Viewing the unseen: Using Google Docs to track prewriting strategies of ESL students

Erik Dean Goodale
Iowa State University

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Viewing the unseen: Using Google Docs to track prewriting strategies of ESL students

by

Erik D. Goodale

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF ARTS

Major: TESOL/Applied Linguistics

Program of Study Committee:
Volker Hegelheimer, Major Professor
Elena Cotos
Michelle Tremmel

The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this thesis. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa
2019

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DEDICATION

To my father, Jack Goodale, who suddenly and unexpectedly passed during my work on this thesis. I am sorry you did not get to see its completion but have hope that we will be reunited one day.
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ABSTRACT

Language teachers often encourage the use of prewriting strategies such as outlining, brainstorming, and mind-mapping as a means of helping students improve their writing. However, it is difficult to determine which strategies were used based only on the finished assignment. Google Docs has a version history feature which could allow teachers to see their students’ writing processes in addition to the final product. This researcher examined the written assignments of a class of university ESL students completed using Google Docs to see what strategies ESL students used, how strategy use related to their writing performance, and what version history could reveal about ESL students’ writing processes. The study found that ESL students used a variety of strategies with some of them specific to the given assignment. The use of prewriting strategies increased after explicit instruction, and some students had a recursive writing process while others appeared to write in stages.
INTRODUCTION

Writing, along with reading, listening, and speaking, is one of the four fundamental skills required for English mastery (Chang & Lu, 2018). The use of English as a lingua franca makes English an invaluable skill in multinational fields such as science, government, and business (Ambrose & Palpanathan, 2017). Writing is a complex process which requires effort and practice yet is also a critical component of literacy (O’Mealia, 2011). Academic writing is particularly challenging due to the generation and selection of appropriate ideas, translation of such ideas into text, and adherence to the conventions of a specific field (Torrance, Thomas, & Robinson, 1994). While this is challenging for any individual, it is particularly difficult for ESL/EFL learners (Ambrose & Palpanathan, 2017; Chang & Lu, 2018; Dujsik, 2008).

Writers employ various strategies to help generate and organize thoughts and ideas. Strategies such as brainstorming, outlining, and mind mapping can all occur before the first sentence is written within an essay or novel or later as a means of organization and revision. However, this process is not to be considered linear as prewriting, writing, and revision can happen at any stage and are not neatly compartmentalized as argued in the cognitive process theory (Flowers & Hayes, 1981). Teachers encourage their students to utilize such strategies in an effort to improve their writing skills. Most of this work goes unseen by instructors, however, and it can be difficult to determine which strategies were used, if any, and how effectively based on viewing only the finished assignment. Though not evaluated, many prewriting strategies are still language output from the student and, according to the output hypothesis, can play a role in second language acquisition (Swain, 1985).
Affordances such as tracking changes and sharing documents offered by various computer programs provide teachers with a unique opportunity to evaluate not only a student’s product but also process. However, while there is literature which examines the effect of such programs on student writing and their uses for collaborative writing, I found little research on the affordances offered by various computer technologies as they relate to tracking prewriting strategies of ESL students.
LITERATURE REVIEW

Benefits of prewriting

Prewriting strategies have been shown to increase performance not only regarding the quantity of writing but also the quality as well as higher motivation (Hung & Van, 2018; Mahnam & Nejadansari, 2012; Niesyn, 2011). Some studies found that while prewriting improved student performance, the degree of this improvement is considered too small to be significant. However, other studies found significant improvement in areas such as organization, detail, and accuracy (McDonough, Vleeschauwer, & Crawford, 2018). Aside from these immediate benefits, teaching prewriting strategies has lasting effects which can continue into future writing projects. When prewriting strategies are taught to primary age schoolchildren, research has found that such strategies can be internalized for children as young as 2nd grade and that the benefits persist past the grade of instruction (Niesyn, 2011). Studies have also shown that students benefit more from well-designed, explicitly taught instructional methods rather than implicit learning (Mahnam & Nejadansari, 2012; Sundeen, 2012). A study of 23 Iranian students found that explicit instruction of prewriting strategies benefits EFL students as the experimental group outperformed the control group on their written posttests based on a holistic scoring rubric covering organization, vocabulary, grammar, and mechanics with t-tests determining these results to be significant. The researchers proposed three explanations. The first is that successfully completing a prewriting task may result in more positive feelings toward the task and thus create better writing. The second is that creating prewriting structures help students create those structures mentally, which is then transferred to their writing. Finally, teaching prewriting strategies accommodates multiple ways of learning and gives students some control over how they learn (Mahnam & Nejadansari, 2012). Though improvement may be small, researchers argue
that even small changes can be important when accrued over time and are noticeable enough for both teachers and students to see the benefits of organizing thoughts and maintaining focus (Sundeen, 2012).

All prewriting strategies are not the same, however, and while any given strategy may have benefits, it is not beneficial for everyone, and alternative strategies should also be developed. Just as readers benefit from multiple forms of expression, writers do as well especially during prewriting stages, and while most educators are familiar with strategies such as outlines, webs, clusters, or maps, they are less familiar with using music, dreams, meditation, and drawings/art as methods for prewriting (Piazza & Jecko, 2003). One study of 20 Vietnamese novice English learners compared outlining with depicting. Researchers found that while depicting helped participants generate more ideas, participants received higher scores for content and organization when using outlining. Surveys in the study revealed that 45% of participants preferred outlining, 38% preferred depicting, 15.5% found both to be equally helpful, and the remaining 1.5% did not like either strategy. During interviews, students agreed that for tasks such as brainstorming or overcoming a weak vocabulary they preferred depicting, but they preferred outlining for organizing ideas. They also commented that outlining was more familiar, efficient, and better for organization but was also boring and limited ideas and creativity. Students stated that depicting was more creative and motivating but was more challenging to complete and more confusing to organize. The students thought teachers should alert students to the strengths/weaknesses of both and cater their use to what they do best (Hung & Van, 2018). Researchers have argued that fluency depends not only on the strategies but also on how they are used. If prewriting is presented as a way of generating new ideas rather than correct answers students will write
longer and more engaging works. Furthermore, rather than considering students’ written words as drafts, educators should view them as moments, insights, or ideas thus increasing the potential to enhance future work. (Piazza & Jecko, 2003).

