offered to the public. He noted that “no human society had ever attempted to formally educate the entire populace,” and he described contemporary public education as “smack-dab in the middle of the largest experiment on children ever done.” For any educator, an awareness of the relative newness of public education within the context of the history of humankind might be a sobering, humbling thought. In fact, it might put any instructional design or pedagogical method, like using the revised Bloom's taxonomy of learning to design REUs, into question. In fact, Bloom's original taxonomy of learning was published in 1956, then revised in 2001. We would hypothesize that as the design of learning in communication contexts with regard to REUs in TPC is better understood, perhaps part of Bloom's taxonomy—usually used in K–12 educational settings—might not directly correlate to learning contexts in higher education (or even K–12). More specifically, the social aspects of learning are not included in any of Bloom's frameworks. And as learning remotely



**Table 1 : Revised Bloom’s Taxonomy and Our Designed Learning Activities**

Revised Bloom’s Taxonomy Verbs	Description	Cognitively Scaffolded Learning Outcome
Create	Produce new or original work.	<ul style="list-style-type: none"> <li>—developed independent content analysis of review comments</li> <li>—constructed categories through affinity diagramming</li> <li>—assembled review comments into preliminary categories through open card sorting</li> </ul>
Evaluate	Justify a stand or decision.	<ul style="list-style-type: none"> <li>—defended reviewer comment category placement post–affinity diagramming</li> <li>—valued review comments via affinity diagramming</li> <li>—appraised review comments through open card sorting</li> </ul>
Analyze	Draw connections among ideas.	<ul style="list-style-type: none"> <li>—questioned the categorizations of others’ post–affinity diagramming</li> <li>—related similarities among review comments during affinity diagramming</li> <li>—organized review comments into categories during open card sorting</li> </ul>
Apply	Use information in new situations.	<ul style="list-style-type: none"> <li>—implemented card sorting content readings</li> <li>—implemented affinity diagramming content readings</li> <li>—demonstrated card sorting and affinity diagramming knowledge</li> </ul>
Understand	Explain ideas or concepts.	<ul style="list-style-type: none"> <li>—reported issues related to card sorting and affinity diagramming content readings</li> <li>—discussed open card sorting process at outset of Meeting 2</li> <li>—identified and selected relevant card sorting and affinity diagramming knowledge for future use</li> </ul>
Remember	Recall facts and basic concepts.	<ul style="list-style-type: none"> <li>—repeated affinity diagramming process after training in order to conduct content analysis</li> <li>—duplicated open card sorting method process independently based on content readings</li> <li>—memorized open card sorting and affinity diagramming processes</li> </ul>

has shown us during the COVID-19 pandemic, socialization is an important (and for some, the most important) element of learning (and some instructors are more adept in supporting student learning in online learning contexts than others). As we designed this REU, we were mindful of the preeminence of socialization in learning and collaboration, which is why we met together as a research team during Meetings 1 and 2. For example, to promote socialization during Meeting 2, we provided meals, which we hoped would encourage informal exchanges and a pleasant experience. In fact, although these meetings were integral for planning, they were also sources of enrichment and motivation for us through experiencing the collaborative joy of participating in cross-institutional research and working on a research team—unforeseeable, valuable, and affective project outcomes outside of our design of these learning activities and research experiences in general.

In tandem with TPC scholars’ calls to assess and prioritize

research for undergraduates (Ford & Newmark, 2011; Ilyasova & Bridgeford, 2014; Clegg et al., 2020), we suggest that partnerships, like the project we undertook, be implemented across two- and four-year institutions. Out of 1,235 public and private not-for-profit 2YCs, 990 2YCs offer at least 1 TPC course, which is 80% of these schools (Bivens et al., 2020a, 2020b). In their content analysis of these 1,235 2YCs, Bivens et al. (2020a, 2020b) created a state-by-state list of 2YCs offering TPC curricula. Using this list as a starting point to institutionally locate potential collaborators and form partnerships, we advocate that faculty from four-year institutions work with faculty from 2YC feeder schools—the schools from which 2YC transfer students primarily matriculate—to design cross-institutional, context-specific research and learning experiences for undergraduate students from both two- and four-year institutions. By doing so, these TPC instructors can intentionally contribute to efforts to address research opportunity inequities.

## CONCLUSION

In closing, this teaching experience report describes the process we used to conduct research with two project RAs at a 2YC. Through our discussion, we also demonstrated how to cognitively scaffold and design learning activities ranging from at-home, lower-stakes open card sorting to in-person, higher-stakes affinity diagramming that prepared these project RAs to analyze content independently and consistently. Our example provides a model for students and practitioners alike to learn about content analysis through the hybrid open card sorting-affinity diagramming method (as previously noted, see Welhausen & Bivens [in press-b] for more detail about our process), which can be applied to other learning and/or training contexts involving content analysis. At the same time, we also advocate for creating and sharing (paid) TPC research opportunities or REUs for students at 2YCs like the one we describe in this report. While we recognize that because TPC instructors are often housed in English departments, obtaining funding for research in humanities-based disciplines, particularly to pay RAs, can be a significant challenge, we also propose that faculty from four-year institutions might be better positioned to procure internal and even external funding for such endeavors. Finally, we suggest that faculty at four-year institutions look for opportunities to work with colleagues at 2YCs to form partnerships like the one we describe here, incorporating as many faculty and students from two- and four-year institutions as can be sufficiently supported. As our discussion in this report shows, the design of our REU moves us toward actively pursuing research opportunity equity for undergraduates—a meaningful, feasible, and ideally enduring pedagogical action aimed to contribute to socially just and racially equitable REUs in TPC that we wholeheartedly endorse.

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## ENDNOTES

1. The Institutional Review Board for the City Colleges of Chicago reviewed this project and found it to be exempt.
2. We are grateful for an early career grant from the Special Interest Group on Design of Communication, which enabled this research project.
3. We also hired one RA from the four-year institution where Welhausen works, who assisted with compiling preliminary results for this project (see Welhausen & Bivens, 2019).
4. As we indicate in the endnote above, some of the grant funding we received was used to hire an RA from Welhausen's institution as we sought to include students from both of our schools for this project. Ideally, students from both of our institutions would have worked together on the different phases of this project. However, because Bivens was in Chicago, Illinois, and Welhausen teaches in Auburn, Alabama, this kind of interaction was not possible. Further, in this report we focus on the experience of working with RAs from 2YCs who are less

frequently the beneficiaries of REUs.

5. Closed card sorting uses predetermined categories to sort content or items, whereas open card sorting does not.
6. We appreciate the RAs' labor as research assistants on the research team.
7. Bivens appreciates the Council for Programs in Technical and Scientific Communication for a grant award that funded this project.
8. We appreciate the Newberry Library for their willingness to furnish a space for Meeting 1 for the research team.
9. Welhausen thanks the Recognition and Development Committee in the English Department of Auburn University for providing the funding to travel to Chicago to conduct this analysis.
10. For a detailed discussion of our categorization and analytical process, please see Welhausen and Bivens (in press-a).

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Candice A. Welhausen is an assistant professor of English at Auburn University with an expertise in technical and professional communication. Before becoming an academic, she was a technical writer/editor at the University of New Mexico Health Sciences Center in the department formerly known as Epidemiology and Cancer Control. Her scholarship is situated at the intersection of technical communication, visual communication and information design, and the rhetoric of health and medicine.

## APPENDIX A: PULSE POINT PROJECT PREPARATION FOR NOVEMBER 15, 2019

It was great to see you today and meet to talk about the preparatory work for November 15.

To review, 1) please read the following pages about card sorting before you begin sorting the comments:

- <https://www.nngroup.com/articles/card-sorting-definition/>
- <https://www.usability.gov/what-and-why/glossary/card-sorting-or-card-sort.html>
- <https://www.usability.gov/how-to-and-tools/methods/card-sorting.html>
- <https://libguides.memphis.edu/c.php?g=587193&p=4068156>
- <https://blogs.cornell.edu/usabilitytoolkit/2019/06/04/card-sorting/>

Then, please watch the following video about card sorting before you begin sorting the comments: open versus closed card sorting

After you have read and watched the sources on card sorting, then please 3) prepare to sort the cards using the open card sort method. This process includes: reading through and annotating all iOS and Android comments, cutting out those comments, and pasting them to the note cards.

After preparing to sort the cards, then please 4) sort the cards into categories. As you sort the cards, please remember that some comments/cards will not contain substantive information. Categorize those non-substantive comments/cards separate from the other categories you identify.

Once you know categories, rubber band cards in sets of 10 and place in an envelope. On the envelope, please write the name of the category. The category might be anywhere from a word to a phrase of 3-5 words.

Finally, please 5) read the following information prior to November 15:

- <https://www.uxmatters.com/mt/archives/2010/09/dancing-with-the-cards-quick-and-dirty-analysis-of-card-sorting-data.php>
- <https://www.nngroup.com/articles/affinity-diagram/>

If you have questions, or parts of these instructions are unclear, please do let me know.

## APPENDIX B: SELECTIVE DATA CODING BASED ON 11/15 CATEGORIES FROM AFFINITY DIAGRAMMING

1. Carefully read and review the User Comments from column A

(RA 1: comments 2-300 and RA 2: comments 301-600).

*Please note that there are an additional 100 comments from 11/15. So, if some of the comments are unfamiliar, that is why.*

2. Choose the appropriate code (see below) from the drop-down menu in column B (see the next page for our original list) for the User Comments.

- a. Audio,
- b. Accurate Notifications,
- c. Compatibility & Integrations,
- d. Currency,
- e. Improvements,
- f. Location,
- g. More Agencies,
- h. \*Multiple Categories\*\*,
- i. Naming & Descriptions,
- j. Privacy,
- k. \*Unsure,
- l. Updates,
- m. Usability/Interface,
- n. \*Useless Comment,
- o. Operating System-Battery-Memory

*Please tag (@/+) Dr. Bivens or Dr. Welhausen in comments for categories h (multiple categories), k (unsure), and n (useless comment). For \*\*h multiple categories, please be sure to name the multiple categories in the comment, too.*

3. Repeat process for all assigned User Comments.

4. When you have finished categorizing all your data, please send a message to Dr. Bivens and Dr. Welhausen. If you have questions, please do let us know.

Audio	Accurate Notification	Compatibility & Integrations	Currency	Improvements	Locations	More Agencies	Multiple Categories	Naming & Descriptions	Privacy	Unsure	Updates	Usability/ Interface	Useless Comment	Operating System/ Battery/ Memory
Dispatch	Alerts	Work with other devices	Updates notifications late	Customization -specific calls -specific notifications	Radius	Expansion		Alert Naming	Legal protections		What happened to?	Operating system crashes	AED -location	Networks
Radio	Accident -details -info -lack of info	Problems with iOS	Delays	Radius	GPS	Coverage		Clear Legend	Gives personal address		When will you bring back?	Scanner doesn't work	Alternative uses	Call time
Sound		Problems with Android	Faster		Maps	Wish it was here		Naming Emergency	HIPPA law		When will there be an update?	When I do this . . . this happens instead	General praise or disdain without a reason	Drains battery
Notification Sounds			Not current					Categorization	Minor child		Why did the update include?	Hard to read or hear	PPF can't do anything with comment	Takes up too much phone memory

# Outcomes of Training in Smart Home Technology Adoption: A Living Laboratory Study

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## ABSTRACT

While various forms of smart home technology have been available for decades, they have yet to achieve widespread adoption. Although they have risen in popularity during recent years, the general public continue to rate smart home devices as overly complex compared to their benefits. This article reports the results of an eight-month study into the effects of training on smart home technology adoption. Building upon the results of a previous study, and using the same living laboratory approach, we studied the effects of training on the attitudes of a group of residents toward use of smart home technology. Results show that training influences those attitudes toward smart home technology, including increased confidence in future use, and increased actual use of more complex smart home features. Results also indicate that users tended to seek out other users rather than training materials for advice, and that privacy concerns were not a deterrent to using smart home devices.

