Web-based CALL Process Writing Tools Website: A Usability Study

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Abstract: Many English as a Second Language (ESL) learners need help writing. Learners prefer to get as much feedback and guidance with their writing as possible. However, teachers are overwhelmed and often do not focus on errors that do not interrupt communication. Web-based Computer Assisted Language Learning (CALL) tools can provide learners with additional feedback and scaffolding. These tools can empower adult learners, allowing them to create and check their own work. A website was developed, on WIX, to provide Web-based automated e-learning, or CALL, writing tools to supplement adult learners to engage in each stage of the writing process. The purpose of this usability study was to evaluate the navigation and satisfaction of content presentation of the site. Qualitative and quantitative data collection included a pre-questionnaire for collecting demographic information; three think-aloud interview rounds, each with 6 to 7 participants; a retrospective post-survey. Revisions were made after each iteration based on the result and following Nielsen's Severity Rating for Usability Problems to guide the selection of issues to address. The results of the study revealed a favorable reception of the website and its contents. Future revision and improvements in presentation and content for this project could further improve this project.

Keywords: Process Writing, Usability Study, Computer Assisted Language Learning

Statement of the Problem

Adult English as a Second Language (ESL) learners struggle writing essays in English (Angel et al, 2018). Learners often have contrastive rhetoric between English and their native language, where there are differences between the linguistic, organizational, and presentational choices they make (Kaplan, 1966). Writing includes many activities to engage in the writing process that ESL students find difficult and not automatic (Hedge, 2000).

I taught English in Japan and Hawaii in various language programs. In these programs and other international programs, teachers and students are provided with only a textbook for learning to write. The books often do not provide proficient information to develop effective writing strategies and process (Hedgcock, 2005). Teachers do not always address all students' writing issues (Amrhein & Nassaji, 2010; Ashwell, 2000). ESL students want teachers to correct more than just grammar errors in communication, they want teachers to mark all major errors (Hyland, 2003; Shultz, 2001; Hedgcock & Lefkowitz, 1996; Leki, 1991).

In the future, I hope to teach again and use online tools easily to help me with providing

guidance to students with their writing, asynchronously. Unfortunately, much of what is available online are descriptions of the writing process. Also, software resources, that could be used for the process approach, which includes Planning, Drafting Revising, and Editing, exist in lists or stand-alone strategies on the internet, such as for brainstorming, error correction, and so on. ESL writers often combine the use of online resources to improve their writing. Many of these online software resources are free to use and only require an email. However, after exploring visually, also known as ocular reconnaissance (Meggs, 1992), no websites were found that consolidated writing process software tools with not only descriptions of the writing stage, but that also provides tools to accomplish each stage of the writing process.

The lack of scaffolding to engage and produce in the writing process was the impetus for this study, with a goal for a free online website to supplement process writing tools for any ESL learner. I act as the webmaster for this website. Before rolling this website out for the general public, I wanted to test its navigation and satisfaction of content presentation. To summarize, English language learners are not sufficiently provided with online tools or information to guide them through an online writing process or get formative feedback to improve their writing by themselves. The purpose of this usability study was to develop the navigation and satisfaction of content presentation of a new Web-based Computer Assisted Language Learning (CALL) tools curated website for adult ESL learners.

Literature Review

Research has shown that corrective feedback can improve the accuracy of second language learners English writing (Ferris, 1999; Bitchener, 2008; Sheen, 2007). Unfortunately, many students often do not understand the meaning of much of the feedback that they are given (Hyland, 1998). Also, teacher feedback may actually misconstrue student intended message (Brannon & Knoblauch, 1982) or be harmful to motivation (Truscott, 1996). Feedback is most effective in preliminary rather than final drafts (Ferris, 1995). However, most get feedback after they have written and as a result have limited impact on their final revision and learning (Cumming & So, 1996). The good news is that student writing quality may increase through more revision and time (Polio & Fleck, 1998), especially when prompted (Ferris & Roberts, 2001).

ESL teachers are moving toward a process approach to teaching writing (Coffin et al., 2005; VanderPyl, 2012). Process writing includes four basic writing stages: planning, drafting, revising, and editing (Seow, 2002). These stages are strategies that develop into skills through practice, which is iterative and interactive acts of writing. It allows changes and looks at practicing these writing strategies and building techniques rather than text products and features. It encourages learners to be more active and critical in writing.

ESL education is looking to computers to help scaffold students in learning to write (Coffin et al., 2005). According to Coffin, technology can have a facilitating effect on the writing process. Laurillard (2005) explains that there are cultural, intellectual, social, practical, and financial benefits for using technology and applications for learning, something he calls ‘E-learning’. This study focuses specifically on the subject of technology in language learning and the application of Computer in Language teaching and Learning (CALL) (Levey, 1997). In CALL, one of the

emerging trends developing is Web-based Learning (WBL) (Quesada Pacheco, 2005), which are "hypermedia-based educational program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (Khan, 1997:6). One example of the WBL environment is known as a Massive Open Online Courses (MOOC). MOOCs are generally on the web, free, and asynchronous. However, language MOOC's are in their neonatal stage of development (Sokolik, 2014). Milton (2006) suggests providing learners with online support tools for self-discovery and exploration in the writing process.

The current trend in online resources and free education that supplement learners are MOOC's. However, Kwak (2017) found that most writing MOOC's still takes a traditional approach to teach writing that focuses on learning grammar rather than process writing that focuses on strategies. Even those that did focus on the process used mostly videos or peer feedback to scaffold students (See Comer & White, 2016).

An alternative way to provide free online resources is through a website. Steve Krug's (2010) explains that to create a truly user-friendly website, usability testing is effective. In usability testing, designers improve interactive designs in iterations based on user feedback. In the test, targeted users, evaluate a website by testing it and identify usability problems. The designer can then address user issues before it is released to the general public and more people have the same issue (Nielsen, 2003).

Instructional design can guide the procedures for developing effective, efficient, and relevant education in a website. While there are many systematic design process, they all include the core elements —Analysis, Design, Development, Implementation, and Evaluation (ADDIE) (Gustafson & Branch, 2002). To facilitate the instructional process, instructional design models describe the 'how to' conduct the steps of the process. One model that is increasing in popularity, due to its attention on student motivation, is John Keller's attention, relevance, confidence, and satisfaction (ARCS) Model (1987a). The ARCS model follows a constructivist approach paradigm for instruction that focuses on the learner.

Education is moving away from teacher-centered lecture delivery of content towards student-centered learning of interactive development, a constructivism paradigm (Gaer, 2014) or active learning (Laurillard, 2005). Under constructivism, learners engage actively, a change from transmission of information to the facilitation of increased opportunities. Constructivism is a theory of cognitive growth, where learners facilitate the interactions and activities necessary for their context to develop their own knowledge and understanding. It is a collaborative environment that supports reflective and experiential processes that can be effective with adult learners (Ruey, 2010). Technology is changing the language learning experience to active and bottom-up with learner support applications online.

Methodology

Research Questions/Goals. The goal of this study was to improve a website that provides Web-based CALL Process Writing Tools website for adult learners through a usability study. The two research questions for this study are:

RQ1: How easy is it for participants to navigate the online CALL Process Writing & Feedback website?
RQ2: How do participants rate their level of satisfaction with the presentation of content provided on the website?

Content Analysis. Rather than a simple list of online writing tools, the curated resource website was developed to provide CALL tools that are categorized to assist the stages in the Writing Process, where learners practice writing strategies, with online tools that supplement the writing stages. This project website included online development tools for the stages of the Writing Process. The content and strategies were separated into the 4 Process writing stages. The website is student-centered by following a constructivist paradigm. The tools and instruction allow students to take control of their own learning. On the website, students engage in the entire writing process online from conception to review. Students can go through the stages in order or go directly to the stage that they need help with. Online software tools can be used to help students in each stage of the writing process to actually produce the required output of the stage. Instead of creating a prescriptive, linear interpretation, of the process approach, but rather one that focused on the creativity and recursive nature of a real writer. A content map of the final website was created to help show how the user is guided through the website. (See Appendix A.)

According to Seow (2002), process writing includes four basic writing stages: planning, drafting, revising, and editing. (See Figure 1.) The first stage is *planning*, which includes generating ideas through strategies like brainstorming and outlining. Coffin et al. (2005), describes the importance of a space that is non-judgmental. The website encourages planning activities such as brainstorming, outlining, and thesis making alike to help in organizing thoughts and ideas to get writing started. Second, *drafting* is when you put your thoughts and ideas into sentences and paragraphs. The site helps writers with word processing software. Students are encouraged to experiment with feedback tools. This is an opportunity for students to focus on fluency, developing meaning and revise their ideas. Third, *revising* writing to ensure it is understandable to the reader. Lastly, *editing* which includes grammar, mechanics and spelling tools.

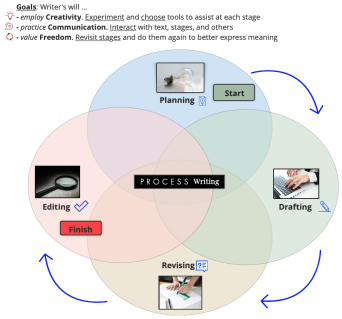

Figure 1. Process Writing Remodel.

Wireframes (Brown, 2011) were used to help design the layout and arrangement for aesthetics and manageable cognitive load. (See Figure 2.) However, the design changed due to feedback from critical friends, peers in the LTEC Master program, to create a final working prototype, the Wix website and final splash page. (See Figure 3.)

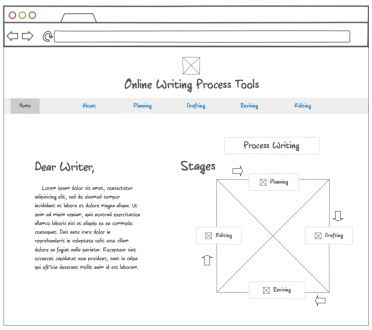

Figure 2. Website Wireframe.

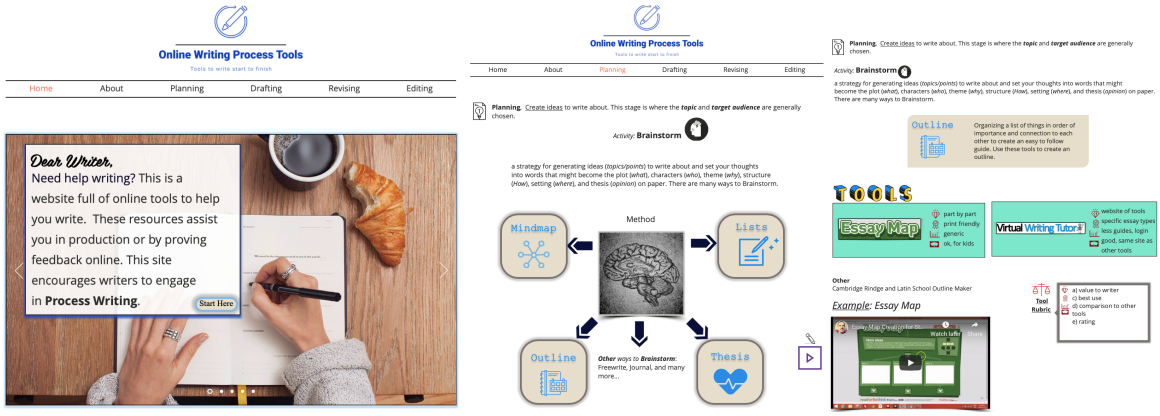

Figure 3. Prototype.

