THE INFLUENCE OF WEB 2.0 TOOLS ON COLLABORATIVE LEARNING FOR SECONDARY EDUCATION STUDENTS IN AMERICAN SAMOA

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAI'I AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

Learning Design & Technology

By

Sabrina Kelani Suluai-Mahuka

December 9, 2022

Dissertation Committee

*Dr. Christine Sorensen Irvine, Chairperson*
*Dr. Peter Leong*
*Dr. Dan Hoffman*
*Dr. Deborah Zuercher*
*Dr. John Casken*

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# ACKNOWLEDGEMENTS

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# ABSTRACT

Over the years, Web 2.0 tools have played a more dominant role in education as they provide the skills necessary for 21st century learning (McLoughlin & Alam, 2014; Sadaf, Newby, & Ertmer, 2012). While this shift with educational technology has been prevalent in most schools, small rural communities such as American Samoa have yet to have as much experience with such tools. The purpose of this qualitative case study was to examine the influence web tools have on small group collaboration for secondary education students through the use of observations, surveys and interviews. The study focused on answering five research questions: How do students interact with each other using Web 2.0 tools during collaborative learning? How do students interact with the Web 2.0 tools during collaborative learning? How do students describe their experience using Web 2.0 tools in collaborative learning? What are the student's perceptions of using Web 2.0 tools for collaborative learning?  How do students believe the use of Web 2.0 tools for collaboration influenced their learning? This study consisted of one 12th grade English Language Arts class from a public high school, totalling 15 participants. The researcher found that the participants perceived the web tools to have a positive impact on their learning as they encouraged collaboration, teamwork, and communication. It was also found that the tools supported learning and  promoted personal accountability; however, technical issues can delay the learning process. This study is significant because it showcases implications for future practice of web tool integration to promote collaboration and learning for students in rural communities.

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# CHAPTER 1. INTRODUCTION

In this networked age, Web 2.0 tools in education have become increasingly popular, as these technologies assist in refining the skills necessary for students of the 21$^{st}$ century (McLoughlin & Alam, 2014; Sadaf, Newby, & Ertmer, 2012). Butler (2012) defined Web 2.0 Tools as "a wide array of web-based applications which allow users to collaboratively build content and communicate with others across the world" (p. 139). With Web 2.0 tools, students are afforded the opportunity to share, interact, collaborate, and communicate (Birdsall, 2007; McLoughlin & Alam, 2014; Sadaf, Newby, & Ertmer, 2012) more easily as the Internet is more accessible. In addition, the implementation of Web 2.0 tools in the classroom also allows teachers to gain the rudimentary yet necessary knowledge and skills to maximize student learning and achievement (International Society for Technology in Education, 2008), which is important to foster collaboration. This study aimed to determine how the utilization of Web 2.0 tools influences collaborative learning for secondary education students in American Samoa.

## Statement of the Research Problem

With the advent of the digital age, technology is immersed in daily living and students are "digital natives" (Prensky, 2001). Currently, there are a myriad of Web 2.0 tools available for educational purposes. With these tools, there has been a significant change of classroom instruction to include extended learning environments (Ajjan & Hartshorne, 2008; Fatimah &

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Santiana, 2017). However, the question is whether or not these Web 2.0 tools can be utilized to enhance the learning process, specifically through collaboration.

In most learning environments, collaboration is a common expectation for all students, including in online courses (Chen, Lambert & Guidry, 2010). Although collaboration is deemed to be a necessary skill for team advancement and progression (Johnson & Johnson, 2004), some learning environments do not utilize this method to its fullest potential (Scager, Boonstra, Peeters, Vulperhorst, & Wiegant, 2016). In addition, utilizing collaborative learning strategies does not ensure that students are completely engaged in the learning tasks (Summers & Volet, 2010). As such, although the learning task may be shared, the learning outcomes may differ based on the amount of effort each group member contributes to the task (Chang & Brickman, 2018).

In American Samoa, the Department of Education (ASDOE) declared that one of the goals for ASDOE is that, "All children will be provided opportunities to become proficient in the arts, technology, life skills, and other academic subjects" (para. 2, 2019). While this is one of the four goals envisioned for the ASDOE, there are no studies to indicate the direction of technology integration. There are also minimal opportunities for teachers to learn to properly integrate technology to support classroom instruction.

On a broader spectrum, there is a need to explore collaboration within an online space. For example, Cheng and Chau (2011) conducted a study to determine the level of collaboration with the use of Web 2.0 tools, blogs and wikis. Here, the researcher found that blogs had a higher level of collaboration and knowledge co-construction than wikis did as the functionality and

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inherent interface were more effective for group communication (Cheng & Chau, 2011). This is the type of information that could be pertinent when educators, local and abroad, seek to facilitate Web 2.0 integration. Ergo, this study is relevant in an educational context to explore the use of Web 2.0 tools to determine tool effectiveness to promote collaboration and learner engagement.

## Purpose

The purpose of this qualitative case study was  to better understand the use of Web 2.0 tools in the classroom and how they influence collaborative learning for secondary education students in American Samoa. Over the years, Web 2.0 technology has become increasingly popular, especially in education (Brodahl, et al., 2011; Lu & Churchill, 2011). The use of Web 2.0 tools has been noted to engage participants and help them to take a more active role in the learning process (Alexander, 2006; Pieri & Diamantini, 2014).

Students of American Samoa may benefit from the guided implementation of Web 2.0 tools in classroom learning, including working on collaborative tasks. The use of Web 2.0 tools has  been found to positively extend the learning space in a collaborative nature as individuals can work together without geographical confines (Ulrich & Karvonen, 2011). The goal of this case study was  to utilize three Web 2.0 tools in a collaborative learning activity to monitor the influence these tools may have on the students' behavior and to determine their perceptions of the learning experience students have about the web tool integration.

## Research Questions

The study's research questions focused on student use of Web 2.0 technology during collaborative learning activities.

1.  How do students interact with each other using Web 2.0 tools during collaborative learning?

2.  How do students interact with the Web 2.0 tools during collaborative learning?

3.  How do students describe their experience using Web 2.0 tools in collaborative learning?

4.  What are the student's perceptions of using Web 2.0 tools for collaborative learning?

5.  How do students believe the use of Web 2.0 tools for collaboration influenced their learning?

## Significance of the Study

With the advent of technology, the focus of learning environments has shifted to a new paradigm for learning, a paradigm that emphasizes technology (Spector et al., 2014). Hence, this study focused on better understanding the influence of technology, specifically Web 2.0 tools, on collaborative behavior in a K-12 learning environment. This study also focused on the development of a soft skill, collaboration, which might be fostered with the use of Web 2.0 tool integration.

With the advancement and increased availability of technology, there have been numerous shifts in the trends of Web 2.0 application (Saeed, Yang, & Sinnappan, 2009).

Expected paradigms include the use of technological tools in daily living, which also extends to the education system (Pieri & Diamantini, 2014). As 21st century learners, it has become an expected skill for all students to be familiar with technology, which includes the use of Web 2.0 tools (Fatimah & Santiana, 2017; McLoughlin & Lee, 2007). This skill is important in the transitioning from secondary to tertiary and/or to career settings, as an individual is expected to be competent in the use of technology, and many universities utilize online instruction (Surry, Grubb, Ensminger, & Ouimette, 2010). The results of this study may be used by teachers and instructional designers to more effectively integrate technology in the classroom to promote collaborative learning.

While there are numerous studies exploring collaboration and Web 2.0 tools, there is little research exploring the link between the use of Web 2.0 tools and collaborative behavior. . This is especially true for K-12 classroom settings in small rural communities, including island nations such as American Samoa. Findings from this study may open up new channels for tool developers to enhance the collaborative capabilities for Web 2.0 tool applications. Findings may help teachers to better understand how such tools can be used to support collaboration and student experiences in using these tools for collaborative tasks. E-learning approaches are more common and relevant to this digital age (McLoughlin & Alam, 2014) with technology integration in the forefront in learning communities (Spector et al., 2014), and as such, small places like American Samoa must keep up with the ever-changing needs of an evolving society. Findings of this study may also provide insights for those seeking to integrate Web 2.0 tools in such remote rural settings.

# Conceptual Framework

Technology is present in almost all aspects of daily living such as the workplace, the home front, and in education. Web 2.0 tools are just some of the numerous digital tools that are used in society's daily routines. This study's conceptual framework draws from Vygotsky's Social Constructivism (Vygotsky, 1986), Modes of Discourse (van Aalst, 2009), and the Technology Affordance Theory (Gibson, 1986) to explain the impact of Web 2.0 tools in today's modern educational setting for collaborative learning. This conceptual framework (Figure 1) explores the use of Web 2.0 tools and its affordances to determine the influence of enabling technologies for collaborative learning activities through the Zone of Proximal Development (Vygotsky, 1978). Figure 1 demonstrates how these theories are related and will be explored in more detail in the literature review

**Figure 1**

*Conceptual framework linking collaborative learning through the affordances of Web 2.0*
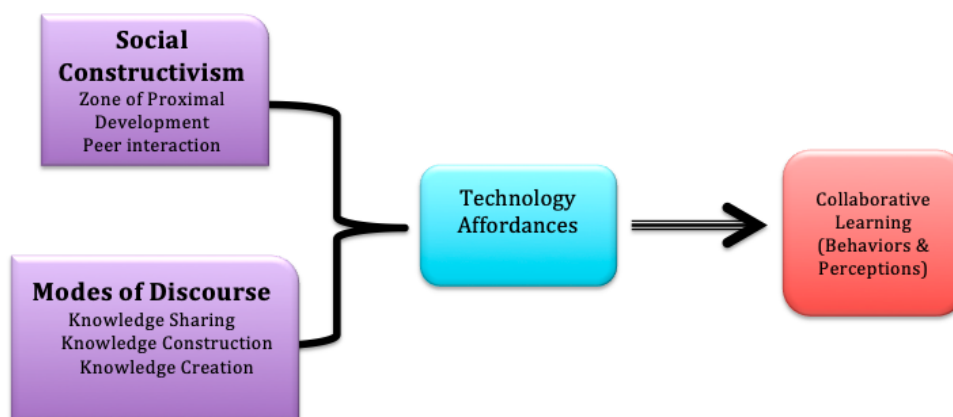
## Summary of Methodology

The research method used in this study was a qualitative case study. A case study is defined as a method to capture the complexity of a single case and is usually for fields in social sciences but also extends to practice-oriented fields like education (Johansson, 2003). Furthermore, a case study is holistic with in-depth description and it usually consists of numerous sources of data collected over time (Ary, Jacobs, Sorensen, & Walker, 2019) and is suitable to describe a phenomenon or build upon theories or relationships (Yin, 2009). Ary et al. (2019) further relayed that case studies are based on a bound unit to identify a phenomena within a specific context and in a longitudinal approach. For this case study, the method of triangulation was utilized, which is a means of using more than one source to collect data on a single topic to capture the different dimensions of the study's impact (Shoaib & Mujtaba, 2016). This process was e used to assure the validity of research through a variety of data collection methods, which included interviews, observations and a survey. These will be explained further in Chapter 3.

This type of research method was appropriate for this study due to the fact that the study focused on a set group of students purposely chosen to participate. The study occurred over a set course of time in a controlled classroom environment so that observations could be conducted to examine the influence of Web 2.0 tools on collaborative learning.

# Role of the Researcher

As an educator of ten years, I have taught secondary education in American Samoa at both private and public schools. I have obtained both a Bachelors and a Masters degree in Education from the University of Hawaii at Manoa and have passed both Praxis I and Praxis II, which showcases my ability to meet the standards of my content area, English Language Arts. For this reason, I have obtained a Professional Teaching Certificate Level III from the ASDOE office of Teacher Quality. With this background, I can see the importance of employing up-to-date learning strategies that are effective to my 21st century students in their preparation for tertiary education. This refers to the use of technology, specifically Web 2.0 tools, and also refers to the use of small group learning to bolster the soft skills of communication and problem-solving. I conducted the study in a school where I am employed and the results of the study can be applied to meeting Goal #4 of ASDOE.

Researcher bias pertains to the researcher's attitude, expectations, interviewing technique, consistency during analysis and rapport with participants (Erickson, 1986; Reis, n.d.). For this study, the researcher also served as the facilitator for the course. As the researcher and facilitator, I worked with the main teacher of the classroom, teaching a set of students in a block schedule. Working with the teacher, lessons were prepared the week prior to implementation and the teacher met with the class three times a week, with each meeting lasting approximately one hour and fifteen minutes. Lessons were based on the writing content standards for ASDOE and were based on teacher experience  .

In addition, I developed the instruments for data collection and all observations and interviews were conducted by myself. However, all instruments were similar to those of past studies to help mitigate potential researcher bias. All responses from surveys and interviews were confidential and did  not impact the students' grades. There was  potential for research bias, which I address in the limitations portion of this chapter.

## Limitations

There were limitations within this study. Such limitations included a research developed-survey, limited generalizability as there was  only one case study in a single classroom, self-reported information from the interviews, and the potential for researcher bias, as I worked with the classroom teacher. I worked to take preventive actions to redress such limitations.

The limitations of this study stem from the confines of a single classroom in one public school of American Samoa. Although the study consisted of multiple participants, the diversity of students did not provide a sample that is representative of other contexts.  As a qualitative case study, the findings may not apply to the general population as data will be from a small sample. Focusing the study on one island and in one secondary school is a  limitation as it presents the possibility of researcher influence. Results may not be applicable to other school levels or other geographic areas.

The researcher-developed survey measured student perceptions and not the grades on the group task.The questions were similar to previous studies that focused on student perceptions. The researcher took care not to include questions that were  leading, loaded, and/or biased.

 In this study, another limitation to consider was subjectivity. Although preventive measures were in place to promote the validity of the study, the interview and survey processes may not be dependable. While the interviewer and survey remained constant, the interviewees and survey respondents may not have fully explained their thoughts on a specific topic as they may have been hesitant to answer (Reis, n.d.). As such, credibility and dependability of the study are based on the truthfulness and completeness of the participant responses. Although the participants were students who may have known me as a teacher at the school, I ensured that the interview was in an open space for voluntary reflection and the students' responses were not reflected in their grades.

## Definition of Key Terms

**American Samoa**. An unincorporated territory of the United States located within the south-central Pacific Ocean in the eastern region of the Samoan archipelago (Creevey, Wendt, & Foster, 2020).

**Collaboration.** An instructional strategy in which students communicate together to accomplish a common goal (Prince, 2004).

**Digital Natives.** Population of society who grew up with the familiarity of the Internet (Khan & Sarkhel, 2015).

**Educator.** Someone who is specialized in the theories and methods of education (Collins Dictionary, n.d.)

**Teacher.** One whose occupation is to instruct (Merriam-Webster, n.d.)

**Technology.** Methods, systems and devices which are the result of scientific knowledge that are used for practical purposes (Collins Dictionary, n.d.)

**Web 2.0 Tools.** A web based-platform where applications and software are able to run on the cloud (O'Reilly & Battelle, 2009)

## Summary

The essential goal of this study was to determine the influence that Web 2.0 tools can have on individual and group behaviors in collaborative learning. This study is significant due to the fact that there are currently no studies in American Samoa that support the integration of Web 2.0 tools to boost or influence collaboration. Yet, according to the American Samoa Department of Education, a common expectation is to foster collaboration. Therefore, secondary educators and students may benefit from this study, as it can provide a basis to build collaborative skills using Web 2.0 technology.

In the upcoming chapter, a synthesis of the literature for this study is provided. This synthesis includes in-depth explanation of the key concepts, theories, and background of the study. Subsequently, Chapter 3 includes a complete overview of the study's methodology. Chapter 4 presents the findings from the study while Chapter 5 discusses the findings and how they relate to the literature. The final portions will be the references and appendices, which include the instruments used for this study.

# CHAPTER 2. REVIEW OF LITERATURE

As the emergence of technology brings numerous educational affordances, the spectrum of educational pedagogies continue to evolve in the realm of academia (Wheeler, 2010). One such evolution is the use of Web 2.0 tools and access to the internet, which have vastly transformed education and given new value to classroom learning (Ajjan & Hartshorne, 2008). With the advent of these Web 2.0 technologies, there are more opportunities for students to collaborate over distances, instead of being limited to face-to-face collaboration. As such, Web 2.0 tools provide affordances that allow students to expand their learning environment (Ajjan & Hartshorne, 2008; Fatimah & Santiana, 2017).

While digital technology such as Web 2.0 tools has allowed teachers to transform simple lessons into lessons that promote engagement and motivation (McLoughlin & Alam, 2014), it has also been determined that these tools foster collaboration and internal knowledge sharing (Dearstyne, 2007; Fatimah & Santiana, 2017). The purpose of this study is to determine how Web 2.0 tools influence collaborative learning for students in secondary education. According to Prince (2004), collaborative learning is an instructional method in which students collaborate together to accomplish a common goal. As such, the study will focus on illuminating how the features of Web 2.0 tools influence individual and group behaviors in collaborative learning in American Samoa. Therefore, this literature review will expand on the facets of Web 2.0 tools, collaborative learning, and Web 2.0 collaborative tools.

# Web 2.0 Tools

Over the years, web 2.0 technologies have become increasingly popular in learning environments (Brodahl, et al., 2011; Lu & Churchill, 2011). Prominent features such as low costs, ease of use and accessibility (Ajjan & Hartshorne, 2008) are just some of the aspects that make Web 2.0 tools appealing for educational use. Web 2.0 tools detract from the conventional learning environments of desks and white boards, but instead, allow for learning platforms that are directed by the learner (Ulrich & Karvonen, 2011). Web 2.0 tools provide extensive collaborative options that can be instantaneously available on a global scale without the limitations or confines of a formal learning institution (Ulrich & Karvonen, 2011). In this section of the literature review, the following topics will be discussed: the definition of Web 2.0 tools, the use of Web 2.0 tools in K-12 education, the features of Web 2.0 tools, benefits of Web 2.0 tool integration, drawbacks of Web 2.0 tool integration, perceptions of Web 2.0 tools, and growth of Web 2.0 integration.

## Definition of Web 2.0 Tools

The term Web 2.0 Tools was first coined in 1999 to describe the transformation of design and use of websites (DiNucci). DiNucci (1999) further described the emergence of Web 2.0 tools as the "embryo" of screen interactivity. In 2004, O'Reilly and Battelle hosted the first conference to explore Web 2.0 tools as a web-based platform (2005). As the term grew in popularity, researchers continued to further define Web 2.0 tools as a web based-platform where applications and software are able to run on the cloud (O'Reilly & Battelle, 2009) and as tools of the World

Wide Web that consist of participative and social elements (Wheeler, 2010). The term Web 2.0 is used for the second generation of Internet services which include blogs, Google Suite, Skype, Facebook and Wiki (Pieri & Diamantini, 2014). Popular tools such as Google Docs, Zoho Writer and PbWorks are forerunners of the Web 2.0 tool trend (Lu & Churchill, 2011; Koh & Lim, 2012). Web 2.0 tools are also known as interactive web technologies (Ulrich & Karvonen, 2011; Wood, 2011) or the read/write web (Ajjan & Hartshorne, 2008; An, Aworuwa, Ballard, & Williams, 2009) that provide the capability of creating information and knowledge as well as sharing ideas (Maloney, 2007; Pieri & Diamantini, 2014).

While Web 2.0 technologies are not new (Ajjan & Hartshorne, 2008), Web 2.0 tools have gained more popularity due to users having a more active role in the development of information (Alexander, 2006; Pieri & Diamantini, 2014). Furthermore, with the transition from passive learning to active learning, Web 2.0 tools provide learners the opportunity to create their own repertoire of knowledge (Maloney, 2007).  As such, the use of Web 2.0 tools has allowed links between people (O'Reilly, 2005) and increased student technological aptitude by using various digital tools (Ertmer, Newby, Yu, Liu, Tomory, Lee, Sendurur & Sendurur, 2011.) Additionally, the use of Web 2.0 tools for education is known as Web Based Learning (WBL) and has become a prominent trend (Chen & Huang, 2014), as it supports student learning and performance goals (Clark & Mayer, 2011).

**Features of Web 2.0 Tools**

In the 21$^{st}$ century, the adoption of blooming technologies and pedagogies has transformed learning in this digital era (McLoughlin & Alam, 2014).  The existence of an extendable online environment allows students across the globe to create and find comfort in their own learning through controlled interaction and collaboration (Ku, Tseng, & Akarasriworn, 2013). Computer supported collaborative learning (CSCL) is rooted in social constructivism (Spector, Merril, Elen, & Bishop, 2014). In turn, group discussions assist in increasing student motivation, which in turn allows students to gain a better understanding of what they are learning (Spector et al., 2014). Lu and Churchill (2014) noted that the features of Web 2.0 technologies allow for numerous educational benefits that include: resource sharing, knowledge building, motivation enhancement, and social interaction.

Newman, Chang, Walters, and Wills (p. 591) further expanded on the aspects of Web 2.0 Tools, which are as follows:

- Services, not packaged software, with cost-effective scalability.
- Control over unique, hard-to-recreate data sources that get richer as more people use them.
- Trusting users as co-developers.
- Harnessing collective intelligence.
- Leveraging the long tail through customer self-service.
- Software above the level of a single device.

- Lightweight user interfaces, development models, AND business models.

Ergo, these facets of Web 2.0 technology have added to the overall growth of Web 2.0 tool integration.