## CCS Concepts

CCS → Social and professional topics → User characteristics

CCS → Human-centered computing

## Keywords

Smart home technology, Training and Technology, Technology adoption, Technology diffusion, Usability

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## INTRODUCTION

The role of training in Smart Home Technology (SHT) adoption has been largely overlooked because of assumptions that consumers will fully understand the technology's complex setup and myriad of potential uses after purchase. In this article, we present the findings of an eight-month study comparing the actions and attitudes of a trained group of SHT technology users in living laboratory houses against a previous cohort who lived in the same houses with the same technology but were not given training. We gain insight into details of the user's desires, use, lack of use, and effects of the training through ten themes that emerged from interviews conducted at the conclusion of the study. Our goal was not to examine particular training methods, nor technology acceptance on the basis of traditional diffusion models, but on the differential impact of training in this situation within the context of a network of smart home technologies.

While only a handful of SHT studies existed ten years ago, now there are dozens of studies on a variety of topics using different methodologies. However, studies that utilize a controlled environment to examine actual users of technology are still few in number. Most recent research focuses on buyer preferences and emotive reasoning for adoption rather than user experiences, training and usability. However, as Wilson et al. (2017) write,

Analysis of reports, studies, websites and promotional material produced by smart home technology developers and service providers reveals a notable absence of user-focused research. User-oriented studies in actual smart home environments are notable exceptions rather than the rule. (p. 15)

Early SHT studies tended to focus on the technical specifications and interoperability rather than users (Hargreaves et al., 2018). But, in recent years, a more humanistic approach has become more popular. Many of the "first wave" humanistic studies focused on the perceived benefits of SHT among users or potential users. For example, users reported that they felt SHT could save energy and money (Mennicken & Huang, 2012; de Oliveira et al., 2015),

enhance security (Brush et al., 2011; de Oliveira et al., 2015), save time (Mennicken & Huang, 2012; de Oliveira et al., 2015), and make life easier (Brush et al., 2011; de Oliveira et al., 2015). People also reported adopting SHT to feel technological (Mennicken & Huang, 2012; de Oliveira et al., 2015), to feel in control (Brush et al., 2011; Mennicken & Huang, 2012), or to feel modern (Mennicken & Huang, 2012). All of these benefits along with knowledge of SHTs continue to be highly related to their adoption and use (Shank, Wright, Lulham, & Thurgood, 2020). Later research shows that users want control over their home environment and products that are “designed to be reliable, easy to use, controllable, and easy to over-ride” (Wilson et al., 2017, p. 83) and that users, “do not want their home to be an unknown person with a mind of its own, but rather an intelligent helper that supports them to complete everyday tasks better or quicker while knowing when to leave inhabitants alone” (Mennicken et al., 2016, pp. 128–129).

Numerous models of technology acceptance have also been applied to SHT in an attempt to explain why users choose to adopt or reject it (Ahn et al., 2016; Yang et al., 2017; Nikou, 2019; Shuhaiber & Mashal, 2019; Baudier et al., 2020; Hubert et al., 2019). Those studies tend to show perceived ease of use and usefulness as primary drivers of adoption and perceived risks such as the time invested in learning to operate that technology (Wright & Shank, 2019) and giving up autonomy and control of the home (Wilson et al., 2017) as primary barriers to adoption. But, although SHT has been available for more than thirty years, it has failed to proliferate as expected (Brush et al., 2011; Fleishman, 2019). This has led some researchers to suggest that, “Smart home providers should survey user needs for their product instead of merely producing smart homes based on the design of the builder or engineer” (Luor et al., 2015, p. 377). Those perceptions do not seem to have changed much over time. According to Hargreaves and Wilson’s 2017 book, 86% of survey respondents agreed that smart home technology is primarily designed to control energy, heating, and appliances. Those objectives do not line up with users’ stated desires for controllable, intelligent systems that help them with everyday tasks (Hargreaves & Wilson, 2017; Mennicken et al., 2016). In fact, as Takahashi (2017) reported, 81% of consumers are aware of smart homes, but only 26% want one. This can be attributed to the discrepancy between their desires and their expectations or their understanding of the risks.

That discrepancy seems to have gone unnoticed by SHT manufacturers. As early as 2013, Balta-Ozkan et al. reported that a lack of knowledge, resistance to change, and the fact that users are not fully aware of their functions, potential risks and benefits was a major barrier to the proliferation of SHT. Hargreaves et al. (2018) agree, stating that complex learning demands placed on users are a strong detriment to utilizing smart home technology and that “there was little interest [among their respondents] in making use of the more advanced and automated features of the systems” (p. 134). Similar findings can be found in other research by Georgiev and Schlögl (2018) who found that insufficient interoperability, complexity, and lack of perceived value all hinder adoption of SHT; and research by de Oliveira et al. (2015) that shows SHT users are often overpowered by complex technology. These trends may have something to do with what Greenough (2016) refers to as the chasm of the technology adoption cycle, that space in between early adopter acceptance and widespread market acceptance. Greenough (2016) also mentions this is partially due to the poor interoperability between devices from different manufacturers,

which makes advanced use difficult and complex.

That state of affairs has made marketing SHT difficult for manufacturers. While some have speculated that younger consumers or “digital natives” who have grown up with digital devices are more likely to use and purchase SHT, and might provide a better market for SHT, other research (Shin et al., 2018) finds older consumers to be more likely to adopt SHT within a given time frame. Also, some authors have convincingly argued that digital natives having superior technology skills is a myth (Selwyn, 2009; Margaryan et al., 2011; Kirschner & De Bruyckere, 2017). So, there is some discrepancy concerning the best potential market for SHT and digital natives cannot be counted as the “saviors” of SHT because of their mythical technology skills.

Regardless, the majority of the population between young and old are still in the “chasm” between the early adopters and the late adopters and have little experience with SHT or its (still) complex features. It is also true that privacy and security issues are still barriers to SHT adoption. Numerous articles have been written about the potential privacy abuses of SHT (Dorri et al., 2017; Geneiatakis et al., 2017; Mocrii et al., 2018) and of smart devices and cities in general (Zhang, et al., 2017; Gilliard, 2020). However, usability issues and a general lack of understanding may be a greater force in preventing its adoption. Zeng et al. (2017) found that users had some awareness of privacy issues but that their concerns were based more on physical security than information security. Likewise, Zheng et al. (2018) show that user’s perceptions concerning information security are dependent upon their perceptions of the benefits they receive from those collecting information and that users generally trust manufacturers to protect their privacy. In addition, Marikyan et al.’s (2019b) review of SHT literature shows, among other things, that a “usability barrier” created by problems with ease of use and reliability continues to be a major hindrance to widespread adoption. Likewise, Park et al. (2017) show that compatibility, connectedness and control are primary motivators for adoption. If this is true, then it stands to reason that a “usability barrier” surrounding SHT is primarily due to a lack of understanding concerning the operation and features of SHT.

Also, there is little support for users from manufacturers at this time. For example, Google and Samsung web sites promoting SHT focus mainly on the benefits of that technology and marketing in spite of the fact that users still:

- see SHT devices as complex and expensive (Georgiev & Schlögl, 2018)
- point to a lack of transparency from manufacturers and overpowering technology as major hindrances to adoption (de Oliveira et al., 2015)
- name ease of use of usefulness as highly important adoption factors (Nikou, 2019)
- cite overall risk perception as a distinct barrier to adoption (Hubert et al., 2019)

That risk can take many forms, including the risk associated with investing time into learning to use new devices that are often proprietary in nature (Wright & Shank, 2019). Thus, it stands to reason that in order to navigate the more complex features of SHT, users will require much more extensive and accessible support from manufacturers (or other sources) including the ability to repair or

alter those devices. While some research (Vasisht et al., 2018; Cook et al., 2012) seeks to design “out of the box” smart homes or homes that can be more adaptively automated, other research (Yang et al., 2017) shows that automation has an insignificant impact on user attitudes toward SHT. So, while SHT may in fact become easier to use and more adaptive, users may always want to have a certain level of understanding and control over those devices. And, because it has been shown that the more individuals use a technology, the more they tend to use that technology in the future (Hew et al., 2015; Nikou & Bouwman, 2014), SHT users might benefit greatly from an initial training period that would get them using SHT devices more proficiently from the start and give them a feeling of control over those devices. If this is true, it could positively affect the process of adoption—thereby making the benefits of SHT more accessible to the average user.

## Effects of Training on Technology

Training has been shown to have a positive impact on technology implementation in some theoretical constructs such as the Unified Theory of Acceptance and Use of Technology (UTAUT) (Marler et al., 2006; Marshall et al., 2008) which posits that users make decisions about technology adoption based on performance expectancy, effort expectancy, social influences, and facilitating conditions. However, studies concerning training and theories of technology acceptance such as the UTAUT, Technology Acceptance Model (TAM) and TAM2 are rare (Harris et al., 2018). Both TAM and TAM2 list perceived ease of use and perceived usefulness as factors in acceptance, and the latter includes social and cognitive factors. But those theories are typically applied to technology adoption independent of training considerations. So, while all of those theories have been very influential in technology adoption, their lack of emphasis on training as a factor in technology adoption limits their value in a training-based comparative study.

However, research in fields such as farming, education, and medicine does show a positive correlation between training and adoption (Nakano et al., 2018; T. Johnson et al., 2012; Mills & Olsen, 2008). Other studies (Durodolu, 2016) have suggested that training can be an effective tool for overcoming resistance to information technology systems. And finally, many articles (Mills & Harris, 2019; Dwivedi et al., 2017; Pynoo et al., 2011) suggest that organizations should provide proper training to users to enhance their willingness to use new technologies.

But training as a factor in technology implementation failure has also been well documented and is not well understood. As Harris et al. (2018) say, “There is widespread acknowledgement, by researchers and practitioners alike, that training is a critical factor in predicting technology acceptance and use. It is also clear that no model has effectively incorporated these features together” (p. 223). Previous research shows that a technological lack of understanding in fields such as the beef industry (Wright, 2015) can lead to rejection of new technology—especially digital or Internet of Things (IOT) technology. Dalcher and Genus (2003) report that approximately \$150 billion are wasted each year in failed information systems implementations. Those failures occur globally and have been extensively documented in a variety of industries including port operations (Gekara & Nguyen, 2020), offshore construction (Boudreau & Holmström, 2011), and air traffic control (Genus et al., 2003). Each of those studies found inadequate training to be a factor in failure. Despite this, companies continue to invest heavily in both technology and training. In fact, as Bunch (2007) reports, although U.S. organizations spend over \$200 billion annually

on training, “much of this investment appears squandered on ill-conceived or poorly implemented interventions” (p. 142). Bunch (2007) goes on to show that training failure has been attributed to many different types of training including leadership, participation, quality management, and team development training.