Recruitment and Participants. Participants were recruited via email, flyer, or in-person invitation. However, recruitment failed for UHM International Student Services Mentor Program and Coffee Hour, as both were cancelled for Spring 2019 semester. The Hawaii English Language Program required internal research approval. The UHM: Outreach College: Professional Program's Japanese Language program also provided limited response, even though a recruitment flyer was also used for recruitment (Appendix B). Therefore, the best form of recruitment was word of mouth with those associated with the researcher. The requirements and guidelines of the Institutional Review Board (IRB) were used to help guide the development of this study and researchers involved had up-to-date Citi Certification for Human Subject Research (Appendix C). The usability study included three rounds, each with six to seven participants, 19 participants total. This was based on Nielsen's recommendations that user experience will overlap somewhat between groups (Turner et al, 2006), with five users "you would need to detect approximately 85% of the problems in an interface, given that the probability a user would encounter a problem is about 31%" based on the Poisson Distribution of problem discovery rates. In the end, this study helped improve the website usability for future users.

Participants for this website were English as a second language learners. They had experience studying English. Participants were adults, over the age of 18. They had basic computer literacy and used the Internet every day. They were all from East Asia, with the majority of students from Japan and between the ages of 18 and 35. Finally, participation was voluntary, and participants were given study details and information prior to engagement. After the study, participants were provided with access to the website for future use. These participants matched the target

audience who are Asian, adult, English learners, who have basic computer skills. (See Appendix D)

Any and all information obtained during the study was confidential. The data, including voice recordings, screen recordings, and surveys, were stored on Google Drive in a password-protected account. Survey and interview data with identifiers were removed. Those participants who participated in the interview had their names removed from presented results as a privacy measure. Only the target population's data was kept until the end of the study for analysis. Other participants were excluded, and their information was deleted as they submitted during recruitment period, January to February. While there was little risk for participating in this research project, there were also no direct benefits to participants for participating in this interview. However, the results of this project were used to improve the Web-based CALL Process Writing tools Website. After each round results were analyzed and changes to the website were made based on user input.

Evaluation Instruments. Over the course of five weeks, from the end of January to the beginning of February, many instruments were used to gather data. The questionnaire and survey were constructed in Google Forms because it offers analytic descriptions, charts, and graphs. The first instrument used was a pre-questionnaire (Appendix E) to collect demographic information to learn more about the participants. For the usability data, or information that was used to make improvements to the website, instruments were designed implementing guidelines from Steve Krug's book, Rocket Surgery Made Easy, described as a "do-it-yourself guide to fixing usability problems" (2010) and Nielsen's Heuristics for Usability (1994). Krug's ideas for an interview protocol (Appendix F) helped as a script to ensure study consistency it included tasks and questions for the interview. The protocol tasks were both exploratory and specific tasks. The tasks corresponded to the four stages of process writing and focused on navigation. The instrument ultimately used to make most judgments for changes, was observations about participant behavior errors during the interview, which were noted to find most catastrophic and major usability errors. This was because navigation issues were primarily assessed through behavior observation and tasks, which were reviewed in screen recordings from interviews. Second, comments made by the participants during the interview were noted, categorized, and analyzed for severity (Appendix G). Both qualitative and quantitative data were categorized to address the research questions on navigation and presentation. Presentation was broken down into two subcategories: text and visual. Navigation also consisted of two subcategories: organization and format.

A post-survey (Appendix H) influenced by Nielsen's Heuristics, was given to participants to provide additional feedback and validation specifically to look at participant's satisfaction. The survey included 16 questions and asked participants to think about their experience during the interview stage of using the website as a whole and to make holistic judgments about factors related to the research questions using a 5-point Likert scale, (1 represented strongly disagree and 5 for strongly agree), and short open-ended answer and commenting for each item for both qualitative and qualitative data, respectively. Participants were asked four questions about format and three on organization that were used as the benchmarks for navigation. For presentation, benchmarks included four questions about text, five questions for visuals, and three for organization. Nelsen's (1995) 5-level Severity Rating scale (Appendix I) was used to help rate

usability issues. Usability problem severity are classified from level 1-5: no problem at all, cosmetic, minor problem, major problem, or catastrophic problem respectively.

The post-survey was collected in Google Forms, which automatically consolidates data received. Google Survey also provided a summary function that was utilized to help tabulate data. The data from Google Surveys was transposed and organized in Google Sheets for analysis where mean scores were the primary means of descriptive statistic evaluation. The researcher identified potential solutions to the usability problems then documented and changed the website. The descriptive statistics helped identify areas of improvement and attitudes towards using the site. It helped find the preferences of the user. In additional, data is represented with visuals such as charts and graphs to help the researcher make better comparisons and informed changes. After each round of usability studies improvements were made to the website.

Project Design Strategies. Instructional design was utilized in the website to make the acquisition of knowledge and skill more efficient, effective, and appealing (Merrill, et. al 1996). The Audience, Design, Develop, Implementation, and Evaluate model (ADDIE) was the instructional systems design framework to guide reliability for this project (Gustafson & Branch, 2002), (See Appendix J.) The audience was considered through literature review and empathetic reflections. The design strategy utilized is the ARCS model of motivational design strategy (Keller, 1987a), (Appendix K). The website site addresses *attention* with active participation using student interaction with internet tools. *Relevance* for students is provided by giving them choice in the tools to use or how to use them. *Confidence* was considered with feedback tools. Lastly, *satisfaction*, is accomplished with recommendations for use of the online tools for real-world application. The website is assists in bridging the gap in feedback and process writing by helping connect students to resources and incorporating constructivism by using process writing that follows the visual and instructional design principles. The goal of the website, an e-learning intervention, was for learners to be scaffolded and practice the writing process outside of the classroom at their own pace.

Development and implementation were done with Wix, a free website builder. All the online tools work both on Mac and PC computers. The platform allows for clean aesthetics. The developed website incorporates Mayer (2009) multimedia learning principles, which promotes images with text and segmentation of content. It also takes into consideration Meggs (1992) 5-Steps to the Design Process, particularly ocular reconnaissance, a looking for inspiration, to synthesize ideas and information that are available online. Evaluation was done through Usability Testing. The ADDIE instructional design was used to organize scaffolding. The ARCS model for motivation provided a strategy to engage student-centered experiences. Both learning methods were used to improve student learning.

The project claim the right to use website trademarks for commentary and critique. The software logos were used for informative purposes, noncommercial use, non-infringement, covered in "Nominative Fair Use" by United States Code 15 §1125(c)(3)(A). The project causes no dilution, It does not associate the website with the software companies and reduce confusion by avoiding creating a website design that looks like one of the software websites. The logos are used in an understandable context close to their intended use, writing. The website includes a disclaimer on the bottom of every page that notifies that there is no affiliation with the linked websites. Also,

small logos, not dominant elements, that link to the original site were utilized for user reference to their source.

Procedures. Initially, participants were sent a recruitment email (Appendix L) to invite them to the study at the beginning of spring 2019. Participants were not given any money for participating in this study. The recruitment email informed participants that participation was voluntary to protect their rights, which included no obligation to take part in this study and open opportunity to withdraw by stopping during any stage of the study. They could have refused to answer any questions or complete any study tasks that they find objectionable. The email included an online informed consent to participate in research project form (Appendix M) that included more details about participation in the study, such as benefits and risks, as well as a privacy and confidentiality clauses. The consent form was filled out on a Google Forms and signed electronically. The recruitment email also contained a link to answer a background pre-study questionnaire administered via Google Forms. The questionnaire collected demographic data that provided descriptive statistics about the participants to find if they fit the target population. Once participants responded with interest and consent, screened target participants were sent a confirmation email (Appendix N) that included Usability Interview Protocol, for participant's reference. Students were also asked to sign up for the study during an available time slot using Google Sheets.

Then to address usability issues in the website, three rounds, of 6 to 7 one-on-one participant sessions, a total of 19, each about 60 minutes were conducted. Participants met the examiner online or in person to participate in the study. Participants were encouraged to meet at a quiet public location for in-person or find a private location for connecting online during the interview in the confirmation email. Each participant only participated in one round. Participants used Zoom, a web conferencing software, and a computer and with high-speed Internet connection to participate. Required equipment, programs, and Internet service used to conduct this study were freely available or owned by the researcher and participants.

After participants were reminded orally about the overview of the study and informed consent, recording of participants audio and screen commenced. Users were told to engage in Concurrent Think Aloud (CTA) by narrating what they see, do, and think during the study (Bergstrom, 2013). For each round, participants were asked to test the Web-based CALL Process Writing Tools website in response to scripted task questions, the Usability Interview Protocol. The tasks focused on navigation and user satisfaction of content presentation. After the interview participants, recording of audio and screen concluded.

Concluding the usability interview session, participants took a semi anonymous retrospective post-survey using Google Forms, provided via link, about their usage and their comprehension of the website to confirm and validate their feedback about the website, particularly content satisfaction. The study minimized the risks and preserved confidentiality in my data collection and handling by not asking for web-camera recording. All recorded files and surveys were stored on a password protected Google Drive and YouTube account for analysis of website suggestions then deleted after the study.

Results

Post-survey qualitative results were generally positive; however, they did not pinpoint areas of improvement. In general, the navigation average of the site somewhat increased, whereas presentation average decreased. The post-survey provided general impressions for each round. (Figure 4)

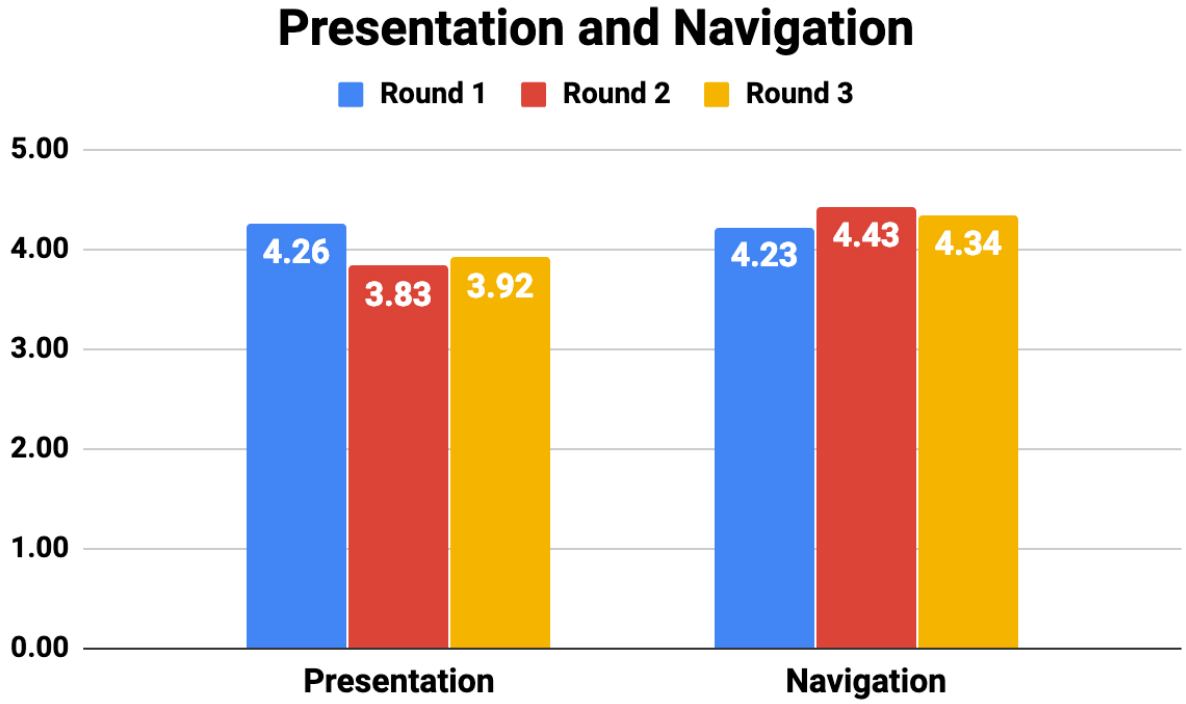

Figure 4. Round averages categorized results.