**Growth of Web 2.0 Tool Integration**

With the ubiquity of the Internet and increased access to media and digital technologies, there is a need for the exploration of Web 2.0 to supplement classroom instruction in education (Ajjan & Hartshorne, 2008; Pieri & Diamantini, 2014)). The popularity of Web 2.0 tools (Ajjan & Hartshorne, 2008) has led to the emergence of information and communication technologies (ICT) as an essential factor of an individual's learning experience (Pieri & Diamantini, 2014). As such, the popularity of these low-cost emergent technologies has led to its rapid adoption in various settings (Newman, Chang, Walters, & Wills, 2016). This popularity extends to"Digital natives", a term coined by Prensky (2001), referring to individuals growing up with digital technology. The use of technology in the classroom has changed significantly over the past few decades (Ajjan & Hartshorne, 2008; Fatimah & Santiana, 2017), as social networks grant teachers and students privileged learning environments (Pieri & Diamantini, 2014). The use of social sites, which includes blogs and wikis (An et al., 2009), in education has grown tremendously (Reich, Murnane, & Willett, 2012).

Dearstyne (p. 25, 2007) shared that the use of Web 2.0 tools has influenced four prominent trends:

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1. The development and popularity of online social networks for exchanging personal information, photos, videos and other information.

2. The broadening availability of easy-to-use-software.

3. The search for techniques to foster more productive use of information

4. The rising importance of knowledge workers who have high degrees of expertise, education, or experience and the primary purpose of their jobs.

As such, these trends are just some of the many indications of how Web 2.0 technology has grown throughout the years and have been implemented in numerous classroom settings.

**Use of Web 2.0 Tools in K-12**

With the development of technological innovations, Web Based Learning platforms have expanded due to the lack of limitations of time and space (Hu, Lo & Shih, 2014). The use of Web 2.0 tools has the potential to support higher education by the enhancement of in-class instruction (Ajjan & Hartshorne, 2008; Fatimah & Santiana, 2017). As such, education systems such as the American Samoa Department of Education acknowledged that technological innovation and resourcefulness are necessary in the progression of a 21st century student (ASDOE, 2019). Common examples of such tools include blogs, wikis, video sharing sites and social media sites (Ertmer et al., 2011; Pieri & Diamantini, 2014).

Professional organizations around the world, such as the International Society of Education and the Partnership for 21st Century Learning, have found ICT skills to be fundamental skills that are necessary for 21st century learners (Hite & Thompson, 2019). With the introduction of ICTs in education, there has been a shift in the hierarchical teacher-student

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model, where the teacher is no longer the key figure in the classroom (Pieri & Diamantini, 2014). Instead, using Web 2.0 tools promote the value of teacher and student contributions (Pieri & Diamantini, 2014) while still emphasizing the role of the student in classroom learning (Carrió-Pastor & Skorczynska, 2015). However, to promote successful integration, learner support is a crucial factor in technology rich environments (Spector et al., 2014).

For instance, Osakwe, Dlodlo and Jere (2017) investigated the use of mobile technology for collaborative learning. The study consisted of 120 high school participants where the researchers looked to use mobile technology to complete a series of collaborative tasks. The range of tasks varied from using embedded phone tools like the calculator to downloaded educational applications. Researchers found that today's technology advancements have provided the opportunity for active engagement in the learning process (Osakwe et al., 2017). Using mobile technology is just one way that collaborative learning can be fostered to present-day learning approaches for active learning and a type of constructivist learning.

As such, the boom of Web 2.0 technologies has allowed K-12 learning to expand traditional learning across the globe (Hite & Thompson, 2019). Teaching with Web 2.0 tools has been perceived as a means to increase student engagement, foster peer interaction, promote communication and enhance learning (Sadaf et al., 2012). An example of such is WebQuest, which researchers used to provide a digital learning experience and stimulate student interest and promote student achievement and accomplishment (Raisinghani, 2016). Hence, the use of Web 2.0 tools can potentially cultivate competent citizens in 21st century learning and skills (Hite & Thomspon, 2019). Raisinghani (2016) found that tools such as Blogger and Skype provided an

opportunity for students to receive effective instruction from qualified teachers, where the students had direct access to receive feedback and direction for the learning. Consequently, the employment of Web 2.0 tools has provided a platform for K-12 learning to be expanded through distance education to better meet the growing number of students in online education (Cavanaugh et al., 2009).

**Benefits of Web 2.0 Tool Integration**

With features of variance, there are multiple benefits with the use of Web 2.0 tools. Web 2.0 technology allows for modification and redefinition of application services (Paolini, 2015) so that information is no longer static (Wood, 2011). While the organization of Web 2.0 enables faster and more efficient interaction (Carrió-Pastor & Skorczynska, 2015; Fatimah & Santiana, 2017; Paolini, 2015), web 2.0 tools also allow for the creation and retainment of knowledge, and has thus transformed the students' experience to become less passive and more active in their learning (Maloney, 2007; Pieri & Diamantini, 2014). Additionally, Web 2.0 tools have enabled the connection between multiple entities through multimedia updates (Newman, Chang, Walters, & Wills, 2016) which then allows for users to stimulate discussions and create learning communities (Pieri & Diamantini, 2014).

The development of numerous Web 2.0 technology has enabled learning to be ubiquitous at all times (Hao & Lee, 2015; Raisinghai, 2016). As such, the use of Web 2.0 tools in Web-based learning (WBL) offer affordances of knowledge sharing, peer collaboration, and organizing information (Pieri & Diamantini, 2014; Raisinghani, 2016). Fatimah and Santiana

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(2017) also argue that the benefits of Web 2.0 technology should be optimized to maximize the learning experience of the 21st century student. The advancements of Web 2.0 technology give learners the opportunity to become proficient in obtaining and producing information in digital format while also simultaneously providing them a platform to receive immediate feedback (Carrió-Pastor & Skorczynska, 2015) from peers and teachers. As such, the methods of Web 2.0 encompass the emerging societal norms for learning that are participative, democratic and collaborative (Wheeler, 2010) are beneficial to 21st century learners (Fatimah & Santiana, 2017).

Studies have found WBL to be significant and are applicable to areas such as language learning and problem-solving (Raisinghani, 2016). Raisinghani (2016) determined that WBL allows students to work at their own pace and is useful in that it provides education for students in remote areas who cannot access traditional classroom learning. Web-based learning promotes student exploration because they can connect to educational resources when it is convenient for them (Raisinghani, 2016). Furthermore, technology, such as Web 2.0 tools, supports the necessary skills students need to promote creative thinking and content retainment (Alismail & McGuire, 2015). Specifically, the integration of WBL or multimedia gives the students the opportunity to participate in an online experience to communicate, share information, build social skills, express opinions, and organize ideas (Alismail & McGuire, 2015).

**Drawbacks of Web 2.0 Tool Integration**

While there are numerous benefits of using Web 2.0 technology, there are also various drawbacks as well. For instance, while there are a myriad of digital natives, there are students

who may not have the capability to understand the Web and its affordances (Pence, 2007). More notable drawbacks are interface issues, technical glitches, openness of knowledge (Lyashenko, 2016), and organizational issues (Surry et al., 2010). Additionally, factors of social, culture, and economic backgrounds play a significant role in the adoption of innovation tools such as Web 2.0 (Spector et al., 2014; Surry et al., 2010).

Another problem that stems from the use of Web 2.0 tools or Web-Based Learning (WBL) is the effectiveness of face-to-face interaction (Raisinghani, 2016). Raisinghani (2016) shared that students may feel a sense of isolation due to ineffective communication. In addition, researchers have determined that students struggle to grasp the learning due to the lack of visual cues in facial expressions that are normally conveyed through face-to-face instruction (Raisinghani, 2016).

Another prominent drawback of Web 2.0 is the challenge of effective pedagogical use of technologies (Spector et al., 2014). While the decision to adopt innovative technology is not difficult, it can be challenging to foster the actual use of said technology (Surry et al., 2010), as technology advancement is not synonymous with technology improvement in terms of education (Spector et al., 2014). While Rogers (2000) has also found that funding, technical support, and lack of training are additional barriers in the implementation of educational technology, Spector et al. (2014) also concluded that while technologies are developed at an accelerated rate, there is a shortage of educators who can utilize these technologies effectively. As such, critics claim that the prominent impediment of successful implementation is the time it takes to learn how to use these new technologies (Pajo & Wallace, 2001; Spector et al., 2014).

Additional issues of Web 2.0 tools is the ambiguity and meaningfulness of the utilization of the technologies (Dohn, 2010). While some Web 2.0 tools function with permission-based editing, some tools, such as wikis, are usually designed for public editing (Wood, 2005), where such features can lead to the distribution of false information. On the other hand, Dohn (2010) found that when students had to use certain tools for courses, there was little understanding of the meaning behind the task. As such, there are drawbacks with the use of Web 2.0 tools.

**Perceptions of Web 2.0 Tools**

Davis (1989) defined perceived usefulness as the perceived advantage or an individual's belief in the degree  of improvement the technology can provide. While there are varying perceptions of Web 2.0 technology, Dearstyne (2007) termed Web 2.0 tools as a "massive phenomenon" as a technology based on interaction and participation of its users that has various advantages. Moreover, the media  favorably reports Web 2.0 technology as tools that connect social networking where users have the opportunity to not only contribute but also consume information (Anderson, 2007; Pieri & Diamantini, 2014). As a rule, Spector et al. (2014) relays that in a technological learning environment, learning will not be effective until it is aligned with the learner's ability, self-management and perspectives on technological learning environments.

Likewise, research deems that technology's perceived ease of use is directly determined by the individual's belief and attitude (Davis, 1989). As such, while students have responded enthusiastically about the integration of social software (Pence, 2007), some teachers ignore the Web and instead teach their students in the traditional way (Pence, 2007). Wheeler (2010)

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explains that in some cases, teachers may balk at the use of Web 2.0 tools in their classroom because they feel that their technological skills are inferior to that of their students. This perception can serve as a hindrance to the adoption of Web 2.0 tools in education.

On the other hand, students perceived using Web 2.0 tools in a classroom setting in a positive light if the following components were provided by the instructors: giving encouragement towards learners, setting clear objectives and goals, supplying timely resources, giving example work, and setting up a structured, defined, and organized instruction (Ku et al., 2013). Additionally, the use of Web 2.0 tools has changed the way people work, as it allows for the creation of new documents (Dearstyne, 2007; Wheeler, 2010). As such, the ease of use is a gargantuan factor in the decision to adopt technology (Davis, 1989). With this in mind, Web 2.0 tools, such as social networks, have become an integral part of the everyday lives of students, as they have the potential for the communication and dissemination of information (Pieri & Diamantini, 2014; Wood, 2011).

## Collaborative Learning

In order for society to advance and progress, a necessary skill is the ability to collaborate and cooperate as a team (Johnson & Johnson, 2004). As such, if pedagogical activities are carefully crafted with the utilization of Web 2.0 tools, designed tasks have a significant positive impact on the student's individual knowledge acquisition (Laru, Näykki, & Järvelä, 2012). Web 2.0 tools are popular educational tools as they allow the users to meet virtually to share and collaborate (McLoughlin & Alam, 2014).  An example of such tools is wikis, which provide an

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effective and practical avenue for peer collaboration and communication (Wood, 2005).

Furthermore, Ajjan and Hartshorne (2008) indicated that an effective learning environment

fosters collaboration between students and faculty.

In this section of the literature review, the following topics will be discussed: defining

collaborative learning, benefits of collaborative learning, drawbacks of collaborative learning,

accountability in collaborative learning, individual and group behaviors, and collaborative

learning in K-12.

**Defining Collaborative Learning**

Collaborative learning can be dated back to the 1970's. Prince (2004) defined

collaboration as an instructional strategy in which students communicate to work together for a

common goal. Furthermore, collaborative learning promotes student engagement of knowledge

construction due to the integration of new knowledge in a learning community (Agosto,

Copeland, & Zach, 2013). Collaborative learning has been deeply considered a key component in

education (Smith & MacGregor, 1992) that influences numerous positive aspects such as active

construction of knowledge, enhanced problem solving and the exploration of shared information

and peer-communication (Haythornthwaite, 2019). Haythornthwaite (2019) further defined

collaboration as individuals working together towards a common goal and demonstrating the

ability to work effectively and appropriately with diverse individuals (National Education

Association, n.d.). However, while collaboration is a widely used method of instruction, the

learning potential of collaboration is often underused (Scager, Boonstra, Peeters, Vulperhorst, &

Wiegant, 2016). Collaborative strategies have been deemed to be innovative in that they promote engagement for both students and teachers (NEA, n.d.; Smith & MacGregor, 1992).

**Accountability in Collaborative Learning**

Assuming shared responsibility in collaborative learning promotes the value of each individual's contributions (NEA, n.d.). As such, establishing team "dynamics, acquaintance, and satisfaction" are critical in a collaborative setting (Ku et al., 2013). To establish team dynamics and team acquaintance, students felt that necessary actions are needed, such actions include: "establishing team commitment, having clear and frequent communication among team members, using interactive software, and holding synchronous meetings" (Ku et al., p. 928, 2013). While there are differences in individual power and effort, students found that the uneven contribution is expected and natural in group settings (Scager et al., 2016). However, students did not view this uneven contribution in a negative light, but, instead, motivated the "stronger" members to feel responsible to do more and found that the variety of students enhanced group discussions (Scager et al., 2016). As such, compromising and exercising flexibility in group assignments is a necessary component of collaboration (NEA, n.d.).

Autonomy is also another facet of the effectiveness of collaboration, as the students are given the chance to make choices in their work (Scager et al., 2016). In their study, Scager et al. (2016) found that when students made their choices as a group there was less individual autonomy and more group autonomy because decisions were made democratically. Additionally, shared motivation is another contextual factor that contributes to collaboration, in the sense that older or more senior students share equal amounts of motivation (Scager et al., 2016). Hite and

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Thompson (2019) relay that a collaborative focus towards a unitary goal needs to be a group effort for more direct accountability in producing a group-sourced product.

**Individual and Group Behaviors**

Wismath and Orr's (2015) study indicated that when students are given the choice of individual work and collaborative work, finding their own rhythm of cycling between the two options was dependent on the metacognitive guidance and learning styles. Moreso, CSCL promotes interpersonal interaction opportunities that foster engagement in online-learning environments (Lu & Churchill, 2014).

In terms of group behavior, building familiarity with team members allowed for the prediction of behavior, which allowed for the formation of group norms (Ku et al., 2013). In some cases, group size also determined the stimulus of the group's behavior in that groups of three to four people were the optimal choice as it allowed for the individual to be responsible for a prominent portion of the group task (Scager et al., 2016). Understanding the process of team interaction is dependent on team participation and controls team satisfaction (Ku et al., 2013). This process of team interaction is also dependent upon establishing communication using social and cross-cultural skills (Hite & Thompson, 2019).

In an online collaborative learning environment, student development should be assessed based on what students can learn collaboratively with their peers rather than what the student achieves independently (Buzzetto-More, 2010; Koohang, Riley, & Smith, 2009). This can be achieved through the means of promotive interaction, which includes: "discussions, exchange of information, and arguments, building on one another's ideas, explaining to one another,

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providing and processing peer feedback, and asking one another critical questions" (Scager et al., 2016, p. 6).

However, students relayed that the intensity of group collaboration was dependent upon whether or not the group assignment determined their final grade (Scager et al., 2016). In their study, Scager et al. (2016) found that while students experienced a difference in power and effort between their team members, the group still experienced positive interdependence when collaborating together.

**Benefits of Collaborative Learning**

Collaborative learning is a major aspect in every discipline of education (Smith & MacGregor, 1992), as the collective construction of knowledge is retained more than in those of individual works (Agosto et al., 2013). Additionally, collaborative learning has been noted to promote various benefits for student improvement (Smith & MacGregor, 1992), as the premise of collaboration encourages broader student outcomes (Prince, 2004). Although collaborative learning stands as the more modern and liberal approach to learning (Smith & MacGregor, 1992), it is often underused and undervalued for assessing student performance (Swan et al., 2008). However, collaboration is particularly important in the learning process as it serves as a flexible learning approach that can be easily adapted to any learning environment (Smith & MacGregor, 1992). In this sense, students working in teams are given the opportunity to build their own social presence, which has been shown to result in team unity and increased critical thinking skills (Haythornthwaite, 2019). In many cases, the process of collaborative learning has been recognized to promote collective thinking, information acquisition, technological

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familiarity, and negotiation skills (Carrió-Pastor & Skorczynska, 2015). Overall, collaborative efforts have been found to create a more holistic learning experience and simultaneously creates knowledge for multiple individuals (NEA, n.d.).

Ku, Tseng, and Akarasriworn conducted a study in 2013 using a Web 2.0 tool called "Blackboard" to assess the relationship between team satisfaction and online collaboration factors. In this study, researchers assessed the collaborative efforts and overall team satisfaction of 197 participants in the semester course. The result of this study was that 60% of the students liked learning in the online collaborative environment, while 73% of the students indicated that learning in a collaborative environment produced more learning. Participants shared that working in a collaborative environment allowed for the enhancement of critical thinking skills and problem-solving skills while simultaneously promoting active learning (Ku et al., 2013; Haythornthwaite, 2019). Similarly, Agosto, Copeland, and Zach (2013) noted that once this sense of community is established, students are more likely to engage in collaborative learning rather than working independently. As such, this is just one indication of the benefits of collaborative learning.

The National Education Association noted that collaboration was one of the four facets of skills that are necessary for the 21st century (NEA, n.d., p.7). Hite and Thompson (2019) shared that K-12 collaborations are valuable because they make connections between cultures and classrooms. NEA (n.d.) noted that collaboration is an essential facet in the classroom because it is an inherent skill that is necessary for the workforce. Linking content with skills such as collaborative learning allows the students to contribute to the construction of their own

knowledge while simultaneously promoting the value of collaborative work, which is essential in future career settings (Alismail & McGuire, 2015).

Koh and Lim (2012) conducted a field experiment with 10 students in which the study focused on the use of various online collaborative applications. In this study, the students were trained to use the applications and then were given the choice to form their own groups. After choosing their groups, the participants were tasked to explore two tools: Mediawiki and Wetpaint. The participants utilized the tools to work on a group project, and researchers found that tools that are more sociable applications have a better chance of a group working with togetherness as the users had a means to interact with each other (Koh & Lim, 2012). Hence, the learner-to-learner interaction developed with online collaboration. Visibility was also a factor when working with Web 2.0 tools. When the students were able to visibly see each other working on the project with the tools, a sound camaraderie of trust was developed to form a team bond (Koh & Lim, 2012).

**Drawbacks of Collaborative Learning**

While there may be some benefits of collaborative learning, there are also various drawbacks. Consequently, teachers have faced challenges when adopting collaborative learning strategies (Smith & MacGregor, 1992). One barrier in particular in collaborative learning is the creation of common ground, where traditions and expectations of group work are explored (Haythornthwaite, 2019). Haythornthwaite (2019) further explicates that in most online learning settings, student assumptions about classwork serves as another hindrance to collaborative work. Other challenges include the questioning of the purpose of the classes, of student and teacher

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roles and responsibilities inside and outside of the classroom, and the relationship between the education system and curriculum (Smith & MacGregor, 1992).

In order to implement collaborative learning, peer-to-peer exchange is solely dependent upon time, effort and trust among group members (Swan et al., 2008). As such, building team dynamics (Ku et al., 2013) also serves as an important facet in collaborative learning because getting to know your team or group members may be difficult for some (Haythornthwaite, 2019). Consequently, building sound social presence and social navigation of team dynamics has been found to be challenging (Haythornthwaite, 2019). However, collaboration, in terms of building team dynamics and social presence, may not occur if time is short and there is a scarcity of available resources (Swan et al., 2008).

Hite and Thompson (2019) relayed that collaboration may provide meaningful learning, but the experience can also overwhelm students. Depending on the project expectations, the outcome often leaves the participants frustrated and detracts from the project objective (Hite & Thompson, 2019). A student may also be put off by collaborative work if the learning goals are reasonable but too numerous (Hite & Thompson, 2019), which indicates that the balance of group and individual tasks can be difficult to create and maintain within collaborative learning. Hite and Thompson (2019) further shared that a final consideration for classroom collaboration is the division of labor, ensuring that all members are engaged in the outcome.

An example of a drawback can be seen in Koh and Lim's study (2012) on using online collaborative tools. Participants found that while they completed the task and enjoyed the process of working with their group, they were not content with the results. Students found that using

tools such as Mediawiki and Wetpaint only added to the final outcome but did not affect team

satisfaction of the final product. Koh and Lim (2012) relayed that the students perceived the tools

as merely a working space that was adequate for their needs rather than an enhancement to their

final outcome. The researchers hypothesized that the sociability of collaborating was more of a

hindrance as idle chat between group members may have been a distraction from the group task

(Koh & Lim, 2012).

**Collaborative Learning in K-12**

Within the learning environment, prominent issues hinder education, and such issues

include but are not limited to: "the distance between faculty and students, the fragmentation of

the curriculum, a prevailing pedagogy of lecture and routinized tests, an educational culture that

reinforces student passivity, high rates of student attrition, and a reward system that gives low

priority to teaching. In many ways, the academy mirrors larger social trends of fragmentation,

lack of civic involvement, and undercurrents of alienation" (Smith & MacGregor, 1992, p.1).

However, collaborative learning serves to counteract such issues because it promotes intellectual

engagement and also encourages mutual responsibility for all members involved in the task at

hand (Garcia-Valcarcel, Basilotta & Lopez, 2014; Smith & MacGregor, 1992). In the classroom

setting, there are options of how collaborative learning can be used for student assessment such

as using individual scores and averaging group scores and also using the rate of individual

contributions (Swan et al., 2008).