Furthermore, while training has been shown to have a positive effect on technology adoption, training alone is not always effective for increasing its use and successful implementation in practical settings such as educational settings. Zhao and Bryant (2006) found that although training teachers on using classroom technology was effective at a basic level, training did not lead to higher levels of use, and participants requested extended mentoring in the future. Similarly, Davis (2002) found that one-on-one follow-up sessions with teachers led to higher levels of technology integration into classrooms after initial training sessions. Researchers in Brazil also found that instructors who had a higher perception of the impact of training were more likely to implement technology in their classrooms, indicating that even the perception of the quality of training can impact its use (Silva Farias & Mesquita Resende, 2020).

Thus, initial training sessions are not always enough to justify use over time, and when used as solitary incidents may cause abandonment of the technology before users have seen maximum benefit. That trend is not limited to digital or IOT technology. Researchers investigating physically assistive technology have found direct links between training and abandonment of the technology. For example, Sugawara et al. (2018) found that follow-up training with users of assistive technology was especially important in preventing abandonment. Likewise, Clawson et al. (2015) show that users of health-tracking technology often abandon that technology because of their inability to comfortably interact with their devices.

Finally, although studies connecting training and IOT technology use in “real” situations are rare and almost non-existent for SHT, some recent studies have spoken to the link. Jakobi et al. (2018) found that, even after training with smart home devices, study participants were only interested in receiving information from the system about things that had gone wrong after living with the devices for some time. That study also concluded that users with little experience with such technology were in effect made the system’s administrator, and thus needed to see feedback tailored to their specific needs. In addition, Coskun et al. (2018) report that communicating SHT lifestyle improvements to users could be a key factor in acceptance—and is a matter of design and communication rather than marketing.

So, although training is an important factor in technology adoption and use, training has not been shown to guarantee acceptance and implementation of technology, and in some cases has been a part of the problem. Training has also not been effectively incorporated into theories of technology adoption. In any case, our focus here was not on the particular training methods used, but on the effects of general training on the use of SHT.

## Prior Research

Our initial study (Wright & Shank, 2019), conducted over a period of eight months, was designed to find answers to two primary research questions.

1. How likely are residents to adopt SHT when they are provided with that technology but not provided with training



to accompany it?

2. How do residents provided with smart home technology learn to operate that technology?

Although participants initially rated the installed SHT quite highly and planned to use the devices, they also believed that the devices would have little impact on their lifestyle. As subjects lived with the devices over the next eight months, they continued to rate the devices highly but made little effort to learn about them. They also continued to rate their lifestyle impact as minimal. Residents did not make use of the more complex features of SHT and were largely unaware of device capabilities. Three primary reasons surfaced from our surveys and interviews with participants. First, smart home technology is still difficult to program, integrate and control. In determining whether to invest the time and energy necessary to learn programming and control (a risk), residents did not see enough potential reward. Second, because residents were given the technology without support for learning to operate that technology, they were unlikely to understand the technology and unlikely to grasp the full range of possible benefits. Third, the technical capabilities that were reported to be understood by residents *were* underwhelming and represented only minimal lifestyle enhancements for them (Wright & Shank, 2019).

Furthermore, from the perspective of models of technology diffusion and acceptance such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and use of Technology (UTAUT), perceived ease of use did not measure up to perceived usefulness, and social factors played little part in mediating that discrepancy. In short, effort expectancy exceeded performance expectancy. Survey comments revealed that without the training required to use the devices, residents did not believe that the potential benefits were worth the required time investment, which they viewed as the primary risk to adoption (Wright & Shank, 2019).

## Current Research

In light of the findings above, our team decided to eliminate some of the obstacles faced by the previous subjects through a training orientation and support. By providing more informational support and training concerning the more complex operational features of the equipment, we sought to strengthen participants' understanding of the more potentially impactful lifestyle benefits of SHT. In doing so, our goal was to eliminate a simple lack of understanding as a barrier to SHT adoption and use. Therefore, for the current study, we sought to answer the following research questions:

1. Would training concerning the individual devices and more complex features of SHT change residents' perception of and use of SHT?
2. How would this data compare to the original research trial?

## METHODS

To investigate these questions, we made investigative choices based on a pragmatic research paradigm, which prizes the research problem as the central focus and promotes, "methods most likely to provide insights into the question with no philosophical loyalty to any alternative paradigm" (Mackenzie & Knipe, 2006, p. 1). In doing so, we chose a mixed-methods approach that is well suited to gaining information about real-world problems (see R. B. Johnson & Onwuegbuzie, 2004; Creswell, 2003, pp. 155–179; Creswell &

Creswell, 2017). Our method employed an exploratory sequential design (Driscoll et al., 2007; Rife, 2009; Fetters et al., 2013) by first collecting survey data and then using that data to inform the creation of specific interview questions in order to elicit high-quality, focused qualitative responses.

## Study Environment

The Solar Village (Figure 1) on our campus consists of six solar houses constructed by student design teams between 2011 and 2017. We endeavored to equip all six houses with the following smart home technology:

- GE Z-Wave In-Wall Dimmer
- GE Z-Wave Smart Outlets
- Honeywell Wi-Fi Thermostat
- Schlage Connect Deadbolt
- Ring Video Doorbell
- Samsung Multipurpose Sensors
- Samsung Motion Sensors
- Samsung SmartThings Hub
- Netgear Nighthawk AC 1900 Smart Router
- Eufy Smart Bulbs (White)
- Eufy Smart Bulbs (Tunable)
- Amazon Echo
- Amazon Echo Dot



**Figure 1: Four of the six solar village houses**

While each house had most of these technologies, there were some minor differences in the number of devices and their setup due to building design differences. For example, not all houses were capable of supporting tunable light bulbs.

The devices can be controlled via voice commands (Amazon Echo), through installed cell phone apps, or manually. Therefore, participants can utilize the devices both within the house and remotely. Typical tasks might include turning on, off, or dimming lights, turning on or off devices plugged into outlets, controlling the thermostat, checking the doorbell video camera, and locking or unlocking doors.

Also, more complex functions (scenes) can be automated. For example, an alert can be sent by the multipurpose sensor to a cell phone if a door or window is unexpectedly opened. The same sensor is capable of automatically adjusting the thermostat in response to changes in temperature or humidity. Doors can be programmed to automatically lock at certain times or in response to sensors and can be locked or unlocked remotely. Motion sensors can be programmed to turn on individual lights or multiple lights in response to motion and can be set to do so at certain times if desired (e.g., only at night).

Users can also create scenes to operate multiple devices simultaneously. For example, the phrase, “Alexa I’m home,” when spoken to the Echo device, might cause the front door to lock, the thermostat to adjust to 70 degrees, a television to turn on to a favorite channel or music station, a coffee pot to begin brewing, and lights to be set to 50% illumination. The phrase, “Alexa, movie time” might cause lighting to change to purple, for example, and Netflix to open on the television.

### Solar Village Residents and SHT Training

There were a total of nine residents in the six houses, with three living alone and six living as housemate pairs. All residents were between the ages of 19 and 22 and enrolled full time at the university (which they must be to live in the village) in a variety of engineering majors. Residents must request to live in the houses and do so in return for reduced rent and paid utilities. They are also asked, though not required, to participate in university research. Therefore, although participants may be aware of SHT in the houses, their primary motivation for living in the village is its affordability.

At the beginning of the semester, we arranged for an SHT trainer (a member of our research team), to meet with residents of each household to discuss the devices installed in their respective homes. After introducing the technologies, the trainer provided more in-depth instruction (2–3 hours) that included:

- Giving the resident an interactive instructional PDF on SHT basics
- Assisting the resident in downloading all relevant cell phone applications
- Walking through the home to familiarize resident with device locations and functions
- Setting up the account names and passwords for their home profiles within the various applications
- Assigning permissions and application interfaces to allow for inter-system communications
- Demonstrating phone app automation naming (e.g., change “living room light” name to “ceiling fan light”)
- Initializing primary setup of connected media accounts
  - Residents were provided an Amazon Prime account if they did not have one
  - Netflix was also installed and resident logged in to ensure initial functionality
- Demonstrating a pre-programmed “scene” (Alexa I’m Home) to elicit responses from the system. This was accompanied with showing resident where they could add additional

functions to existing “scenes” within the application

- Assisting residents in setting up an individual “scene”, in which a wake word or phrase would initiate a more complex system response
- Providing each resident with a folder in a private Google Drive which contained their username and password information in the event of control device loss
- Following up via email with the trainer’s contact information, along with typical “if you have any questions” boilerplate

While there are numerous other technological/privacy issues that could have been covered in training, we chose to focus on these items because we were most interested in how users would learn about and use the SHT. Also, because of our IRB agreement, we were able to interview and survey residents but not able to visit the houses regularly or to collect data analytics. This was not an issue for our investigation, as we were mainly concerned with users’ experience with the devices.

### Surveys

The initial survey was administered in August 2019, while the monthly surveys (Appendix A) were administered from September 2019 through March 2020. We had originally planned to continue the surveys through May 2020, but the COVID virus forced most residents to move out of the village in March. In addition, four of the final monthly surveys were not completed. The surveys included both quantitative and qualitative questions and asked about the 10 most identifiable SHTs in their home (Power Monitoring Device, Environmental Sensors, Smart Home Hub Controller, Amazon Echo and/or Fire TV Cube, Smart Outlets, Motion Sensors, Smart Door Locks, Smart Thermostat, Smart Switches for Lights, Video Doorbell). For each survey, residents were asked to rate their use of and attitude toward each of the 10 devices on a seven-point scale with anchor phrases on each end for each concept (see Table 1). This is the same procedure used in the previous research<sup>1</sup> (redacted for review) allowing us to make a direct comparison of the effects of training. Qualitative data was used to frame specific questions for interviews and is not presented separately.

**Table 1: Primary SHT Measures in the Surveys**

Concept Measured	Left Anchor Phrase (coded 1)	Right Anchor Phrase (coded 7)
<i>Current Use</i>	I have never used one	I often use one
<i>Planned Use</i>	I plan to not use this at all over the next month	I plan to use this often over the next month
<i>Usefulness</i>	I am uncertain of its usefulness	I am certain of its usefulness
<i>Easy to Use</i>	It seems difficult to use	It seems easy to use
<i>Innovative</i>	It is not innovative	It is innovative
<i>Positivity</i>	I feel negative about it	I feel positive about it
<i>Sensitive Data</i>	It does not involve sensitive data	It involves sensitive data
<i>Know People Who Use</i>	I do not know anyone who has one	I know many people who have one

Concept Measured	Left Anchor Phrase (coded 1)	Right Anchor Phrase (coded 7)
<i>Beneficial</i>	It is not be beneficial to me	It is beneficial to me
<i>Dangerous</i>	It is safe to use	It is not safe to use
<i>Understandable</i>	I do not understand it well	I do understand it well
<i>Reliable</i>	It is unreliable/unpredictable	It is reliable/predictable
<i>Easy for Visitors</i>	It is difficult for visitors to use	It is easy for visitors to use
<i>Not a Privacy Concern</i>	It is a privacy concern	It is not a privacy concern
<i>Technology Compatibility</i>	It does not work well with other technology	It does work well with other technology
<i>Fit with Home</i>	It does not fit well with my home	It does fit well with my home

Note: The last seven measures were only asked in monthly surveys. Beneficial had slightly different wording in the initial survey.

## Interviews

After the surveys had been completed and a cursory analysis performed, a series of interview questions were developed to elicit more detailed responses from residents (Appendix B). Seven of the nine residents were interviewed individually<sup>2</sup> using Zoom during April and May. The interviews were informal in nature, but structured according to the questions listed in Appendix B. All interviews were recorded and kept on a private server for analysis. We began by looking for common themes among the responses by comparing responses from interviewees by question, then by participant, looking for themes and rhetorical similarities. We then grouped responses according to themes identified by a Thematic Content Analysis as part of intuitive inquiry, as described by Anderson (1998, 2007).