Many users did provide oral comments during the interview think-aloud compared to the post-survey. Particularly in Round 2, participants left little to no written comments (Appendix G). Participant comments and behavior during interview provided helpful information for iteration. Overall, based on the interview and post-survey data, users reflected positively about the website and were interested in the writing process and using online tools for writing that they never heard of. Moreover, the changes made to the site for presentation did reflect positive reactions from users.

Round 1. The first round of the usability study had the most participants, a total of seven. Usability problems based on Nielsen's Severity Ratings (1994), ranged from catastrophic to minor. Navigation organization and presentation text were focused on based on highest severity rating and done as 'tweaks' to address usability problems and varied based on the time to fix, after encountering, effort, and severity of the problem and not necessarily their severity.

There were three major errors in the first round. First, while observing the participants access the site, some of the links did not work and the layout did not match with what was intended. These easy fixes but high in severity, such as broken links or buttons, were updated. Second, users found formatting and layout inconsistencies stating, "different formats between Planning and Revising" and consistency between pages was thereafter ensured. Some comments resonated as

priority, “I want to see flow chart in home site” and, “I didn’t know this order or steps before coming to the website”, so that the navigation bar was streamlined. The ‘Process Writing’ was included in the navigation to create emphasis. While the ‘About’ button was removed, and its subpages were relocated under ‘Home’ and corresponding icons were placed in the footer for ‘Creator Info’ and ‘Contact’ respectively. The stages for Process Writing were numbered to show sequence. Third, choosing tools by users also proved to be a challenge for users, “it’s stressful to find the good one”. In tools page, a ‘best choice’ icon was integrated, and the rubric was moved to the top of the page to help users choose a tool to use.

Some minor issues were also addressed in Round 1 regarding presentation of font text, “maybe you can consider making words bigger? Sometimes when words are too small, I tend to skip it.” Text fonts were made consistent in response to readability concerns. Users did not know what some of the subcategory words meant. The vocabulary for some of the sub-navigation bar were changed, such as ‘Bibliography’ to ‘Reference Maker’, ‘Grammar’ to ‘Grammar Checker’, and ‘Comment’ to ‘Feedback’. Also, additional information was added by creating instructions and relabeling the header to include the word free and the footer was moved down to provide space. For visual, slideshows were set to allow the user to operate transition and include videos, because users requested more instructions and wanted the designer to “create examples of tools”. (See Appendix O.)

Round 2. The second round had six participants. Users in the second round were also asked fewer tasks because of the long duration and task difficulty experienced by users during the first round and tasks were selected to ensure interaction with each of the four writing process stages. The IRB Protocol was also revised to reflect those changes. The researcher decided to resubmit the IRB for the project to reword the tasks and questions during the interview.

In the second round, just like in the first round more concerns about navigation and organization issues were revealed in comments like, “I cannot decide which menu is better," this validated and addressed the findings concerns from the first round and four major changes were made. Again, simple changes such as broken links and formatting were done. Second, a major change was the location of tools, which learners remarked that some tools didn’t follow the order what they usually do when writing. Many users expected to see the reference maker and plagiarism earlier in process writing, so it was moved to drafting. One participant’s comment was especially insightful, “reference maker, does it have to be under editing, could it be some other...it’s probably too late when you are editing you already cited a bunch of people… plagiarism too they should be thinking about this when they are thinking about [sic] draft”. So, plagiarism was moved to ‘Drafting’. Third, users still did not recognize the icons and pictures. Users suggested icons for the navigation bar to help users understand their meaning. To accommodate these issues better instructions, images, and examples were written for pages with added instructional videos for tools. Fourth, users expressed difficulty with differentiating the tools due to redundant or arbitrary ratings and a revised staring system. A rating out of five stars was used instead of word ratings to show range. Tool rubric systems were also overhauled, and graph comparison of tools were added in an effort to create more objective presentation of tools utilizing empirical stats of site visits, login requirements, and resource limitations.

Minor usability issues from the second round were again about text and visuals, therefore five

changes were made. First, site colors were busy and users desired consistency, "You could do same font's maybe...and then the colors too, I was thinking like three colors and then make it consistent". The site colors were changed to a blue color scheme. Second, users suggested larger and more consistent fonts. Text size was increased across the website to at least 20 font and changed to Open Sans font. Third, a suggestion by one user was that the number of online website tools per a singular tool type were too numerous and were reduced to four or less. Fourth, after user observation, hover description buttons were removed because users didn't realize that there was hidden text and needed to be prompted to look. Finally, to increase navigation and clarity a dictionary and site search box were added during the second round based on suggestions from the first round. Additionally, a visitor count was added for usage statistics. However, second round users said that icons were distracting, and pictures did not help their understanding. (See Appendix P.)

Round 3. Finally, the third round also had six participants. This group was used to further check the revamped graph system for tool evaluation and the site navigation. One participant mentioned that “blue makes peoples mind calm, so how to choose color was good”, which positively reinforced the color change to blue. Another said, “The website was very well organized and simple to approach.”

A major issue was that participants commented that text was still long and too much for them. To address this some pages were separated, and some hidden subpages were added to separate content for segmentation with pictures. Scaffolding was done with arrows to sequence actions in each stage. Instructions and descriptions for each action was also incorporated. Headers were also included in the video bar at the bottom of tool pages. Some minor cosmetic changes were made. First, with regard to post-survey comments revealing perceptual concerns about the content by the majority of users and the suggestion for examples and pictures were added. Second color changes to neutral and less boxed text were done in an effort to simplify content. Last, icons were added to search boxes because participants suggested more pictures with text. (See Appendix Q.)

Discussion

The usability study was very valuable but presented some challenges to conduct. For example, recruitment at first was a bit of an issue and resubmission of the IRB to improve recruitment with a flyer and in-person interviews was needed. After the first few initial interviews, the researcher realized that users had many technical issues and setup required a lot of time when interviews were done remotely. There were six lessons learned about conducting usability study that might be useful to future researchers.

First, an instructional design study should be conducted or considered before a usability study. Fortunately, the ADDIE instructional design was useful in organizing the overall project development by dividing instruction development into its 5 stages. The ARCS model provided specific design strategy considerations, for active learning. The tool pages included more than one tool to align with the ARCS model and allow users choice in an effort to increase motivation. However, users questioned, why there were options. Developing a non-linear CALL,

with technologies or applications for learning or learner support in the process approach to teaching writing proved difficult and prescriptive, some online application tools did not fit into the specific functions of the four process writing stages. For example, citation, was not something covered in the initial description of the drafting stage but was added by the researcher and not something users were familiar with. The researcher tried to provide many options for both strategies and tools, however, instructional design could have been given added consideration. Users were also often able to locate most tools but sometimes did not know how to use them.

Second, if you are doing a usability study, keep it simple and don't change things too much without confirming changes are necessary. One option of usability is to look for small tweaks and refinement rather than redesign (Krugs, 2009; Nielsen, 1993). Usability usually involves iterative development and steady refinement of the design based on user testing and other evaluation methods. Nielsen notes that "Typically, one would complete a design and note the problems several test users have using it. These problems would then be fixed in a new iteration which should again be tested to ensure that the "fixes" did indeed solve the problems and to find any new usability problems introduced by the changed design". This is the approach that the first iteration took in the study, with a focus on formatting aesthetics and specific navigation that were mistakes or overlooked problems. However, Nielsen also concedes that only incremental changes may limit creative insights necessary for a fundamentally novel and better interface design via interface reconceptualization. The second iteration of the study tried to change the global navigation and content organization in graphs and hidden pages to meet the perceived need. The researcher also made changes to the website during rounds between interviews that may have confounded results, but it was assumed that users would focus on different aspects. Some issues were not fixed between iterations, addressing them early on by spending more time revising would have prevented them from persisting in later iterations, but may have also resulted in mixed testing that might have produced inconsistencies. In the end, like Nielsen warned, the fundamental redesign introduced unexpected usability problems that will require additional iterations to fix them in the future. In hindsight, it might have been easier to continually improve the original design for the website.

Third, for a usability study keeping a strict schedule with a participant cap of three per round would have helped organize the study. The number of participants was overwhelming, and more time should have been spent between iterations to make more informed analysis and revision. While Nielsen (2003) recommends 5 users and a minimum of 3 to ensure covering the diversity of behavior within the group, the minimum would have allowed more time between iterations for analysis and modification to the website.

Fourth, structure interview tasks to meet research questions and determine scope and priorities. Initially, users were not able to complete some of the tasks and mentioned that they were

unfamiliar with the means, procedures, location, or wording. Some of the tasks or scenarios might have been too vague, either too exploratory or too specific and confused the user and was somewhat verified by users commenting on the difficulty in completing some of the tasks during the interview, during the second round one of the participants' said, "I'm confused this question... before this question, you can, we have to some training to operate these...or some instructions on how to operate these menu". Some of challenge in task seemed to be a result of having multiple ways to complete a task. For example, task nine, which asks participants to check word order. Some participants used a different strategy than was intended for the task. Other participants did not use global navigation, which are the site's top-level category links that occur on every page of the site, to find tools. Users hovered over the navigation bar to see the subpage contents and went directly to subpages. Even when users could find most tools, they often had trouble operating them because they had many advertisements, hidden buttons, and limited instruction, or they had never used them before. Some commented that they trouble choosing tools because they didn't know what tools would produce without accessing the site connected to logo links on site. The task ordering and number of tasks given to each participant were changed based on logical progression and sought feedback, navigation. For tasks many participants took an additional step and interacted with the tool websites to accomplish tasks, this may have inadvertently caused users to base opinions based on what they experienced or saw as example on the tools websites instead of the one created for this project.

The tasks were written following Nielsen's (2014) advice to be realistic, actionable, and avoid giving clues and describing what steps to take to interact with an element. However, Nielsen notes that it is best to use established terms and ask the users to do the action, rather than asking them *how* they would do it, unfortunately 'how' was used. More information and context might have been provided to allow users to complete tasks by themselves. One participant said, "actually I would go to Google". Nielsen warns "asking a participant to do something that he wouldn't normally do will make him try to complete the task without really engaging with the interface." Users should have all the information and context needed to complete the task by themselves. Unfortunately, there might not have been enough information or context. One example was creating bibliography using a reference maker, users weren't familiar with the concept or had little experience doing it. In another case, a user said that they don't have knowledge about readability.

Fifth, usability study means allowing participants to work without interruption. Nielsen (2005) warns "a cardinal rule of user testing to have observers remain absolutely quiet". More concrete examples and time for participants during the interview might have provide more insight, the interview was sometimes led to progress and rushed before participants could fully think or express their opinions. The interactions with users and seeing and hearing their reactions and feedback helped add value and direct the researcher to notice things that would probably have been missed in the development of the website. These results reflect Nielsen suggestion that, "the

most effective way of understanding what works and what doesn't in an interface is to watch people use it" (Nielsen, 2014). More attention was put onto the behavior and letting participants comment and provide feedback about other things. The researcher sometimes forgot or omitted questions or asking about task difficulty ratings. The greatest insights were about website complexity which lead to the need for simplification and reduction. Users comments and actions suggest that more instruction, explanations, and examples could improve content presentation.

Sixth, pay attention to the little things. A technical problem was that for more than a few of the participants, the recording was forgotten during the interview. However, observations and notes were taken along with all participants taking the post-survey. More attention might have been paid to following the checklist (Appendix R) for the usability study to ensure that all questions were asked.