While the type of prewriting strategy plays an influential role, it is not the only aspect to take into consideration. The method in which prewriting strategies are taught also influences their effectiveness. Shafiee, Koosha, and Afghari (2015) investigated prewriting instruction methods divided 107 Iranian EFL learners between the ages of 19 to 36 into four groups: a control group in which no prewriting strategies were taught, a conventional prewriting instruction group in which instruction was given in a conventional classroom setting, a web-based prewriting group in which instruction was given in an online setting, and a hybrid prewriting group in which prewriting instruction was taught in a classroom setting, but participants then had to discuss and complete follow-up activities online. This study found that teaching prewriting strategies increased writing quantity as all experimental groups produced significantly more idea units than the control group. Furthermore, the hybrid group outperformed the web-based and conventional groups in terms of idea units with the latter two groups showing an insignificant difference from one another (Shafiee, Koosha, & Afghari, 2015). Another aspect to be considered is the platform and research indicates that social media improves student motivation and participation due to its portability, accessibility, and communicative qualities. Though in an EFL context social media has the disadvantage of exposing students to only informal communication, scaffolded prewriting strategy use on social media among Taiwanese university students has been found to improve communicative quality, linguistic accuracy, and linguistic appropriacy as well as encourage students to give feedback and ensure accurate communication (Chang & Lu,
Research involving Thai university students found that students who collaborated during prewriting wrote texts that were more accurate and received higher scores in the areas of content, organization, and language. They had significantly fewer errors but were not significantly different regarding complexity (McDonough, Vleeschauwer, & Crawford, 2018). If these are some benefits of using various online platforms for prewriting strategies, what other affordances might online technology possess?

**Affordances of online technology**

Just as there is research supporting the benefits of prewriting strategies, there is also research on the affordances of online technology. However, most studies focused on affordances related to collaborative writing, individual writing, and feedback, with few attentive to students’ writing processes.

The ability to simultaneously compose text with multiple authors in multiple locations around the world is an affordance unique to online programs, so it is unsurprising that collaborative writing is an area of focus for researchers. Collaborative writing regardless of mode contributes to student development in skills such as decision-making, conflict management, and communication. However, until recent advancements in using technology in the classroom, collaborative writing in a classroom setting was limited due to time as the process of writing, reading a partner’s contributions, and effectively combining the two is an intensive process (Suwantarathip & Wichadee, 2014). Online programs could be a solution to this limitation. Other researchers have pointed out the advantages of Google Docs for collaborative writing as the program allows students to work on the same document at the same time with the changes appearing almost instantaneously. They add that contributors can
see who else is logged on and changes are saved at regular intervals with users being warned if they are working on a text that has been changed by another writer (Kittle & Hicks, 2009; Perry & Morphett, 2015). One advantage of collaborative writing via Google Docs is that it can serve as a relaxing atmosphere in which learners can gain knowledge, determine whether mistakes should be corrected, and learn to accept feedback from others (Suwantarathip & Wichadee, 2014). There are also concerns that using various computer programs when writing interrupts creative flow, causes writers to only see part rather than the whole document, and in the case of writing collaboration, anxiety as a person’s initial writing becomes semi-public (Perry & Morphett, 2015). Perry and Morphett (2015) tested this by using Google Docs to collaboratively write their article and found these concerns to be largely unwarranted, though they recommend making it clear to participants that it is okay to work outside of Google Docs and later copy and paste their work into the program once they are comfortable presenting it.

Other studies found that students who used Google Docs improved their writing and had a more favorable opinion of Google Docs and computer-assisted language learning (CALL) in general (Alsubaie & Asuraidah, 2017; Ambrose & Palpanathan, 2017). A study comparing the writing skill of 114 ethnic Chinese Malaysians using pen and paper versus using Google Docs found that students wrote better using Google Docs. Essays were assessed according to a grading rubric which covered content, organization, word choice, spelling, grammar, and punctuation with each category being rated on a scale of 0 to 3. The study found that 74 students showed improvement using Google Docs, 17 showed neither improvement nor deterioration, and 18 students showed deterioration using Google Docs with changes in scores ranging from -4 to +8. (Ambrose & Palpanathan, 2017). Students also
had favorable opinions of Google Docs’ ability to help with spelling, grammar, revision, research, ease-of-use, generating ideas, and general use in the classroom. Student interviews also revealed positive attitudes towards Google Docs for reasons similar to what has already been mentioned, though students also expressed concern about being lazy and cutting/pasting material (Ambrose & Palpanathan, 2017). Another study involving 22 Saudi Arabian students found similar attitudes as well as a significant improvement in writing performance for both individual tasks which displayed a mean score increase of 2.82 points and paired tasks which exhibited a mean score increase of 2.7 points (Alsubaie & Asuraidah, 2017).

Simultaneous collaboration is not only useful for writing but also for feedback. Studies have utilized this function to examine synchronous and asynchronous as well as implicit and explicit corrective feedback (Ebadi & Rahimi, 2019; Shintani, 2016). A study of 6 university students in Iran revealed that dynamic assessment improved participant writing skills with participants gradually needing less explicit feedback, instead making a larger number of corrections during the implicit feedback stage. This is an important step for learner autonomy and self-regulation (Ebadi & Rahimi, 2019). Another study employed the comment feature to specifically compare synchronous and asynchronous corrective feedback. In this study of 25 Japanese ESL students, asynchronous corrective feedback was found to be similar to traditional feedback while synchronous corrective feedback was interactive and allowed for more opportunities for internalization (Shintani, 2016).