However, in order to successfully utilize collaborative learning within the classroom,

specific requirements must be met; these requirements are as follows: detailed assessment rubrics

and emphasis on critical collaborative process (Swan et al., 2008). Another prominent factor for collaborative learning is not just interaction, but meaningful interaction centered around a purpose (Laister & Koubek, 2001). For instance, Garcia-Valcarcel, Basilotta and Lopez (2014) explained that teachers of Junta Castilla and Leon found collaborative learning through ICT to be more advantageous than disadvantageous in that it promotes social interaction, develops transversal skills, and expands curriculum development. Essentially, the core elements of collaborative learning is not focused on a singular activity, but producing jointly-created work (Prince, 2004).

Focusing on collaborative online reading, Kiili, Laurinen, Marttunen and Leu (2012) examined the individual and collaborative learning patterns of high school students in Finland. The study focused on the exploration and construction of knowledge in an activity where students read online information and engaged in collaborative argumentation. The final task was to use their knowledge gained from the readings and from peer discussions to co-construct an essay on a controversial topic. Within this study, the researchers found that the readers worked collaboratively to build upon each other's ideas which, in turn, assisted in the expansion of their own thinking. Kiili et al. (2012) further discovered that students who spent more time collaborating and co-constructing their knowledge with their partner scored relatively higher on their essay than students who spent less time collaborating with their partner. As such, this study suggests that collaborative learning can have positive effects on student achievement as well as the promotion of knowledge construction (Kiili et al., 2012).

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Collaborative learning can be seen both at a small and large scales. A prime example of collaboration is the Global Learning and Observations to Benefit the Environment (GLOBE), which is a world-wide collaborative project consisting of students in primary and secondary education (NEA, n.d), where the students collaborate to find solutions to address global issues through inquiry-based investigations of the environment. Conducted at a large scale, GLOBE serves as proof that collaboration is possible on a global scale and can be used to facilitate learning outside of a traditional classroom experience (NEA, n.d.). On the other hand, another instance of K-12 collaborative learning was a case study conducted with 32 secondary education students that focused on the discovery of spatial concepts using a Diary of Discovering Geometry (Choo, Eshaq, Samsudin & Guru, 2009). Researchers utilized a combination of descriptive and qualitative approach to explore students' online interaction with activities designed around the Engagement Theory. While the gain of knowledge in geometry was minimal, researchers found that the integration of the Diary increased student interest in computers and geometry and participants were willing to interact through discussion (Choo et al., 2009).

Collaborative learning has been seen to have social effects in K-12 settings. Research indicates communication and relational skills are pertinent in collaborative learning (Tolmie, Topping, Christie, Donaldson, Howe, Jessiman, Livingston & Thurston, 2010) and can be increased through group activities and tasks. Collaborative work results in both a gain in conceptual grasp and also a gain in social skills (Choo et al., 2009; Tolmie et al., 2010). Observations of group dynamics in collaborative tasks such as discussions indicated more

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willingness in student participation and peer interaction (Choo et al., 2009; Tolmie et al., 2010).

Additionally, researchers found that in order for collaborative learning to be productive, the

attitudes and interest of the students in the class activities is imperative for successful

implementation (Choo et al., 2009). Overall, collaborative learning results in both cognitive and

social gains (Choo et al., 2009; Tolmie et al., 2010).

## Web 2.0 Tools and Collaborative Learning

Web 2.0 services are heavily influenced by the social aspect in which these technologies

enable multimedia connections to any entity (Newman et al., 2016). Consequently, Web 2.0

technologies have allowed users and participants to create, use, share and distribute content

much easier than ever before (Dearstyne, 2007). Participatory technologies examples include

wikis, blogs, instant messaging and sites of social media (Ajjan & Hartshorne, 2008; Wood,

2005). Wheeler (2010) further relays that Web 2.0 tools are a viral change in society that

connects like-minded people and give them the opportunity to access information and organize

their own learning. Likewise, Spector et al. (2014) confirmed that the inclusion of such

programmed instructional materials to include collective knowledge has paved the way for

knowledge construction to emphasize authentic learning.

Furthermore, the emergence of Web 2.0 technologies was driven due to the easability of

collaboration (Dearstyne, 2007; Garcia-Valcarcel et al., 2014). Over the past few years, there are

many online collaborative tools that have been integrated into classroom learning (Brodahl et al.,

2011). For example, a case study, with 166 students, sought to illuminate student perceptions of

collaborative writing using collaborative Web 2.0 tools: Google Docs and EtherPad.

Approximately 26.5% of the student participants felt that the toll was effective in working

collaboratively as a group, but only 15.7% of the student participants found the tool to influence

the quality of collaborative work (Brodahl et al., 2011). Another study determined that while

using Blackboard as a course supplement, there were three prominent collaborative factors,

which were team dynamics, team acquaintance, and instructor support (Ku et al., 2013).

In this section of the literature review, the following topics will be discussed: web 2.0

tools for collaboration, example studies, and wikis and blogs.

**Web 2.0 Tools for Collaboration**

The adoption of Web 2.0 applications has grown in popularity because they have been

found to promote the development of sharing internal knowledge and collaborating using

document sharing tools (Dearstyne, 2007). Collaborative software, such as wikis and blogs, have

risen in popularity due to features such as instant messaging and unified communication

(Dearstyne, 2007; Wood, 2005, 2011). The use of Web 2.0 tools gives the users the ability to

collaborate and communicate to produce content (Pieri & Diamantini, 2014; Wood, 2011).

Due to the development of Web 2.0 tools, collaborative learning is no longer confined by

the boundaries of time and geography (Agosto et al., 2013; Hao & Lee, 2015). Not only does

Web 2.0 technology encourage collaboration amongst its users, the tools actively promote

participation in a learning environment (Garcia-Valcarcel et al., 2014; Pieri & Diamantini, 2014).

Carrió-Pastor and Skorczynska (2015) relayed that the many advantages of technology should be

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utilized in collaborative learning activities. Students found that an online collaborative setting is

successful if course objectives are clear and if the learning environment is supported, structured

and organized (Agosto et al., 2013; Ku et al., 2013). Agosto et al. (2013) further affirmed that

true online collaboration can only occur through thoughtful and careful planning with increased

assignment structure and specific due dates.

The facilitation of web 2.0 technology and collaborative activities has allowed for

meaningful learning (Carrió-Pastor & Skorczynska, 2015; Faja, 2013). Online management

systems (Faja, 2013) and tools such as Poliformat and Google Docs (Carrió-Pastor &

Skorczynska, 2015) allow students to communicate with their peers for specific content,

resulting in the promotion of social interaction. Communicative technology, file sharing, and

collaborative writing spaces provided the means for the students to complete group tasks.

However, in both Faja's (2013) and Carrió-Pastor and Skorczynska's (2015) studies, researchers

determined that while the learners are in charge of their peer interaction and study activities, all

tasks need to be facilitated and supervised by the teachers to result in positive outcomes. As

such, when the instructor provides clear instructions and monitors the collaborative activities,

online collaboration can be beneficial as it allows students to seamlessly maximize their learning

(Carrió-Pastor & Skorczynska, 2015; Faja, 2013).

**Wikis and Blogs for Collaboration**

While there are numerous types of Web 2.0 collaborative tools, two prominent tools are

blogs and wikis (Dearstyne, 2007; Wheeler, 2010). Moreover, blogs and wikis, known as the

"killer apps" (Cheng & Chau, 2011), are helpful in that they allow users to generate and share content (Wheeler, 2010). As noted by Cheng and Chau (2011), the popularity of blogs and wikis has increased due to the read/write capabilities for users to edit, amend, browse and generate content, graphics, and hyperlinks to expand knowledge with a global audience. Consequently, blogs and wikis have become a prominent tool in higher education (Dohn, 2010).

In particular, tools like wikis have been found as powerful tools that connect users together (Wood, 2005). In a 2005 - 2008 study, researchers found that wikis promote positive competencies in skills such as critical thinking, technology literacy, and communication (Reich, Murnane, & Willett, 2012). Wheeler (2010) further noted that wikis are collaborative in nature that they allow for multiple authors, which promotes interaction between peer members and produces documents that are nonlinear and continuously evolving documents. Additionally, wikis are useful for providing information and gathering feedback and allow for continuous editing for optimal viewing (Hudson, 2018; Wood, 2005). This allows for the wiki document to last longer as it is able to be edited with updated information (Wood, 2005). Sites like Wikipedia have been the epitome of online interconnectedness and emphasizes the benefits of online collaboration (NEA, n.d.).

When using wikis, users can equally contribute to a work (Cheng & Chau, 2011) and do not need technical skills or training due to the tool's features (Hudson, 2018). A study examined the use of an education wiki for collaborative writing, where the study took place over the course of two weeks and the students were tasked with using Wikispaces, an educational type of wiki, to complete a series of collaborative writing tasks (Hudson, 2018). Through data triangulation,

findings suggested that students found value in working collaboratively on the writing task and that the tool allowed users to differentiate their writing and improve their English language skills (Hudson, 2018). However, participants relayed that while there were benefits to using Wikispaces, the teacher's role was significant to keep learners engaged throughout the tasks (Hudson, 2018). Consequently, research suggests that a blended approach with teacher participation is necessary for wikis to be used in collaborative tasks (Hudson, 2018).

On the other hand, blogs are singularly owned (and identified as flexible technology that are attached to a core system with changing features for template styles (Wood, 2005) where users do not need any technical background to use (Lu & Churchill, 2011). Moreover, Wood (2005) and Lu and Churchill (2011) relay that blogging software and systems are popular in use as a web publishing application. While there are numerous blogs that are designed for corporate use, blogs can also be used for personal blogging (Cheng & Chau, 2011; Wood, 2005) and are designed to contain multiple features such as text, graphics, animations, links and other media (Lu & Churchill, 2011).

Blogs have similar features to wikis but substantially differ in terms of ownership. Blogs are controlled and owned by the blogger themselves and are predominantly individualized writing works (Sun & Chang, 2012). Students have used personal blogs to run continuous commentary on their learning experience by communicating their personal thoughts, sharing ideas with peers, posing questions for discussion, challenging specific topics and commenting on other blogs (Wheeler, 2010). An example of a blogging platform is Twitter, which is a form of microblogging, in that it allows its users to engage in short messaging services (Wheeler, 2010).

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Additionally, blogs have been found to be easier than creating a word processing document (Wood, 2005) and can serve as a tool that resembles a learning diary (Cheng & Chau, 2011; Wheeler, 2010). Consequently, digital natives (Prensky, 2007) have used Web 2.0 tools like these in their everyday lives (An et al., 2009).

Using blogs effectively in pedagogical settings allows knowledge sharing and builds connections among learners that is not limited to a classroom (Sun & Chang, 2012). In one study, researchers found that using a blog provides a platform for the students to re-construct their knowledge with each other online, as social interaction (Sun & Chang, 2012). Participants were given the opportunity to share their breakthroughs of writing, reflect and analyze learned knowledge and seek clarification regarding writing. Collaborative tools, such as blogs, provide a space for students to interact and socially support each other through academic tasks (Sun & Chang, 2012). Additionally, critical thinking skills were seen as a benefit from this study, as a participant could verbalize an issue via his/her blog and other participants could collectively engage in problem-solving through knowledge-constructive dialogue.

In sum, there are numerous Web 2.0 tools available for public and free use. Technologies such as these can be used in various manners but have been found to have positive effects in the classroom setting (Garcia-Valcarcel et al., 2014). Over the years, studies on the uses of Web 2.0 tools have been documented with beneficial results (An et. al, 2009). According to literature, the benefits of using Web 2.0 tools include the provision of user autonomy and the range of interactive features to communicate, share and contribute to a project (Hudson, 2018). Fatimah and Santiana's (2017) study, for example, found that with the use of Web 2.0 tools, such as

Edmodo, Prezi, Glogster, Goanimate, and Toondoo, there were numerous benefits for both the students and the teacher. Fatimah and Santiana (p. 130, 2017) specifically stated the benefits as:

1. Media technologies can improve teacher's creativity.

2. Media technologies can produce better learner experience.

3. Media technologies can increase students' motivation.

4. Media technologies can help to assess students.

5. Media technologies can make the students focus on the material given.

6. Media technologies can build teacher confidence.

In contrast, researchers have noted that exposing technologies to students does not necessarily equate collaboration, but instead, collaboration is only afforded through strong instructor support, low learning curves and facilitated peer interaction (Agosto et al., 2013). While tools like wikis and blogs can be used as platforms for extending student knowledge, instructor presence is a necessary aspect with Web 2.0 tool integration (Hudson, 2018; Sun & Chang, 2012). In order to beneficially facilitate a productive learning space, instructors must monitor student interaction, give timely feedback, provide online support, set up structured learning activities and encourage collaborative behavior (Hudson, 2018; Sun & Chang, 2012). Consequently, Web 2.0 tools seem to be perceived as mostly beneficial for education if specific criteria are met.

# Conceptual Framework

In today's society, technology is present in almost all aspects of daily living such as the workplace, the home front, and even in education. With the availability of technology, the use of digital learning environments has been prevalent in K-12 schools (Spector et al., 2014). With this in mind, Web 2.0 tools are some of numerous digital tools that are used in society's daily routines. This study's conceptual framework expounds on the impact of Web 2.0 tools in today's modern educational setting for collaborative learning. In the past, the three main pedagogical theories that drove education were Cognitivism, Behaviorism, and Constructivism; however, with the shift of knowledge epistemology, new theories have been developed to accommodate the emergence of technology (Spector et al., 2014; Wood, 2011). Therefore, this study's conceptual framework is founded upon three theories: Social Constructivism (Vygotsky), Modes of Discourse and Technology Affordance Theory.

## Social Constructivism

For this study, the focus will be on the exploration of the relationship between the social constructivist theory (Vygotsky, 1986) and the affordances for collaboration provided by Web 2.0 tools. Lev Vygotsky's (1978) works that emphasize social interaction to increase cognition. A key aspect of Vygotsky's theory pertains to the Zone of Proximal Development, which was developed in Vygotsky's Mind in Society (1978). The Zone of Proximal Development (ZPD) is defined as: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving

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under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Essentially, if a student is in the ZPD, the student's learning is assisted by a person with more knowledge, scaffolded instruction, and social interaction (McLeod, 2019; Vygotsky, 1978). Spector et al. (2014) and Liu and Chen (2010) support this claim and argue that human activity plays a major role in gaining knowledge.

According to Vygtosky's Zone of Proximal Development, the central concept is that individuals learn best through collaborative endeavors (Shabani, Khatib & Ebadi, 2010). Specifically, students are given the opportunity to internalize new ideas and skills through collaborative efforts (Shabani et al., 2010). Badrova and Leong (2015) clarify that socially constructed learning is not simply through learning from peer-to-peer interaction, but states that the individual learns from a more knowledgeable peer capable of providing assisted tutoring or teaching. The application of ZPD is not limited to one-on-one interaction but also extends to group assistance where the group is collectively "more knowledgeable" rather than singularly knowledgeable as an individual (Bodrova & Leong, 2015). The idea of ZPD is that after the learner has completed the joint task with a more skilled peer, they will, in turn, have the ability to do the same task by themselves independently (Shabani et al., 2010). However, this learning does not stem from mindless copying of action, but is founded upon imitation through the learner's understanding and within the zone of the learner's intellectual potential (Vygotsky, 1986).

McLeod (2019) further explains that the modern interpretation of Vygotsky's theories functions as reciprocal teaching, which is used to improve student learning. Beetham and Sharpe

(2013) relay that in a situated perspective, all learners are somewhat subjected to external influences on social and cultural levels. Learning is distributed socially and learning outcomes are a result of individuals participating in those practices (Beetham & Sharpe, 2013; Raisinghani, 2016). With the phenomena of web-based social networking, it has put emphasis on the potential of social learning (Beetham & Sharpe, 2013), as CSCL supports groups of learners who collaborate to co-construct knowledge (Spector et al., 2014). Through virtual/digital learning environments such as online forums, educational games, social constructivism is utilized in inquiry-based learning (IBL) and problem-based learning (PBL) where students construct solutions in small groups with the instructor serving as a facilitator (Spector et al., 2014). With this in mind, McMahon (1997) determined that Vygotsky's theories favored learning as a social construct that is mediated through social discourse.

**Modes of Discourse**

Discourse is defined as "the set of norms, preferences, and expectations relating language to context, which language users draw on and modify in producing and making sense out of language in context" (Ochs, p. 289, 1990). Discourse knowledge refers to the production and interpretation of verbal acts and communication (Ochs, 1990). In terms of collaborative learning, collective knowledge advancement pertains to three modes of discourse: knowledge sharing, knowledge construction, and knowledge creation (van Aalst, 2009).

Knowledge sharing is the transmission of knowledge between individuals, where only information can be communicated between the sender and the receiver (van Aalst, 2009). Van

Aaslt (2009) further explains that in social practice, knowledge sharing can be seen as an accomplishment because people do not naturally tend to share knowledge unless there is an avenue for promotion of social position. In terms of collaborative inquiry, knowledge sharing practices pertain to introducing information and ideas without delving deeper into knowledge interpretation, evaluation and development (van Aalst, 2009).

Knowledge construction pertains to the system in which students solve problems and construct their own understanding of content (van Aalst, 2009). It is assumed that constructivism is when the students make meaningful connections to prior knowledge (von Glasersfeld, 1995). Due to the high levels of interaction, knowledge construction can lead to the restructuring of knowledge and even the creation of new concepts (van Aalst, 2009). Van Aalst (2009) notes that an example of such reconstruction is the perception of an apple falling from a tree, in which two individuals observe the motion of the apple and can imply deeper understanding of the relationship between gravity and the earth's orbit. This synthesis of information is the result of knowledge construction and the development of a higher plane of understanding (van Aalst, 2009). Furthermore, knowledge construction extends to involve multiple cognitive processes, which include "explanation-seeking questions and problems, interpreting and evaluating new information, sharing, critiquing, and testing ideas at different levels, and efforts to rise above current levels of explanation, including summarization, synthesis, and the creation of new concepts" (van Aalst, 2009, p. 6). In comparison to knowledge sharing, knowledge construction emphasizes the building upon the student's prior knowledge to produce deeper and more complex knowledge (van Aalst, 2009).

Knowledge creation is the development of new ideas and is strictly dependent upon external conditions where the knowledge is to be created (van Aalst, 2009). As van Aalst (2009) noted that knowledge creation is not a rational effort, Bereiter (2002) informed that design and improvement of intellectual concepts are prime factors of knowledge creation discourse. In order for knowledge to be created, discourse is required to identify the priorities and long-term goals of the community (van Aalst, 2009). Bereiter (2002) identified a class of students to be a community, as they share a commitment to create works and ideas as intellectual artifacts through social discourse.

While all three modes of discourse share similarities such as posting questions and summarizing progress, they inherently differ in their interpretation according to psychological perspectives (van Aalst, 2009). In summary, knowledge sharing, knowledge construction and knowledge creation are pertinent to multiple theoretical perspectives but are not limited to singular modes of learning (van Aalst, 2009). Consequently, computer systems and Web 2.0 technologies support community discourse as students are able to communicate ideas and exchange information to build shared knowledge in an established database (Spector et al., 2014). Ergo, anyone or anything, including tools, who directly interacts with the learner in a learning context has an influence on the social world of the learner (Liu & Chen, 2010).

**Technology Affordance Theory**

Due to the use of technology in the study, this research study will explore Gibson's Affordance Theory and its relevance to identifying the influence of Web 2.0 tools on

collaborative behavior. The term affordance was first introduced to expand concepts within the field of ecological psychology and was defined as things that will result in both bad and good consequences (Gibson, 1986). Gibson further defined this term as the perception in which an object is used. On the other hand, Norman (1988) affordances can be determined by four main constraints: physical, semantics, cultural and logical. For instance, Norman (1988) used the construction of a lego motorcycle as an example where these four constraints are universal in that individuals were given pieces of legos and were able to construct the motorcycle without any need for instructions or guidance. Hence, the participants were able to identify the affordance of the lego pieces based on the physical, logical, social, and semantical aspects of the object.

While it was originally Gibson (1986) who perceived affordance as environmental possibilities to the actor, Hutchby (2001) was the first researcher to relate the environmental affordances to technology. Mesgari and Faraj (2012) further expanded on the elements of technology affordances, which are functional and relational. Functional pertains to the purpose or task and relational pertains to relating to a specific group or user (Mesgari & Faraj, 2012).

There are numerous perspectives pertaining to theory on technology affordance and the features of Web 2.0 technology (Mesgari & Faraj, 2012). As such, the genesis of the study derived from the affordances that Web 2.0 tools provide. In terms of research, affordances of technology refers to the intended, prescribed or designed function of technology (Conole & Dyke, 2004). In order to comprehend the affordances that technology provides, the users must first understand the capabilities and limitations that technology possesses (Gaver, 1991; Mesgari

& Faraj, 2012). Concurrently, Gaver (1991) explained that the perception of affordances are determined by the user's culture, social setting and experience, where the concept of affordances implies that the aspects of the object refer to the compatibility to the user.

A particular affordance is the collaboration affordance, which refers to the possibilities of cooperative and interdependent activities (Mesgari & Faraj, 2012). In their Wikipedia study, Mesgari and Faraj (2012) explored the collaborative affordance of Wikipedia, as thousands of users contribute to the same work. They concluded the Web 2.0 tool, Wikipedia, opens the floor for numerous behaviors in article discussions, page creations, and group announcements (Mesgari & Faraj, 2012). Furthermore, it is on these pages of numerous behaviors that interpersonal collaborations take place; yet ,this space is bound by social norms, such as user politeness and positivity (Mesgari & Faraj, 2012).