Conclusion

A limitation to this study was the scope which was limited to free tools. Another limitation was that the study was developed to address a perceived problem for students and may not directly address the needs of a specific community. Based on the need presented in the literature review learners want feedback and guidance with their writing. The researcher was able to present a revised pilot live version of the CALL website. The website answers a need for online scaffolding through the writing process and provides web application tools and information to guide them through an online writing process and get formative feedback to improve their writing by themselves. The online CALL tools website provides added value to learning English, improving understanding by allowing learners to interact and articulate their ideas with student-centered supports to provide choice in how they want to construct their process writing essays. The reception of the Process Writing Tools Website project was positive based on user comments and initial and subsequent mean scores of both presentation and navigation over 4 of 5 on the post-survey (Figure 4). Critical friends were supportive for the website and helped guide the development of the instructional and visual design. Various instructional design and visual design elements were incorporated to help ensure a meaningful experience for learners. However, using Wix as a platform for the content proved to be limited and tedious for revision, which required a lot of effort. The researcher had to find work arounds for functionality that the site did not offer such as drop-down menus or deeper submenus.

The goal of the usability study was to check the feasibility of the presentation and navigation in the CALL Writing Process website. The site provides ESL language learners with a tool for supplementary feedback on their writing. The study helped rid the website of confusion and make the resource more understandable for the end user. The end user will be able to choose between different tools to improve their writing by guiding them to receive the feedback that they desire themselves. However, after observation and feedback from participant more revision to the website is still necessary.

Future development for this project might include more participants, iterations, and revisions. First, scaffolding, such as organizing video tutorials and providing examples for each application or strategy. Second, adding user empowerment by allowing them comment and add their own

tool suggestions, which they find and want to suggest to others to increasing interactive community. Third, would be to add paid tools that might best assist users. Finally, and most important would be to conduct an instructional design study.

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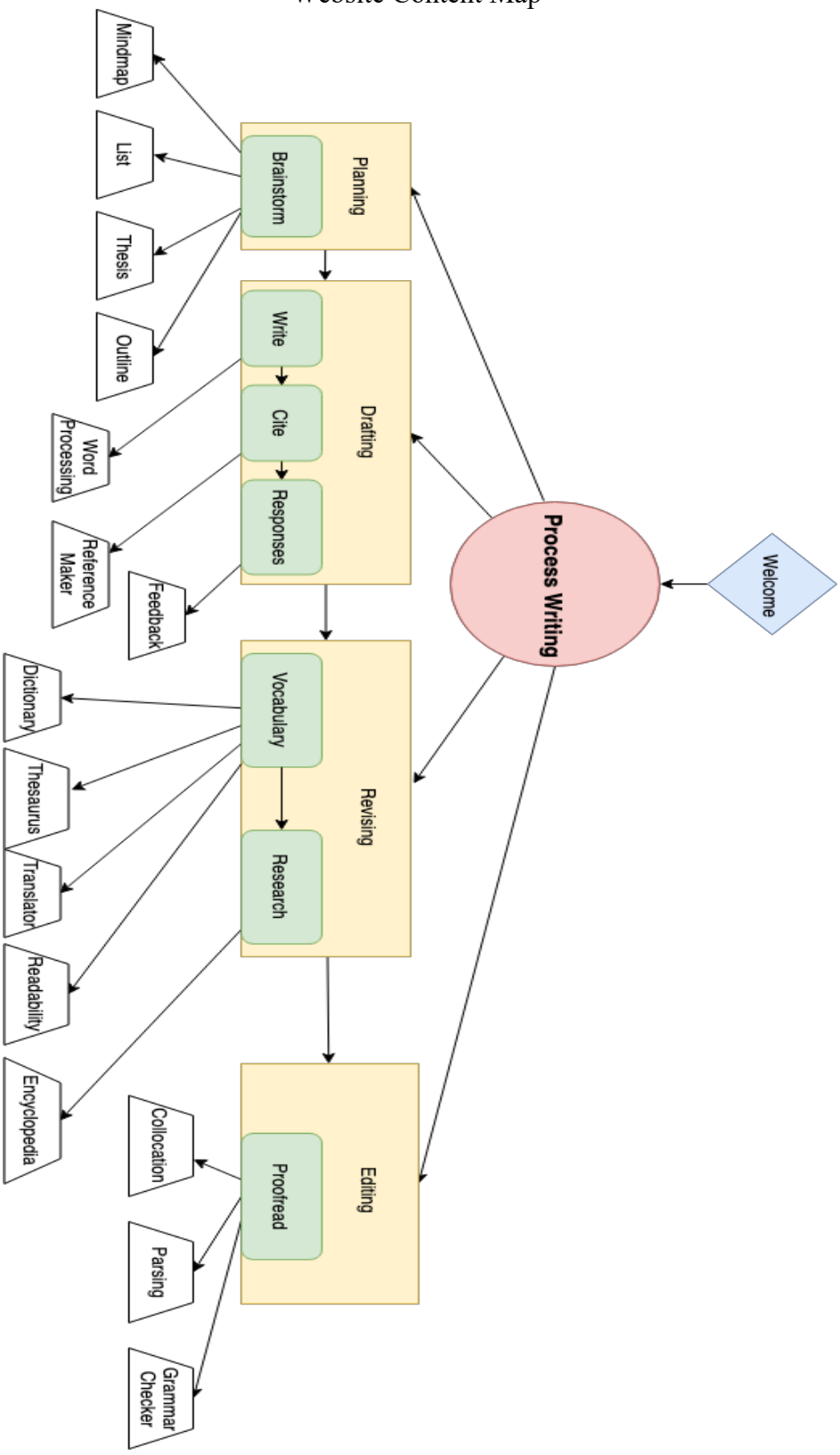
Appendix A
Website Content Map



Appendix B
Recruitment Flyer

Are you learning English? Are you interested using online tools for writing?

THE UNIVERSITY OF HAWAII IS CONDUCTING A STUDY

WEB-BASED CALL PROCESS WRITING TOOLS WEBSITE: A USABILITY STUDY

The **purpose** of this usability study will be to evaluate the navigation and satisfaction of content presentation of a writing website.

- Study will be about 1 hour using web-conferencing
- Meet online or in-person
- Voluntary

To learn more, contact the researcher, Joseph Peters at:

jo1aloha@gmail.com

Appendix C
Citi Training Certificate for Human Studies Research

CITI PROGRAM

Completion Date 23-Feb-2018
Expiration Date 22-Feb-2021
Record ID 25823830

This is to certify that:

Joseph Peters

Has completed the following CITI Program course:

Human Subjects Research (HSR) (Curriculum Group)
Exempt Researchers and Key Personnel (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Hawaii

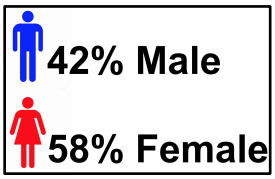
CITI
Collaborative Institutional Training Initiative

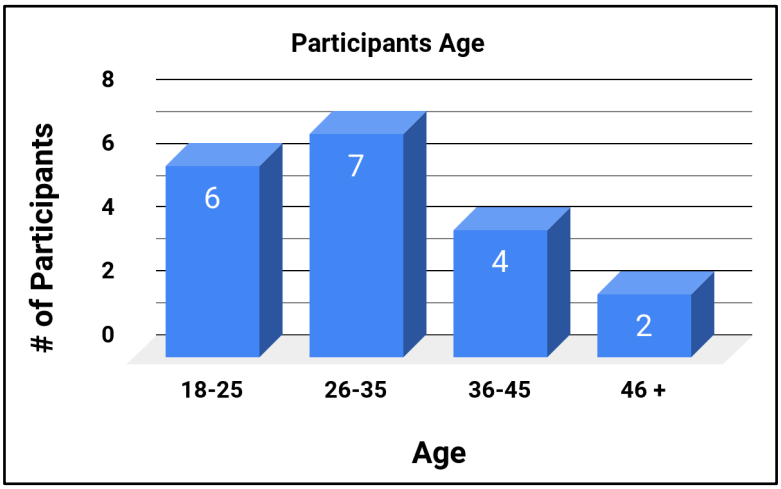
Verify at www.citiprogram.org/verify/?w5ec2a44f-c218-4d05-b5e6-4379a48fe02d-25823830

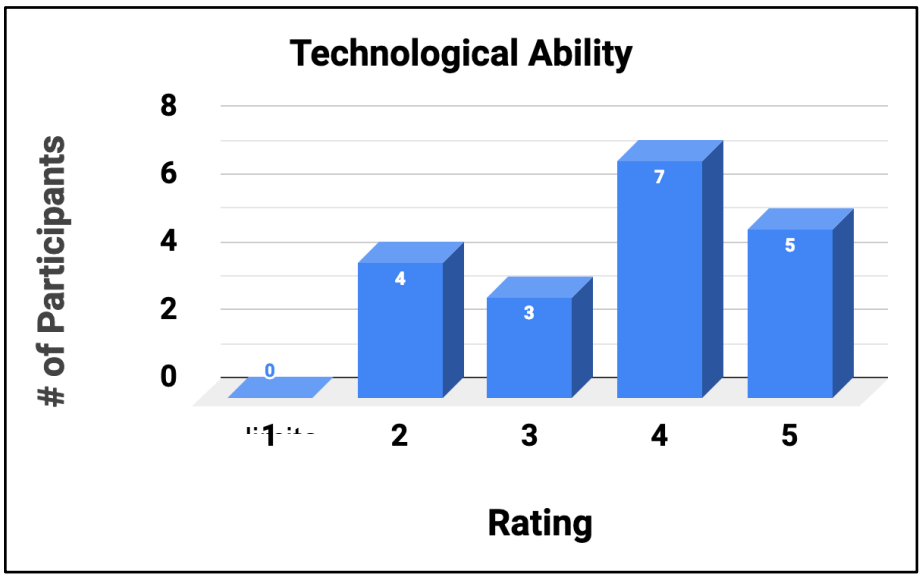
Appendix D
Demographic Overview

19 Participants Total

Gender







English Experience

Internet Tools

Appendix E
Pre-Study Questionnaire

6. **Date** *

Example: December 15, 2012

Pre-Study Questionnaire

Aloha! Thank you for your interest in taking part in this study. The pre-study questionnaire is designed to gather background information regarding demographic, learning, and technology experience only and is not a test. The survey is composed of 14 questions and should only take about 5 minutes.

7. **1. Will you be able to participate in the studies during January and February?** *
Mark only one oval.

- ◯ Yes
- ◯ No *After the last question in this section, skip to "Thank you ."*

8. **2. Do you have a working computer with web camera, microphone, and a reliable internet connection.** *
Mark only one oval.

- ◯ Yes
- ◯ No *After the last question in this section, skip to "Thank you ."*

9. **4. Please select your gender** *
Mark only one oval.

- ◯ Female
- ◯ Male

10. **5. How old are you?** *
Mark only one oval.

- ◯ 18-25
- ◯ 26-35
- ◯ 36-45
- ◯ 46 +

11. **6. What is your first language?** *

_____

12. **7. Are you currently studying English?** *
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

13. **8. What English writing classes have you taken?** *

_____

_____

_____

_____

_____

14. **9. How many years have you been in Higher Education?** *
Mark only one oval.

- ◯ 0-1 years
- ◯ 2-3 years
- ◯ 4-5 years
- ◯ 6 +- years

15. **10. How many other languages, besides English, do you speak?** *
Mark only one oval.

- ◯ 0
- ◯ 1
- ◯ 2
- ◯ 3 or more

16. **11. How would you rate your proficiency with using web technology?** *
Mark only one oval.