## RESULTS

### Quantitative Analysis from Surveys

First, we compared the mean ratings across all participants and devices for the previous study to the original study (Figure 2). Current use, planned use, usefulness, ease of use, innovativeness, positivity, benefit, understandability, reliability, ease of use for visitors, technological compatibility, and fit with home—all increased by at least 1 entire point the seven-point scale from the previous study to the current one. Additionally, residents in the current study reported the SHT seemed less dangerous (by 0.74) and involved less sensitive data (by 0.32). Residents were fairly similar (< 0.2 difference) in knowing people who use this technology and in their level of privacy concern about it. Across nearly all measure, the current study participants after receiving training reported greater use and more positive attitudes compared to participants just two years earlier with the same technology in the same houses, i.e., the previous study.

Next, we examine the distribution of ratings in the current study across product types to see if attitudes and use differ depending on SHT type (Figure 3). Both the current use and planned use for the next month display the same pattern with very different use

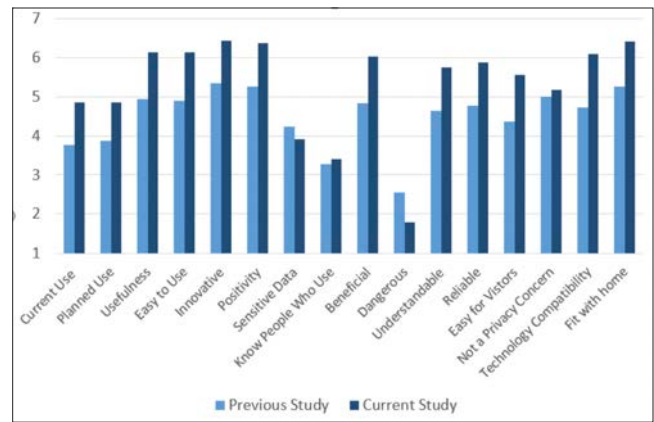


Figure 2: Reported Use and Attitudes Comparison between Studies

levels across products. The Amazon Echo, Smart Door Locks, and Smart Thermostat have the highest level of use and planned use. Smart Outlets, the Hub Controller, the Environmental Sensors, and the Power Monitoring Devices are at moderate levels of use and planned use. The Motion Sensors and Video Doorbell have low levels of use and planned use. Residents reported that the Amazon Echo, Smart Door Locks, the Hub Controller, and the Video Doorbell were moderately high in their use of sensitive data and therefore somewhat of a privacy concern. The remaining products clustered as being low in sensitive data and high in not being a privacy concern. Finally, on most of the other attitudes, there was not a strong difference or clustering by device.

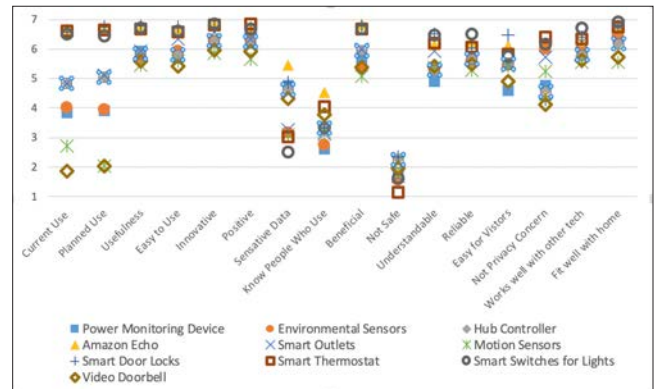


Figure 3: Reported Use and Attitudes Comparison among Devices in the Current Study.

### Qualitative Analysis from Interviews

Our interviews added much needed depth allowing us to uncover ten rhetorical themes not available from the surveys.

First, most residents reported that the training was very helpful and that they understood much more after the training than prior to it. As one resident put it, “Before the training I had no idea what to do. After, I felt much more comfortable experimenting with the new stuff.” Another resident reported that, “The training did help. It helped a ton to show us what we could do with it.” Yet another resident reported that, “It really made things much faster to show us what we could do with it.”

Second, residents also reported feeling much more comfortable with using SHT in their everyday lives. One resident reported

liking, “being able to get ready in the morning without freezing” while knowing that their heating system was still being efficient. Others commented on liking having things connected and, “being able to turn off lights and things like that without getting distracted.” Yet another resident said, “I used the automated locks the most. As soon as you walk in, it made me feel more secure. I’d say all of them are useful. It was just the matter of getting used to using them. The lights were useful.”

Third, most residents had favorite items. Comments such as, “I like our thermostat. We can set like a range... just instead of having a constant turning it up or down,” were common. Others reported that using their phones apps to control devices was most satisfying. Still others said, “Number one would be Alexa just because it makes it easier. If I had a preference, I would definitely say that what always caught my attention on the surface was the camera doorbell.” Or, “Again, I like the thermostat because of the energy savings... and I still really like the idea of motion sensors.” In general, the users reported much more interaction with the SHT devices and feeling more comfortable living with them. We were able to see a marked difference after training in their ability to take the initiative with SHT. Therefore, based on the inclusion of the training, the perception that it was helpful, and the higher levels of use and attitudes (Figure 2), we conclude that the training did enhance perception and use of the SHTs.

Fourth, they also felt that even more training would have been useful—especially, concerning sensors, more complex SHT functions, and phone applications. As one resident said, “I definitely knew a lot more after the training but I still didn’t understand how to use a lot of the stuff like the sensors.” In hindsight, it appears that although residents were much more capable than they had been with no training, even more training would have allowed them to move comfortably into the more complex aspects of SHT. In addition, some residents commented on the fact that they did not use the devices immediately after training but came back to them later. By that time, they wished that they still had access to training beyond the written documentation. As one person said, “I didn’t really know my way around the apps then. I gave up on it.” This suggests that it is not simply more or less training that makes a difference, but training as a time-sensitive scaffolding with different modes to help SHT users at the time they desire to understand and use new features of the technology. Different modes of information availability would also be helpful.

Fifth, residents were more likely to experiment with the more complex features of SHT devices after training and did feel more confident about its capabilities. Having devices connected was also more important to this group than we had observed in Study 1. They clearly enjoyed having more advanced features as an option and took more advantage of those features after training. This was especially true for lights, thermostats, door locks, and televisions.

Sixth, the Amazon Echo was widely regarded as the most useful item with its most common use related to SHT being to control lights within the houses and to control any scenes that had been developed during training or afterward. Its usefulness is understandable, because along with the installed cell phone app, it was the primary controller of SHT within the house and could also be used to answer simple everyday questions. One resident reported that, “Being able to make sure all of the lights were off through my phone was really nice.” However, residents reported that they would have liked to have had more time and training to develop “scenes” for use in

the houses. Two of the seven residents reported developing scenes to control multiple devices simultaneously, but most residents did not set up scenes, either because of a lack of time or because even after their training they did not feel fully competent in doing so. However, interviews show that most residents were unsure of how difficult it would be to set up scenes and therefore how much time might have to be invested. As a group, residents would also have liked more training with their phone applications.

Seventh, additional training probably would have helped most with the motion sensors and multipurpose sensors. Although most residents were intrigued by them after training, saying things such as, “I still really like the idea of the motion sensors,” the prevalent theme among comments on these devices was that residents did not understand their capabilities, found them to be more complicated devices than the other SHT, and did not understand how to include them in scenes with other devices.

Eighth, as was true in our initial study, residents who did not take full advantage of SHT failed to do so because they were still unsure of what could be accomplished and how much time it would take to learn. Despite being more confident with the technology and more assured of its capabilities, some of the residents were unwilling to invest even a small amount of time into learning new skills that would have allowed them to do so much more with the equipment.

Ninth, residents also generally agreed that SHT would be more useful in a larger house. More specifically, and perhaps surprisingly, all but one resident plan to install SHT when they have a house of their own and they seem to intent on learning more about the technology at that time. One participant said, “I will definitely install SHT in my own house when I have one. I think it would be more useful then.” That sentiment was shared by all but one of the interviewees, even though most only used the most basic features and devices available.

Tenth, residents, at least in their stage of life as a young adult and student, gained information only by asking other residents, asking friends or conducting simple web searches. They did not refer to the pdf file that was given to them. In general, most residents feel that SHT is still a little “difficult to get into.” Interestingly, this particular group was not overly concerned about privacy issues or security, even though most acknowledge that SHT is still insecure in some ways. As one resident said, “I was never really concerned about Alexa. I know that there are a lot of privacy concerns with Alexa, but it was never really near the top of my mind.” So, there seem to be fewer concerns with this group over privacy and security than with the first group, but almost all participants acknowledged that they still do not completely trust the devices to be secure or private.

## DISCUSSION

Returning to our original research questions,

1. Would training concerning the individual devices and more complex features of SHT change residents’ perception of and use of SHT?
2. How would this data compare to the original research trial?

The survey data and themes from the interviews clearly shows an upward trend concerning both use and perception for SHT. Residents were more aware of SHT capabilities and were more likely to experiment with and use SHT. In addition, survey data

shows that residents had much more positive views of how SHT might impact their lifestyles after training. This alone is perhaps our most substantial result. It shows that training does impact both expected value and expected efforts in terms of SHT. Still, most residents did not take advantage of the more complex features of their SHT, even after training. We attribute this to three major issues. First, the skills needed to set up “scenes” with multiple devices or to use some of the more intricate devices such as motion and multi-purpose sensors were still beyond most of the residents. Second, they did not have access to the in-depth training after the original meeting. Third, interoperability issues and technical issues still caused some problems (Appendix C). Although most errors with the technology were overcome quickly, they can become an ongoing annoyance. Some of those issues were self-inflicted by users (forgetting what they had named particular lights or outlets) many others were completely out of their control. For example, an internet provider changing service parameters such as bandwidth allotment might cause a hub controller to cease functioning. Or, a general software update might cause an account to reset—thereby suspending service as well. The truth is that SHT devices are still not very easy to use, are highly proprietary, and “break” easily. Continual issues with service can become demoralizing and were not part of the training that was offered to residents.

So, it seems obvious now that the initial training helped greatly, but that even more extensive training would have been helpful, and that access to that training beyond the initial meeting would have been helpful as well. Also, training concerning device repair and operability may have been helpful, although this is somewhat specific to the device and issue causing a problem. It is worth noting that residents did still have access to the interactive PDF (Appendix D) file that they were given during their training, but that none of them mentioned returning to that document for troubleshooting. In terms of SHT they seemed unwilling to risk going beyond simple efforts to learn about SHT. This was especially true of household sensors, which were typically examined by residents and dismissed as too difficult to incorporate. In this light, it seems that a recorded video or web-based interactive demonstration of setting up the more complex aspect of SHT that could be accessed after the initial training enhance users’ ability to fully utilize these technologies. As one resident put it, “Until you see these things in action you don’t really know what they can do.”

Because manufacturers still offer so little in terms of extended setup training, interoperability issues are still a problem between devices, and adoption rates among the general public remain low, training for new users seems imperative. YouTube videos abound on the subject, of course, but are often of questionable veracity, quality, and authenticity. Manufacturers may be relying on those videos as a training source rather than producing their own content. But, due to the highly individualized nature of home environments and equipment combinations among the general public, those companies should begin to take a more active role in training their user base if they desire SHTs to proliferate.