However, affordance refers to both the intended and unintended uses that technology provides (Conole & Dyke, 2004). One example of unintended use is the feature of Google's hyperlink, which now provides a means of creative use for user engagement (Conole & Dyke, 2004). Another example of technology affordance of the hyperlink is when classroom teachers utilize this feature to create more interactive lessons (Conole & Dyke, 2004). Davis and Chouinard (2017) further expand on the conditions of affordances, which are perception, dexterity, and cultural and institutional legitimacy.

**Study's Conceptual Framework**

The study's conceptual framework, depicted in Figure 1, began with the exploration of enabling technology to complete collaborative activities in small groups. In the first lesson, the

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teacher introduced the purpose of the group activities, which were to be completed with the use of Web 2.0 tools. As students began using the tools, they explored the affordances of Web 2.0 technology and utilized the collaborative features of the tools to work with their small groups. The expectation was that the students would internalize the learning within their small groups, engendering Vygotsky's Zone of Proximal Development.

The study focused on how the students used the Web 2.0 tools to complete collaborative activities and examined if there was an influence on collaborative behavior as a result. A deeper understanding of student behaviors, perceptions of the tools and collaborative learning was sought. The researcher collected data through triangulation obtained from a participant survey, observations, and interviews. Figure 1 shows how this researcher visualized the links between these theories and collaborative learning.

**Figure 1**

*Conceptual framework linking collaborative learning through the affordances of Web 2.0*
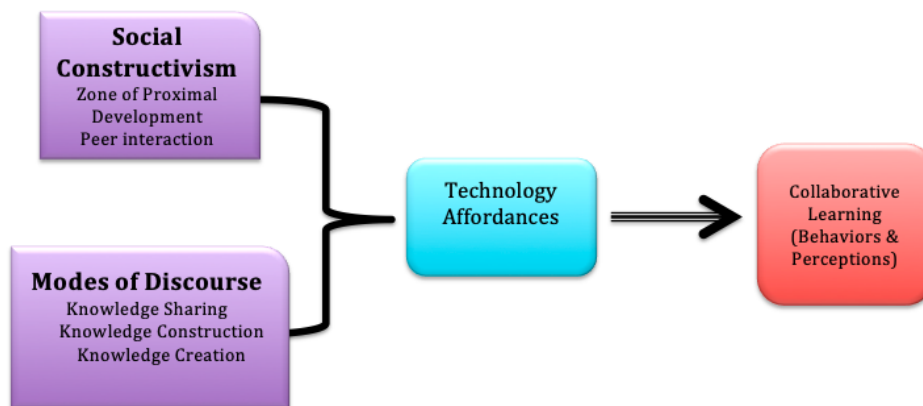
## Need or Significance

With the advent of technology, the focus of learning environments has shifted to a new paradigm for learning, a paradigm that emphasizes technology (Spector et al., 2014). Hence, this study will focus on determining the influence of technology, specifically Web 2.0 tools, on collaborative behavior in a K-12 learning environment. This study will also focus on the development of a soft skill, collaboration, which will be fostered with the use of Web 2.0 tool integration. While there are numerous studies exploring collaboration and Web 2.0 tools, there is little to no knowledge of the link between these two concepts. This is especially true for K-12 classroom settings in small rural communities, including island nations such as American Samoa.

Although Web 2.0 tools are world-renowned, there have been few empirical studies on educational technology integration and how the tools can potentially impact online collaborative learning environments. Additionally, the findings of this study may not be limited to American Samoa, but may also be applicable to other teaching environments that are looking to integrate technology and boost student collaboration. This study may open up new channels for tool developers to enhance the collaborative capabilities for Web 2.0 tool applications. Consequently, e-learning approaches are more common and relevant to this digital age (McLoughlin & Alam, 2014) with technology integration as a forefront in learning communities (Spector et al., 2014), and as such, small places like American Samoa must keep up with the ever-changing needs of an evolving society.

## Summary

This chapter looked at the research literature in the fields of Web 2.0 technology and collaborative learning and defines both concepts in this study. Research indicated evidence of the significant affordances that Web 2.0 technology provides to promote collaborative learning. The chapter further reviewed the impact of collaborative learning on individual and group behavior of student participants.

This study is significant due to the fact that there are currently no studies in American Samoa that support the integration of Web 2.0 tools to boost or influence collaboration. Yet, a major aspect of every education discipline is collaborative learning (Smith & MacGregor, 1992). Therefore, secondary educators and students can  benefit from this study, as it will provide a basis of a guide to build collaborative skills.

# CHAPTER 3. METHODOLOGY

The purpose of this qualitative case study was to determine how the utilization of Web 2.0 tools influences collaborative learning for secondary education students in American Samoa. The study addressed the following research questions:

RQ1: How do students interact with each other using Web 2.0 tools during collaborative learning? (observation)

RQ2: How do students interact with the Web 2.0 tools during collaborative learning? (observation)

RQ3: How do students describe their experience using Web 2.0 tools in collaborative learning? (interview and survey)

RQ4: What are the student's perceptions of using Web 2.0 tools for collaborative learning? (interview and survey)

RQ5: How do students believe the use of Web 2.0 tools for collaboration influenced their learning? (interview and survey)

This chapter includes an overview of the participants, study setting, instrumentation, and data collection and analysis processes. Furthermore, this chapter addresses the process for recruiting participants and gaining their assent as well as the consent of their parent(s) or guardian(s). Finally, this chapter addresses the rigor of this study.

# Research Design

A case study is defined as a method to explore and understand how individuals or a group of individuals contribute to a social problem (Creswell, 2003). Case studies can further be defined as a research process that "involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes and the researcher making interpretations of the meaning of the data" (Creswell, 2003, p. 37). The primary essence of case studies is to explore multiple perspectives rooted in a specific context (Lewis & McNaughton, 2018). Furthermore, Yin (2009) concludes that a case study focuses on answering the "why" and the "how" questions of exploring behavior in contextual conditions. Figure 2 illustrates the process for conducting a case study (Kähkönen, 2011).

**Figure 2**

*Process for Case Study Flow Chart. From Kähkönen, 2011, p. 32*
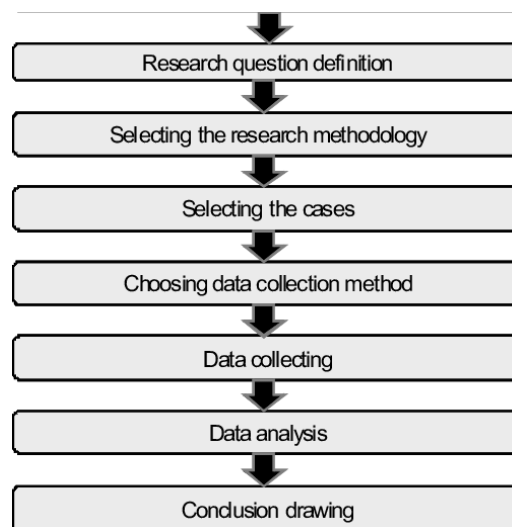
The case study is considered an "all-encompassing method" as it is a research strategy that covers all  facets: design, data collection techniques and approaches to data analysis (Yin, 2009). This case study used qualitative data collection methods to capture the complexity of the study. A qualitative case study is a method researchers use to study an intricate phenomena within a specific context (Baxter & Jack, 2010; Ormston, Spencer, Barnard, & Snape, 2018). Creswell (2003) shared that qualitative research is structured to render the intricacies of a situation while maintaining focus on individual meaning.

This qualitative case study design was to determine how the utilization of Web 2.0 tools influences individual and group behaviors in collaborative learning for secondary education students in American Samoa. The study investigated how students interact within a collaborative learning activity while using various Web 2.0 tools. The study also explored the perceptions students have about utilizing these tools for collaborative learning and student perceptions of how each tool may have impacted student learning. The case study utilized triangulation to gather data that are detailed and involve multiple sources of information (Baxter & Jack, 2010; Shoaib & Mujtaba, 2016).

## Conceptual Framework

The foundation of this study was  based on three theories: Social Constructivism (Vygotsky, 1986), Modes of Discourse (van Aalst, 2009) and Technology Affordance Theory (Gibson, 1986). As noted in Chapter 2, the research is rooted in exploring the knowledge individuals construct through the Zone of Proximal Development (Vygotsky, 1978) with three

Modes of Discourse: Knowledge Sharing, Knowledge Construction and Knowledge Creation

(van Aalst, 2009). The study aimed to explore the affordances web tools may provide which may

influence individual and group behavior in collaborative learning.

All five research questions were developed to answer the overarching focus of how Web

2.0 tools affect student behavior in a collaborative learning activity. Specifically, RQ1 and RQ2

were designed to examine student interaction with each other and with the tools. RQ1 and RQ2

will be answered through researcher observations.

The third, fourth and fifth research questions were developed to gather student

perceptions and beliefs they had during this study while using the tools for collaborative

learning.  RQ3, RQ4 and RQ5 will be answered through participant interviews and a survey.

Below is Figure 3, which indicates how each research question connects to the Conceptual

Framework of this study.

**Figure 3**

*Connection of Research Questions to Conceptual Framework*
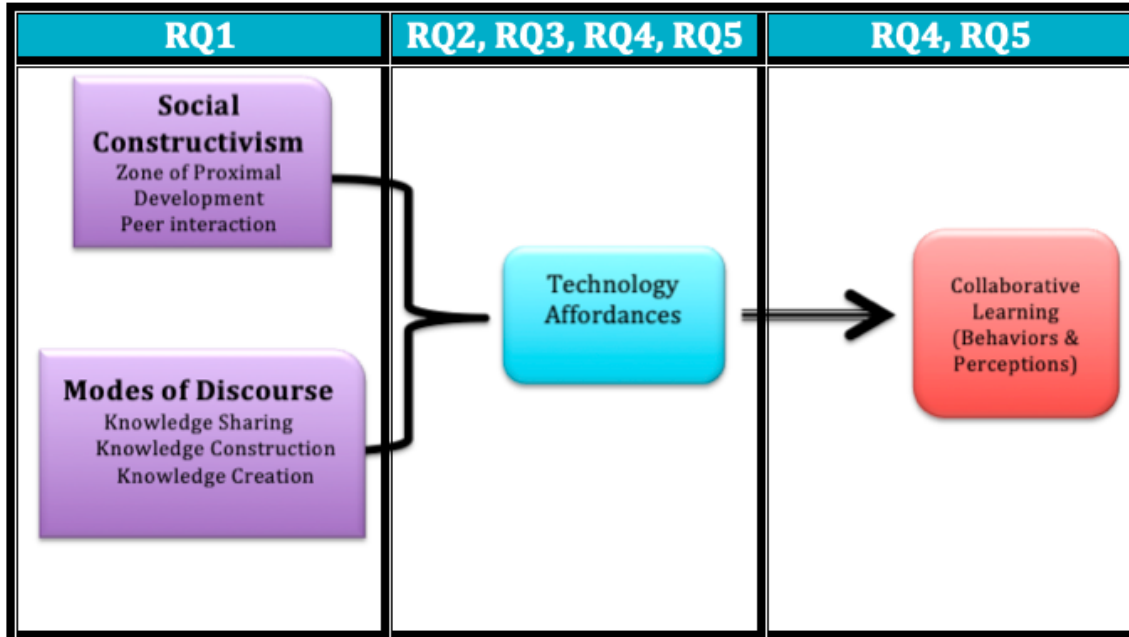


## Participants and Context

### Study Setting

The study institution was a public high school located in the central district of an island located in the Pacific. Total enrollment of the institution averages about 900 students every year and has an average of 170 - 190 students per grade level. The institution offered face-to-face instruction with an average class size of 20 - 25 students in core subject classes. In addition, the institution abides by a standards-based curriculum. While the entire education system encourages technology integration with its Goal #4 (as noted in Chapter 1), the institution did not have a formal learning management system and does not offer online learning. There was no formalized

teacher training to integrate technology, and access to technology devices is minimal. In addition, consistent and accessible wireless Internet was rare and most teachers did not have access to Internet connection from the classrooms.

## Participants

The participants in this study were students from the secondary education institution described above. Specifically, the students were of one class of 12th graders who ranged from the ages of 16 to 18 years old. The class size was 20 students with a total 15 participants. As the study was a qualitative case study, a purposeful sampling approach was used. Purposeful sampling is commonly used in qualitative research to identify information-rich cases (Palinkas, Horwitz, Green, Wisdom, & Hoagwood, 2015).

The purposeful sampling consisted of students enrolled in public high school in American Samoa in the central district of Tutuila, American Samoa's main island. The sampling frame was chosen as a typical case sampling as the students were the typical population affected by technology integration in a school setting, and it is a goal of ASDOE to foster technology development (ASDOE, 2019). The criteria for inclusion in this sample was based on enrollment into the senior level English class at the public high school.

Throughout the research process, ethical practices were used and were a priority to uphold. Approval was first gained from ASDOE (Appendix A) as the study took place in an ASDOE institution. Approval was also gained from the University of Hawaii IRB (Appendix B) as the study involved human participants. Parental consent (Appendix C) and student assent

(Appendix D) from each potential participant were also gained prior to the start of study. If parental consent and student assent were not signed and submitted prior to the study, the student still participated in the class instruction but the student's individual data were not  utilized and they were not noted for observations or  selected for an interview. Participation in the study was voluntary and the participants were fully informed about the study's purpose, benefits, and risks, as well as the handling and accumulation of data.

Near the culmination of the study, the researcher selected six participants to interview. Creswell (2003) notes that six is  an average number of interviews for this type of qualitative data. The participants were evenly selected with three males and three females. Selection was based on completion of the collaborative activities using the selected Web 2.0 tools and to try and include a range of ability levels.

All forms, observation notes, artifacts and any other documents related to the research have been kept confidential. Throughout the study, a locked fireproof safe, at the private residence of the researcher, was used to store the documents. The computer used was  encrypted to protect confidentiality.

## Instrumentation and Procedures

The purpose of this study was  to provide in-depth insights into how Web 2.0 tool tools impact individual and group behavior in collaborative learning. As this was  a qualitative case study, all data were analyzed through coding, categorization and theme development. Table 1 illustrates the alignment of research questions to the conceptual framework.

**Table 1**

*Alignment of Research*

| Research Question | Connection to Conceptual Framework | Measurement | Data Outcome |
|---|---|---|---|
| RQ1: How do students interact with each other using Web 2.0 tools during collaborative learning? | Social Constructivism & Modes of Discourse | Researcher observations of the participants throughout the study. | Provided data to determine how participants interacted with each other while using web tools. |
| RQ2: How do students interact with the Web 2.0 tools during collaborative learning? | Technology Affordances | Researcher observations of the participants throughout the study. | Provided data to determine how participants interacted with the web tools to complete a task. |
| RQ3: How do students describe their experience using Web 2.0 tools in collaborative learning? | Technology Affordances | Interviews and Post-survey about participant views on using web tools in the classroom. | Provided data to understand participants' views about using web tools for collaborative learning. |
| RQ4: What are the student's perceptions of using Web 2.0 tools for collaborative learning? | Technology Affordances & Collaborative Learning | Interviews and Post-survey about participant views on using web tools for learning. | Provided data to understand participant views of using web tools for collaborative learning. |
| RQ5: How do students believe the use of Web 2.0 tools for collaboration influenced their learning? | Technology Affordances & Collaborative Learning | Interviews and Post-survey about views about how web tools influenced learning | Provided data to understand participants' views of how using web tools influenced learning. |

The instrumentation aligned with key elements considered common characteristics of qualitative research identified by Ormston, et al., 2018:

- Aims and objectives that are directed at providing in-depth and interpreted understanding of the social world of research participants by learning about the sense they make of their social and material circumstances, their experiences, perspectives and histories

- Data that are detailed, rich and complex

- Analysis that retains complexity and nuance and respects the uniqueness of each participant or case as well as recurrent, cross-cutting themes.

- Openness to emergent categories and theories at the analysis and interpretation stage.

- Outputs that include detailed descriptions of the phenomena being researched, grounded in the perspectives and accounts of participants.

The instrumentation for this qualitative case study is  detailed in the paragraphs below.

**Observations**

For this study, the researcher created the observation notes form (Appendix E) adapted from Creswell's (2007) observation field notes form. The researcher utilized direct observations, specifically naturalistic observations. Observations in a natural setting refer to researchers collecting data from "the site where participants experience the issue or problem under study" (Creswell, 2003, p. 175). The observations served to answer research questions one and two. The observations focused on how the participants used each tool and how the participants interacted with each other while using the tools.

**Interviews**

The secondary source of data were semi-structured interviews from six participants from the learner groups. Interviews are often used in combination with observations to provide the reconstructed perspectives of how behaviors or events arise (Ritchie & Ormston, 2018). With this in mind, the researcher developed the interview protocol (Appendix F) based on the research questions for this study. The interview was used to answer RQ3, RQ4 and RQ5. The interview consisted of open-ended-questions to elicit the students' perceptions, views, and opinions (Creswell, 2003) on the affordances web tools can or cannot provide. In this case study, I aimed to investigate what happened, how it happened and why it happened. For example, what the students did while using the tool in the collaborative activity, how the students behaved/acted while using the tool in the collaborative activity, and why the students did what they did while using the tool in the collaborative activity.

Moreover, I asked questions regarding the dynamics of the group and aimed to uncover how web tools can be used to bolster collaborative learning. With the semi-structured interviews, I learned more about how the participants felt about the tools and explored which tool they thought would be the better fit to employ in collaborative learning activities. I also explored students' perceptions of how using the collaborative tools and participating in collaborative activities influenced their learning. Table 2 showcases examples of the relationship between the interview questions and research questions three, four and five.

**Table 2**

*Research Questions and Interview Questions*

| Research Questions | Interview Question |
|---|---|
| RQ3: Describe experience using Web 2.0 tools for collaborative learning | How did your group use XXX tools to begin the group task(s)? Can you give me some examples? How did your group decide to begin the task(s) this way? How did you use XXX tools to communicate with other group members? Can you give me some examples? How did your group decide to communicate this way? Was the XXX too easy or difficult to use? Please explain why or why not? How did you use the XXX tools to share resources with your group members? Can you give me some examples? How did your group decide to share resources this way? |
| RQ4 Perceptions of using web tools for collaborative learning | What is your most memorable experience in using XXX tools? Why is that experience memorable? What did you like or not like about XXX tools? Google docs? Blogger? Wikidot? Tell me about your group members and their work styles. How do you think the XXX tools helped or did not help you collaborate? How did your group use the XXX tools to keep everybody productive? Can you give me some examples? Overall, how would you describe this group collaboration experience using the XXX tools? |
| RQ5 : Perceptions of how Web 2.0 tool use influenced learning | How did using the XXX tools affect your overall learning experience? Overall, how do you think using these web 2.0 tools influenced your learning? Is there anything you would tell other students about your experience using these tools? If another teacher were planning to use these tools in their classes, what advice would you give them? |

**Survey**

The third and final source of data was from a post survey. The quantitative survey allowed participants to rate their experience using a scale or number (National Business Research Institute, 2020). For this study, each participant took the post survey after each tool was implemented, which helped answer RQ3, RQ4 and RQ5. The survey assessed the students' perceptions of the tools, collaborative learning, and their own learning and how it may have been impacted by the Web 2.0 tools. The survey collected the participants' responses to gain a better understanding of how students perceived web tools and determined how each affordance emerged (or did not emerge) in collaborative learning. The researcher sought to measure constructs such as tool usability, communicative features, and ability to promote collaboration. The post survey was developed by the researcher based on the five research questions and literature reviewed for  this study.

## Treatment

Before the implementation of web tools in the classroom, the participants were introduced to the writing process as the collaborative activity encompassed this concept. The writing process was reviewed to include pre-writing (brainstorming), drafting, editing and publishing. This process was taught prior to the implementation of web tools so that all participants were familiar with this practice.

For this study, the participants were introduced to the three different web tools that were used for collaborative writing. The teacher introduced each web tool during a tutorial session, where the teacher used slides and media clips to introduce the tool. The participants were allowed to research additional tutorials and tips to assist them in becoming more familiar with the web tools.

The study's treatment consisted of a two-week implementation each for three separate Web 2.0 tools. The three web tools were chosen based on the ease of use, accessibility, and collaborative features. The tools were also chosen to accommodate the writing tasks. The following web tools were  implemented based on the level of difficulty for participant use:

1.  Google Docs

2.  Blogger

3.  Wikidot

The researcher first became familiar with each tool prior to the implementation of the study. This was to promote a more fluid learning experience for the participants and so that the researcher could  provide effective tutorials for maximum tool use.

The first web tool, Google Docs, was used through the participants' personal Gmail accounts, which were  mandated in the course. As the tool is similar to Microsoft Word, a platform the students were  familiar with, the tutorial lasted 15 - 20 minutes long. The tool allows for multiple users to collaborate on a document with real time changes and has saved drafts of the document with color coded tracking. For the first day of the first two-week session using Google Docs, the teacher introduced the objective of the writing assignment, which was to

produce a collective writing piece. The end objective was for the students to identify a college/university of their choice to research. The small group of participants split the research into specific parts for each group member to collect information and then paraphrase the information in their own words. Together, the students collaborated to complete the final write up to promote consistent tone and fluidity of information. Essentially, the writing had multiple sources but one production, which was in the form of a brochure.

Blogger was the second tool implemented. Blogger is a free domain product that offers easy-to-use templates with flexible layouts, which makes it easy for users to edit. To create this blog, the participants used their Gmail accounts. The platform for Blogger differs from Google Docs, where it does not show real time editing or have color coded history tracking. As such, the level of difficulty to use was slightly higher than Google Docs, so the tutorial was 30 minutes long. Throughout the tutorial, the teacher showcased example blog posts that the students emulated. At the end of the two-week period, the objective for the students was to create a blog series of at least three posts that highlighted a college of their choice (could not be the same college as the previous assignment). Each blog post was written in paragraph form where the participants collaborated to compose summaries/highlights for their chosen colleges. Each post was at least three paragraphs long, with a minimum 5 - 7 sentences in each paragraph.