	1	2	3	4	5	
limited	◯	◯	◯	◯	◯	advanced

17. **12. How many years have been using the web (internet)?** *
Mark only one oval.

- ◯ 0-1
- ◯ 2-3
- ◯ 4-5
- ◯ 6 +

18. **13. How often do you use the Internet?** *
Mark only one oval.

- ◯ Every Day
- ◯ Once a Week
- ◯ Once a Month
- ◯ Never

19. **14. What Internet tools or software tools do you use to help with your writing?**

Contact Information

20. **Full Name** *

21. **E-mail** *

22. **Contact Phone number (Optional)** *

Thank you

Thank You!

Thank you for your time and responses. All the information from the survey is confidential and will not be shared other than the purposes for this research. (Please press "Submit" below)

Thank you for your time answering questions.

STOP filling in this form. However, we are sorry that you are NOT eligible for this research study. Due to one or more of the following reasons: 1. No available time between January and February

Powered by
Google Forms

Appendix F
Usability Interview Protocol

INTRODUCTION *[5 minutes]*

Hi, my name is Joseph Peters, and I will be walking you through this session today. Before we begin, I have some information for you, and I am going to read it to make sure that I covered everything.

First, remember your participation is completely voluntary and you may stop the session at any time without penalty. Don't worry about my feelings or risk to you. This study is not related in any way to your academic or professional standing. The interview will take about 30 minutes. The post-survey is intended to gain further insight and attitudinal feedback and consists of 16 questions and take about 15 minutes. The entire usability study, including surveys and debriefing interview, will last about 60 minutes. Remember the purpose of our session today is to review the navigation and user satisfaction of content presentation for the new website.

In the interview, you will be asked to explore a website to determine if it works the way it is intended. We would like to see what you think of it and how you think you would complete a few tasks in the website. As you perform these tasks, I would like you to do what you would normally do when surfing the web. That is, if you feel like stopping, just stop, or if you feel like exploring more just go ahead and explore. We'll learn a lot more about how well the site works that way.

Also, as you use the site, try to think-aloud: to say what you're looking at, what you're trying to do, and what you're thinking. For instance saying, *"Now, I'm going to click this link because I think it will take me to a page about finding ebooks,* or *"I'm surprised because this button doesn't do what I thought it did".*

Lastly, if you have any questions as we go along, just ask them. I may not be able to answer them right away, since I'm interested in how people do when they don't have someone who can help. But if you still have any questions when we're done I'll try to answer them then.And if you need to take a break at any point, just let me know. Do you have any questions so far?

Do you understand what you need to do? Are you ready to begin?

Tasks *[30 minutes] * <u>All users will start on Task 1 and 2, the rest of the tasks will be chosen by researcher total around 10</u>*

<u>Task 1:</u> **Navigate / Design of the Homepage**

a. Give me your immediate impressions as you look at this page. What would you click first?
b. What do you think is the purpose of this site? What is it trying to do?
c. Is there anything you don't understand on this page?

Participants verbal comments

Thanks for doing that. You did a great job. Now I'm going to ask you to try doing some specific tasks. I'm going to read each one out loud. You should have received a copy of these before this study. Again, as much as possible, it will help us if you can try to think out loud as you go along.

Task 2: **Navigation**

You are a learner who, after hearing about this new website and how it will help you be a better writer, decide to try it out. You have heard that it includes a writing process. Find out where you can start or learn more about this process.

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 3: **Navigation**

You have just been given an assignment to write an essay. You are not sure where to start with your paper. Show me where to find tools for helping you develop or organize ideas for your paper.

You are a learner who has decided to focus on making sure you have not plagiarized in your writing. Find where you can check your writing.

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.

(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 4: **Navigation**

Let's pretend that you found information on a website that you want to use for a class assignment, but you are unsure how to format or cite it for reference in a paper that you are writing. Show me how you would use the Written Feedback website to find how to create a proper reference for your source.

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 5: **Navigation**

You are a learner who wants to locate online tools for storing documents online. How would find this information?

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 6: **Navigation**

You are a learner who has just finished writing a paper and want feedback from a real person. Find where you can go to share your writing.

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 7: **Navigation**

Now let's say you've written an essay and need to check it for grammar errors. Where would you go on the Written Feedback website to find tools to help you check for errors in your paper?

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 8: **Navigation**

Let's pretend that you've been asked to reduce the difficulty of for your essay so that it is easier to read. Where would you go on the site to discover tools that would enable you to do this?

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 9: **Navigation**

Imagine, you just used a translating application to change a sentence into English. However, you are not sure if the words are in are in the correct order.
Where would you go to find tools to see if words are ordered correctly?

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

Task 10: **Navigation**

You want to check if native writers have written sentences similar to you. Where would you go to find tools that can help you to do that?

Participants verbal comments

Rate the level of difficulty completing this task on a scale of 1 to 5.
(1 being very easy and 5 being very difficult)

Explain your rating.

Any suggestions on how to make this task easier?

DEBRIEFING *[5 minutes]*

7. Thank you for sharing your thoughts. I also have a few debriefing questions.

    a. What did you like about the CALL Written Process Feedback website? What did you not like?
    b. If you could add anything else to the website – a new feature or new information – what would you add?

Thanks, that was very helpful. We are done with the main questions, and the last part is a post-survey that you can do online (Google Forms).

[Ask participant to complete the Post–Survey]

POST INTERVIEW SURVEY *[15 minutes]*

Do you have any questions for me, now that we're done?
I want to thank you for your time and willingness to be a participant in this study. This has been very helpful.

Appendix G
Usability Analysis Post-Survey Comments and Severity

Interation			
Round	**1**	**2**	**3**
Dates	**1/22/19 - 1/29/19**	**1/30/19 - 2/8/19**	**2/12-2/18/19**
Participants	**7**	**6**	**6**

Iteration 1

Text		**Mean Score of Q 's**	**4.32**	**Severity Rating** **M= 3.25**
Question	**Mean Score**	**Survey / Interview Comments**		
1. The webpages were easy to understand.	**4**	- for Japanese sometimes can't understand some words so i hope to have an English-Japanese dictionary. - So much texts for me - "What does it mean good option?" - "give examples, instead of the actual homepage because it requires a further step to get in and see"		**3**
2. The site provided text that is short and does not contain too much information in one section.	**4.14**	- If you use icon or picture, it will be 5! - some overlapping explanations on same topic - Maybe you can consider making words bigger? Sometimes when words are too small, I tend to skip it.		**3**
3. The text is clearly written and easy to read.	**4.43**	- I would say that there can be one sentence of explanation of what the tools do for each page.		**3**
4. The text formatting is consistent.	**4.71**	- Different formats between Planning and Revising		**4**

Visuals		**Mean Score of Q's**	**4.2**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**M= 2.4**
5. The website is visually appealing.	**4**	- You can add more picture or icon. - Font size is small, and text is everywhere. You may increase font size and differentiate title size and text size. Align texts to the left. Use more colors and bigger marker to emphasize "best choice" tools. For example, change a background color if it is a *best choice.* - There are little Images.		**3**
6. The images are interesting	**4.14**	- I would say that image is necessary but not that interesting.		**1**
7. The images and graphics help with understanding the information.	**4.29**	- Yes, you can add more - In my case, there are some unknown words on the pages, perhaps a little more emoji or pictograph might help low English level students to use this website - I could not image about some icons relationship to the text, for example some of icons similar to each other. - There are interesting graphics giving me better understandings, but I wish I could see more videos. You may relocate videos on the top of page to increase accessibility - "how many rating, can you say?" - "When I see icon, I don't understand what the software is about. Unless I click in there and explore. It will take me some time for me to understand how does this app work"		**3**
8. The site does not have information which is not useful or distracting.	**4.43**	- many website links that I was led by on the website are actually advertisements. need to see actual trying-out examples.		**3**
12. The site provided appropriate alternatives, such as videos for supporting accessibility.	**4.14**	- better locate videos on the top of the page to improve its accessibility. Scrolling all the way down to see videos is hassle for me.		**2**

Organization		**Mean Score of Q's:**	**4.1**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**M= 3.7**
9. The organization of the site is logical and easy to follow.	**4.14**	- I want to see flow chart when I start - I would like more information of navigation for steps. No *start* button is found on the home page. - I don't know about flow. - "I'm not sure what, which one is where or not, and also parsing is not a familiar word" - "I hope there is more explanation about what it is about" - "give users some tutorial" - "citation.. happens when i am drafting not at the end of the process" - "I want to try a little or I want see an example of one someone already tried"		**4**
10. The site allowed the user to know her/his current position in the website structure. It made it easy to access all areas of the website.	**3.86**	- I was sometimes confused where I was. - I didn't know where I was currently located on the website. maybe give a title on the top of the page or change the button color if users are in there.		**4**
11. The site organized information hierarchically, with more general information appearing before more specific detail.	**4.29**	- I did not notice the big category such as editing could be selected.		**3**

Format		**Mean Score:**	**4.35**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**3**
13. The website was easy to navigate.	**4.29**	- Menu bar words are usually difficult for me. - Maybe add page links on the bottom of the page. - “I’ve never experienced these kinds of steps to write something” - " I couldn't find this Process Writing in About" - “I’m not sure which topic should I choose” - “present all the list in one scroll..I not going to go down”		**4**
14. The theme and structure of the pages are consistent.	**4.71**	- Consider putting the video below the tool you introduced.		**2**
15. The labels for the buttons or pages are clear and concise.	**4.29**	- I would like to know where the button is. - some buttons do not work. - Sometimes it is not easy to distinguish the differences between revising and editing, so I need to look for tools I need by reading the subtitles. - “I hope I can access the start button everywhere” - “I don’t know what start means” - “It's stressful to find the good one” - “I accidently pressed the footer”		**4**
16. Headings and titles are clear and concise.	**4.29**	- Too simple. - Some pages do not have titles		**2**

Iteration 2

Text		Mean Score	3.96	Severity Rating 2.25
Question	**Mean Score**	**Survey / Interview Comments**		
1. The webpages were easy to understand.	**4.67**	- "What helped was this diagram first" - "I simply have never heard of these things… but being new to this I was like oh what is this" - "I would like to know the popularity...I think i should go with the majority"		**2**
2. The site provided text that is short and does not contain too much information in one section.	**3.5**			**1**
3. The text is clearly written and easy to read.	**4.5**	- "You highlighted things: underlining, bold letters, italics those made it easy" - "This sentence is not the same as I expected" - "One more problem is, English listening ability, my English listening ability... and this English is a little difficult to understand for me"		**2**
4. The text formatting is consistent.	**3.17**	- Keep fonts consistent (in Process Writing visual diagram) - Fonts can be changed to emphasize the words or save the area. - "You could do same font maybe...and then the colors too, i was thinking like three colors and then make it consistent"		**4**

Visuals		**Mean Score of Q's**	**3.7**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**2.2**
5. The website is visually appealing.	**2.83**	- Fonts can be bigger to improve visibility - The colors were not my favorite and as I mentioned on the above question, the fonts can be more stylish.		**3**
6. The images are interesting	**3.5**	- I felt there was not that many images.		**2**
7. The images and graphics help with understanding the information.	**4.33**	- "I don't know what they, so those are different brand names or something? I don't understand" - "I want to see the sample, example" - "more simpler explanations, more like pictures included" - "put the picture of that reference... an example, instead of the words... because it's for English learners, maybe too much words on the page"		**3**
8. The site does not have information which is not useful or distracting.	**3.83**	- More catchy images can be used too.		**1**
12. The site provided appropriate alternatives, such as videos for supporting accessibility.	**3.5**			**2**