Though most studies are limited to examining the final product, research utilizing CALL tools to investigate the writing process has been conducted. One example by Strobl (2014) revealed that collaborative writing seems to inherently spur recursive writing whereas individual writing tended to be linear. It was also observed that while the primary focus was
on lower-order concerns such as language morphology, stronger performing groups tended to show greater awareness of higher-order concerns such as content. Ranalli, Feng, and Chukharev-Hudilainen (2018) developed and used an online tool called CyWrite to track and record keystrokes, text changes, and eye fixations. The authors recruited two university freshmen to use the program for a series of writing tasks. The subsequent data was then analyzed finding one student spent little time reading the prompt, less time revising, and no time on prewriting, while the other student spent a substantial amount of time planning but little time evaluating and revising. The method of this study produced a rich set of data, but though the tool is familiar to those accustomed to word-processors, it is still not found in typical classrooms. Additional research is needed, however, as gaps still exist in areas such as writing processes, technology’s effects on writing, and ESL/EFL contexts. These gaps will be expounded upon in the next section.

**Research gaps**

Despite the professed importance of prewriting strategies and the affordances of CALL tools, many authors acknowledged a dearth of research either into prewriting strategies in general or in specific contexts as well as in the use of Google Docs. Niesyn (2011) has spoken to the lack of research on prewriting strategies for primary school age children. Torrance et al. (1994) have addressed the opposite spectrum noting the lack of research into prewriting strategies for expert academic writers. McDonough et al. (2018) have pointed to collaborative prewriting as an area lacking in research specifically regarding the types of discussion it would elicit as well as correlations with the final product. Piazza and Jecko (2003) have stated that nontraditional forms of prewriting strategies such as
creative visualization, art, music, dreams, and meditation are even less researched than strategies such as mind mapping and outlining. Several researchers posit the ESL/EFL context as being a neglected area of prewriting strategy research (Hung & Van, 2018; Negari, 2011; Shafiee et al., 2015). Takayoshi (2018) is probably the most critical, chastising composition researchers for largely ignoring the composition process, including prewriting strategies, for the past 25 years. Regarding the use of Google Docs, Alsubaie and Asuraidah (2017) stated that though research of Google Docs is present, there still remain gaps to be filled. Similarly, in support of their research, Ambrose and Palpanathan (2017) argued that though there are many features of Google Docs which should benefit students, there is still a lack of research to determine whether or not it is actually effective for student writing. Though Perry and Morphett (2015) presented several opinions from individuals concerned with the effects of technology on the writing process, few of them were from empirical studies researching the matter.

The low number of studies examining either prewriting strategies or online programs becomes even smaller when looking for research which combines the two. There are university writing courses which require students to use online word processors during all parts of the composition process including prewriting. Investigating the effects of prewriting and various online program affordances together could have pedagogical implications for such a policy. Such research could also be beneficial for expanding our knowledge into how literacy in terms of writing skill is learned and honed. As was already established, prewriting and online word processors individually improve writing ability. When taken together, could this hinder or enhance improvement? The affordances of sharing documents and tracking changes could allow teachers and researchers both to analyze and evaluate student process as
well as product. Therefore, conducting a study which measures the effectiveness of prewriting strategies and the affordances of sharing documents and tracking changes to evaluate writing processes could be very valuable indeed. To address this gap in the research, the following questions are asked in the study:

1. What prewriting strategies do ESL students use in their writing?
2. What are the strengths and weaknesses of using online word processors for prewriting strategies?
3. Does the use of prewriting strategies in online word processors influence the quality of ESL students’ writing?
4. What observations can be made using version history to view ESL students’ prewriting behaviors?
MATERIALS AND METHODS

This mixed methods approach implements a case study with observation data being collected to determine which prewriting strategies were utilized by students. Student writing scores were quantitatively assessed to measure writing quality, and the researcher also observed and evaluated from a teaching perspective the affordances offered by the selected technology. The methods for this research, where I served as both researcher and instructor, were reviewed and approved by the local Institutional Review Board (IRB), see Appendix A.

Participants

Participants for this study were from a class of 18 non-native English-speaking undergraduate students who are attending an ESL writing course at a midwestern university in the United States. Of the class, 17 students, 6 females and 11 males, agreed to participate. Participants were between the ages of 18 and 22 and from a variety of L1 backgrounds including Arabic, Malay, Mandarin, Marathi, Sinhala, and Thai. Each student’s English writing proficiency was considered “intermediate” due to the specific ESL course admitting only students who required supplemental writing instruction at an intermediate level.

Materials

Participants used Google Docs, a free web-based program which includes affordances such as word processing, forms creation, online storage, document sharing, revision tracking, and collaborative real-time editing. Google Docs implements revision tracking by regularly saving changes and compiling those saved versions into a version history which is normally not displayed but can be viewed later at any time. Figure 1 below shows a screenshot of a Google Doc with the version history displayed to the right. It also shows an example of one of the prewriting strategies, copying and pasting assignment instructions, used by a student.
The previously mentioned affordances and Google Docs’ already established use in the course were key reasons for choosing it as the primary writing tool in this study. Students were not assumed to be familiar with Google Docs, so I dedicated one of the initial lessons for the class to demonstrate the program and allowing students to explore its features. Participants primarily worked on their own electronic devices such as laptop computers and iPads but also had access to university computer labs. I also created a list of five interview questions to gauge students’ attitudes and opinions (see Appendix). I developed the first two questions in order to hear what the students typically used for prewriting and revision strategies and especially, to have a point of comparison for what I was seeing in Google
Docs. The remaining three questions were related to Google Docs and used to both get their views on the program and have confirmation regarding how they appeared to be using the program. The two questions about benefits and barriers of using Google Docs are loose adaptations of the questions asked in Ambrose and Palpanathan’s (2017) study on the effectiveness of CALL tools on writing.

Tasks

As part of their regular work for the course, students were required to complete four major writing assignments on the topics of consumerism, cultural diversity, technology and society, and culture clash. The tasks were ordered by the course in such a way that later tasks built upon skills developed in earlier tasks. The first task was an argumentative essay in which students were given the topic of consumerism and asked to respond to their choice of one of three prompts: 1.) “In what ways have you experienced or seen consumerism being excessive?” 2.) “What are the problems you see with living in a consumer society?” and 3.) “How could we change our behavior that might make us less materialistic or less consumer oriented?” The teacher provided students with both oral and written instructions regarding the prompts, expectations, and requirements for the assignment. The focus of this task was to write their opinion in a clear and compelling way, and students were directed both verbally by the teacher and in writing via the assignment instructions to support their claims by drawing from their own experience as well as outside sources.