The final tool that was implemented was Wikidot, which is a platform where users can build wiki-based websites to publish content and share documents. Wikidot differs from the features of Google Docs and Blogger and is, instead, similar to web tools like Weebly. Multiple users can edit the page, but it differs in that only one editor can make changes to a specific

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section at a time. The platform was a bit more difficult to use than Blogger as you can employ more features, so the tutorial was 40 minutes and included multiple example sites for the students to reference. The final assignment focused on the students collaborating to complete the same assignment but through a "website" . The goal was to "sell" or introduce their school with their own writing to recruit their peers to their chosen college/university.

The purpose of each assignment focused on the key components of the ASDOE English curriculum which include reading and writing. ASDOE graduates are expected to read information and cite evidence from the text, and the curriculum strongly encourages students to write fluently. Another aspect ASDOE promotes is college and career readiness. For this school's senior English curriculum, students are expected to fill out multiple college applications. Ergo, the assignments were relevant to the participants as they provided the students with information that was relevant to the curriculum and college and career preparedness. As such, the students worked on comprehending the readings from their research on the colleges to practice their writing skills in assignments that were  applicable to them.

In sum, each tool was implemented in the classroom for a two-week period. Each assignment was similar in focus so that the participants were doing collaborative writing. The participants used the tools three times a week for 40 minutes each class meeting. During the duration of the 6-week treatment, the researcher observed how the participants interacted with the tools and with their group members. The observations were coded by the researcher through MAXQDA once the data was collected. Once the two-week implementation was completed for each tool, the researcher surveyed the students. The final tool survey contained an additional set

of questions to determine the perceptions of using web tools overall. From the survey, the researcher selected a subset of students for interviews based on the varied responses of the participants.

## Data Collection

In traditional qualitative studies, researchers focus data collection through observations, interviews and document review (Wheeldon & Faubert, 2009); however, new approaches have emerged in the past decade as researchers have determined there is no single way to carry out qualitative research (Lewis & McNaughton, 2018; Ormston, et. al, 2018). Yin (2009) noted that case studies differ from histories in that case studies provide two additional elements of data collection: observations and interviews. For this study, data was collected using three methods, which were direct observations, interviews and a post survey. At the end of each two-week period, the participants used the web tool to complete a collaborative writing assignment. In this way, the researcher assessed the affordances each tool may provide for collaborative learning.

The purpose of observation was to observe behavior perceived to occur in a natural setting (Lewis & McNaughton, 2018). The researcher was the observer as a participant, which is when the researcher is known and recognized by the participants (Sauro, 2015). During the observations, the researcher did not interact with the participants and was only present to observe. Observations were made with the observation field notes form (Appendix E) with a column to describe the events as they occurred and another column for researcher reflective notes. The researcher used observations to expose possible influences and behaviors that

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individuals may not be aware of and focuses on understanding what actually occurred rather than

an account of what was thought to occur (Lewis & McNaughton, 2018). In addition, there was

no use of video or audio recording at this time.

A survey refers to the study of a population through a systematic method of gathering

information (Hansen, 2010). For this study, a quantitative survey was used. Quantitative surveys

can be used to explore attitudes and behaviors and also permits an understanding of the

magnitude of a response (National Business Research Institute, 2020). Quantitative surveys can

use scaled values, such as a Likert scale, to measure perceptions of how much participants agree

or disagree with a particular statement (Mcleod, 2019). The post survey for this study employed

a Likert scale as displayed below in Figure 4 (Mcleod, 2019).

**Figure 4**

*5 Point Likert Scale. From Mcleod, 2019, para. 4*

| Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |

For this study, the end goal of the survey was to develop a deeper understanding of the

participants' views and opinions on the use of different Web 2.0 tools in their collaborative

learning. The survey aimed to get a more robust description of the participants' experience while

using the web tools in terms of the tools affordances and the effect the tools had on their learning

experience. The post survey was pre-structured with main topics and categories defined

beforehand (Hansen, 2010). The survey utilized the 5-point Likert scale and at the end of the

third tool implementation, the survey also included open-ended questions. The researcher used

the survey in Appendix G.

Qualitative interviews involved one-to-one interactions, as they focused on the individual

and provided an opportunity for each person's individual views and opinions to emerge

(Creswell, 2003; Lewis & McNaughton, 2018). Generally, most qualitative interview studies

consist of at least six participants and are unstructured with open-ended questions (Creswell,

2003). For this study, the researcher interviewed six participants with an even number of three

males and three females. The selection was made based on the survey results, where the

researcher attempted to choose participants with varied responses. In terms of using the web

tools for collaborative learning, the researcher chose participants who had more positive

responses, participants who had more neutral responses and participants who had more negative

responses. This was in an effort to promote a fuller spectrum of participant perceptions in the

study. The interview was semi-structured to follow the interview protocol (Appendix F) that

consisted of questions focused on uncovering student perceptions and views of the web tool

implementation. The one-to-one interactions allowed the researcher the opportunity to gain

clarification about the individual's motivation and decisions whilst exploring the study's impacts

and outcomes (Lewis & McNaughton, 2018). Semi-structured interviews were preferable for this

study as it allowed the researcher to use probing questions to ask individuals to explain their

ideas with more details (Creswell, 2003). The interviews occurred after all three web tools were

implemented and after the final survey was completed, where the researcher used audiotaping to

record the interview while simultaneously taking handwritten notes. The researcher used Otter.ai to transcribe the interviews.

The results from the three data collection methods provided triangulation. As mentioned, all protocols were  structured to identify emergent affordances that web tools may provide and to determine the effect the implementation of the web tools have on individual and group behavior.

## Data Analysis

### Data Management

As explained in the section above, the raw data was collected through three different means: observations, interviews and  post-surveys. Within the 6-week timeframe of the study, the researcher conducted direct observations by watching the participants interacting with each other and with each tool. The researcher noted how the students communicated with each other to complete the collaborative task and also noted how well the students used each tool. All observation field notes were completed using a researcher generated observation notes form (Appendix E). Researcher thoughts were also included in the observation field notes. Collected altogether, the data were entered into MAXQDA for data analysis. To promote security and maintain confidentiality, the data were  secured in an external hard drive, which only held the study's findings, and when not in use, the data were  stored in a locked fireproof safe at the private residence of the researcher.

In addition, the responses from the post survey were analyzed through the SPSS (Statistical Package for the Social Sciences) software. This software offers "advanced statistical

analysis, a vast library of machine learning algorithms, text analysis, open source extensibility, integration with big data and seamless deployment into applications" (SPSS Software, 2020, para. 1). SPSS is noted to be useful in analyzing large amounts of data to produce a pattern of characteristics which can be displayed through easily understood graphical representation (Thomes, 2018). Due to the ease of use and flexibility, researchers often utilize SPSS as accessibility is appealing to users of all skill levels (SPSS Software, 2020). For this study, the researcher used SPSS to analyze the survey data for descriptive statistics through frequencies and measures of central tendency (range, mean, median, mode, standard deviation).

After the six week timeframe of the study and the dissemination of the final survey, six participants were interviewed. The interview questions focused on the student's perception of the impact Web 2.0 tools might have had on their collaborative learning. Six participants, three male and three female, were interviewed and audio recorded with a digital recording device. All audio recordings were stored on an external hard drive and as mentioned above, when it was not in use, the hard drive was locked away. The interviews were transcribed through a web tool called Otter.ai, which can convert live speaking into written transcription. Transcriptions were stored on the external hard drive. If identifying information was recorded, the information was deleted from the transcripts so that the participants' identities remained confidential. Participants were referred to using a pseudonym. Transcriptions were coded and further sorted into categories and themes. Once the transcripts were completed and recorded, the audio recordings were deleted from the hard drive and digital recording device. Interpretation of the results began after data analysis was complete.

Additionally, the researcher used the following six steps to analyze the data within the study:

1. Organize and prepare the data for analysis

2. Read through all the data

3. Begin detailed analysis with a coding process

4. Use coding process to generate a description of the setting or people as well as categories or themes for analysis

5. Determine  how the description and themes will be represented in the qualitative narrative

6. Make an interpretation of the meaning of the data (Creswell, 2003, p. 185-189).

**Initial Qualitative Analysis**

With the nature of this study being a qualitative case study, there was  a large amount of data to analyze. The three methods of data collection, observations, interviews and surveys were analyzed through coding. Coding involves a general analysis of the data to generate categories of information to identify emergent themes and patterns (Creswell, 2003; Medelyan, 2019). As mentioned, the study used inductive analysis (Creswell, 2003; Medelyan, 2019) with the coding based on the data from the observations, interviews and post survey. Data from the multiple sources were converged in the analysis process as each source was  "one piece of the puzzle" to contribute to the entire phenomena of the study (Baxter & Jack, 2010, p. 554).

The researcher used MAXQDA to code the data. MAXQDA is a computer-assisted qualitative data analysis software (CAQDAS) which assists researchers in gaining insight from written documents like surveys and interview transcripts (Kuckartz  & Rädiker, 2019;

PublicVoice, 2019). There are numerous benefits to utilizing MAXQDA such as: "the ability to work with multiple data types, quick and easy qualitative analysis, and attractive visualisations" (PublicVoice, 2019, para. 3). As such, the qualitative software classifies and stores voluminous amounts of text data, which alleviates the researcher's task of data management (Kuckartz & Rädiker, 2019). On the other hand, there are also disadvantages to using software such as MAXQDA. The functionality of MAXQDA is a bit difficult to grasp as it does have complex menus that go beyond a simple step-by-step process (Kuckartz & Rädiker, 2019). However, the researcher determined that the benefits of using MAXQDA outweighed the negative aspects. As this software can analyze all three types of data collected for this study, the researcher used this qualitative data analysis software to analyze the observations and interviews and SPSS was used to analyze post surveys.

**Higher Level Qualitative Analysis**

Once the coding was complete, the researcher then analyzed the emergent codes as qualitative data analysis is an ongoing process that involves continuous reflection upon the data (Creswell, 2003). The researcher categorized the codes and then sorted the categories into themes. At this point, it was now the researcher's responsibility to convert the complex nature of the findings in a concise manner (Baxter & Jack, 2010). This was done by extracting themes from the text through analysis of word and sentence structure (Medelyan, 2019). The goal was to report the study in a comprehensive manner to provide the reader with a holistic view of the study (Baxter & Jack, 2010). To reiterate, the researcher used inductive coding, open coding, for the data, which encopasses the following steps (Medelyan, 2019):

1. Break your qualitative dataset into smaller samples.

2. Read a sample of the data.

3. Create codes that will cover the sample.

4. Reread the sample and apply the codes.

5. Read a new sample of data, applying the codes you created for the first sample.

6. Note where codes don't match or where you need additional codes.

7. Create new codes based on the second sample.

8. Go back and recode all responses again.

9. Repeat from step 5 until you've coded all of your data (Medelyan, 2019).

While inductive coding is an iterative process, it provides a more comprehensive and unbiased analysis (Medelyan, 2019). In addition, the analysis returned to the propositions of the study to limit exploration of data outside the scope of the research question as it may refer to an alternate phenomena not relevant to this study (Baxter & Jack, 2010; Yin, 2009). Ergo, the goal was to use inductive coding to narrow down the categories into themes relevant to the study.

The emergent themes were utilized to answer the five research questions. RQ1 and RQ2 were answered by the observation field notes, which focused on the observations of the participants in their natural setting. RQ3, RQ4, and RQ5 were answered through the post surveys, focused on the descriptions of the participants' views from their web tool use throughout the study, and by the individual semi-structured interviews, focused on the participants' perceptions and beliefs on the effects of web tool use for collaboration.

# Rigor

Several key elements were implemented in this study to enhance the study's quality and rigor. Rigor is defined as the precision in planning in data collection, analysis and reporting (Marquart, 2017). Qualitative studies are expected to be conducted with rigor to avoid potential subjectivity and enhance trustworthiness (Cypress, 2017). There are four elements of rigor in qualitative research: credibility, confirmability, dependability and transferability (Cypress, 2017; Forero, Nahidi, De Costa, Mohsin, Fitzgerald, Gibson, McCarthy & Aboagye-Sarfo, 2018). The researcher addressed all four of these elements to ensure that rigor was accurately assessed in the study. Table 3 indicates how each element was addressed in this study.

**Table 3**

*Rigor and Research Design*

| Criteria | Research design element |
|---|---|
| **Credibility** | <ul><li>triangulation</li><li>detailed coding definitions</li><li>data analysis using constant comparison</li></ul> |
| **Confirmability** | <ul><li>audit trail</li><li>clear descriptions of researcher role</li><li>clear description of limitations</li></ul> |
| **Dependability** | <ul><li>audit trail</li><li>clear and detailed descriptions of methods</li><li>inter-rater reliability</li></ul> |
| **Transferability** | <ul><li>triangulation</li><li>collection of thick descriptive data</li></ul> |

Credibility is establishing confidence in the results by providing true and credible participant perspectives (Forero et al., 2018; Maher et al., 2018). This effort is determined by the assessment of the researcher's plausible interpretation and analysis of the data set (Langtree, Birks, & Biedermann, 2019). The researcher employed three means to promote credibility: triangulation, detailed coding definitions and constant comparison. The researcher used triangulation of data sources as it is a primary strategy to support case study research to indicate parts of a whole to explain a phenomena from multiple perspectives (Baxter & Jack, 2010). The triangulation of data for this study was based on the collection of data from observations, interviews and post surveys. A thorough account of the coding process was documented on a regular basis. Constant comparison of the study's findings such as codes and themes were used to assure that they were clearly defined. Constant comparison is a method that breaks down the data into units and coding them into stimulating and explanatory categories (Maher, Hadfield, Hutchings & de Eyto, 2018). As such, the method of constant comparison assisted in the development of a clear coding process to finely develop the relationship between the identified categories.

Confirmability is considered as a strategy to confirm or extend the confidence that the results are confirmed by other researchers (Forero et al., 2018). This can be done through various ways such as triangulation and reflexivity (Forero et al., 2018). To promote confirmability, the researcher used an audit trail, provided a clear description of the researcher's role, and outlined the limitations of the study. An audit trail is a strategy to establish trustworthiness in a qualitative

study, where the researcher will use a physical audit trail to thoroughly document each stage of the research study (Carcary, 2009; Forero et al., 2018). The researcher kept a track record to record the steps taken for the data collection and analysis processes. In addition, the role of the researcher was described  prior to the study so that the role was clearly understood before the study was  implemented. As such, it was important for the researcher to remove personal biases so no prejudices are present in the data analysis (Gasson, 2007; Langtree et al., 2019). The limitations were thoroughly outlined to accurately express the restraints of the study. The limitations were briefly outlined in Chapter 1 and will once again be reviewed at the culmination of the study.

Dependability refers to the trustworthiness of the study to ensure that the findings are sufficiently documented with thorough description for another researcher to repeat the process (Forero et al., 2018; Maher et al., 2018). Dependability is determined by the evaluation of steps the researcher takes during the research process (Langtree et al., 2019). For this study, the researcher used an audit trail, provided clear and detailed description of study methods and used peer debriefing to promote dependability. As mentioned, the researcher used an audit trail, which in turn, provided clear descriptions for the study's processes (Langtree et al., 2019). This included detailing the data collection and analysis procedures and the progress on a weekly basis. In addition, inter-rater reliability was used to promote neutrality and to eliminate biases or assumptions. The researcher asked two additional coders to independently code a portion of the collected data. From this, the researcher compared the findings from the peer researchers in an

effort to decrease researcher subjectivity and increase study reliability. This strategy was used to promote an objective analysis of the data (Gasson, 2007).

Transferability is defined as a strategy to extend the study in which the results can be generalized to other contexts or settings (Forero et al., 2018; Maher et al., 2018). The researcher used triangulation of data sources, and provided a collection of thick descriptive data to showcase the transferability of this study. To increase applicability to a broader range of readers, rich details of the findings (Langtree et al., 2019) were included so that the readers can determine whether the data is relevant and applicable to their own context..

All phases of the data collection and data analysis were thoroughly documented to provide a clear audit trail and develop thick descriptions at each step of the study. Various means were taken to eliminate personal bias to provide objective insight on the study's findings. In sum, the researcher promoted rigor by meeting the four dimensions of credibility, confirmability, dependability and transferability.

## Summary

This qualitative case study explored the influence of three different Web 2.0 tools on collaborative learning for secondary education students in American Samoa. This chapter described the data collection and analysis methods used in this qualitative case study. The following chapter presents the findings.

# CHAPTER 4. FINDINGS

The purpose of this case study was to determine the influence of Web 2.0 technology on collaborative learning for secondary education students in American Samoa.

For this study, the research questions were:

1.  How do students interact with each other using Web 2.0 tools during collaborative learning?

2.  How do students interact with the Web 2.0 tools during collaborative learning?

3.  How do students describe their experience using Web 2.0 tools in collaborative learning?

4.  What are the student's perceptions of using Web 2.0 tools for collaborative learning?

5.  How do students believe the use of Web 2.0 tools for collaboration influenced their learning?

To answer the research questions, a case study was utilized. The first and second research questions were answered through the use of classroom observations. The classroom observations took place in a senior English course with another teacher serving as the instructor. The observations occurred during the two-week usage of each web tool, with a total of six weeks of observations for the overall study. The observation notes were then analyzed through MAXQDA to identify codes, categories and themes. Research questions three to five were answered through a combination of one-on-one interviews and post-surveys. After each tool was implemented, the participants answered questions about the tool through a post-survey. The questions were formatted to be answered through Likert scales, with additional open-ended questions at the end

of the study. The quantitative survey data were analyzed through SPSS using descriptive statistics. The one-on-one interviews were conducted to answer research questions three to five and were conducted at the end of the study. Six participants were interviewed using a set of prepared questions to solicit open-ended responses. The description of the six participants can be found in the beginning of the Interview Findings. The responses were then analyzed through MAXQDA to be coded, categorized and themed.

## Observation Findings

Observations were used to anwer RQ1: How do students interact with each other using Web 2.0 tools during collaborative learning? and RQ2: How do students interact with the Web 2.0 tools during collaborative learning? For the implementation of the three tools Google Docs, Blogger, and Wikidot, there were a total of 12 observation periods. The observations were generally within 45-55 minutes for each meeting period. Periods included introductions of the tools, learning tutorials, explanations of the writing assignments, participant web tool work days, and participant group presentations.

The researcher took observation notes with minimal interaction with the participants. After each observation, the researcher added reflection notes relevant to the study. After the completion of the implementation period, the researcher analyzed the data as the observation notes were coded using MAXQDA and categorized and themed using Microsoft Word.

Based on the analysis, the participants had different perceptions of the usage of the three tools,  the researcher found multiple themes that addressed the interaction of participants with the

web tools during collaborative learning. For RQ1, which is, How do students interact with each other using Web 2.0 tools during collaborative learning?, the following five themes were extracted from the observations:

1. Looking for leadership

2. Group decision making

3. Sharing resources

4. Supporting each other

5. Working independently

**Theme 1: Looking for Leadership**

The first theme, Looking for Leadership, derived from two categories of codes outlined in the table below.

**Table 4**

*Theme 1 - Looking for Leadership*

| Theme | Categories | Codes |
|---|---|---|
| Looking for leadership | Relying on one person | Relied on one particular member<br>One member takes charge |
| | Looking for leadership | Looked for who had the most experience<br>Decided as a group who would be the leader<br>Had problems without group leader |

These categories focused on how some participants were reliant on their peers, specifically for one peer to take charge. This was especially true for the first assignment using Google Docs, and once this was established, this continued for the other two tools. While using the web tools, there were a few instances where a participant would wait for a peer to take charge

to guide them on completing the task using the web tool. I observed that in some cases, a participant would not engage with the tool until their peer assigned them a task to complete. I also observed that in most of the small groups, the assignment of leadership was unspoken. The participants automatically chose a peer they could look to for direction and assistance. I observed that the "assigned" leaders were also the participants who appeared to be more proficient in using the web tools. From the observation notes from the Google Docs tool implementation, it stated "Groups 1, 2, and 3 automatically chose their person to make the document with minimal discussion. Group 4 discussed before deciding on participant 4C." I reflected that "It looked like the groups made the choice based on previous experiences with each other to see who was more proficient in creating the document."

In one instance, a participant was unable to complete his task until his "leader" showed him her own screen to further demonstrate how to utilize some of the tool's features. In my observation for Google Docs, I observed that "4A leaned over to look at 4B's screen" to confirm whether or not her peer was on the right track and doing the assigned task. This behavior was also true for Google Docs when it was time to present their final brochure. I observed that "When it came to sharing, one group member shared on behalf of their answers. Groups looked at one particular person in each group, then that person shared with the class." It was clear that the group already solidified the role of who would take charge of the overall sharing with the rest of the class. This remained the same with all the tools.

**Theme 2: Group Decision Making**

  The second theme, Group Decision Making, stemmed from two categories of codes which were working together and deciding as a group. Table 5 showcases categories and codes for this theme.

**Table 5**

*Theme 2 - Group Decision Making*

| Theme | Categories | Codes |
|---|---|---|
| Group decision making | Working together<br><br>Deciding as a group | Discussed the assignment<br>Examining the template together<br>Group decision on video clip<br>Group decision not to use the chat<br>Group decision on the task<br>Checked for group preference<br>Worked cooperatively on separate tasks |

  While the participants were assigned the collaborative writing task, they seemed to grasp the idea that teamwork was necessary for the success of the assignment. This can be seen through observing how the participants discussed the expectations of the writing task and how to use the tools. In these discussions, the groups made decisions that shaped the direction of the work for each member. While the group was tasked with using Google Docs, one group made the decision to not use the chat feature of the tool. From my observation notes, I observed "Group 1 asked questions out loud and responses were exchanged using the tool. Group 3 solely communicated with each other out loud and did not use the chat feature." I observed that this decision was based on the group's preference for talking aloud rather than replying to chats

virtually. I also observed that in this instance, this may have been the result of some group members not responding fast enough to the group chat.