Organization		**Mean Score of Q's:**	**4.44**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**3**
9. The organization of the site is logical and easy to follow.	**4.83**	- "Reference maker, does it have to be under editing, could it be some other...it's probably too late when you are editing you already cited a bunch of people… plagiarism too they should be thinking about this when they are thinking about draft" - "I have no experience these mindmap" - "This is the first activity write an English sentence. I want to learn more English words about my topic...I want to know more information... to write a sentence"		**3**
10. The site allowed the user to know her/his current position in the website structure. It made it easy to access all areas of the website.	**4.5**	- "I'm confused this question... before this question, you can, we have to some training to operate these...or some instructions on how to operate these menu" - "I cannot decide which menu is better" - "We need enough time to trial and error" - "a couple of times if I try to use the screen, I will use myself"		**2**
11. The site organized information hierarchically, with more general information appearing before more specific detail.	**4**			**1**

Format		**Mean Score:**	**4.42**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**1**
13. The website was easy to navigate.	**4.5**	- "I would google first"		**1**
14. The theme and structure of the pages are consistent.	**3.83**			**1**
15. The labels for the buttons or pages are clear and concise.	**4.67**			**1**
16. Headings and titles are clear and concise.	**4.67**			**1**

Iteration 3

Text		Mean Score	4.13	Severity Rating
Question	**Mean Score**	**Survey / Interview Comments**		**2.5**
1. The webpages were easy to understand.	**3.83**	- for Japanese sometimes can't understand some words so i hope to have an English-Japanese dictionary. - So much texts for me		**3**
2. The site provided text that is short and does not contain too much information in one section.	4	- Three are considered good for people to understand, so when you compare graphs, three are better than five. - The definitions and explanations were very simple and straight to the point, thus not overwhelming the user with too much information or too much reading.		**3**
3. The text is clearly written and easy to read.	**4.5**	- blue makes people's mind calm, so how to choose color was good. - Important aspects of either the definition or explanation of the task and tool were very helpful. Also, the texts were large so that they were clear to read. - Sometimes text is long		**2**
4. The text formatting is consistent.	**4.17**	- I think that important words are bold letters. - It was consistent in a sense but was very colorful and did not have a design theme. But the use of the icons and colors were consistent throughout the sections.		**2**

Visuals		**Mean Score of Q's**	**3.7**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**1.8**
5. The website is visually appealing.	**3.17**	- Some part seem to be too simple. - Please color the picture. - Personally I like to view websites that are very simple (even Facebook seems too colorful and confusing). So, having many different colors, different icons, different fonts were a bit of a distraction. - More pictures of example will be good - Too much distractive icons.		**3**
6. The images are interesting	**3**	- Most of pages but not all pages. simple is good but it may have been too simple. - The icons used were simple and clean. not so much images - Images are relevant, but not interesting.		**3**
7. The images and graphics help with understanding the information.	**3.33**	- In the process writing page, the picture of cycle helps me to understand. - I didn't know the picture of revising and editing. - Some of the icons used were helpful, but some felt unnecessary. The graphs were very helpful though. - More images will help to understand - Ummmm, not really, be honest.		**1**
8. The site does not have information which is not useful or distracting.	**4.17**	- I cannot see the difference of other sites which are linked until I click on it.		**1**
12. The site provided appropriate alternatives, such as videos for supporting accessibility.	**4.67**			**1**

Organization		**Mean Score of Q's:**	**4.28**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**1.3**
9. The organization of the site is logical and easy to follow.	**4.17**	- Some parts difficult to follow, for example I did not know where to find feedback section.		**2**
10. The site allowed the user to know her/his current position in the website structure. It made it easy to access all areas of the website.	**4.33**			**1**
11. The site organized information hierarchically, with more general information appearing before more specific detail.	**4.33**			**1**

Format		**Mean Score:**	**4.4**	**Severity Rating**
Question	**Mean Score**	**Survey / Interview Comments**		**1.5**
13. The website was easy to navigate.	**4.33**	- Place to find what I am looking for is difficult		**2**
14. The theme and structure of the pages are consistent.	**4.33**	- Aesthetically the theme and the structure seemed more colorful than necessary, but the entire theme or "writing tool" was consistent.		**2**
15. The labels for the buttons or pages are clear and concise.	**4.17**			**1**
16. Headings and titles are clear and concise.	**4.83**			**1**

Appendix H
Post- Survey

Post-Survey

Thank you so much for participating in the usability study interview. Next, below you will rate your experience using the website. Explaining your answer is optional. However, responding with detail will better help me to improve the website. The post-survey has 16 questions and should not take more than 15 minutes.

Again, your responses will be kept for research purposes only and not affect your standing.

Thanks again.

* Required

Design and Layout

1. **1. The webpages were easy to understand.** *
   Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

2. **Please explain your answer (optional)**

3. **2. The site provided text that is short and does not contain too much information in one section.**
   Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

4. **Please explain your answer (optional)**

5. **3. The text is clearly written and easy to read.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

6. **Please explain your answer (optional)**

7. **4. The text formatting is consistent.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

8. **Please explain your answer (optional)**

9. **5. The website is visually appealing.** *
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

10. **Please explain your answer (optional)**

11. **6. The images are interesting.**
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

12. **Please explain your answer (optional)**

13. **7. The images and graphics help with understanding the information.**
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

14. **Please explain your answer (optional)**

15. **8. The site does not have information which is not useful or distracting.**
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

16. **Please explain your answer (optional)**

17. **9. The organization of the site is logical and easy to follow.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

18. **Please explain your answer**

19. **10. The site allowed the user to know her/his current position in the website structure. Its made it easy to access all areas of the website.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

20. **Please explain your answer**

21. **11. The site organized information hierarchically, with more general information appearing before more specific detail.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

22. **Please explain your answer (optional)**

23. **12. The site provided appropriate alternatives, such as videos for supporting accessibility.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

24. **Please explain your answer (optional)**

Navigation

25. **13. The website was easy to navigate.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

26. **Please explain your answer (optional)**

27. **14. The theme and structure of the pages are consistent.** *
Mark only one oval.

- Strongly Disagree
- Strongly Agree

28. **Please explain your answer (optional)**

29. **15. The labels for the buttons or pages are clear and concise.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree						Strongly Agree

30. **Please explain your answer (optional)**

31. **16. Headings and titles are clear and concise** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

32. **Please explain your answer (optional)**

33. *Mark only one oval.*

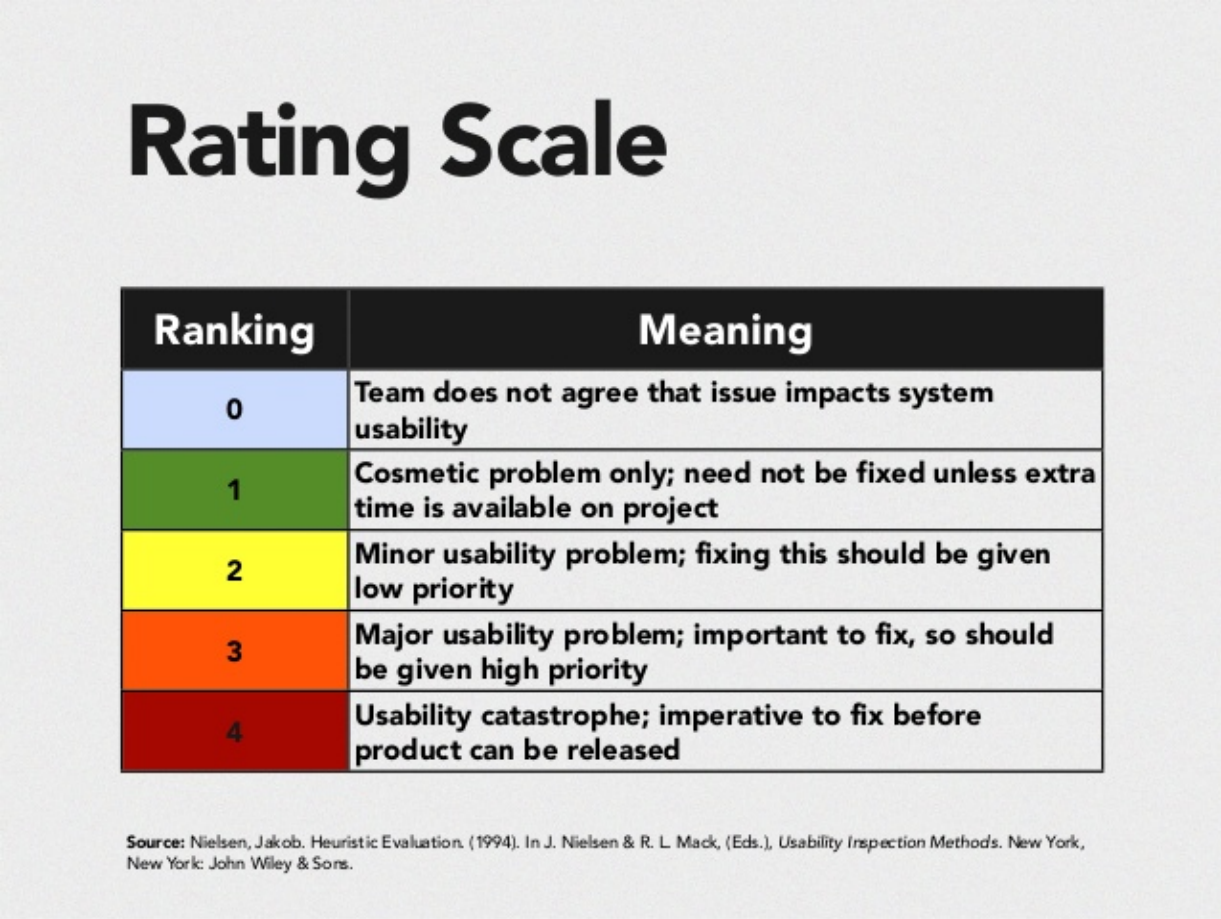
◯ Option 1

Thank you for your participation in the survey!

Your feedback will help improve the course design.