The second task was an interview and comparison paper in which students were assigned a partner who was from a different culture. Both students interviewed each other orally face-to-face and then wrote individual papers discussing the other person’s culture and comparing it with his/her own. The teacher and assignment instructions directed students to
write their papers based on the information they gathered from the interview and not to use any outside sources such as Internet searches. They also encouraged students to ask questions narrow in focus to provide a more intimate and personal perspective of their partner’s culture, as the purpose was to learn and present information about not only the culture but also the individual.

For the third task, students were asked to write a summary and response paper related to the topic of “The Information Age.” Students were asked to find a relevant news article related to society and the information age, summarize the news article in their own words, and then respond to the news article by stating areas of agreement and disagreement. For the response portion of the assignment, students were encouraged to bring their own knowledge and experience into the discussion and not limit themselves only to the points mentioned in their chosen article.

The fourth task was the creation of a movie review website. Students worked in groups consisting of 3 or 4 students each. As a group, the students watched a movie involving some form of culture clash and then created a website summarizing the movie, providing information about it, and including a section for both professional reviews as well as reviews by the students themselves. While the actual site and the summary were completed as a group, each student wrote his or her review of the movie individually and then posted it to the website. Table 1 below shows the four writing assignments and their characteristics.
Table 1 Writing assignments

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Form/Style</th>
<th>Topic</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>Argumentative Essay</td>
<td>Consumerism</td>
<td>Individual</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>Comparison Paper</td>
<td>Cultural Diversity</td>
<td>Semi-collaborative</td>
</tr>
<tr>
<td>Assignment 3</td>
<td>Summary and Response</td>
<td>Technology and Society</td>
<td>Individual</td>
</tr>
<tr>
<td>Assignment 4</td>
<td>Movie Review</td>
<td>Culture Clash</td>
<td>Collaborative</td>
</tr>
</tbody>
</table>

Students primarily completed the tasks outside of class, though some time in class was also provided. Though students were directed to complete all written aspects of the tasks on Google Docs, the instructor observed students also using other computer programs such as Word as well as pen and paper. Students had three weeks for each task to complete all aspects including research, prewriting strategies, writing, peer review, and revision. At the beginning of each assignment, students created a Google Doc and shared it with the instructor. The first two weeks were allotted to research and composition of initial drafts which were converted to either Word or pdf files and submitted online via Canvas Learning Management System. The instructor had two days to grade the assignments, provide feedback, and return them to students also via Canvas. The students then had the third week to review the feedback and make any necessary changes before submitting their final drafts. The instructor also provided feedback and grades for these drafts.

Procedures

I served as both researcher for this study and instructor for the class. To maintain as much objectivity as possible, I followed Mackey and Gass’ (2005) recommendations. I approached participants and requested permission to use the work they were already doing in the course for this study. I informed students of the purpose of the research, that participation was entirely voluntary, that it would not require them to complete any extra classwork, and that choosing or refusing to participate would not affect their grades in any way. I provided a
written consent form for each of those choosing to participate to read and sign. I viewed and collected prewriting strategy data only after the assignments were graded to help ensure that I would not form a subconscious bias of the grade based on my knowledge of any given student’s use of prewriting strategies.

Students were directed to complete all of their work, including prewriting strategies and revisions, on Google Docs and share their documents with me so that I could track and review them. During the lessons leading up to their first major assignment, I encouraged students to use prewriting strategies and discussed their benefits but did not instruct the students on how to use them. This was done to see which prewriting strategies students would use on their own accord. Students did not express unfamiliarity with using prewriting strategies, and in fact most students provided some sort of indication that they were familiar with them such as nodding their heads and/or listing examples. During the lessons covering the second major assignment, I provided direct instruction on the outlining and mind mapping strategies, walking students through how to use them and how they could be used on Google Docs, and then gave them a task for practice.

Assignments were graded according to a rubric comprising five categories consisting of context, substance, organization, style, and delivery. The rating of context focused on how well the introduction engaged the audience and set the topic including the use of a thesis statement. The substance of student papers was graded based on the relevance of supporting points and the development of those points through the use of details, explanations, and examples. Organization dealt with the use of paragraphs and how well the paper transitioned from one idea to the next. The evaluation of a paper’s style focused on the use of grammatical structures including verb tenses and forms, complex sentence structures, and so
on. An essay’s delivery related to document formatting such as the use of paragraph indentation, capitalization, line spacing, and so on. Each category was assessed on a scale of “Great,” “Good,” “Okay,” “Some,” or “Lacking” with “Great” being scored the highest and “Lacking” being scored the lowest. The rubric was not developed for this study but was the standard rubric used for all sections of this course. However, these categories had to be converted into numerals in order to calculate factors such as mean and standard deviation. For this study, I created a five-point scale with “Great” being worth five points, “Good” being worth four points, “Okay” being worth three points, “Some” being worth two points, and “Lacking” being worth one point.

After the assignments were graded, I collected prewriting strategy data by viewing the version history of each student’s Google Doc and taking screenshots of the changes to have a more permanent record in case the student decided to delete his or her document once the assignment was completed. I removed identifying information such as names and assigned each participant an identification code. I coded the types of prewriting strategies utilized by each student for later comparison assigning labels such as “None” which referred to no strategies appearing to be used. Some category labels were largely self-evident such as “Outline” referring to the student outlining a list of main points and subpoints and “Brainstorm” referring to a list of topics and ideas with no apparent concern for structure or organization. Other categories were more nuanced such as “External resources” meaning that students copied and pasted weblinks and/or online material to serve as an easy reference while “Instructions” referred to students specifically copying and pasting the assignment instructions to serve as a more convenient reference. I used the label “Questions” to refer to students preparing questions related to the assignment, typically for their partner in
Assignment 2 though some were for the instructor, and “Collaboration” to refer to students conversing back and forth via Google Docs. Table 2 below provides a list of the prewriting strategies observed, a description of the strategy defining it and marking its distinction in relation to other strategies, and examples selected from student Google Documents.