### Future Study and Limitations

The most obvious limitation of the study is its small sample size. Working with a controlled environment in a living laboratory setting has many advantages, such as being able to add standard technology for all residents whether they desire it or not as well as following up with ongoing surveys and a final interview. Also, the participants in this study were given SHT without asking for it. Therefore, their motivation to use the technology cannot be said

to originate from personal desire, as might be found in a research sample that had purchased by choice. This may be important. For example, Clawson et al. (2015) found that only 5 of 23 users who abandoned physically assistive technology had purchased it. Additionally, Shank, Wright, Nasrin, and White (under review) found that those who were had been gifted an Alexa or smart home assistant often would completely disable it after a negative incident, whereas those who had purchased one would take less drastic actions like moving it to another room. Also, training that might include more emphasis on privacy issues might be beneficial. Although we did ask about privacy issues in our survey, and found that participants were not overly concerned, we cannot know what unnamed concerns may have been present.

Although all participants did show interest in using SHT on the initial survey, an interesting step forward might be to provide SHT to a greater number of research participants who indicate a desire for SHT before beginning the study. In that case their personal motivation could be established beforehand and the training variable more effectively isolated. Finally, more extensive and accessible training for users should be studied for impact.

### ACKNOWLEDGEMENTS

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### ENDNOTES

1. “Amazon Echo and/or Fire TV Cube” was only “Amazon Echo” in the previous research. The Fire TV Cube technology was added between studies.
2. Two residents, who were housemates and sisters, were interviewed together.

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## APPENDIX A: ONGOING SURVEYS

### Solar Village Ongoing Survey

Start of Block: Introduction

Q1 Technology Diffusion Patterns in Smart Living IRB 01-



## Informed Consent Form

**Purpose:** This research study is to find out how people use, adapt, think about, and change their behavior in response to living in a house with smart home technology. There are no expected risks for participation.

**Procedures:** If you agree to participate, you asked to complete a survey once a month. The initial survey will include demographic and general questions, and all of the surveys will ask about your use of the smart home technology and your day-to-day life and routines in the house. We anticipate each survey will take most people 10–25 minutes, depending on the length of response to the open-ended questions.

**Voluntary Participation:** Your participation in this study is completely voluntary, and you can skip any specific question without penalty or explanation. If desired, you are free to withdraw consent and/or to discontinue participation in this study at any time.

**Confidentiality:** The information you provide, such as your name below, will be identifiable to the researcher team only. The members of the research team will maintain strict confidentiality and not share any of your personal information. For the eventual academic publications individual participants will be referred to in deidentified ways such as “female resident 1.”

Q2 If you agree to participate in this study as described above, please enter your first and last name here. This will only be used to match surveys to each other and to the specific solar house.

Q3 Since the last survey has anything changed about your living, education, or work situation such as a change in your housemates, academic major, or job(s)?

Q4 Have you learned anything in your classes about house design and the placement or use of smart home products in your house? If so, let us know what class and a brief summary of what you learned.

Q5 On each of the following pages there will be a short description of a device and questions about that device.

#### Device Questions:

Q6 Please rate each device based on where you think it best fits between each phrase set.

Q7 Please rate each device based on where you think it best fits between each phrase set.

Q8 In which ways would this device be beneficial to you? (Mark all that apply)

Q9 Please add any additional comments you have about this device.

Q10 Thank you for rating those. Now, we would like to ask you a few general questions pertaining to all the devices you have seen in this survey.

Q11 How much do you agree with the following statement: If I had to purchase these smart products on my own, the cost of them would likely be a major obstacle.

Q12 How important are each of these to you in regard to setting up your home? (Mark all that apply)

Q13 What technologies and devices have you added to your solar house since the last survey? Please list if any.

Q14 Since the last survey, have you use any of the following to learn about any of the smart home products in your house? (Mark all that apply)

Q15 Were you satisfied with the information you found?

Q16 Did you enable, disable, or move around any of the smart home products this month? If so, please explain.

Q17 Did you connect any of the smart home products to each other or to other technologies in the last month? If so, please specify which ones and explain what you did and why.

Q18 Did you or others add any new technology to your house or change any of the existing technology? This could be repairs, additions for a specific purpose like a box fan for summer, or just new purchases like an Xbox. Tell us the any additional information about what happened or why it was added.

Q19 What new smart home products or technologies would you like to be added to your house? Why would they be useful?

Q20 Who are the other people who come to your house and how do they use the smart home products if at all (do not mention names, but refer to people by roles such as friends, classmates, relatives, or significant others)?

Q21 Thank you for taking part in this study! If you have feedback or encountered any problems, please let us know here:

## APPENDIX B: INTERVIEW QUESTIONS

1. Did you feel that the training you received at the beginning of the semester was sufficient for you to use the devices in your home?
2. If not, what training would you like to have received?
3. How important was it for you to take advantage of the SHT in your house?
4. What features did you utilize most—or wish you had been able to utilize?
5. Did you use any advanced features—such as paring devices to control your thermostat or using a mobile phone app to control the household lights, doorbell, etc.?
6. If you did not use many of the features—why not?
7. How much time did you spend trying to learn to use the technology?
8. What sources of information did you consult? Web sites? Friends and family?
9. How important is SHT to you moving forward in your life?
10. Do you see yourself investing in SHT in the future? Why or why not?

## APPENDIX C: SMART HOME PROBLEMS

During the semester, various issues were encountered regarding the technology installed in the various smart homes. These issues

ranged from simple items such as users forgetting what they had named a device, to inability to access some software critical to using the full suite of available technology.

The encountered problems included:

- Resident forgetting what they had named a particular item.
  - Issue encountered in 2 homes (2002, 2013)
  - First instance was resolved by re-sending Google shared Drive link with account information
  - Subsequent instance required installer to visit home and conduct remedy directly from user's device (all apps were still on device, and logged in correctly)
- Residents unable to connect to system
  - Issue encountered in 1 home (2015)
  - After initial setup, and successful deployment of technology, users were unable to operate smart home devices
  - Several rounds of troubleshooting concluded issue was with "Wink 2" smart hub device (device allows various technologies to communicate with each other)
  - Problem arose from internet provider changing parameters of service (change of bandwidth, among other attributes)
  - "Wink 2" product was very difficult to perform a "reset" on without changing IP address (troubleshooting guide covered how to move locations, but resetting while keeping original IP address was not covered)
  - Problem was eventually solved by physically moving device to connect with different internet service, then returning to original home
- 3rd party software
  - System installed in a home (2015) does not allow for direct communication between installed control technology and voice supported devices
  - Loxone system does not support voice control
    - Have communicated with factory representatives, they REFUSE to allow any direct control from major automation companies (Alexa, Google Home, Apple Homekit, etc.)
    - They will allow system control through a cloud-based 3rd party application (1 Home)
      - 1 Home application requires paid monthly subscription
      - To use voice activation, user is required to give login information for service being used (In this instance, Amazon Alexa)
        - Issue arose when Amazon account being used by residents was family account with parents. Account had several paid subscriptions and was also linked to a credit card for on-demand purchases
        - Residents did not feel comfortable giving information to 3rd party to utilize voice control
- General software issues

- Several instances were encountered where various software used updated terms and conditions, or other such cases.

- These required resetting accounts, and occasionally reconnecting inter communication access

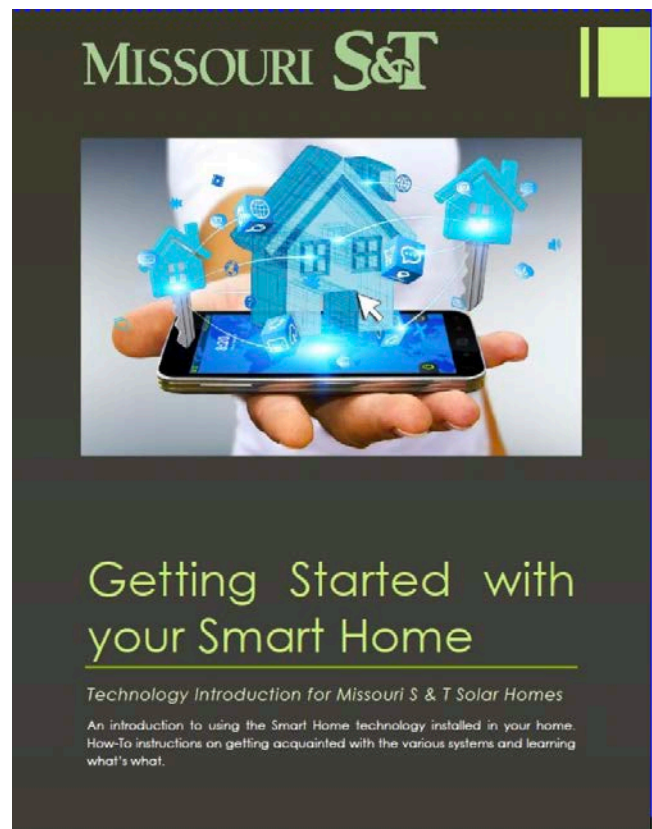
- One instance involved Lutron system in which an expired security certificate within the code caused sever disruption between voice activated control, and the app for lighting control

- Troubleshooting eventually resolved this issue, after inquiring on Lutron Forum

- Resolution involved fully deleting both applications from user device, then re-installing application in a particular order while performing cache clearing

- While investigating this problem, various software used in home automation use the types of security certificates, and many are known to cause significant disruption in the near future without much notice

## APPENDIX D: (CLICK FOR FULL DOCUMENT)



# Rewriting Sexual Violence Prevention: A Comparative Rhetorical Analysis of Online Prevention Courses in the United States and New Zealand

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## ABSTRACT

As part of a larger research project on the rhetoric of sexual violence prevention in online university courses, the researcher conducted rhetorical analyses of two prevention courses from the United States and New Zealand. This study analyzed the rhetorical strategies used in two courses with attention to five subcategories: content genres, ways the content addresses the audience, messaging strategies, levels of prevention, and sentence-level choices. From the analyses, the researcher recommends rhetorical considerations for prevention courses. While the New Zealand course had more effective language choices, the US course had a better overall narrative structure.

## CCS Concepts

CCS → Human-centered computing → Interaction design → Interaction design process and methods → User interface design

## Keywords

sexual violence prevention, rhetorical analysis, online training courses

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## INTRODUCTION

This project examines which rhetorical strategies in online sexual assault prevention courses for college students best promote prevention. In the past, few researchers have studied which rhetorical elements make online prevention courses more effective, and this study intends to fill the gap through a multi-cultural comparative analysis of courses from New Zealand and the United States.

I compared a popular US course to a New Zealand course because New Zealand has some of the best sexual violence prevention programs in the world (Julich et. al, 2015). Julich et. al (2015) discusses how, because New Zealand has higher reporting rates than other countries, people feel confident to report incidents of sexual violence, demonstrating their prevention efforts are more effective than countries such as the US, which has lower reporting rates. However, little research has been done comparing specific prevention courses between the two countries.

Online courses, such as these two online prevention courses, have transformed learning instruction. Croom et. al (2009) discusses how these courses make topics such as alcohol prevention accessible to a larger population and allow students to digest the information at their own pace. A study from Jaggars and Xu (2016) suggests the most important variable for students' learning in online courses was interpersonal interaction. While many of their interpersonal interaction suggestions couldn't be built into a one-time prevention course, some— such as showing empathy by appealing to shared values, constructing a narrative with the student in it, and using multiple genres of content—could be implemented in prevention course design. While online courses are more accessible, course designers need to try to create content that resonates with the user.