In another instance for the Blogger assignment, all of the groups decided to break down the assignment and give a set of mini tasks per group member. Figure 5, shows the "roles of responsibility" that this group established for each member. For Blogger, this was also observed when "Student 1D wrote notes on notebooks and placed it in the middle of the group. Student 1D asked members if they wanted to take a specific part. Group put laptops to the side." Here, it was clear that Student 1D established a set of tasks that she thought would be needed to complete the assignment.

Figure 5 details how the participants devised a plan to complete the assignment. This allowed the group to work together and maximize the chances of getting the overall assignment completed. I observed that many of the participants were able to complete their tasks and work cooperatively to write their assigned portions for all three tools. Once this pattern of roles was established, the groups continued to follow the initial roles that were given out for Google Docs, then to Blogger, and then to Wikidot. To note, the names on this document were edited according to the group and changed to codes to provide  confidentiality.

**Figure 5**

*Group Roles of Responsibility on Google Docs*



Furthermore, when the groups were working on their collaborative writing assignment for all three tools, I observed that most of the group members would check in with each other before moving forward. For several groups, a member would complete a portion of their task and then show another group member to verify if their work was correct or aesthetically appealing, this was especially true for Google Docs and Blogger. An example of this was when a group member was choosing a picture to use in their blog in Blogger. He chose a photo from Google Images and inserted it into the blog. Before clicking on publish, he turned his laptop to his group member to

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ask if the image was acceptable. This was just one of the many examples that indicated groups

preferred to ask for their group mates approval while working collaboratively. Another example

was from my Wikidot observation where I observed "Student 1A was editing and sharing

changes and Student 1D spoke aloud about how to fix taglines. Student 1B watched Student 1A

edit." I reflected that the participants were collaborating to ensure that their website on Wikidot

had the agreed upon text.

**Theme 3: Sharing Resources**

The third theme, Sharing Resources, stemmed from two categories which can be seen in

the table below.

**Table 6**

*Theme 3 - Sharing Resources*

| Theme | Categories | Codes |
|---|---|---|
| Sharing resources | Watching additional resources | Showed each other Youtube videos |
|  |  | Showing the screen to each other |
|  | Sharing resources | Shared notes with each other |
|  |  | Passed the laptop to another |
|  |  | Looked up additional videos for the task |

For this theme, the participants seemed willing to work together to share resources. This

was done through researching additional resources online such as Youtube videos to gain further

understanding of the web tool. This was done specifically for the second tool Blogger and the

third tool Wikidot. These tools were generally more difficult to utilize, so perhaps this motivated

the participants to seek additional resources outside of the class tutorials. I observed that in some

cases, participants would individually look up video explanations and then share their screen to

their group members, despite each member having their own laptop.  From my observation

notes: "Student 4C looked up additional information and a Youtube clip to create a brochure using Google Docs. Entire group shared a screen to review the Youtube clip then decided on a format to use. After sharing screens, Group 4 decided to use the blank Google Docs template. 4C opened formatting features."

In addition, while the groups were working on their writing task, there were many instances in which I observed the participants passing resources back and forth. While they were using Blogger, two of the four groups would consistently pass each other their laptops to showcase the section they were working on. In another instance, the second group would also pass their notebooks to each other to review the collected information from their research. In my observation for Blogger, I saw that " Student 1C asked for Student 1D's notebook to look at" where despite having their own notes, the participants still opted to share their resource of notes with each other.

This type of behavior indicates that the volition of working together was not limited to just the web tools but also to the devices and traditional notebooks. Below is an example of the work that was completed on the Web 2.0 tool, Blogger.

**Figure 6**

*Blogger Student Work*
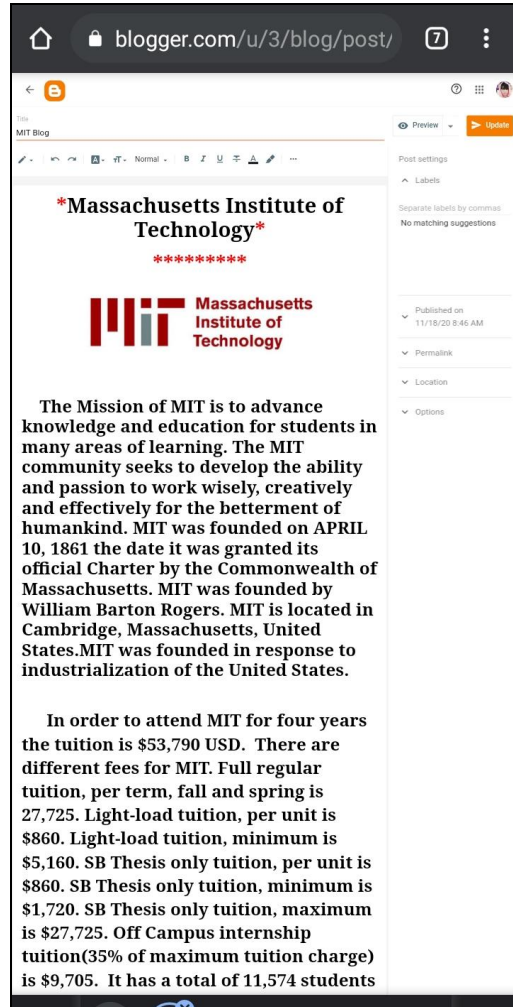


**Theme 4: Supporting Each Other**

The fourth theme derived from the observations is Supporting Each Other. This stemmed from three categories which are Looking for extra help, Looking for assistance, and Supporting each other. The codes are outlined in the table below.

**Table 7**

*Theme 4 - Supporting Each Other*

| Theme | Categories | Codes |
|---|---|---|
| Supporting each other | Looking for extra help<br>Looking for assistance<br>Supporting each other | Asked for help outside the group<br>Needed peer assistance for task<br>Giving reminders about the task<br>Helped one another<br>Giving confirmation for their work<br>Q&A with each other<br>Talking to each other in chat<br>Talking to each other about non-assignment<br>Felt comfortable to joke around |

I observed that the participants were willing to help each other to complete the collaborative writing tasks. In the small groups, participants asked each other for help, especially for the more difficult tools Blogger and Wikidot. For example in my field notes for Blogger, "3B looked at 3A's screen and 3A asked what to do. 3B relayed to repeat what they did for the last post while pointing to 3A's screen. 3A then began typing". However, I observed that each member was open to helping their group members and even observed groups helping other groups. This help ranged from reminding each other about the goal of the collaborative writing task to double checking if their work was correct. This was further evidenced in my Blogger observation where "Student 2A lifted the computer to show all members the open Blogger post and then answered aloud to Student 2D." I reflected that while using the tool, this group felt more comfortable using the laptop to show guidance for each other.

Additionally, the groups seemed to develop a support system while working together. This can be seen in their interactions virtually and in person. Through the Google Docs chat

feature, I observed that a few of the groups used the chat to talk about their assignment but also to keep each other focused on the task at hand. I also noticed that some members used the chat to just send messages that were not necessarily task oriented but related to their group dynamics. When observing for Google Docs, I saw that "Student 2D used chat to verify the task she completed." This indicates that the participant sought verification from her group mates for their approval as a whole. I observed that some groups were particularly comfortable with each other and while they were working, they were also telling jokes and showing light hearted humor. During my Wikidot observation, "Group 2 was talking aloud, giggling with each other while Student 2A showed her screen to the group." I reflected that working together in small groups has allowed the participants to become more comfortable collaborating with each other. This sort of bond was more prevalent towards the end of the intervention period for Blogger and Wikidot, as the groups had time to develop this rapport while exploring the tools and completing the writing tasks.

**Theme 5: Working Independently**

The final and fifth theme for RQ1 is Working Independently. This theme was minimal but still relevant to the overall research question. The theme derived from two categories and two codes seen in the table below.

**Table 8**

*Theme 5 - Working Independently*

| Theme | Categories | Codes |
|---|---|---|
| Working independently | Working by themselves<br>Working alone | Working separately<br>Work without consulting other group members |

While the groups worked collaboratively for the most part, there were some cases where the participants chose to work independently. In my field notes for Google Docs, "Group 1 had all eyes on the screen and were typing silently", every individual was aware of their role in the group and started to work individually. In my observation for Wikidot, I saw that "Group 3 had their screens logged onto wikidot and their research sites and then stayed silent while working." This was also prevalent in my Blogger observation where "Student 3B accessed blog post 1 and scrolled through the writing, while Student 3A stayed on search engine and Student 3D stayed on login page and typing in the keyboard." The participants were all working towards the same task but decided to work independently.

I observed that this was the case for the participants who were more comfortable or proficient with using the web tools. While these instances were rare, I did notice that the decisions made on an individual basis were still deemed acceptable to the rest of the group members. In one case, I observed a participant changing the font style and size of the text in the blog while using Blogger. This change was accepted by the group. Another example of this was using the third tool, Wikidot where I observed "Student 3D was typing directly into the wikidot editing box, then switched tabs to a Google Doc that had information already typed in from all group members." This may be due to the fact that the changes were made to benefit the group as a whole.

**Observation Themes for RQ2**

From the observations, there were three themes that emerged from the observations for

RQ2: How do students interact with the Web 2.0 tools during collaborative learning? The themes

were:

1. Technical issues caused delays

2. Tool features allowed for group collaboration

3. Assistance in building tool familiarity

Overall, the themes share many similarities but relate to the overall use of web tools and

how the participants used them for the collaborative task. Before the implementation of the tools,

the researcher gauged the ease of use  per tool, such that the tools were introduced from the

easiest tool to use to the hardest tool to use. Google Docs was deemed to be the easiest tool, then

Blogger, and then Wikidot. For the writing task, the participants were asked to research and write

about colleges of their choice. For the tools, Google Docs was used to create a brochure, Blogger

was used to create a blog, and Wikidot was used to create a website.

**Theme 1: Technical Issues Caused Delays**

The first theme, Technical Issues Caused Delays stemmed from three categories of codes:

Technical Issue with Device, Technical Issue with Email Access, and Technical Issue with

Internet Connection. Table 9 outlines the categories and codes for this theme. From the start of

the tool implementation for Google Docs, there were several issues with getting the participants

started. First, while there were several laptops for the participants to use, some devices would not

turn on and the participants had to share a laptop once or twice during the study. This was a

minor barrier as participants had to take turns using the tools.

**Table 9**

*Theme 1 - Technical Issues Caused Delays in Learning*

| Theme | Categories | Codes |
|-------|-----------|-------|
| Technical issues caused delays | Technical issue with device<br>Technical issue with email access | Needed a different device<br>Shared laptop to access the tool<br>Needed access to email to access the tool<br>Shared screen with each other<br>Needed teacher assistance to get email access<br>Forgot their email and password combo<br>Used school accounts to access tool |
| | Technical issue with Internet connection | Needed multiple sources of wifi connection<br>Did not have wifi connection |

In my fourth observation for Google Docs, "Student 3B exchanged laptops with one that

was not in use." This also occurred in my Blogger observation where "Student 1B stood and

went back to the teacher, while the teacher typed. Student 1B replaced the laptop with the extra

one and then began typing in." In both cases, this was a minor setback because participants were

able to find a working laptop but it delayed them from getting on the assignment right away.

Another issue was gaining access to the participant's school email accounts. Prior to the

study, the participants were using their designated emails with the American Samoa Department

of Education. However, forgotten passwords prevented some participants from accessing the tool

right away. This was particularly evident with the two week implementation period for Google Docs. As an example from my notes, "Students 4A & 4B got kicked out of their emails for entering a wrong password and could not access the group document." Teacher assistance was required for password resets which needed to be done with the local E-Rate office, so the participants waited about a day to be given access. This caused a setback for the group. The participants tried to make adjustments by sharing screens. In my observation for Wikidot, "Student 1D looked  at Student 1C's laptop and pointed to the username log in section." While the email passwords worked, the participant needed further assistance with logging into the tool. Despite this challenge, the participants were able to get access and for Blogger and Wikidot, the participants no longer had this issue as all passwords were saved manually.

The third technical issue was due to the poor internet connection. Prior to the study, the E-Rate office "fixed" the wifi routers and as the researcher, I also purchased portable wifi devices. Despite this, reconnecting to the Internet was needed often. This caused delays in the participants' work to use the tools. From my notes, "All groups formed a line to the teacher while holding their laptops." Participants were unable to get connected to the various internet connections. From my Google Docs notes, I also observed two incidents in which "Student 1A and Student 1B went to the teacher with their laptops and shared their screen, and the teacher had to reenter  the mifi passwords"  and also when "Student 4C and Student 4D came in late to class, opened laptops to the wifi across screen, and walked to the teacher to ask for access to mifi." I observed that this constant issue caused a bit of frustration for the participants. During these times, the participants would ask the classroom teacher for assistance. While waiting for

reconnection, I observed that the participants would put the laptop to the side and look at their peer's screen to follow along with the tasks.

**Theme 2: Tool Features Allowed for Group Collaboration**

The second theme, Tool Features Allowed for Group Collaboration was pulled from four categories: Use of Tool Features, Use of Tools in Assignment, Group Interaction with the Tool, and Exploring Tools. The table below outlines the codes and categories for this theme.

**Table 10**

*Theme 2 - Tool Features Allowed for Group Collaboration*

| Theme | Categories | Codes |
|---|---|---|
| Tool features allowed for group collaboration | Use of tool features | Used tool's features to correct mistakes<br>Used chat feature to give confirmation of their work<br>Opted to use the tool's chat feature<br>Used sharing feature to give editing access |
| | Use of tools in assignment | Used tools to work together on one particular task<br>Restarted their task with the tool<br>Used the tool to create a group document |
| | Group interaction with tool | Asked group for preference on tool features<br>Helping each other to use the tool<br>Group reminder to stay on the tool |
| | Exploring tools | Used the tool right away<br>Seemed to use the tool easier<br>Exploring the different tool features<br>Examined the tool template |

Based on the observations, the participants were able to utilize the tools features to work together. I observed that features such as the chat and the sharing feature were particularly helpful. For the chat, the participants were able to talk to each other about their task and share pictures and links about their colleges. The chat box was a feature in Google Docs and was used from the beginning of the tool implementation to the end of the study period as it was the only tool that provided instant messaging. I observed "Student 4C told the group in chat if they have any problems to ask in the box." It seemed this feature allowed them to communicate with each other, sharing ideas, links, and images. In my Google Docs observation I also saw "Group 3 had no headings but the chat box had ideas for headers and types of colors and how many titles they wanted to include."

The sharing feature was also an aspect of the tool that I observed helped the participants with Google Docs. The participants were able to work on one document at the same time. Google Docs color codes the participants so they are able to see who made the changes and when they made the changes. I observed that if one of the participants made a change that was not in agreement with the group, they would go back into the history of the document to reverse the change and advise their member not to do that change again. This can be seen in the Google Docs observation notes, " Group 4 made four columns then talked out loud who made the change. Group said Student 4B made the change and told them to fix it." For Blogger, the tool did not offer history tracking but the group members were still able to work on the document at the same time.

However, one thing to note is that although the participants were using Blogger and Wikidot for the tasks, they still opted to use Google Docs at the same time for convenience. I observed that for Blogger, the save feature was not automatically embedded and the participants had to click on the publish button for changes to be seen for everyone in the group. For Wikidot, the participants were able to work on the same page but had to wait for a member to finish saving their section before changes could be made. From my Wikidot observation notes, "Student 3B had the wikidot invitations page open and then looked at Student 3A's screen. Student 3A opened up the group Google Doc from the email invitation." This was further evidenced when I observed "Student 1D relayed that she will share a Google Docs to write their work in it." This shows that the group used the first tool Google Docs to complete the assignment for the third tool Wikidot. The figure below displays the end result of utilizing the tool Wikidot.

**Figure 7**

*Wikidot Site Student Example*
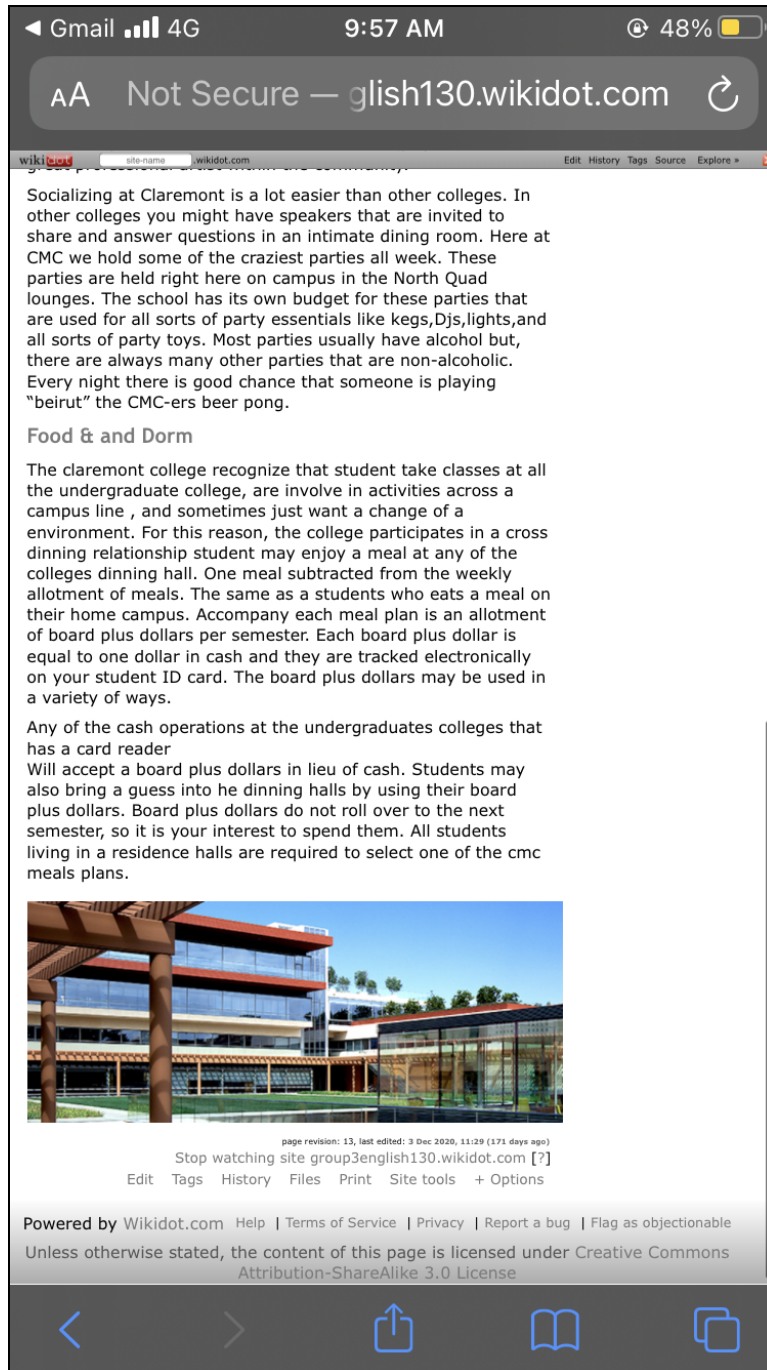
Because of this feature, I observed the participants double checking with their group members

before trying to initiate edits or document changes. Due to these reasons, I observed that the

participants used Google Docs to put their writing together before inputting it into the designated

tool. While this was done because of the limited editing features, I also observed that this

allowed the group members to view each other's work, discuss the correctness of their work and

agree together on what work was approved.

**Theme 3: Building Tool Familiarity**

The third theme, Building Tool Familiarity stemmed from six categories as outlined in Table 11.

**Table 11**

*Theme 3 - Building Tool Familiarity*

| Theme | Categories | Codes |
|---|---|---|
| Building tool familiarity | User preference | Did not use tool for note taking |
| | | Did not use the history feature to see changes |
| | | Opted to not use the tool chat feature |
| | | Did not try to fix the mistakes with the tool |
| | Restarting work | Opted to use a blank template |
| | | Using the tool template |
| | Needed assistance with tool | Needed help from peer to use the tool |
| | Difficulty accessing tool | Needed extra assistance from the teacher for the tool |
| | | Tried to use tool without group discussion |
| | Using tool without group | |
| | | Seemed to have difficulty with tool |
| | Additional resources to understand tool | Had difficulty understanding how to access the tool |
| | | Used the tool incorrectly for the task |
| | | Looked up additional examples |
| | | Asked for help to use the tool |
| | | Used Youtube video to work tool |

During the observations, I was able to witness the participants exploring the features of the tools to understand how to use the tools to complete their collaborative writing tasks. While the tools had user friendly features such as the chat box or prepared templates, some groups opted to forgo the tool features and use traditional note taking methods and/or spoke aloud rather than use the chat box. From my Google Docs observation, "Student 4C & Student 4D spoke out loud to review the content that needed to be included in the brochure." I observed that this may have been due to user preference as the participants were not quite familiar with using the tool features yet. I also observed this in my Wikidot observation where "Student 4A and Student 4C had open discussions with each other while typing into their keyboards." This may be due to the fact that it was faster to speak aloud and because Wikidot did not have a chat feature.