Table 2 Prewriting strategies classification

<table>
<thead>
<tr>
<th>Prewriting Strategy</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
</table>
| Outline             | Structured plan of main points. | Introduction  
Hook:  
Background information:  
Thesis statement:  
Body paragraph #2  
Topic Sentence:  
Supporting Sentence Details:  
Concluding/Transition sentence: |
| Instructions        | Assignment instructions copied and pasted into the document. | Week 1  
Create a google drive shared folder;  
Read the instructions for all part of MA#4; Watch the movie, Take notes! Review notes and discuss movie; Make a PLAN for the project |
| Brainstorm          | Production of ideas with little attention to structure. | • Parents are worried about their toddlers’ development  
• Children not paying attention  
• Less than 3 years old kids use technology  
• Social media + text message |
| Questions           | Questions created to ask classmate or instructor. | Is my article work? |
| Collaboration       | Student communication within the document. | Hi guys this is [name] i have attached the image of the how this assignment should go according to weeks just for convenience. |

Though technically not a prewriting strategy, the number of students who actively revised their work in Google Docs was also tracked as “Revision” to show that though many students didn’t use prewriting strategies they were still actively engaged with the program
and to differentiate them from students who appeared to be working outside of Google Docs and then copying and pasting their completed work. This is also in keeping with the Cognitive Process Theory of Writing’s assertion that the writing process does not happen in linear stages (Flowers & Hayes, 1981). However, due to practical constraints, I was not able to analyze revision beyond a binary “present” or “not present.” To ensure rater reliability of coding, I re-examined and recoded the prewriting strategies 4 to 6 months later depending on the assignment. I compared the initial codes with the recodes and calculated an intra-rater reliability of 93.4%.

I also used version history to observe and code where in the writing process students were using prewriting strategies. I examined each version and noted what changes were made such as adding heading information, prewriting strategies, writing, or revision. I coded these changes and then continued to the next version. Once all versions were coded, I documented where in the process the prewriting stage occurred by recording what, if any, writing came before and after. This analysis was limited to the three individual assignments as I wanted to view individual prewriting behaviors, and trying to isolate each student’s contribution from the group assignment was beyond the practical limitations of this study. I chose to be the sole coder in this study to help ensure confidentiality of the data and to test and hone my own skills as a researcher for future studies as I work toward my PhD.

As a part of individual conferences held during the thirteenth week of the course, I interviewed students to confirm any observed patterns or themes of the writing and revision process as well as to better understand why participants made specific choices. I also asked them questions regarding their typical writing process, their use of Google Docs, and their
opinions regarding its use. After noting responses, I read my notes back to the participant to ensure that I had accurately captured his/her views.

Analysis

For the analyses related to RQ #1, I reviewed the version history of each student’s assignment on Google Docs to determine the types of prewriting strategies utilized by each student. As there was a lesson between Assignments 1 and 2 designated for teaching prewriting strategies, comparisons were also made across assignments to see if there were differences in prewriting strategy usage due to explicit instruction. One important note is that Assignment 4 was a group assignment, and as such one student might have initiated a certain prewriting strategy and another student initiated another. During data collection, I debated whether to try to separate prewriting strategies based on the user who posted them. However, I decided against this as even though one student might have initiated or even solely completed writing the strategy, it would have been used by the other members of the group thus benefiting everyone. For this reason, if a group had four members and one member initiated an outline, the outline was counted for all four members of the group. Though one could argue that this artificially inflates the number of prewriting strategies implemented for Assignment 4, based on McDonough et al.’s (2018) study on the benefits of collaborative prewriting, I believe that this still more accurately reflects how the prewriting strategies influenced assignment scores and that trying to parse the strategies according to students who wrote them would artificially deflate those numbers and less accurately portray their effect.

To address RQ #2, I examined the data for patterns and themes regarding the choices and directions connected to student prewriting strategies and revisions such as if a student appeared to be merely copying and pasting work from another program such as Microsoft
Word. During individual conferences, I spoke with each student about these themes to ensure my interpretations were correct. I also examined the interview responses from the conferences for themes in students’ opinions of the strengths and weaknesses of Google Docs similar to what Ambrose and Palpanathan (2017) employed in their study. Additionally, I examined and evaluated the affordances of Google Docs for their efficacy regarding prewriting strategies in relation to the study (Perry and Morphett, 2015).

For RQ #3, I measured the number of prewriting strategies used by students for each assignment. I also used descriptive statistics to calculate the mean, standard deviation, and sample variance across assignments (Shafiee, Koosha, & Afghari, 2015; Alsubaie & Asuraidah, 2017). Once both sets of data were determined, I examined the two of them for patterns and themes.

The analyses in RQ #4 involved using version history to examine student prewriting behaviors similar to RQ #1. However, in addition to seeing what prewriting strategies were present, I also recorded the patterns of prewriting, writing, and revision use to see if they were a closer fit to the stage model or the cognitive process model (Flowers & Hayes, 1981). I then calculated the percentage of students who had similar patterns in their prewriting and used my interview notes to interpret and understand their writing process.
RESULTS AND DISCUSSION

This study yielded some interesting results regarding the use of prewriting strategies by students and the potential benefits of affordances offered by online collaborative programs such as Google Docs. The outcomes of this study have been organized based on the four research questions asked in the study.

What prewriting strategies do ESL students use in their writing?

During interviews, students self-reported their typical use of prewriting strategies. Of the 17 students, 10 (59%) reported that they did not use prewriting strategies, 6 (35%) stated they used prewriting strategies outside of Google Docs, and 1 (6%) reported using prewriting strategies on Google Docs. As can be seen in Figure 2 below, this is consistent with what was observed on Google Docs for the first assignment. Figure 2 shows the distribution of prewriting strategies among students and across assignments.