Little research exists about the rhetorical aspects of sexual violence prevention courses. Studies have concluded that even programs with the exact same information will vary in effectiveness (Breitenbecher & Scarce, 2001; Rich et al., 2010; Orchowski et al., 2016; Choate, 2003). Scholars have suggested that areas such as content delivery, usability and organization of programs, and

length of course are under-examined, and more research on how to effectively deliver these programs is needed (Anderson & Whiston, 2005; Kleinsasser et al., 2015; Vladutiu et al., 2011).

Nevertheless, there are some established best practices for prevention training. When it comes to the organization and genre of prevention courses, scholars have determined online courses can be more accessible than face-to-face courses, especially if they are well designed and include videos and examples. Orchowski et al. (2016) found that online sexual assault prevention courses are more effective than in-person programs because they are accessible to more individuals and can be taken at the convenience of the user. Scholars also have established that treating the audience as bystanders instead of potential perpetrators or victims is the best audience approach (Choate, 2003; Kleinsasser et al., 2015). Some scholars have found that perpetrator prevention can create hostility in men, while others have found victim-based prevention can increase anxiety and fear in participants (Rich et al., 2010; Breitenbecher & Scarce, 2001). Most people can recognize themselves as bystanders, but it's hard for many to picture themselves as a potential perpetrator or victim. However, some believe perpetrator prevention can work too (Choate, 2003).

Along with how the audience is treated, it is also best to address prevention on an individual, communal, and societal level while appealing to shared values (Dills & Brown, 2019). Addressing sexual violence on the individual level focuses on what the individual can do to prevent or respond to sexual violence. Community-focused content looks at what the local community, including university administration and on-campus groups, can do to prevent or respond to sexual violence. Society-focused content is geared towards creating a culture that supports sexual violence prevention or content about the actions of legal and governmental institutions.

There are also considerations around building a narrative and creating empowering messaging around prevention. Productive courses create a narrative around the issue, and show specific, anecdotal ways in which prevention is possible (Svejkar, 2019). It also is important for the narrative to not only address heteronormative relationships and normative bodies, but to also address the larger spectrum of sexual violence issues outside of straight relationships (Edenfield, 2019). Baker, Henriquez, and Hostler (2018) also recommend evoking shared values, acknowledging negative feelings, and illustrating past prevention successes through examples to strengthen the messaging of prevention courses.

From a language perspective, scholars recommend using people-first language, active voice, examples and analogies, and to not hide verbs (Baker, Henriquez & Hostler, 2018). People-first language emphasizes the humanity of the person instead of the label. For example, in the context of the research, "a person who is a survivor of sexual assault" instead of "a survivor of sexual assault." Scholars also have determined that it's best to use active voice over passive voice (Choate, 2003; Kleinsasser, et al., 2015). Other scholars have expanded those language guidelines to include using plain language, emphasizing the importance of prevention, and conveying what prevention looks like in "concrete, measurable terms" (Dills & Brown, 2019). Overall, using plain language and having cohesive, empowering messaging might lead to more effective prevention courses, though few have studied all these variables together from the rhetorical perspective. This study

attempts to address this gap so that professional writers and other communication specialists are better prepared to contribute to the (re)design of online prevention courses.

## ONLINE PREVENTION COURSES STUDIED

With this prior research in mind, the current study examined the rhetorical choices enacted in two online prevention courses. The US course was created by a company contracted by universities across the country. The company claims their course is the most widely used in the United States. At the time of analysis, the course was organized into modules with a quiz before each module and two quizzes (a survey of attitude and a content-based quiz) after each. The modules were:

- Introduction
- Presurvey
- Quiz
- Values
- Identity and relationships
- Gender identities and stereotypes
- Sexual harassment and stalking
- Consent, coercion and stepping in
- Reporting and responding
- Exam
- Conclusion

The New Zealand course was created by a company that distributes sexual violence prevention courses to residential halls and campus-owned apartments in New Zealand and Australia. It included a couple significant sections and a content-based quiz at the end. The course was significantly shorter than the US course and did not have official modules, though sections covered were:

- Sexual assault
- Sexual harassment
- Consent

With the best practices derived from past literature in mind, I designed a comparative rhetorical analysis to measure the effectiveness of these courses. Through the rhetorical analysis of these two online courses, I addressed the following questions: What are the most effective rhetorical techniques in online sexual assault prevention programs? What is the best rhetorical model for these courses? Are there any differences in the rhetorical strategies between the New Zealand and US courses? If so, how do these differences impact the effectiveness of these programs?

## METHODOLOGY AND METHODS

Even though this comparative rhetorical analysis is focused on a text-based analysis, my work is guided by a user-centered methodology. Writing about user-centered methodology, Michael J. Salvo (2001) argues, "the development of effective collaborative methods requires meaningful communication between users and designers" (p. 273). User-centered research and design treats users

as partners and is a good framework to consider when studying online communication because online mediums allow for more opportunities for users to interact with texts (Potts, 2009). In order to ensure these rhetorical analyses were user centered, I paired them with a literature review on the culture around sexual violence prevention in the United States and New Zealand. By pairing these methods with secondary research on the cultural context of prevention in both countries, I could ground the research in the rhetorical context to make my analysis and recommendations more useful.

The rhetorical analyses of the two courses focused on the organization and language of each course. These two categories were determined based on the emphasis of higher order and lower order concerns in the field of rhetoric. The individual practices (some of which were recommended from past literature and are marked with an asterisk in Tables 1-5) within each category were based on recommendations from past literature on the topic and are outlined in depth in the discussion of each subcategory.

Both courses had multiple pages or screen views, with buttons to click to go from one slide to the next, and one screen capture was taken every time the user clicked onto a new screen. In order to see how often, and the quality of, best practices in these courses, I utilized a mixed methods approach. Mixed methods research provides more insight into the overall effectiveness through providing quantitative and qualitative data. While mixed method research is less common than qualitative analysis in the field of rhetoric and communication, it can provide a more holistic picture, such as how often best practices were used in this particular study.

My quantitative data was collected through counting how often each variable (shown below in Tables 1-5) occurred in each screen capture and was recorded on a spreadsheet. Each time a best practice was found in a screen capture, I made note of that in the spreadsheet and totaled up how often each best practice occurred. For qualitative data, I wrote down in a separate Word file every example of each best practice to provide more context to the quantitative data. While I based the majority of my results off of the quantitative data and how often best practices occurred, the qualitative data gave examples of how they were being used and could be insightful to future, more specific analyses of how the best practices were used in each course.

### Genre of Course Content (Subcategory 1)

The first subcategory was the genre of the instructional material in the screen capture, whether an interactive activity, a video, a text only screen capture, a reflective question, or policy/legal content (see Table 1). The genres were determined based on the content found in both of the courses; however, the “text only” and “contains a reflective question” were added to discern when a screen capture contained only a body of text. Vladutiu et. al. (2011) found programs with more opportunities for interaction led to larger content retention rates; thus, interactive content was an important variable to research when addressing genre.

### Analysis of genre in the US and New Zealand

The organization for the US course emphasized the quiz and survey portion with less time devoted to teaching course materials. There were 43 screen captures (or 33% of the course) devoted towards the pre-survey, quiz, and exam. While reflection on behaviors and

**Table 1: Genre of content addressed in both courses**

Variable	Definition	Example
Interactive*	Screen captures where the user must interact with the online course in some capacity	Activity where the user defines their values in US course
Policy/Legal Question	Screen captures that have links to legal and university policies and ask the user to acknowledge that they read those policies	Certain parts of the US course take users to a separate page with their state’s domestic abuse laws
Reflective Questions	Screen captures that contain reflective questions, but don’t ask the user to interact with those questions	“Have you ever thought about what you would do if you saw someone in an unsafe or problematic situation?” from the US course
Text only	Screen captures that contain only text	The New Zealand course discussed types of sexual harassment in a text-only screen capture
Video	Screen captures of video content	Different people talking about how they are a part of the <i>It’s On Us</i> movement in a video from the New Zealand course

course content is effective, 33% is more than a third of the course and over half of that material was before the modules began. This is not an effective strategy to keep the users interested in the course as the pre-survey and quiz were lengthy. Further, the pre-survey and quiz delayed the narrative building until users were 24% through the course.

While the quizzes covered 33% of the content, the rest of the course was divided into five genres: text only, interactive content, reflective questions, policy content, and videos. The most common course genre was text only screen captures with 87 of the 175 screen captures falling into this category. For over 50% of the course, students were reading without being asked to interact or reflect. For example, screen capture 128 presents only a long block of text (100 words or more) about reporting and responding to sexual violence.

The second most common category asked the students to interact with the course content. Thirty-one screen captures (18%) fell into this category, with most centering around real-world examples to apply the course content. While examples are effective, many of these examples did not provide outcomes, something that might make students believe prevention isn’t possible.

The third most common genre was policy content, with 15 screen captures (9%) including information on the legal and administrative consequences of sexual violence. Screen capture 49 outlined the sexual violence and interpersonal violence policy for users. It used legal jargon which might be difficult for users in the target age

group (those entering university) to understand. This content might be more helpful if broken down into more common language along with the legal terminology.

The last two genres were reflective questions and videos. Reflective questions asked users to consider how the course material related to them; only six screen captures fell into this category. Screen capture 120, for example, asked students to consider, “Have you ever thought about what you would do if you saw someone in an unsafe or problematic situation?” Another example is screen captures 44 and 45, which contain identity prompts where users can reflect on their identity, but there is nowhere for students to answer these questions. More video content also might have better engaged students. There were 10 videos in total and many contained real-world examples, which is a rhetorically strong way to reinforce course material. For example, a video in the “Consent, Coercion, and Stepping In” module dealt with the importance of consent when on a date. This video walked users through how a fictional character asked for consent on a date. Allowing users to see characters act on principles from the course can be a great way to engage users and reinforce content at the same time.

The New Zealand course was significantly shorter with only 16 screen captures. Six of the screen captures (or 37%) were of quizzes, which is a significant portion focused on quizzing instead of educating. However, the course was organized so the education and narrative came before the quiz. While there were no official modules due to how short the course was, the names of the different sections were clearly labeled.

For subcategory one, the New Zealand course included a lot of interactive screen captures. Six of the screen captures were interactive, with eleven true or false questions that users interacted with. Half of the screen captures were text only. An example of this was the first screen capture, which included a large block of text. Zero screen captures had reflective questions; one had an outline of policy, the sexual discrimination act in New Zealand; and two included videos. Neither video was produced by the course creators, nor in New Zealand; one was from the United Kingdom, and the other was part of the US campaign, *It’s On Us*.

The biggest organizational difference between the courses was the length of each. The US course had over 175 screen captures, including 10 videos, and took the user a couple hours to complete. The New Zealand course had 16 screen captures and 1 video. The length of the course influenced how likely students were to stay engaged. Because the New Zealand course is shorter, past research suggests students might be more engaged during the course (Vladutiu et al., 2011). However, length of course is only one differing variable between the two courses.

The genre of content differed, as well. While the New Zealand course did require the user to take a quiz at the end, there was little interaction throughout the course. In the New Zealand course, the user could click through slides without having to stop and read them until the quiz, which had some questions that didn’t correspond to the course, such as a question on bystander intervention even though the course didn’t cover that topic. In the US course, although individual screens might be text only, the student had to interact with the content at some point in every module through activities or selecting next steps for characters in role playing situations. However, both courses seldom asked the students to stop and reflect on what they were learning. Reflection is a key step to the learning process; it’s hard to retain information without space to

reflect (Ambrose et. al, 2010).