In terms of using the premade templates, I observed that a few of the groups opted to use blank templates instead. I saw that this was due to the fact that the participants were not able to manipulate the layout of the template to their liking, so they figured that a clean slate would be preferable. This was observed during the Google Docs assignment to create a brochure, where "Student 2B asked the teacher permission to restart the document and not use the document that was created in the last class." I observed that the "brochure template" was initially used for Group 2, but when they were unable to change some of the layout, the document was deleted and a new blank template was used. This was not the case for Blogger and Wikidot as these tools had set layouts that the participants could follow with minimal guidance.

In addition, there was a need for additional assistance and resources to navigate the tools. This was particularly prevalent for the use of Wikidot, where I observed participants using the tool incorrectly, looking for additional Youtube video tutorials, and looking for site examples. I observed that to build familiarity with the tool, the participants helped each other by sharing screens and physically pointing out how to use the features. From my observation notes for Wikidot, I saw that "Group 1 discussed how to input pictures into Wikidot and Student 1A relayed that she had no idea. Student 1D relayed that she would try a couple times and then would allow Student 1B to try. After a few minutes, Student 1A was able to input a picture which was a URL of the image." Here, it took a few minutes for this task to be done as the participants had to find ways to work the tool more proficiency and then they were able to share that with the rest of the group. I also observed that participants were willing to play around with the features to determine which features were preferable. In my notes for Blogger, I observed that "Student 4B continued to look around the room and did not touch the computer while Student 4D had both screens in front of her. Student 4D accessed Student 4B's email account and Blogger. After 2-3 minutes, Student 4D gave the laptop back to Student 4B." In this case, only one participant was familiar with using the tool Blogger and assisted her group mate so that he could contribute to the writing task.

The time it took for the groups to build familiarity was different for each tool. For Google Docs, I observed that the participants were more familiar with the features such as the tool bar, font style and such as it resembles Microsoft Word, a common tool used in almost all classes. The participants were able to manipulate the features very quickly and did not have to look up

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too many additional tutorials. Figure 8 is an example of the student work that was completed when the participants used Google Docs to create a brochure.

**Figure 8**

*Google Docs Brochure Student Example*



However, for Blogger and Wikidot, it took more time to build familiarity and there was some trial and error to develop skills. An example of this is from my Blogger observation notes where "Student 1D reminded all members to update and relayed that she kept forgetting to update on her end." This participant learned from her mistake of not saving her work and relayed that information to her group members so that they too did not make the same error. For Blogger,

the participants of two groups looked up additional tutorials but were able to grasp the features of the blog tool fairly well. The layout and features are similar to that of a traditional document, so the only new features were the publishing and tag buttons. However, for Wikidot, I observed the participants had the hardest time. Due to the interface, the participants spent more time trying to figure out how to use the tools features. In my Wikidot observation notes, I observed "Student 1D spoke aloud to Student 1A while 1A asked questions. Student 1B leaned over while Student 1A was asking. Student 1A then clicked on the edit features of Wikidot." I reflected that the confusion led to additional peer assistance and additional online resources to better understand the tool.

However, as the study continued, the participants became more and more familiar with Google Docs as they continued to use this platform to put their collaborative writing together. This could be seen with both Blogger and Wikidots. An example of this is in my observation notes from Blogger where "Student 1B leaned over to ask Student 2A what their group was doing, where she relayed that her group was using Google Docs to type it altogether as a group." Another example of this is from my observation notes from Wikidot where "Student 2A was inputting a picture with the text on Google Docs and Student 2B relayed that they are using this document to map out their preferred layout for Wikidot."

## Survey Findings

As stated in Chapter 3, the quantitative survey consisted of questions to be answered through a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The

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survey consisted of a set of eight statements that remained the same for each tool. The statements ranged from gauging group responsibility, personal accountability, encouragement for participation, ease of tool function, tool usefulness, future use, assistance with learning, and helpfulness with group learning. These same statements were given to the participants after each two-week learning period after each tool was implemented and the collaborative writing assignment completed. After the third and final tool was implemented, an additional six statements were added to gauge the candidates' perceptions of the overall effect of the web tools on their learning.

The survey was designed to help address three of the five research questions, which were as follows: RQ3: How do students describe their experience using Web 2.0 tools in collaborative learning? RQ4: What are the student's perceptions of using Web 2.0 tools for collaborative learning? RQ5: How do students believe the use of Web 2.0 tools for collaboration influenced their learning? Interviews were also used to answer these same questions. The tables below outline the survey responses indicating student perceptions of the tools Google Docs, Blogger and Wikidot.

**Google Docs**

The participants were surveyed regarding their experience using web tools in collaborative learning. The average rating indicated they agreed on the majority of aspects related to their collaborative learning experience. Table 12 showcases the participants' responses for each of the items on the survey, including the mean and the standard deviation.

**Table 12**

*Student Perceptions of the Tool - Google Docs (N=15)*

| Item | # of students who selected Strongly agree or agree | # of students who selected neutral | # of students who selected Strongly Disagree or Disagree | Mean | Standard Deviation |
|---|---|---|---|---|---|
| *Using Google docs helped my group members to be responsible* | 10 (67%) | 3 (20%) | 2 (13%) | 3.93 | 1.10 |
| *Using Google docs helped keep me accountable to my team* | 10 (67%) | 3 (20%) | 2 (13%) | 3.93 | 1.10 |
| *Using Google docs encouraged me to participate in the learning activity* | 13 (87%) | 1 (6.5%) | 1 (6.5%) | 4.33 | 0.90 |
| *The way Google docs functioned made it easy to use for the learning activity* | 12 (80%) | 1 (7%) | 2 (13%) | 4.07 | 1.03 |
| *I found Google docs useful for this assignment* | 11 (74%) | 2 (13%) | 2 (13%) | 4.07 | 1.28 |
| *I plan to continue using Google Docs in the future* | 10 (67%) | 3 (20%) | 2 (13%) | 4.00 | 1.13 |
| *I think using Google docs helped me learn* | 12 (80%) | 2 (13%) | 1 (7%) | 4.27 | 0.96 |
| *I think using Google docs helped me work more effectively with my group* | 13 (87%) | 2 (13%) | 0 (0%) | 4.33 | 0.72 |

With the mean number of 3.9 and standard deviation of 1.1, which can be interpreted as "Agree" according to the Likert scale above, participants agreed that the tool helped their members become accountable for their divided work and responsible for their role in the group performance. With the mean of 4 and slightly past and a standard deviation of .9, the participants also indicated that the tool had impelled them to continue their participation in the activity and to remain active, possibly because of the efficiency of the tool in the completion of the group project. The participants used the web tool to complete their project, and with this tool they agreed that they were able to complete the assignment because the tool was easy to use, which resulted in the mean score of 4 and a standard deviation of 1.28. In summary, the participants agreed that the use of the tool Google Docs led to a positive outcome of their collaborative learning experience.

Just like the responses towards collaborative learning experience, the responses regarding self-perception have a similar positive outcome. Through the survey, with the mean number of 4.2 on the Likert scale and standard deviation of .96, participants shared that they thought the tool was helpful, especially in the assignment that was given, which involved group collaboration. The results of the survey showed that they agreed that they were able to effectively work with their group members through this tool (Mean=4.3), encouraging team momentum towards the completion of their project. When it comes to the future use of the tool, they agreed (Mean=4.0) that they would use the tool for upcoming projects, which is a good review overall for any tool. Simply put, the participants believed that the tool was  definitely of  good use in

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school assignments, and they should not limit their experience with the tool to the given assignment but to many others.

The participants were encouraged to work with their group and were able to do so effectively; however, another aspect was whether the tool influenced their learning. The survey asked students about their experience with the tool especially in collaborative learning, but there were also questions that required self-reflecting. One part of the survey had the student reflect on whether the tool helped them learn individually, with a reported mean of 4.2 agreeing that the tool did in fact help them learn, also responding that since the tool was easy to use they were able to work effectively with others. Comparing the overall responses with this criteria, we can confirm that the participants learned through the web tool through accountability, performance, and teamwork

Overall, the survey indicated strong agreement on most items. Ratings for Google Docs where 80% or more of the students indicated agree or strongly agree included: encouraged me to participate in the learning activity (87%), helped me work more effectively with my group (87%), easy to use for the learning activity (80%), and helped me learn (80%). Areas where between two-thirds and three-fourths of the students agreed or strongly agreed included: useful for this assignment (74%), helped my group members to be responsible (67%), helped keep me accountable to my team (67%), and I plan to continue using Google Docs in the future (67%). The percentages of students giving ratings of disagree or strongly disagree ranged from 0% to 13% (no more than two of 15 students for any item).

Figure 9 below showcases the survey items with the highest mean to the lowest mean for

Google Docs. The two highest items received a 4.33 which were "Using Google docs

encouraged me to participate in the learning activity" and "I think using Google docs helped me

work more effectively with my group." This indicates positive feedback in terms of using this

tool for engagement and personal efficiency. The two items with the lowest mean of a 3.93 were

"Using Google docs helped my group members to be responsible" and "Using Google docs

helped keep me accountable to my team." While these are the items with the lowest mean, they

were still rated quite high and indicate that Google Docs does assist with working in small

groups.

**Figure 9**

*Google Docs Items with the Highest to Lowest Mean*



Google Docs Items with the Highest to Lowest Mean
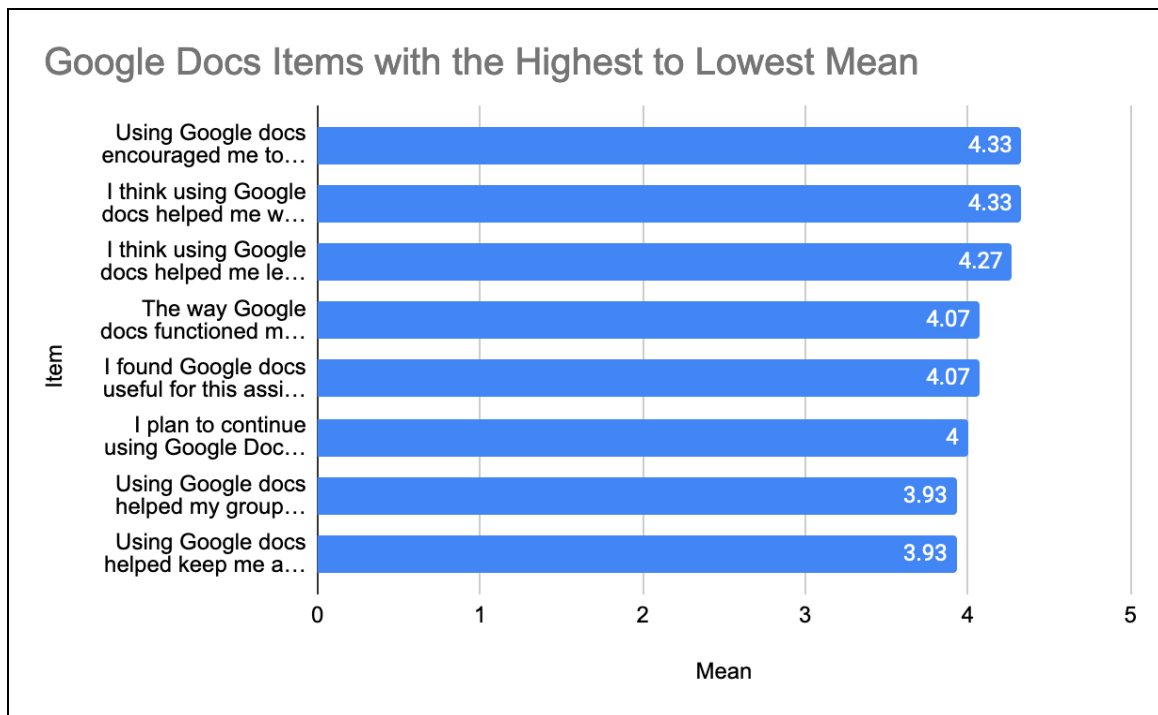
**Blogger**

In Table 13, the participants outlined their feelings about using the Web 2.0 tool for collaborative writing. This tool had some differences in responses compared to the previous tool Google Docs. There was a slight decline in agreement, which means more participants disagreed with portions of the survey than the first survey. In collaborative experience, we can see that the participants leaned more on the side of "Undecided," not really sure how to feel about the tool's role in their group collaboration.

The responses shared when it came to helping students become accountable for their individual duties and be responsible for their roles in group performance, the mean was below 3.5, which reveals that the tool could have some good aspects in helping collaborative learning experience, but there could also be inconveniences that could stall the completion of the project.

When it comes to student perception of this tool, the average responses are somewhat contradictory, supporting the statement that the participants indeed were feeling neutral about the use of this tool. The survey responses regarding the encouragement of the tool towards student productivity had a mean of 4, but the mean for option of future use of the tool was more "Undecided" than "Agree" with a 3.33 mean. The survey shared that some participants agreed that they were able to learn with the tool as it resulted in a mean of 3.8, but a resulting mean of 3.6 regarding effective collaboration revealed that the participants were more neutral in terms of whether the tool helped the participants in team collaboration. These responses showed that although the tool has some good aspects, there were also some downsides which resulted in lower mean scores than the previous chart.

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**Table 13**

*Student Perceptions of the Tool - Blogger (N=15)*

| Item | # of students who selected Strongly agree or agree | # of students who selected neutral | # of students who selected Strongly Disagree or Disagree | Mean | Standard Deviation |
|---|---|---|---|---|---|
| *Using Blogger helped my group members to be responsible* | 8 (53%) | 3 (20%) | 4 (27%) | 3.47 | 1.46 |
| *Using Blogger helped keep me accountable to my team* | 7 (46.5%) | 7 (46.5%) | 1 (7%) | 3.40 | 0.63 |
| *Using Blogger encouraged me to participate in the learning activity* | 11 (73%) | 3 (20%) | 1 (7%) | 4.00 | 0.93 |
| *The way Blogger functioned made it easy to use for the learning activity* | 9 (60%) | 4 (27%) | 2 (13%) | 3.6 | 0.91 |
| *I found Blogger useful for this assignment* | 11 (73%) | 2 (13%) | 2 (13%) | 4.00 | 1.09 |
| *I plan to continue using Blogger in the future* | 6 (40%) | 6 (40%) | 3 (20%) | 3.33 | 1.18 |
| *I think using Blogger helped me learn* | 9 (60%) | 5 (33%) | 1 (7%) | 3.80 | 0.94 |

| | | | | | |
|---|---|---|---|---|---|
| *I think using Blogger helped me work more effectively with my group* | | 9 (60%) | 4 (27%) | 2 (13%) | 3.67 | 1.18 |

When it comes to the influence of the tools towards student learning, participants agreed in most aspects of the survey. The resulting mean of 3.8 and standard deviation of .94 showed participants agreed that the tool helped them learn, whether it be in general or for the specific assignment given to them. However, the other aspects had means that leaned more on the "Undecided" rating of the Likert scale than the "Agree" rating, and because of that we could conclude that the participant opinion on this tool's influence towards their learning is more neutral.

For example, only fifty percent of the participants agreed that the tool helped members be responsible in group collaboration, the other half had either marked "Disagree" or "Neutral" For assisting members in accountability, the tool could barely get fifty percent of the participants to agree, the majority expressed that they disagreed or were neutral about this aspect of the tool. However, sixty percent shared that the tool helped their group effectively and that it was easy to use.

Overall, the survey showed agreement on most items. Ratings for Blogger where 70% or more of the students indicated agree or strongly agree included: encouraged me to participate in the learning activity (73%) and useful for this assignment (73%). Areas where between one-half to two-thirds of the students agreed or strongly agreed included: made it easy to use for the

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learning activity (60%), helped me learn (60%), helped me work more effectively with my group (60%), and helped my group members to be responsible (53%). The percentages of students giving ratings of disagree or strongly disagree ranged from 7% to 27% (no more than four of 15 students for any item). The item with the greatest percent of respondents indicating disagree or strongly disagree at 27% was "using Blogger helped my group members to be responsible."

Figure 10 shows the survey results with the highest mean to the lowest mean for Blogger.

**Figure 10**

*Blogger Items with the Highest to Lowest Mean*
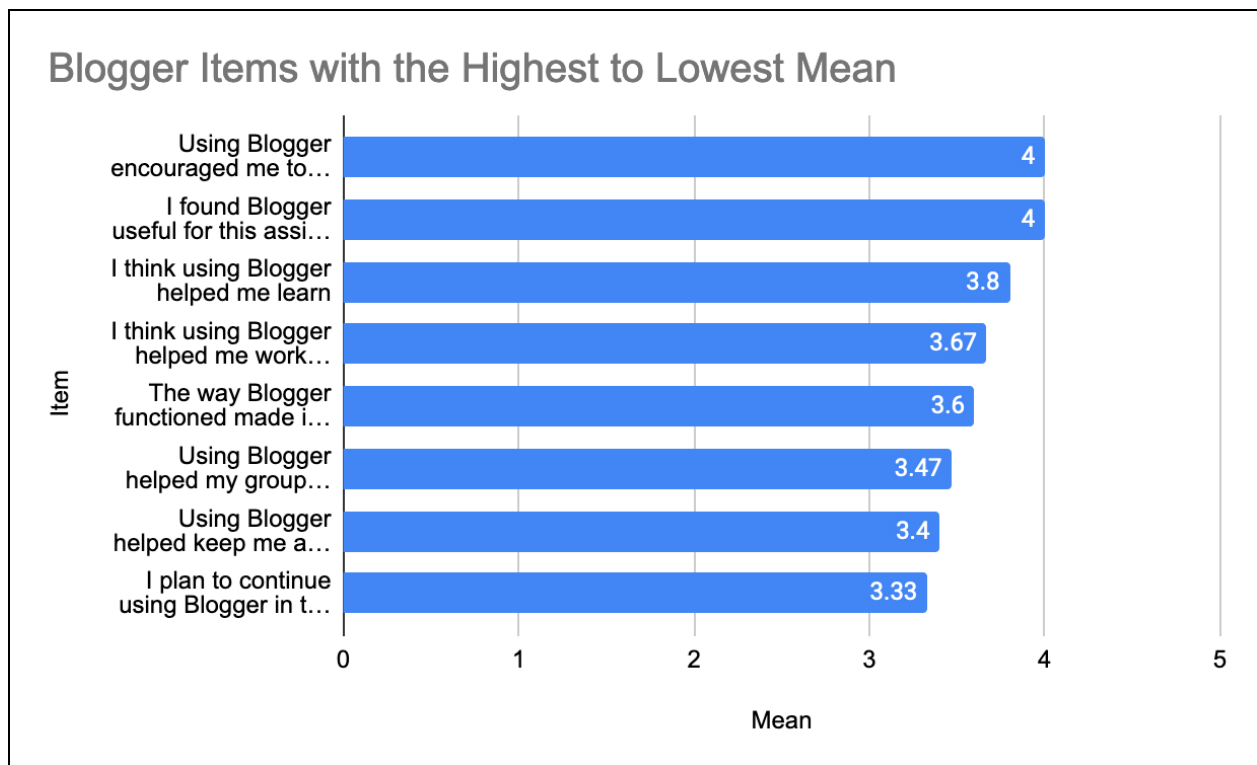


The two items with the highest mean of a 4 were "Using Blogger encouraged me to participate in the learning activity" and "I found Blogger useful for this assignment." This indicates that this

specific tool encouraged them to stay engaged in the writing task, which was creating blog posts.

An item with an average mean of 3.6 was "The way Blogger functioned made it easy to use for

the learning activity" which showcases mostly positive feedback on using this tool for the group

writing activity. The item with the lowest mean of 3.33 was "I plan to continue using Blogger in

the future." This could be due to the difference in features such as the lack of a chat box or

automatic save.

**Wikidot**

For Wikidot, the participants reflected on their usage of the Web 2.0 tool. In Table 14, the

participants shared their feedback on using this tool with their group members. Analyzing the

survey, Wikidot scored a slightly higher average than the previous tool (Blogger) in some

aspects, as participants are divided on a few of these items. Regarding the student collaborative

experience, the tool scored a mean of 4.1 and standard deviation of .92 for participant

responsibility in group performance, which means that the participants were able to keep tabs on

their group progress through this tool. The survey also revealed the mean of 3.8 and standard

deviation of 1.21 on the effectiveness of the tool towards team accountability, although it is a

little lower than a 4, only a minority of students felt indifferent. However, both scores were

enough to show that the participants were able to use the tool for collaboration whether it had its

complications or not.

The tool earned a mean of 3.4 regarding the tool's performance in the assignment. This

revealed that the participants either felt the tool was not as useful for collaborative learning or

had too many complications. However, the tool did earn a mean of 3.8 on its effectiveness in

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learning in general; some participants perhaps thought  it was not suitable for the given

assignment. The tool earned a mean of 3.8  and standard deviation of 1.06 for being helpful.

Unfortunately, the tool had a very low mean score of a 2.66  and standard deviation of 1.35 when

it came to possible future use, the participants might have decided that the other tools were much

more preferable for their learning career.