Figure 2. Writing strategies utilized by ESL students across assignments
For the first assignment, Figure 2 shows that only two prewriting strategies were utilized, each by 6% of students. It should be noted that students could and did use multiple prewriting strategies, so the percentages in the chart do not calculate to 100% as a total. Figure 2 also shows that the use of prewriting strategies on Google Docs increased from Assignment 1 to Assignment 2 after explicit instruction. Outlining, brainstorming, collaboration, and noting questions all increased while the number of students that used no prewriting strategies slightly decreased. This effect was also demonstrated in one student’s interview in which he said, “Mr. Goodale mentioned taking note of points, so I copied and pasted main points from the article.” This is consistent with other studies which found explicit instruction resulted in increased the use of prewriting strategies (Niesyn, 2011; Mahnam & Nejadansari, 2012; Sundeen, 2012). Assignment 3 saw the utilization of a new strategy – copying and pasting links from online resources to use as a quicker, more efficient reference. Though the numbers for most strategies fluctuated across assignments, the number of students using outlining steadily increased and the number of students not using any strategy steadily decreased. This seems to indicate that certain assignments such as the comparison paper naturally lend themselves to certain types of prewriting strategies such as creating questions and that some prewriting strategies such as outlining seem to be valued and provide benefits regardless of the assignment.

What are the strengths and weaknesses of using online word processors for prewriting strategies?

For this question, I consulted my conference notes on student opinions of Google Docs and found that 5 students liked using Google Docs, 10 preferred other programs or methods, and 2 were neutral in their opinion of Google Docs. I tracked student opinions of
the benefits Google Docs and what they found to be barriers when using the program. The most mentioned benefit was the ability to share documents, which students found helpful for both group work and the instructor to observe progress. The autosave feature was the second most listed affordance as students didn’t have to worry about losing work due to neglecting to save their document. Students also found Google Docs to be efficient for group work and similarly liked how it tracked changes so they could see group members’ contributions. Several students stated being able to work from any computer with online access was a major benefit, especially when personal computers lost power or crashed. Finally, students thought using prewriting strategies on Google Docs helped with organization. Figure 3 illustrates the observed benefits students observed using Google Docs.

![Figure 3. Benefits of Google Docs expressed by ESL students](image)

As shown in Figure 3 above, several benefits were identified by multiple students with 53% of students identifying the ability to share documents as an important benefit, and 24% of students stating that it helped them organize their work. As with the prewriting strategies, students could provide more than one benefit hence why the combined percentages of each benefit do not calculate to 100% as can be seen in one student’s
response, “Google Docs auto saves, is easy to convert to PDF, can make comments as notes, and sharing is very convenient.”

Observed barriers included students being unfamiliar with the program, students having difficulty mixing Google Docs with other programs used in the course such as Grammarly, Google Docs being blocked in the user’s home country, not possessing spelling or grammar alerts, and being less efficient than other writing methods. Figure 4 shows the barriers students found when using Google Docs.

![Figure 4. Barriers to using Google Docs expressed by ESL students](image)

As shown in Figure 4 above, Google Docs being unfamiliar to the students was by far the most significant barrier as it was reported over twice as much as the second most-listed barrier. As one student stated when asked about barriers, “[This class] was my first time to use Google Docs, so I was not familiar with the program.” The remaining barriers were noted by smaller percentages of students when compared with the benefits with the second highest barrier, mixing programs, being equivalent to the lowest charted benefit at 24%. It is also noteworthy that 18% of students reported “none” when asked if they had observed any barriers.
In addition to student observations, I also documented my observations as I examined participants’ Google Docs and categorized them as strengths or weaknesses. In addition to observations already mentioned by the participants, I also noted that Google Docs worked very well for text-based strategies such as outlining and brainstorming. However, Google Docs was less accommodating to creative strategies such as mind mapping. Though it is possible to insert images and other graphic features to imitate a mind map, the process is extremely cumbersome. Typing the bullet points of an outline or listing a brainstorm of ideas, on the other hand, is much simpler and more efficient.

*Does the use of prewriting strategies in online word processors influence the quality of ESL students’ writing?*

Two aspects were examined for this question, the use of prewriting strategies and the scores students received for their assignments. To determine the first aspect, I calculated the number of prewriting strategies used during each assignment. Figure 5 below shows the tabulated number of prewriting strategies separated by assignment.

*Figure 5. Prewriting strategies utilized by ESL students across assignments*
As can be seen, the number of prewriting strategies used increased with each assignment with a substantial increase from Assignment 1 to Assignment 2, a smaller increase from Assignment 2 to Assignment 3, and the largest increase from Assignment 3 to Assignment 4. As discussed in the methods section, Assignment 4 was a group assignment and as such would influence this result. Nevertheless, based on the increased use of prewriting strategies, one would expect to see similar improvements in later assignments compared to earlier assignments if prewriting strategies are beneficial to those areas.

As the number of prewriting strategies used across assignments only reflects half of the equation, we will now draw our attention to student scores. Scores used to determine mean and standard deviation are based on the five-point scale discussed in the methods section. Table 3 below shows students’ mean scores, standard deviation, and sample variance across all four assignments organized by rubric category.

Table 3 Student writing mean scores across assignments and rubric categories.