## **How the Courses Treated the Audience (Subcategory 2)**

The second subcategory was the audience focus, analyzing if each screen capture treated the audience as a bystander, potential perpetrator, potential victim, person responding to sexual violence, or person creating an identity (see Table 2). Breitenbecher and Scarce (2001) studied prevention programming targeted at females which treated the audience as potential victims and found participants had negative emotional responses. Choate (2003) created a Men Against Violence model wherein prevention programming addressed men as potential bystanders. Bystander-focused prevention increases confidence in intervening (Choate, 2003; Kleinsasser et. al., 2015). Those who identify as male can sometimes be hostile towards prevention programming, which treats the audience as potential perpetrators (Rich et. al., 2010). Identity building and response-focused content were added as categories due to the appearance of both in the courses, though little research supports either as a best practice. Thus, bystander prevention is the most effective overall.

## **How the Audience is Addressed in Both Courses**

Forty-two screen captures (24%) in the US course treated the users as potential responders, an interesting audience lens for a course on sexual violence prevention. Screen capture 148 treated the users as those responding to sexual violence prevention as a victim, “even if you are undecided about filing a report, it’s important to consider preserving evidence in case you decide to report in the future.”

While bystander intervention is seen as the most effective audience focus, the course only had 12 screen captures (6%) that treated the audience as potential bystanders. Screen capture 93 provides users with “what you can do to step in if you see a potentially problematic situation.” Screen capture 120 outlines how the next few screen captures will go over what to “do if you saw someone in an unsafe or problematic situation.” Screen captures 121-124 focused on how users can distract, delegate, and direct, and each includes a video of what the respective strategy looks like at a party.

More of the screen captures addressed the audience as potential perpetrators instead of bystanders. Fifteen screen captures (8%) took this approach with some practical examples. On screen captures 109 and 110, the user is presented with an example where Kim has said “no” to Jameel multiple times and the user has to decide what Jameel should do. On screen capture 111, the course advises, “When we think about interacting with people sexually or otherwise, our values should be our guide.” In contrast, zero of the screen captures dealt with the students as potential victims.

The course also treated the audience as builders of identity. One of the larger modules also covered identity building, and the course focused on how we can uphold our values through respecting others’ identities. Screen capture 42 states, “Values and identities are central to our relationships.” Other parts of the course touched on how to show up authentically, as one of the characters in Video 5 stated, “Just be who you want to be, but also let people know that this is who I am and it’s OK to be who I am.” This sentiment weaved throughout the course with equal emphasis on forming one’s own identity and respecting the identities of others.

The New Zealand course primarily used potential perpetrator prevention and focused on how the audience could respect others’

**Table 2: How the audience is addressed in both courses**

Variable	Definition	Example
Bystander focused*	Focuses on the audience as bystanders who can intervene in instances of sexual violence	The example titled A Prank or a Problem? Preventing your friend Brody from stalking his ex from the US course
Victim focused	Focuses on the audience as potential victims and gives advice on how to prevent victimization	“Sexual assault is when a person touches you inappropriately” from the New Zealand course
Perpetrator focused	Focuses on potential perpetrators and gives tactics to prevent the audience from committing acts of sexual violence	An example asking “What should Ian do?” in the US course. Maria falls asleep and you have to decide what Ian should do
Response focused	Focuses on the audience as those who are responding to instances of sexual violence	“You’ll learn how to recognize and address sexual harassment and stalking and what you can do if you or someone you care about is affected by these issues” from a screen capture in the US course
Identity focused	Focuses on the audience as individuals who form identities and values for themselves	“In part, your values represent what you stand for. They influence your identity and how you relate to others” from a screen capture in the US course

rights by not acting in a harmful way. Eleven (68%) of the screen captures treated the audience as a potential perpetrator, such as screen capture 7 which read, “It (consent) also means taking responsibility to ensure that the person you are attracted to is comfortable and agrees to go further.” In contrast, two screen captures treated the audience as potential victims, using sentences such as “Sexual assault is when a person touches you inappropriately.”

Only one screen capture treated the audience as a bystander, though it did include a question on bystander intervention and gave a couple bystander intervention strategies. Screen capture 13 dealt with response to sexual violence prevention and gave the users location specific contact information. Zero questions treated the audience as creators of an identity. Overall, the course didn’t enact research that showed bystander intervention as the most effective perspective for a course, though research out of New Zealand and Australia suggests perpetrator prevention to be the most effective within those cultures (Svejkar et al., 2019).

The majority of the New Zealand screen captures focused on the audience as potential perpetrators while the US course focused on

how the audience could act as bystanders. Past evidence shows bystander intervention as the most effective approach, yet some research points to perpetrator intervention being effective when it is employed in the right social environment (Choate, 2003; Svejkar et. al., 2019). The differences in how the courses treat the audience could be a reflection of different cultures, especially paying attention to the aversion of some Americans to perpetrator-based prevention (Rich et. al, 2010).

### **Messaging Strategies (Subcategory 3)**

Messaging, the third subcategory, covered empowering messaging, negative messaging, value appeals, providing measurable goals, and constructing a narrative around course content (see Table 3). Baker, Henriquez, and Hostler (2018) found prevention programming that has measurable goals and appeals to shared values is more successful. They also stressed the importance of empowering messaging over negative messaging. The CDC guide on sexual violence prevention also emphasizes the importance of conveying what prevention looks like in measurable terms (Dills & Brown, 2019). Gold et. al (2010) also highlighted the importance in empowering and promotional messaging for public health concerns as people are more likely to take action if they feel empowered.

### **Messaging Strategies in the US and New Zealand Courses**

The first variable in subcategory three, narrative construction, occurred around the content that treated the audience as identity-creators. For example, screen captures 54, 55, and 56 relate different forms of abuse back to violated values to create cohesion with the personal values activity in the same module. In the Consent, Coercion, and Stepping In module, screen capture 111 relates back to the identity module when it states, “our values should be our guide” to not coercing others. However, only seven screen captures created a narrative, meaning it did not run throughout the entire course.

Another messaging strategy underutilized by the US course was appealing to shared values, which the course did only ten times (5%). Screen capture 128 appeals to shared values in a college community: “Everyone wants to live, learn, and work in a safe and supportive environment.” However, other screen captures focus on the contrast in values instead of similarities. Screen capture 42 advocates, “It’s important to be aware of what we value” but adds “and what others value.” This creates an interesting dynamic that places our values at odds with others’ values instead of appealing to commonalities. Overall, the course could have appealed to shared values more often, perhaps even connecting them to an overarching narrative.

Another successful messaging technique is to include measurable goals. Fifteen screen captures (8%) included measurable goals or specific actions the users could take. In videos 6, 7, and 8, the narrators give specific examples of wording to shut down harmful language. This would allow students to measure prevention and to have action steps towards preventing sexual violence. It is worth noting, however, that some of the screen captures and videos which fell under this category, such as video 8, provided indirect goals. Video 8 provided students with the goal of non-confrontational intervention when a video character called out his friend for an insult against someone’s sexuality, but it didn’t give tangible strategies for intervening or a strong outcome other than the person apologizing with no change in future actions and words. The course

**Table 3: Messaging strategies in both courses**

Variable	Definition	Example
Constructs narrative for course*	Refers back to previous materials or themes to connect two or more modules together in one cohesive narrative about prevention	A screen capture in the US course connects survivors' experiences to their identities, as referenced earlier in the Gender Identities and Stereotypes module
Appeals to values*	Discusses values shared by the presenter and audience and how those values could be implemented in prevention	"If you ever thought 'I want to help', you're not alone" from the US course
Measurable goal*	An instance where a specific strategy to deal with prevention is given and serves as an accessible example the user could utilize in their own life	A video in the New Zealand course defines consent and gives strategies so the user
Empowering messaging*	Content which inspires the user to take action	"We encourage you to use your experiences, your perspective, and your values to make a positive impact on your community" from the US course
Negative messaging	Content which warns the user against a certain action	The US course discusses the negative effects of alcohol consumption and warns users against intoxication

gave tactics but didn't have a strong call to action for students to implement these steps in their own lives.

The last two messaging variables analyzed if the messaging was empowering or negative. Empowering messaging on screen capture 137 stated, "If a friend discloses a harmful situation to you, you're in a position to make a significant, positive impact on their recovery process." Other screen captures included negative messaging that didn't empower the user to act, such as on screen capture 70, which gave stereotypes people sometimes use but didn't include positive language choices. By not including positive language choices, this screen capture focused on what users should not do without empowering them to speak in a more positive manner.

Overall, there were 26 screen captures (14%) with empowering messaging and 16 (9%) with negative messaging. While there was less negative messaging, an overwhelming number of screen captures fell into the neutral messaging category instead of negative messaging or the more effective empowering messaging.

In contrast, the New Zealand course did not use a lot of best

messaging practices. Zero screen captures constructed a narrative and zero provided the audience with measurable prevention goals. Two screen captures did appeal to shared values; screen capture 1 highlighted the value of a safe community, and screen capture 7 referred to the value of responsibility. The course only had two screen captures that included empowering messaging, but six screen captures with negative messaging. An example of positive messaging was on screen capture seven: "Consent means to freely and voluntarily agree to a sexual activity." On screen capture 8, there was an example of negative messaging, or telling the audience what not to do, "If someone is manipulated, threatened, or forced into sex, then they are not consenting." While empowering messaging can help motivate the user to act, more negative messaging correlates to the audience focus on perpetrator prevention as it focuses on what users shouldn't do to avoid violating someone's rights or safety.

Because the New Zealand course focused on perpetrator prevention, there was more messaging that told users what not to do, or negative messaging. In contrast, bystander intervention tends to promote what users should do, so the US course had a lot more empowering or positive messaging—though both courses could have included more empowering messaging. Both courses lacked narrative construction, measurable goals around prevention, and appeals to shared values.

### Addressed Levels of Prevention (Subcategory 4)

The fourth subcategory, levels of prevention, addressed if the specific language was geared as prevention on the individual, communal, or societal level (see Table 4). This category was determined based on the CDC's levels of prevention recommendation (Dills & Brown, 2019). Researchers at the CDC recommend courses and materials that address sexual violence on all three levels. Svejkar et al. (2019) researched prevention programming at the different levels in Australia, as well, and found programs with more focus on the community and individual level were effective.

### Levels of Prevention Addressed in Both Courses

One-hundred-and-fifty-nine screen captures (90%) dealt with prevention on the individual level. For example, screen capture 46 focused on respect on the individual level: "We all want others to accept who we are and to treat us with respect. That's why it's so important to be respectful of other people's values and uniqueness." Screen capture 95 also dealt with preventing on the individual level, as it outlined consent as, "communicating what you do and what you don't want, what is right for you, and what might make you feel comfortable is a normal, natural, and expected part of healthy communication."

While the course focused on the individual level for the majority of the course, it also had significant chunks devoted to prevention on the community and societal level, with 99 (56%) and 44 (25%) screen captures respectively (note some screen captures dealt with prevention on multiple levels). Screen capture 150 stated, "It's important to understand options for reporting incidents of violence, harassment, abuse, or sexual assault to our school." This example, as well as many of the 99 community-focused screen captures, highlighted a school as a community. The course also focused on larger societal actions. Screen capture 47 discussed a similar topic to screen capture 150, but from the societal standpoint, "one of the ways that society or an institution promotes certain values is



through laws and policies.” Overall, there was good representation

**Table 4: Focus on different levels of prevention addressed in both courses**

Variable	Definition	Example
Individual focused*	Content that focuses on what the individual can do to prevent or respond to sexual violence	The US course says, “you make decisions, set boundaries, and respect other people’s choices all the time”
Community focused*	Content geared towards what the local community, including university administration and groups of bystanders, can do to prevent or respond to sexual violence	The New Zealand course discusses how all members of the residential hall deserve to feel safe from sexual harassment and violence
Society focused*	Content geared towards creating a culture that supports sexual violence prevention or content about the actions of legal and governmental institutions	“Sometimes the media depicts romantic relationships as one person pursuing and finally convincing the other to engage in sexual activity” (from the US course)

of all three levels.