Powered by
Google Forms

Appendix I
Nielsen's Usability Severity Rating Scale



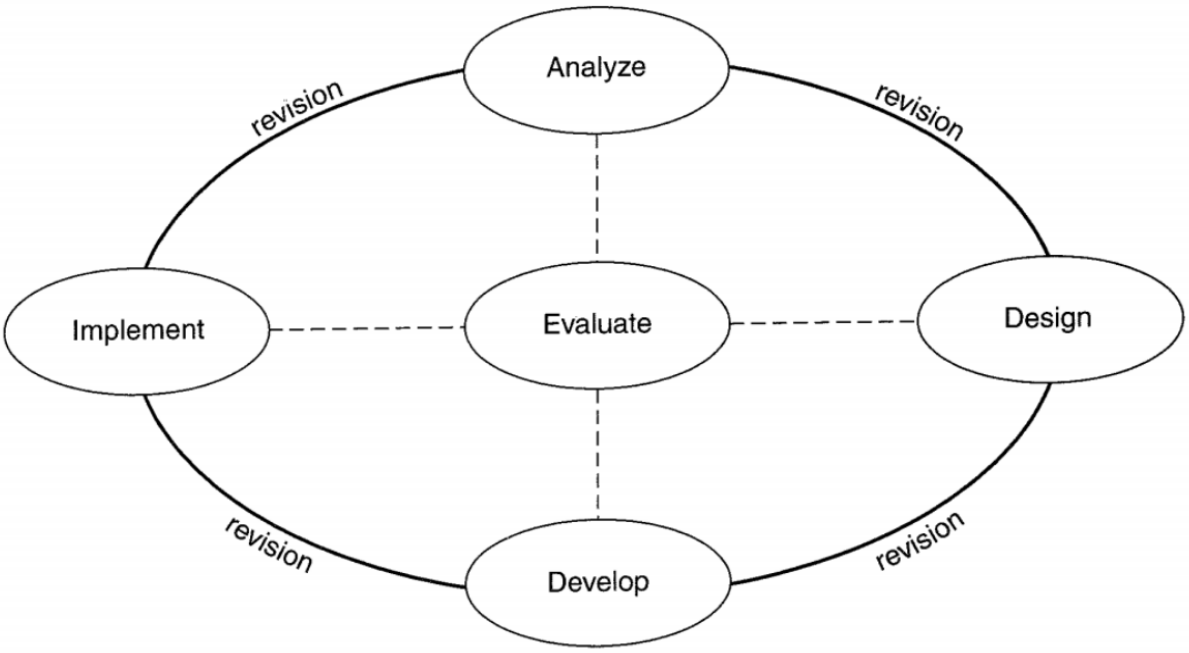
Rating Scale

Ranking	Meaning
0	Team does not agree that issue impacts system usability
1	Cosmetic problem only; need not be fixed unless extra time is available on project
2	Minor usability problem; fixing this should be given low priority
3	Major usability problem; important to fix, so should be given high priority
4	Usability catastrophe; imperative to fix before product can be released

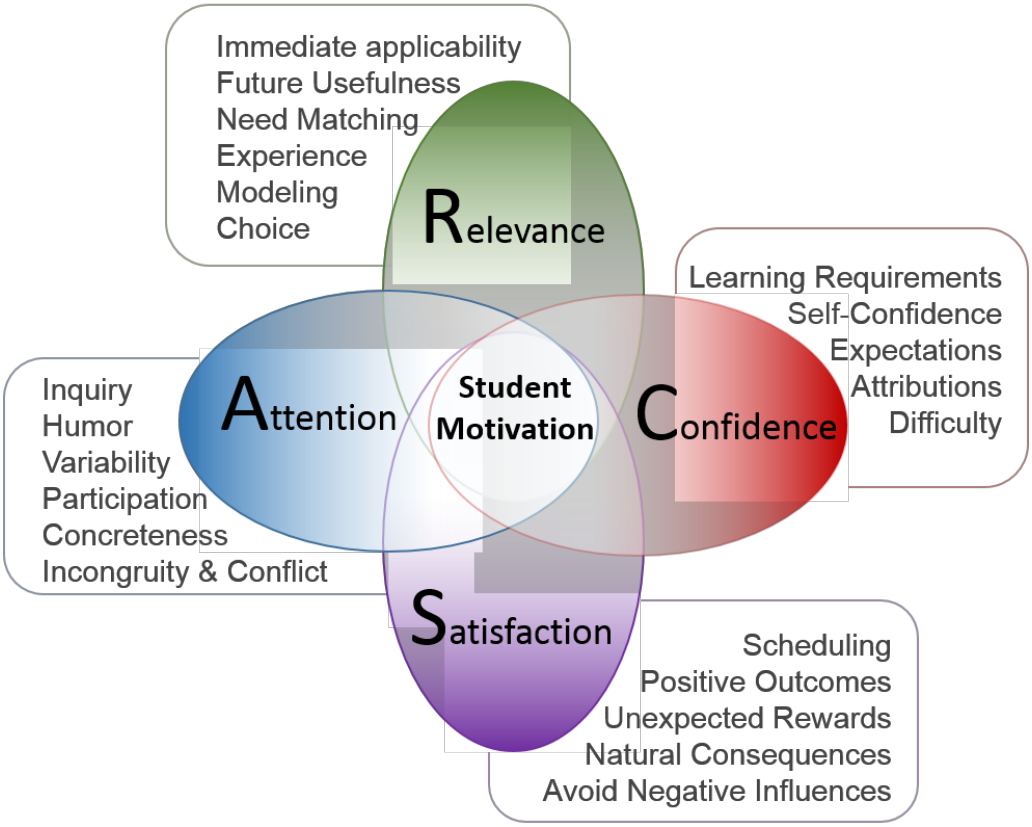
Source: Nielsen, Jakob. Heuristic Evaluation. (1994). In J. Nielsen & R. L. Mack, (Eds.), *Usability Inspection Methods*. New York, New York: John Wiley & Sons.

Appendix J

ADDIE Instructional Design (from Gustafson & Branch, 2002)



Appendix K
ARCS Model (from Davidpol, 2016)



Appendix L
Recruitment Email

SUBJECT LINE: Invitation to Participate in Research Study
Dear Potential Participant,

Do you need help writing? Do you want tools to help you to write? Have you heard of the process writing? Good writers go through process writing, which includes four basic writing stages: planning, drafting, revising, and editing. There are many online tools to help scaffold and engage in the writing process.

My name is Joseph Peters, from the Department of Learning Design and Technology (LTEC) Master's program. I am currently working on my final project, a usability study of a website for ESL learners that provides assistance in engaging in the writing process.

What am I asked to do? I am looking for volunteer adult ESL learners with at least 1 year of experience using the Internet. I'm looking for people who are interested in trying out the website and providing suggestions and feedback for improving the website of writing tools, a usability study. The study will help improve the navigation and satisfaction of content presentation. You won't need to write anything!

Overview:

- **Where?** You will meet with me online using a computer and Zoom conferencing (*link will be sent by confirmation email).
- **How long?** *About* **60** minutes:
    - Preparation Check/ Welcome/ Introduction. 5+ minutes
    - Usability Study Interview: 40+ minutes
    - Post Survey: 15+ minutes

  (Note: With your permission and consent; conversations and desktop screen activities will be recorded during the usability session interview)
- **When?** At a good time for you based on appointment between *January 7th & February 15th*

Interested in participating? Please see the attached consent form and pre-questionnaire for more information on the study and what you will be expected to do. If you agree to participate, please complete the consent form then the pre-questionnaire, or if you have questions, *Please reply to this email at jo1aloha@hmail.com or call me at (808) 724-2807.*

Thank You,
Joseph Peters

Appendix M
Consent Form

UNIVERSITY of HAWAI'I at MANOA
College of Education
Master's of Education (MEd), Learning Design & Technology
Usability Research Protocols
https://docs.google.com/forms/d/1izTXPs3vpJDpzgIBktvt6ccDoyTTEfUhnBCtYg3M1xM/edit?usp=sharing

Consent to Participate in Research Project

Aloha! My name is Joseph Peters. I am a graduate student in the Department of Learning Design and Technology (LTEC) Program at the University of Hawai'i at Mānoa (UHM). I am conducting a usability study as a part of the requirements for earning my graduate degree. The purpose of this usability study is to develop the navigation and satisfaction of content presentation of a writing process tool's website. Your participation in this study will help determine the changes to be implemented on the website and improve user satisfaction of content presentation. I am asking you to participate in this study because you fit the target population, of at least 18 years or older, ESL student, and computer experience.

Project Description

Activities and Time Commitment:
If you participate in this project, I will meet with you online for the usability session at a time convenient for you. You will need a computer and internet connection. There will be a pre-questionnaire and post-survey that will be completed before and after the usability study. The pre-questionnaire will collect demographic information to specify target group needs. The usability study will consist of 10 open ended questions. It will take about 30 minutes. The post-survey is intended to gain further insight and attitudinal feedback. If you participate, you will be asked to navigate through the website while being prompted by a series of scenario questions. You will be asked to share your thoughts out loud as you navigate through the website. The entire usability study, including surveys and debriefing interview, will last about 55 minutes.

Only you and I will be present during the usability study,. With your permission, I will do a screen and audio recording of the usability study so that I can later transcribe the discussion, view your navigation of the website, and analyze the responses. You will be one of three to five people who will participate in this round of the study. There will be three rounds with three to five people each round.

Confidentiality and Privacy:
The data taken from your participation in this study will be used solely for the purpose of this usability study. The data will be stored securely on a protected computer and Google Drive. Only my university professor and I and will have access to the information. Other agencies that have legal permission permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study. When I report the results of my research project, I will not use your name or any other personal information that would identify you. The recordings from this study will be transcribed to determine commonalities from all participants. Once the research is complete, any and all recordings will be destroyed.

Voluntary Participation:
Your participation in this project is completely and strictly voluntary with no obligation. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you. Your choice to participate or not to participate will not affect your academic or professional standing. Participants can withdraw at any time by stopping during any stage of the study.

Subject Compensation and Costs:
No money will be given to participants for their time or effort in the study. Participants will be provided with access to the website, which may be useful in helping them in the writing process in the future. This study will help improve the website usability for users. Participants will need their own equipment, programs, and internet service used to conduct this study, which are freely available or are owned by the researcher or participants.

Questions:

If you have any questions regarding your participation in this research study, please contact me at jo1aloha@gmail.com or (808) 724-2807. You may also contact my advisor, Dr. Catherine Fulford, at fulford@hawaii.edu or (808) 956-3906. You may contact the UH Human Studies Program at (808) 956-5007 or uhirb@hawaii.edu. to discuss problems, concerns and questions; obtain information; or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

* Required

1. **I understand that I can change my mind about being in the project at any time by notifying the researcher.** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No *After the last question in this section, skip to "Thank you ."*

2. **I consent to participate in this research study: Web-based CALL Process Writing Tools Website: A Usability Study.** *
   Mark only one oval.
   - ◯ Yes
   - ◯ No *After the last question in this section, skip to "Thank you ."*

3. **I understand and consent to the recording of my verbal responses during the usability study interview.** *
   These audio recordings will only be accessible by the researcher and will be destroyed once the research is complete.
   Mark only one oval.
   - ◯ Yes
   - ◯ No *After the last question in this section, skip to "Thank you ."*

4. **I understand and consent to the recording of my computer screen activity during the usability study interview.** *
   These audio recordings will only be accessible by the researcher and will be destroyed once the research is complete.
   Mark only one oval.
   - ◯ Yes
   - ◯ No *After the last question in this section, skip to "Thank you ."*

5. **Please input your Full Name as a digit signature of reading and completing the consent above.** *

Appendix N
Confirmation Email

SUBJECT LINE: Confirmation to Participate in Research Study - UH Manoa

Aloha,

Thank you again for volunteering to participate in my usability study research project. Your participation will help improve the website to be better adapted to its intended audience.

You are scheduled to meet with me on:

DATE/TIME: Choose date and time or E-mail response

LOCATION: Online using Zoom link: https://zoom.us/j/228376777 OR in-person

Notes:
- Please be in a quiet place where you can talk. Also, please find a place you feel comfortable and sufficiently private.
- If you are unable to attend our scheduled meeting for whatever reason, please notify me as soon as possible (at least 24 hours).

Please reply to this email to confirm our scheduled meeting.