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.94</td>
<td>3.59</td>
<td>2.76</td>
<td>4.29</td>
</tr>
<tr>
<td>SD</td>
<td>1.14</td>
<td>1.00</td>
<td>0.83</td>
<td>1.05</td>
</tr>
<tr>
<td>S²</td>
<td>1.31</td>
<td>1.01</td>
<td>0.69</td>
<td>1.10</td>
</tr>
<tr>
<td>Substance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.76</td>
<td>2.94</td>
<td>3.41</td>
<td>3.29</td>
</tr>
<tr>
<td>SD</td>
<td>0.90</td>
<td>0.90</td>
<td>1.00</td>
<td>1.05</td>
</tr>
<tr>
<td>S²</td>
<td>0.82</td>
<td>0.81</td>
<td>1.01</td>
<td>1.10</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.35</td>
<td>3.59</td>
<td>3.82</td>
<td>4.06</td>
</tr>
<tr>
<td>SD</td>
<td>0.70</td>
<td>0.62</td>
<td>0.73</td>
<td>0.24</td>
</tr>
<tr>
<td>S²</td>
<td>0.49</td>
<td>0.38</td>
<td>0.53</td>
<td>0.06</td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.12</td>
<td>2.88</td>
<td>3.35</td>
<td>3.65</td>
</tr>
<tr>
<td>SD</td>
<td>0.86</td>
<td>0.99</td>
<td>1.00</td>
<td>0.61</td>
</tr>
<tr>
<td>S²</td>
<td>0.74</td>
<td>0.99</td>
<td>0.99</td>
<td>0.37</td>
</tr>
<tr>
<td>Delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.82</td>
<td>4.29</td>
<td>3.82</td>
<td>4.82</td>
</tr>
<tr>
<td>SD</td>
<td>1.13</td>
<td>0.77</td>
<td>0.81</td>
<td>0.39</td>
</tr>
<tr>
<td>S²</td>
<td>1.28</td>
<td>0.60</td>
<td>0.65</td>
<td>0.15</td>
</tr>
</tbody>
</table>
Table 3 shows that for the five rubric categories the mean scores generally increase from earlier assignments to later assignments. For the most part, this is consistent with the increase in the use of prewriting strategies seen earlier in Figure 5. In the area of context, mean scores progressively improve for Assignments 1, 2, and 4. However, the average score for Assignment 3 is the lowest of all four assignments. This pattern does not match the constant increase in the use of prewriting strategies. The mean scores for substance also improved from Assignments 1 through 3. However, though Assignment 4 shows improvement compared to Assignments 1 and 2, the mean score is lower when compared with Assignment 3. This is interesting given the fact that Assignment 4 was a collaborative assignment and subsequently also had the greatest use of prewriting strategies.

Regarding organization, students’ mean scores consistently improved with each assignment. This would seem to indicate that the writing strategies used by students were effective in improving their organization. Something worth noting is that as earlier observed in Figure 3, the use of outlining also steadily increased and may have influenced the scores seen here. Though other factors such as time spent both in the course and in an English-speaking country are likely to have played a role, a connection between outlining and organization would be consistent with other studies’ findings (Hung & Van, 2018). As with organization, style mean scores also improved from Assignments 1 through 4. Part of the reason for this increase is likely due to the nature of both the category and the assignment. Since style includes grammar, vocabulary, and syntax, it is a prominent focus of material and tools in the class. Exposure to these materials and becoming more familiar with the use of Grammarly likely attributed to at least a portion of these gains. Moreover, as Assignment 4 is
a collaborative assignment, students again likely benefited from having others in their group examine and provide feedback on their writing.

The scores in Table 3 above also show that while students were already strong in the category of delivery, they still tended to improve from earlier assignments to later assignments. As it did with context, Assignment 3 deviates from the general trend of improvement instead having an average score lower than Assignment 2 and equal to Assignment 1. The nature of Assignment 3 may have affected these results as it was more comprehensive than the previous two requiring students to research, summarize, and formulate a response. Another thing to consider is that although the number of prewriting strategies increased from Assignment 2 to 3, that increase was minimal and may not have been enough to offset the increase in the assignment’s difficulty. Furthermore, though Assignment 4 also involved the synthesis of previously applied skills, the fact that it was a collaborative assignment likely allowed students to support each other as seen in Alsubaie and Asuraidah (2017).

_What observations can be made using version history to view ESL students’ prewriting behaviors?_

While tracking student prewriting strategies, I noted various observations I made during the process. My first observation was that at first glance, many students appeared to not use prewriting strategies. In fact, tracking of prewriting for Assignments 1 through 3 revealed that 63% of student writing did not use any prewriting strategies though of this 63%, exactly half were from Assignment 1. Through conferences, I later learned that while many students did not use prewriting strategies, other students used prewriting strategies but in
ways which were most familiar and comfortable to them such as via Word documents or pen and paper. As one student said in her interview, “I read the topic instructions and then feel lost (laughed at this). I note bullet points and then do more complete outlining. I feel I have improved with thesis statements, flow, and organization. I use prewriting strategies outside of Google Docs usually using paper because I feel I remember the information better by writing.”

My second observation was that when students used Google Docs it did reveal aspects of their writing process. Google Docs enabled me to see the history of every student’s document which allowed me to observe and code writing stages as discussed in the methods section. Table 4 shows the position of prewriting strategies within student writing processes for Assignments 1 through 3.

*Table 4 Position of prewriting stage within student writing process.*

<table>
<thead>
<tr>
<th>Type of writing prior to the prewriting stage</th>
<th>Type of writing following the prewriting stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recursive</td>
<td>26%</td>
</tr>
<tr>
<td>Heading</td>
<td>21%</td>
</tr>
<tr>
<td>Nothing</td>
<td>53%</td>
</tr>
<tr>
<td>Writing</td>
<td>0%</td>
</tr>
</tbody>
</table>

From this we see that 53% of student writing that used prewriting strategies started with the prewriting stage, 21% started by creating a heading and then proceeded to use prewriting, and 26% had a recursive mixture of prewriting, writing, and revision such that their writing processes were difficult to parse into defined stages. Similarly, we see that 47%
of student writing that involved prewriting strategies followed those strategies by moving to the writing stage, 21% had nothing following their prewriting stage, 5% moved on to creating a heading, and 26% had a recursive mixture of stages. These results indicate that though most student writing uses prewriting strategies as truly a method that comes before writing, a sizable number have a recursive pattern to their writing methods. As one student shared when asked about his writing process, “I brainstorm three main points, then write one or two supporting ideas, then write the hook and a summary, then I write a thesis statement followed by the body paragraphs and conclusion.” It should also be noted that 11% of student writing that used prewriting strategies had a separate Google Doc dedicated to use those strategies. This means that 20% of writing in the “Prior” column and 50% in the “Following” column were due to prewriting strategies only being used on a strategy dedicated document. One reason for this variation is likely classroom experience or as one student said, “teachers don’t want to see process only product.” If teachers do not examine and assess the methods students use and teach them how to employ them most effectively, students will continue to use only what they know. This is not to say instruction of skills is the only factor. One student also admitted in interviews that he didn’t use prewriting strategies despite knowing both that they are beneficial and how to use them. Both his Google Doc and interview, however, still revealed a recursive composition process. As he put it, “I read through the paper, revise, then write again, then read and revise again, and I keep doing that until I turn it in.”