The New Zealand course overwhelmingly focused on prevention at the individual level. Twenty-one sentences across the 16 screen captures in the course dealt with prevention on the individual level, such as screen capture 2 which included this statement: “Sexual assault is when a person: forces you against your will to commit an act of indecency.” One screen capture included a community specific prevention, highlighting the residence halls: “All residents of Campus Living Villages are committed to providing a safe and inclusive environment.” Zero screen captures focused on society-focused prevention. Despite the uneven distribution, users might feel the most empowered to address sexual violence on the individual level.

The New Zealand course focused on the individual, ignoring the communal and societal level of prevention while the US course encompassed all levels of prevention, although over 150 screen captures did focus on individual prevention. While both courses could better adopt the CDC recommended model of confronting prevention at multiple levels, these courses are working in tandem with other measures. The CDC recommends in that same report that prevention should be scaffolded within a community; the communication design and rhetoric of prevention throughout the community instead of in one course could be a topic for future research.

### Sentence Level Variables (Subcategory 5)

The fifth subcategory focused on syntax-level considerations, such as active voice, passive voice, hides verbs, doesn’t hide verbs, people-first language, not-people-first language, gives examples, gives analogies, and uses us vs. them language (see Table 5). Baker, Henriquez, and Hostler (2018) stress the importance of

plain language that does not hide verbs and uses active voice for prevention programming.

### Sentence-Level Choices in the US and New Zealand Courses

Two contrasting variables in this subcategory were people-first and not-people-first language. There were 19 examples of not-people-first language and 22 examples of people-first language. On screen capture 134, the course referred to LGBTQ survivors, which was not people-first as it stressed their identity within the LGBTQ community and role as a survivor instead of saying people who are LGBTQ survivors. On the other hand, screen capture 73 discussed “people who experience sexual harassment”, which is people-first language. While there were more examples of people-first language, the number of screen captures that used people-first language and the ones which didn’t were close, signaling the course could have worked on being more consistent in the use of people-first language.

Another interesting variable to look at is the use of active and passive voice. One-hundred-and-eighty-nine sentences of the 175 screen captures used active voice, and 157 sentences used passive voice (with some screen captures using both as this variable was counted on a sentence level). Active voice examples included the phrase “most of the time, we express ourselves naturally through a combination of words and actions...” on screen capture 96 and “everyone deserves to live, learn, and work in a safe environment” on screen capture 128. Passive voice examples were more likely to be related to heavier subjects, such as reporting sexual violence and abusive relationships. Examples include “However, it’s important to be able to recognize when relationships are abusive and conflict with our fundamental values...” on screen capture 66 and “It’s important to understand options for reporting incidents of violence, harassment, abuse, or sexual assault to our school” on screen capture 150.

The variables of hiding verbs or not hiding verbs related to active voice and passive voice as usually passive voice hides verbs and active voice doesn’t hide verbs. Two-hundred-and-nine sentences over all the screen captures hid verbs, and 129 sentences didn’t, signaling that sometimes even sentences which used active voice hid verbs. Screen capture 55 gives an example of a sentence which doesn’t hide verbs: “emotional abuse and isolation undermines the values of...” because the verbs are all clear and easy to find. When the course hid verbs, it clouded the meaning of the sentence. Screen capture 95 is a good example of this: “Communicating what you do and what you don’t want, what is right for you, and what might make you feel comfortable is a normal, natural, and expected part of healthy communication.” The sentence includes many hidden verbs, which creates a lack of focus on one particular action in the sentence. Hiding verbs was one of the biggest hindrances at the sentence level of the US course.

One of the most effective sentence types in prevention courses are those which give examples so the user can see how to apply course material to their own lives. There were 121 examples within the course, such as the example of someone catcalling a friend, Tiana, on screen captures 78 and 79. While the example is easy to follow and used “you” to include the user in the example, there was not a resolution. It ends by asking the user what they would do, but it didn’t give any options or say what ended up happening with Tiana or the boy who catcalled her. Most of the other examples in the course constructed potentially effective learning situations but

**Table 5: Sentence level variables addressed in both courses**

Variable	Definition	Example
People-first language*	Language that values the person over the descriptor	The US describes, “people who experience sexual harassment...”
Not-people-first language	Language that values the descriptor over the person	In a different screen capture, the US course says, “survivors who identify as male”
Hides verbs	Language that does not highlight all verbs--commonly verbs are hidden in the -ing form or masked as nouns	“Think about approaching a conversation about consent as a simple, informal way of “checking in” with someone to make sure everyone is OK with what may happen” from the US course.
Doesn't hide verbs*	Language where all verbs are identifiable as verbs in a sentence	“Most of the time, we express ourselves naturally through a combination of words and actions...” from the US course.
Active voice*	When the subject performs the action of the sentence	“The person makes an unwelcome sexual advance” from the New Zealand course.
Passive voice	When the action of the sentence is performed on the subject	“It also means taking responsibility to ensure the person you are attached to is comfortable and agrees to go further” from the New Zealand course.
Gives examples*	The use of real world scenarios to support a point	The US course had a scenario where your roommate has a stalker and you have to respond to situation
Gives analogies*	A comparison of two things that don't appear similar on the surface	Neither course did this
Uses us vs. them language	Language that otherizes a particular group	“We'll explore how to support survivors by listening, discussing reporting actions, connecting them with resources for additional support, and empowering them to make their own choices about their experience” from the US course.

didn't have resolutions or tangible steps users could take. Another useful sentence-level strategy for sexual violence prevention is analogies, but the course did not use any analogies.

One variable I wasn't expecting to find was us versus them language. This language can otherize populations and is not helpful in courses on sensitive topics, such as sexual violence. In the 22 screen captures that used this language, the us versus them language separated "us" from survivors, ostracizing survivors as a different category than the users. On screen capture 157 the course used this tactic, "understanding a survivor's experience can help you to be a more empathetic listener and friend." While there were only 22 examples of this, it can be harmful and should be avoided at all costs in similar courses.

The New Zealand course included more examples of active voice. Fourteen sentences over all screen captures included active voice, such as this sentence on screen capture one: "Sexual assault covers a range of different types of assault." Ten screen captures included passive voice, such as screen capture 3: "In circumstances in which a reasonable person, having regard to all circumstances, would have anticipated that the person harassed would have been offended, humiliated, or intimidated."

Similarly, 10 examples hid verbs, while 12 didn't hide verbs with a correlation between active voice and not hiding verbs, as would be expected. Screen capture 7 hid verbs and used passive voice: "It (consent) also means taking responsibility to ensure that the person you are attracted to is comfortable and agrees to go further." In contrast, screen capture 3, did not hide verbs and used active voice: "A person sexually harasses another person if the person makes an unwelcome sexual advance, or an unwelcome request for sexual favours, to the person harassed or engages in other unwelcome conduct of a sexual nature in relation to the person harassed." While more examples of active voice and not hiding verbs were present, more active voice or sentences that didn't hide verbs could be included.

The New Zealand course utilized only people-first language. Four screen captures included this sort of language, and there were zero with not-people-first language. An example of people-first language was this sentence on screen capture 1: "Sexual assault occurs when a person indecently assaults another person."

Over half of all screen captures included examples. Almost all were in comics included in the course, allowing the users to read and see a visual of the examples. This course included zero analogies, but it included three examples of us versus them language. The us versus them language in the course usually treated the "us" as potential perpetrators and the "them" as survivors, such as this sentence on screen capture 8: "If they are so intoxicated that they don't know what is going on, then they are not consenting." Overall, the New Zealand course paid attention to intentional, active, and people-first sentence level choices.

The courses relied on different language practices to get their messages across. The New Zealand course relied on active, people-first language that didn't hide verbs. It used language, such as, "Sexual assault occurs when a person indecently assaults another person." In contrast, the US course hid more verbs and tended to use passive language. This made some of the language of the course confusing and muddled. It's best to use active language with the verbs in plain sight. The US course also referred to people as victims and perpetrators instead of people who commit sexual

assault or people who are survivors. The language in the New Zealand course offered a more clear, humanistic view of prevention and was easier to read. This might be due to increased confidence around this topic within New Zealand society whereas in the US, sexual violence prevention is a more difficult topic to discuss. Regardless of the confidence levels in the larger societies, it would be better for courses in either culture to utilize language choices that reflect clarity, such as using active voice and not hiding verbs.

## CONCLUSIONS AND IMPLICATIONS FOR FUTURE DESIGN

The comparative rhetorical analysis points to two key differences between the New Zealand course and the US course. The first key difference is the language used, with New Zealand using more active voice and less hiding verbs; and the US using language that lacked clarity, such as passive voice and hiding verbs. New Zealand is known for more effective prevention than the US, and active voice and not hiding verbs are known to be more effective in general. This suggests that using clear language with an active, confident tone might improve the effectiveness of sexual violence prevention courses.

The second key difference between the courses was that the US course followed the basic recommendations for higher-level rhetorical concerns; it addressed the users as bystanders, included more empowering messaging, and addressed prevention at the individual-, community-, and societal- levels. On the other hand, the New Zealand course addressed the audience as potential perpetrators, included more negative messaging, and addressed prevention at the individual-level, with only one instance of community-level prevention. When paired with the knowledge that New Zealand's prevention is more effective, this might suggest that language-level concerns impact the effectiveness of courses more than higher level concerns focused on messaging and how prevention is addressed. However, it still is important to consider both higher-level and lower-level concerns around prevention communication.

- In order to incorporate both higher-level and lower-level best practices, the most effective rhetorical practices might be to:
- Use active voice and sentence structures that don't hide verbs.
- Make sure the language of courses is clear and confident.
- Pay attention to the language decisions, as they might determine the effectiveness of the course more than larger order rhetorical issues.
- Ensure that the tone of a prevention course conveys the importance of the topic.
- Address the audience as potential bystanders whenever possible.
- Integrate empowering messaging into prevention courses.
- Emphasize the feasibility of the prevention education, highlighting how prevention is possible.
- Integrate a narrative throughout the course to which students can connect.
- Be intentional with decisions made in all five subcategories, as all of them contribute to the feasibility and clarity of the course.

Future research might strengthen these findings by focusing on one or two specific subcategories of rhetorical considerations. It also could be interesting to compare and contrast data collected from New Zealand and US university students to see how students perceive prevention course material and maybe even prevention courses from the other country. A prevention course is only one part of a larger scaffolded prevention plan within a community; so, in the future, more research could be done to compare and contrast the rhetoric and communication in other facets of New Zealand and US prevention. While some research was done on the larger rhetorical context, it might be beneficial to dive deeper into the legal and public perception differences around sexual violence in both countries.

Overall, this research points to the need to focus on multiple rhetorical considerations instead of one category of considerations. To create an effective prevention course, developers must consider their audience and effective messaging strategies and approaches while also paying attention to sentence-level rhetorical choices. Paying attention to rhetorical considerations in sexual violence prevention courses could have a direct impact on the effectiveness not only of these courses, but on the safety of college campuses in the US, New Zealand, and beyond.

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