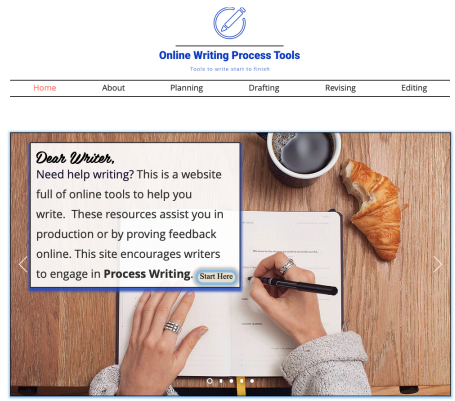
Attached to this email:

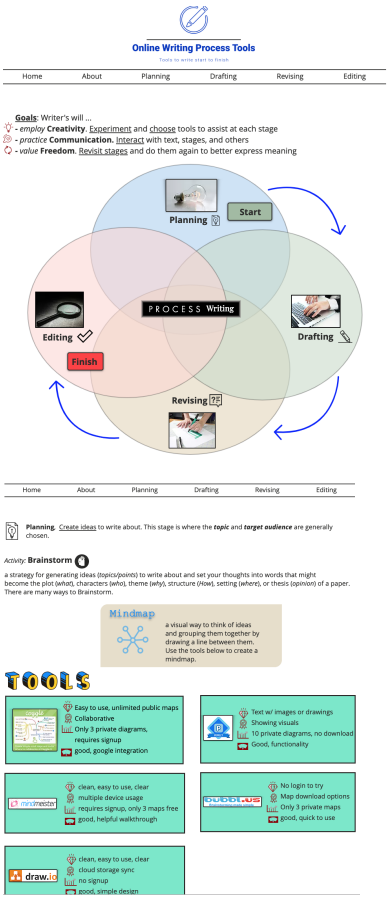
- **Interview Questions & Tasks Sheet**
  (For reference only. This will be used during the Interview, about ***10 tasks*** will be chosen)

Thank you,
Joseph Peters

Appendix O
Round 1 Changes to the Website

Before





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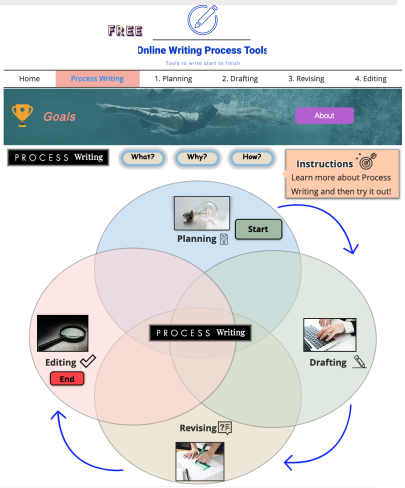
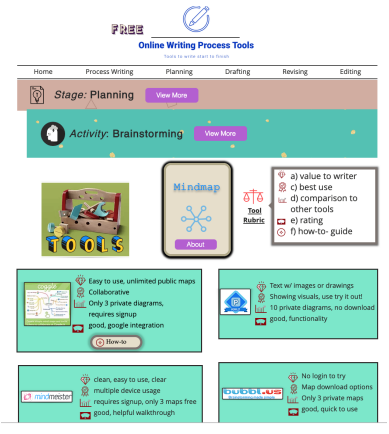
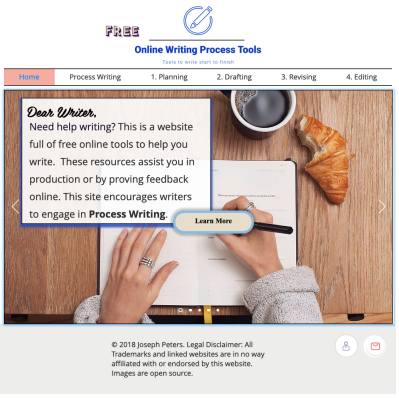
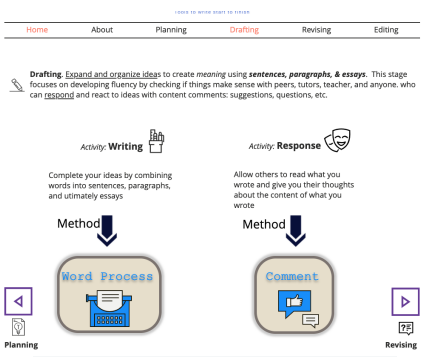


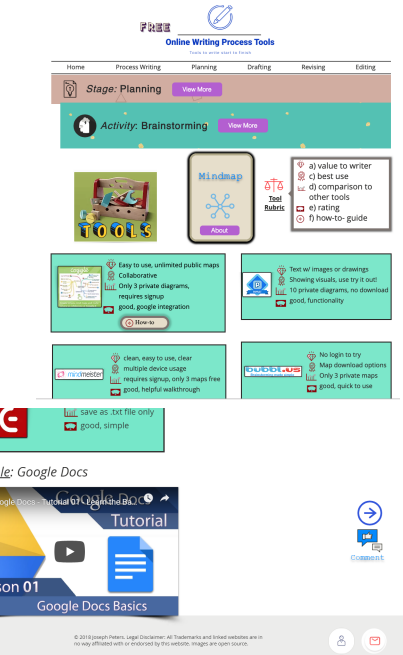


Appendix P
Round 2 Changes to the Website

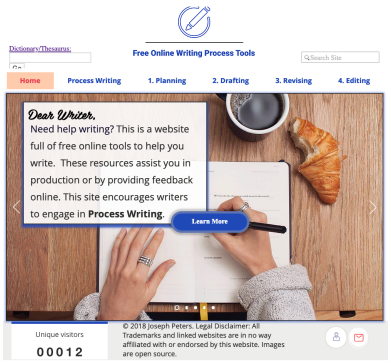
Before

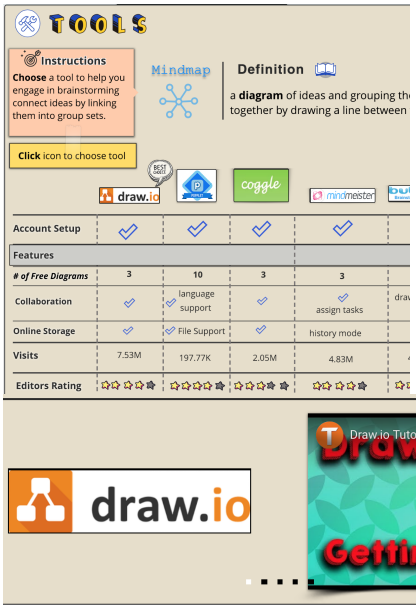






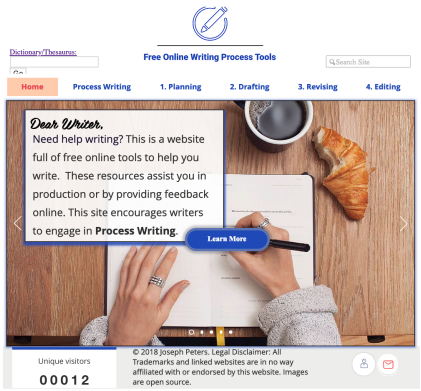
After

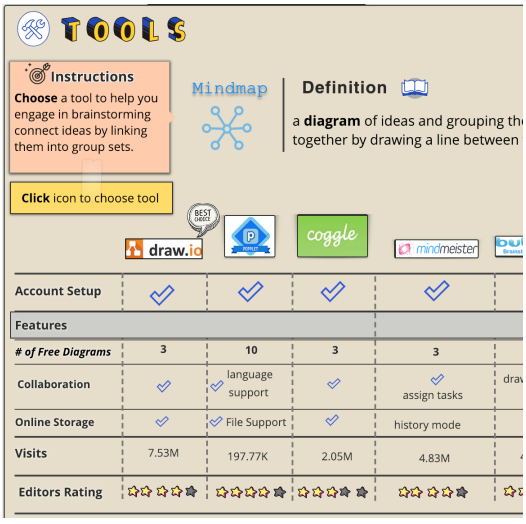




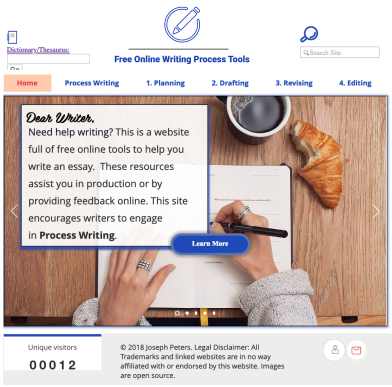
Appendix Q
Round 3 Changes to Website

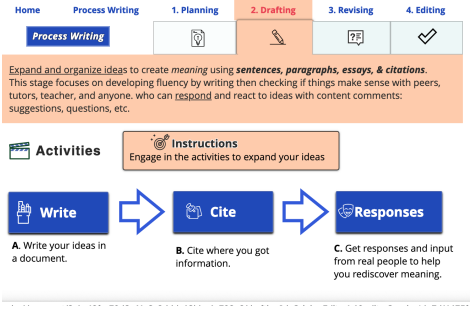
Before

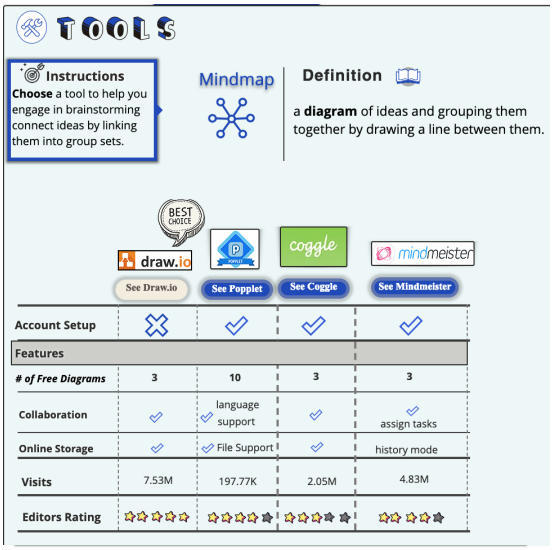




After







Appendix R
Checklist for Your Usability Test

At-A-Glance

- Before
    1. Email Zoom participant the link to access Zoom meeting room before scheduled session time
    2. Have this Usability Checklist and Protocol doc handy
    3. Launch Zoom and connect with your usability study participant
    4. Start recording
    5. Welcome and explain the test to your participant
    6. Direct your participant to start Screenshare in Zoom and ensure that they share their entire desktop
    7. Work through your usability protocol with your participant
- During
    1. Be prepared to perform any technical support needed
    2. Ensure your participant is "thinking aloud" - remind him or her as necessary
- After

1. Direct your participant to stop Share Screen in Zoom
2. Thank your participant and ask if they have any further questions
3. End Zoom for all participants - End Share Screen
4. Your archived Zoom recording is now stored as a video in "My Documents" called "Zoom."

Setting Up & Conducting the Study:

1. Set up your computer and attach all cords/peripherals
2. Plug into a power outlet (don't trust the battery)
3. Make sure you are connected to the Internet
4. Set up audio and test
    a. Ensure the microphone is working
    b. Ensure the volume is at a reasonable level
5. Login into Zoom account
6. Prepare your computer for Zoom:
    a. For best results, ensure that you are running the Chrome browser
    b. Ensure you have the current Zoom Voice and Video Setup plugin

7. Schedule for Participant/Facilitator to sign in to their Zoom account at a scheduled time.
   A. How to test if Zoom is working:
    a. Start a meeting by clicking on 'host a meeting' on top right of the account page next to your name.
    b. At the scheduled time when the participate/facilitator is ready to participate in the study, notify participant to click on emailed link to join Zoom meeting.
8. Participant will join the Zoom meeting at the scheduled time.

9. To begin recording your session, click on the grey button labeled “Record.”
    a. Alternatively, a box can be checked when setting up the meeting to automatically record.
    b. Once you end your Zoom meeting and terminate your session, your recordings will be saved in the Zoom folder within My Documents on your default drive.

10. Explain your study to participant. Ensure that they understand all directions.
11. Next, guide your participant to sharing their screen. This can be done by clicking on the “Screenshare” link on their right-hand navigation in the Zoom window.
12. When the participant has completed their tasks direct the participant to end “Screenshare.”
13. Thank them for their participation and ask if they have any further questions.
14. When you feel that the conversation is complete, you may click on “End Recording” Your study will be saved and posted to “My Documents > Zoom” folder with date and time.

After the Study:

1. Navigate to “My Documents > Zoom” to ensure that the video is available and saved to your computer.
2. Quickly scrub through the video to ensure the integrity of the audio and video.
3. Add video to Google Drive.