However, a related discovery was that in order to view version history I needed to have status as an editor. When students shared documents but only gave me “can comment” or “can view” permissions, I was not able to view version history and had to request a change
in permissions. Another observation was that students responded to explicit instruction on prewriting strategies. As was already illustrated in Figures 2 and 5 above, there was an increase in the use of prewriting strategies on Google Docs with each assignment from Assignment 1 to Assignment 4. However, prewriting strategies were limited to writing-based methods such as outlining, brainstorming, and so on. More creative-based strategies such as mind mapping were not observed on Google Docs. This is particularly noteworthy due to mind mapping being explicitly taught during the lesson on prewriting strategies, yet still no student chose to use it likely due to the cumbersome process mentioned in the discussion of research question 2.
CONCLUSION

The purpose of this study was to determine which prewriting strategies are used by ESL students, the strengths and weaknesses of using online programs for their use, if they influence ESL students’ writing, and what version history reveals about ESL students’ writing processes. This study’s findings support those of previous research which found that use of prewriting strategies improve student writing.

This study is not without limitations the first being its small sample size, and thus limiting the generalizability of the findings. A second limitation is that the study was based in a classroom setting which meant that the researcher could not control for other factors such as course instruction and time spent in an English-speaking country which could influence the findings. The study’s short duration and inclusion of only four assignments also limits the strength of the conclusions drawn by the results. The second assignment was collaborative in nature and likely influenced the degree to which students used Google Docs as well as their use of questions as a prewriting strategy. The fourth assignment was a group assignment which certainly affected students’ use of both Google Docs and prewriting strategies. This study was also limited in the extent to which the researcher could analyze student writing using version history and, as mentioned in the methods section, was unable to analyze student writing when completing the group assignment.

Future areas of research could address these limitations by conducting a larger study with more participants, tasks, and so on. An experimental designed study that controls for outside influences could be another avenue for research. Using version history to investigate what types of revisions were done and at what points during the writing process could be another interesting area of research.
The results of this study indicate that the affordances of programs such as Google Docs can be helpful in assessing writing processes. Online storage and document sharing improve the convenience of viewing prewriting strategies. Whereas in the past teachers would need to collect and store paper copies, online storage eliminates this need while document sharing allows students to share their documents with their teacher who can view them at any time that is convenient. Furthermore, this can be done without hindering student access to the document as would be the case with paper copies, and teachers have instant access to updated versions unlike with electronic files such as Word. Version history enables teachers to view changes to the document and observe choices made by the student though using version history to view prewriting strategies does require extra time and effort from teachers who simply may not have the time necessary to evaluate the prewriting strategies of every student. However, this could be a method for focusing on struggling students and evaluating their writing process to better help them succeed. Another restriction is that since students often work outside of the program, a teacher cannot solely rely on the information found on version history to assess writing process. For this reason, using version history to assess prewriting strategies may work best for lessons dedicated to prewriting strategies in which the teacher may have more control over what programs students use. One particularly interesting implication of this study is that using version history offers a middle ground between introspective analysis and protocol analysis. Though the information available is not as rich as recording someone thinking aloud during his/her writing process, it still reveals choices made in the moment and in a way that is less invasive, especially for an ESL learner. Simultaneous collaboration is a major advantage as students were able to jointly use prewriting strategies and benefit from a strategy initiated by a peer. These findings should
encourage teachers to implement more collaborative tasks and projects. There is potential not only for students to benefit from prewriting strategies for that assignment, but to also see the strategies demonstrated in action and apply this experience to future projects. This could be an exciting area of research as well.

However, not all writing strategies seem to be as compatible with online word processors as others. Students’ exclusive use of text-based prewriting strategies calls into question whether or not such programs are suitable for more creative types of prewriting strategies especially when considering that mind mapping was one of the strategies explicitly taught during the lesson on prewriting strategies, yet no student opted to use it. If teachers choose to use a program such as Google Docs, they should dedicate time to help students become familiar with the program as this was revealed to be the biggest barrier noted by students. Though a lesson was dedicated to familiarizing students with Google Docs at the start of the semester, this proved to be insufficient which means depending on students’ needs, teachers should consider dedicating multiple lessons to its use.
REFERENCES CITED


The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

1. Research conducted in an established or commonly accepted educational setting; involving normal educational practices, such as (i) Research on regular and special education instructional strategies, or (ii) Research on the effectiveness or the comparison among instructional techniques, curricula, or classroom management methods.

The determination of exemption means that:

- You do not need to submit an application for annual continuing review.

- You must carry out the research as described in the IRB application. Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. The purpose of review is to determine if the project still meets the federal criteria for exemption.

In addition, changes to key personnel must receive prior approval.

Detailed information about requirements for submission of modifications can be found on our website. For modifications that require prior approval, an amendment to the most recent
IRB application must be submitted in IRBManager. A determination of exemption or approval from the IRB must be granted before implementing the proposed changes.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

**IRB 03/2018**

Please note that you must submit all research involving human participants for review. **Only the IRB or its designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed**. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please be advised that your research study may be subject to **post-approval monitoring** by Iowa State University’s Office for Responsible Research. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu. IRB 03/2018
APPENDIX B: INTERVIEW QUESTIONS

1. What is your usual writing process?

2. What is your revision process?

3. How did you use Google Docs for class?

4. What barriers did you experience?

5. What benefits/advantages did you notice?