**Table 14**

*Student Perceptions of the Tool - Wikidot (N=15)*

| Item | # of students who selected Strongly agree or agree | # of students who selected neutral | # of students who selected Strongly Disagree or Disagree | Mean | Standard Deviation |
|---|---|---|---|---|---|
| *Using Wikidots helped my group members to be responsible* | 12 (80%) | 2 (13%) | 1 (7%) | 4.13 | 0.92 |
| *Using Wikidot helped keep me accountable to my team* | 10 (67%) | 3 (20%) | 2 (13%) | 3.80 | 1.21 |
| *Using Wikidot encouraged me to participate in the learning activity* | 11 (73%) | 2 (13%) | 2 (13%) | 4.00 | 1.07 |
| *The way Wikidot functioned made it easy to use for the learning activity* | 9 (60%) | 3 (20%) | 3 (20%) | 3.67 | 1.29 |
| *I found Wikidot useful for this assignment* | 7 (47%) | 5 (33% | 3 (20%) | 3.47 | 1.25 |

| | | | | | |
|---|---|---|---|---|---|
| *I plan to continue using Wikidot in the future* | 5 (33%) | 3 (20%) | 7 (47%) | 2.67 | 1.35 |
| *I think using Wikidot helped me learn* | 11 (73%) | 3 (20%) | 1 (7%) | 3.87 | 1.06 |
| *I think using Wikidot helped me work more* | 10 (67%) | 3 (20%) | 2 (13%) | 3.87 | 1.25 |

Despite one low mean, the tool had generally positive feedback, especially when it came to the participant's reflective responses towards their own thoughts about the education experience. Participants shared that the tool encouraged them to remain active in the assignment, this resulted in the mean score of 4 and a stable response of "Agree" on the scale. While the mean score regarding the description of the tool's functionality for the assignment was lower, it still leaned towards "Agree" on the Likert scale with a 3.8, sharing that a number of participants thought that the tool had indeed contributed to their work. To sum up, the tool earned positive feedback from the users who were able to perform with it.

Overall, the survey showed agreement on most items. Ratings for Blogger where 70% or more of the students indicated agree or strongly agree included: helped my group members to be responsible (80%), encouraged me to participate in the learning activity (73%), and helped me learn (73%). Areas where between one half to two-thirds of the students agreed or strongly agreed included: helped keep me accountable to my team (67%), made it easy to use for the learning activity (60%), and helped me work more (67%). The item with the strongest disagreement was "using Wikidot in the future" with 47% of the participants disagreeing.

However, for the other items, the percentages of students giving ratings of disagree or strongly disagree ranged from  7% to 20% (no more than three of 15 students for any item).

      Figure 11 showcases the survey items with the highest mean to the lowest mean for Wikidot. The highest item with a mean of 4.13 was "Using Wikidots helped my group members to be responsible" and the next highest item with a mean of a 4 was "Using Wikidot encouraged me to participate in the learning activity." This indicates that this tool was useful for group work as it encouraged group members to stay active and involved in the learning activity. The item with the average mean of 3.8 was "Using Wikidot helped keep me accountable to my team" which further indicates that this tool is beneficial to small group assignments to promote personal accountability. The item with the lowest mean of 2.67 was "I plan to continue using Wikidot in the future" which could be due to the difficulty of using the tool and also the limitation of website creation in the school system.

**Figure 11**

*Wikidot Items with the Highest to Lowest Mean*



## Wikidot Items with the Highest to Lowest Mean

| Item | Mean |
|------|------|
| Using Wikidots helped my group… | 4.13 |
| Using Wikidot encouraged me t… | 4 |
| I think using Wikidot helped me learn | 3.87 |
| I think using Wikidot helped me work… | 3.87 |
| Using Wikidot helped keep me a… | 3.8 |
| The way Wikidot functioned made i… | 3.67 |
| I found Wikidot useful for this assi… | 3.47 |
| I plan to continue using Wikidot in t… | 2.67 |
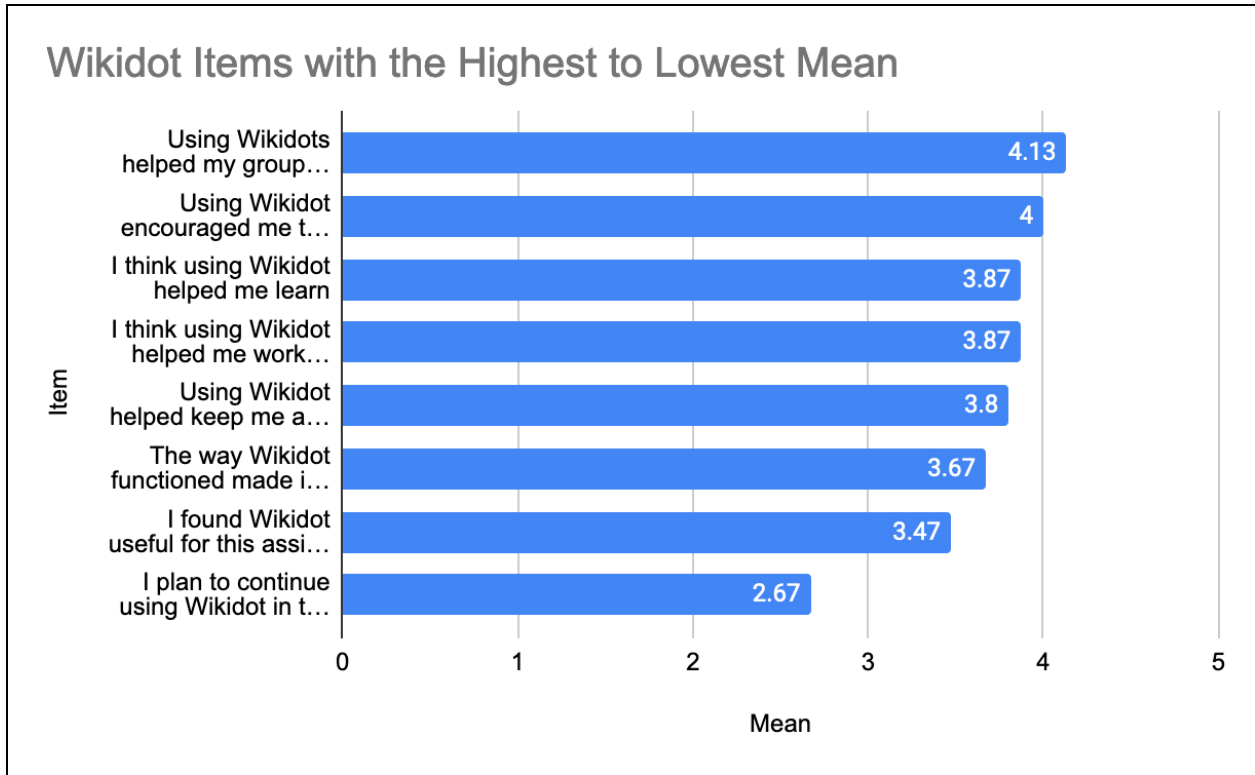
**Additional Feedback - Overall Tool Usage**

For the survey that was conducted at the end of the Wikidot implementation period, the participants were also asked to provide feedback on their overall experience using the three web tools. In the table below, there were six additional statements that the participants could provide feedback on using the five-point Likert scale. The participants shared their individual opinions on each web tool, and for this part of the survey, they were given the opportunity to use the Likert scale to describe their thoughts on all the tools together.

When it came to the tools' assistance in helping individual participants in contributing to the project, the responses showed a mean of 3.60 and standard deviation of 1.24. The tools earned another 3.60 and standard deviation of 1.29 when it came to helping participants grasp the assignment better within groups rather than working independently. The tools helped participants work, and although the responses regarding the effectiveness towards collaboration was 4 on the Likert scale, the tools could have possibly earned a lower score because of external complications that could have not been because of the tools' functionality. However, as the participants are 21st century learners, where technology advances and is making its way into the learning environment, the participants give a mean of 3.8  and standard deviation of 1.37 on the tools' relevance in the education of present and future students. As individuals had to transition from notebooks to laptops for this study, this could be a reason why some tools have a rating below 4 on the Likert scale.

**Table 15**

*Student Perceptions of the Tools - Overall (N=15)*

| Item | # of students who selected Strongly agree or agree | # of students who selected neutral | # of students who selected Strongly Disagree or Disagree | Mean | Standard Deviation |
|---|---|---|---|---|---|
| *I feel that using the web tools helped me contribute to completing the group task* | 9 (60%) | 3 (20%) | 3 (20%) | 3.6 | 1.24 |
| *I feel that using the web tools while learning in a group helped me grasp the task better than learning independently* | 8 (53%) | 3 (20%) | 4 (27%) | 3.67 | 1.29 |
| *I feel that using the web tools is relevant to me as a 21st century learner* | 9 (60%) | 3 (20%) | 3 (20%) | 3.8 | 1.37 |
| *Overall, I think using web tools supported my learning* | 10 (67%) | 4 (27%) | 1 (7%) | 3.93 | 1.03 |
| *I would recommend using web tools in the classroom* | 10 (67%) | 4 (27%) | 1 (7%) | 3.87 | 0.92 |

For the tools' support in the overall learning of the participants, the mean of 3.9 still can

be deemed as "Agree" on the scale and considered  positive feedback. The assignment involved

group collaboration, and the tools introduced were to make things easier for the participants to

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work together. A mean of 3.8  described the convenience of the tools in the assignments. Further positive feedback, the tools also received a mean of 3.8 for recommendations about using the tools in the classroom. Although some may feel indifferent, the surveys indicate many believe that web tools are convenient for educational learning and experience despite some difficulties.

The participants shared their individual opinions on each web tool, and for this part of the survey, they were given the opportunity to use the Likert scale to describe their thoughts on all the tools together. The idea that earned the mean of 3.6 was whether the participants were able to learn and work collaboratively. The mean of 3.6 gave the impression that the surveyed participants were able to work and learn within groups, but not all would agree that the web tools were effective and possibly could have stalled part of the project. However, as 21st century learners, participants had surveyed a mean of 3.8 in agreement that web tools should be used in classrooms, especially in the era of technology advancement. In which shares an insight that the participants think that the web tool is convenient in their work, but also shares how it could be hard for some students to transition from traditional learning to modern advancement as not all students agreed enough to get a solid mean of 4.0 on the Likert scale. Despite some indifference towards the web tools, the majority of the participants, with a mean of 3.9, shared that the web tools indeed supported their learning, and could possibly be a new way of learning in schools. Although some may feel indifferent, the surveys indicate many believe that web tools are convenient for educational learning and experience despite some difficulties.

In Table 15, the participants shared their beliefs about using the Web 2.0 tools while working in their groups. Using the Likert scale, the participants gave specific feedback ranging

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from Strongly Agree to Strongly Disagree. The table showcases that some participants may feel conflicted with the tools' appearance in their group collaborations while others may see it as a new way to learn. The tools were introduced to them to assist them with their project, and then a survey to help reflect their experience was given right after assignment completion.

In all, comparing all responses, there are good features that the tools have that can help with group projects but there are features that should be taken into consideration for students to become more comfortable using such tools in the future. The post survey of the tools displayed positive reviews of the three Web 2.0 tools. After each implementation period, the participants were able to complete the survey while the experience was fresh in their minds. Based on the information above, it is clear that the implementation of the tools worked well in completing the collaborative writing tasks in their small groups.

Overall, the survey showed agreement on most items. Ratings for the Overall Webtools where two-thirds or more of the students indicated agree or strongly agree included: using web tools supported my learning (67%) and would recommend using web tools in the classroom (67%). Areas where between one-half and three-fifths of the students agreed included: using web tools helped me contribute to completing the group task (60%), using web tools is relevant to me as a 21st century learner (60%), and using web tools while learning in a group helped me grasp the task better than learning independently (53%). The percentages of students giving ratings of disagree or strongly disagree ranged from 7% to 27% (no more than four of 15 students for any item).

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Figure 12 showcases the survey items with the highest to the lowest mean. The item with the highest mean of 3.93 was "Overall, I think using web tools supported my learning." The item with the average mean of 3.8 was "I feel that using the web tools is relevant to me as a 21st century learner" which indicates learning through web tools was meaningful for students The item with the lowest mean of 3.6 was "I feel that using the web tools helped me contribute to completing the group task." While it was the lowest mean, this was still positive indicating that web tools could be effective to implement group assignments.

**Figure 12**

*Overall Webtools Items with the Highest to Lowest Mean*



Overall Webtools Items with the Highest to Lowest Mean
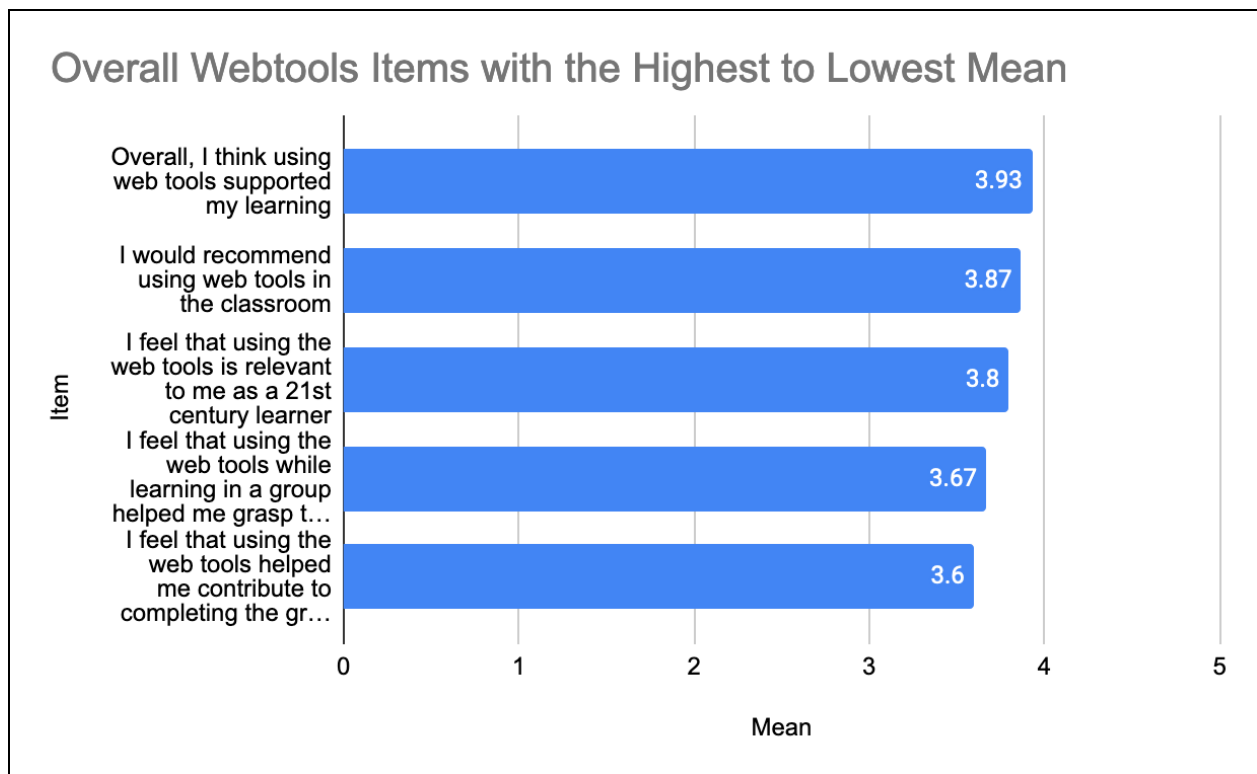
**Comparison of the Tools**

For all three web tools Google Docs, Blogger, and Wikidot, there was mostly positive feedback of agree and strongly agree for the survey. Below, Table 16 compares the level of agreement across all three tools.

**Table 16**

*Comparison of Level of Agreement Across Tools*

| Item | Google Docs % Agree/Strongly Agree | Blogger % Agree/Strongly Agree | Wikidot % Agree/Strongly Agree |
|---|---|---|---|
| Encouraged me to participate in the learning activity | 67% | 53% | 80% |
| Helped me work more effectively with my group | 67% | 46% | 67% |
| Helped me learn | 87% | 73% | 73% |
| Made it easy to use for the learning activity | 80% | 60% | 60% |
| Useful for this assignment | 74% | 73% | 47% |
| Plan to continue using in the future | 67% | 40% | 33% |
| Helped my group members to be responsible | 80% | 60% | 73% |
| Helped keep me accountable to my team | 87% | 60% | 67% |

Based on the table above, Google Docs seems to be the favored tool with the highest percentage of students indicating agree or strongly agree for all but two items. Generally, students found Google Docs more effective than the other tools in terms of helping them learn, being easy to use, being useful for the assignment, helping group members be more responsible, and helping students be accountable to their team. They also indicated an intent to continue using Google Docs at a much higher rate than the other two tools. In terms of helping students work more effectively with their group, two-thirds of students indicated agree or strongly agree for both Google Docs and Wikidot, with less than half indicating Blogger was effective in this area. Wikidot was rated highest in terms of encouraging participation in the learning activity with 80% of students agreeing. Two-thirds of students indicated Google Docs was effective in encouraging participation and about half indicated Blogger was effective at this.

## Interview Findings

The interview data were analyzed using qualitative content analysis through MAXQDA to code, categorize and theme the data. The interviews were used to help answer RQ3: How do students describe their experience using Web 2.0 tools in collaborative learning?, RQ4: What are the student's perceptions of using Web 2.0 tools for collaborative learning?, and  RQ5: How do students believe the use of Web 2.0 tools for collaboration influenced their learning?

There were a total of six interviews conducted post-implementation. Out of the fifteen participants, the six interview participants were based on the feedback from the post-surveys. The participants were three male and three female with descriptors outlined in Table 17.

**Table 17**

*Participants Interviewed by Gender and Survey Feedback*

| Number | Pseudonym | Gender | Survey Feedback |
|--------|-----------|--------|-----------------|
| 1 | Samson | Male | Positive |
| 2 | Britney | Female | Positive |
| 3 | Ryan | Male | Neutral |
| 4 | Ivy | Female | Neutral |
| 5 | Nathan | Male | Below Neutral |
| 6 | Ally | Female | Below Neutral |

Each participant was asked a total of 21 questions for a semi-structured interview. There were two questions for background information, eleven questions about interactions and affordances, two questions about collaborative learning, and six questions for wrapping up overall experiences and last comments. From these six interviews, the researcher found the following themes per research question: five themes for RQ3, four themes for RQ4, and five themes for RQ5. These themes all stemmed from the participants' responses to the interview questions and are outlined in the table below:

**Table 18**

*Themes Found in Interview Data*

| R3) experience using Web 2.0 tools in collaborative learning? | R4) perceptions of using Web 2.0 tools for collaborative learning? | R5) beliefs of how the use of Web 2.0 tools for collaboration influenced their learning |
|---|---|---|
| Building group dynamics<br>Building group communication<br>Providing peer support<br>Experiencing a learning curve<br>Using tools for productivity | Encourages teamwork<br>Preference dependent on usability<br>Tools make learning convenient<br>Tools are useful once familiarity is established | Positive effect on learning<br>Assists in group collaboration<br>Promotes individual initiative |

**RQ3: Experiences Using Web 2.0 Tools in Collaborative Learning**

For Research Question 3, the five themes will be described next. In Table 4.16, the codes

and categories are displayed to showcase how the theme "building group dynamics" was

developed. This theme derives from the participants' feedback on how they were able to work

together as a group to complete the assigned writing tasks. Participants shared that using the web

tools allowed them to build a sort of dynamic to complete the task together. Nathan shared

> "Yeah, we all- before we started typing, we all chose two- two important features to go
>
> over when working on the colleges. So like one of us was demographics and like
>
> achievements, like that was mine. And then for the other one was, like location [and]
>
> cost. And then we would all just go over those and after- like we had a- had a order that
>
> we did, because when we first did it, we did a positioning, but it didn't really flow that,

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well, if you're going to read it, if you're going to read it, it looked like it was all over the place. So then we decided to fix each other's paragraphs. At times, like we always peer edit, before we post anything. It's like we would always look at each other's paragraphs to see what we need to change, see if we should move certain [things], like move the headings around and stuff like that. That's basically how we decided it."

**Table 19**

*Theme 1- Building Group Dynamics*

| Theme | Categories | Codes |
|---|---|---|
| Building Group Dynamics | Sharing work and resources | Cut, paste and summarize<br>Shares among members<br>Pitches in ideas<br>Group review and editing<br>Sharing work |
| | Group decision making | Collaboratively chose features<br>Discussion on web tool<br>Compromising time management<br>Individual research and separate tasks<br>Assigned their own tasks<br>Had a strategy to complete assignment |
| | Group Strategy | Discussed when to paste information<br>Able to see each other's progress |
| | Group leader | Able to see if members did their work<br>Initiates the document<br>Able to work on paper and then paste on web tool |

While using the tools, the format of the groups also allowed them to discuss with each other to form a sort of strategy to tackle the collaborative writing task. Group decision making stemmed from breaking down the overall assignment into smaller tasks for each group member

to have a part to complete. The decisions of the group members ranged from which tool features to use, what topics to research, the timeframe to complete, and the format to insert their work. These group decisions were based on determining best choices for the benefit of the overall project. Ryan more succinctly stated,

> "Um, yeah, we all look for our own tasks given by one of our group members. And then each one of us would research about our topic, or the certain tasks given and then we input all of our information into Google Docs." and "With our group, some strategy of using Google Docs really helped us to be independent and doing our part of the task."

Furthermore, the "Share" feature of the tools was another factor that influenced the groups' experience. This was due to the ability to work individually and collaboratively at the same time. On the document tools, the participants could pitch in ideas and headers for the other members to review. This also gave them the opportunity to cut and paste important information that may be applicable to the whole group. This allowed them to further choose which portion of the writing they would like to complete. Participants shared that they were able to complete their own work independently, then had the ability to review and edit each other's work to verify if their own work matched.

Ally relayed that "Google Docs is easy and very helpful because all our work [is] typed in, we can edit each other's work and all our information together, and we can also chat on the doc and decide to discuss what to put in our work."

When asked how the group used Google Docs, Blogger or Wikidot for the group task, Britney noted

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"Google Docs was one of the main web tool[s] that we used in terms of communication. That way we can all work together and we can keep track. So for Google Docs we had one doc and everybody made a copy, so they can edit it and turn it on their own separate time. And we would talk on that original doc[ument], in terms of planning on who does what, and especially when we go home and we don't have enough time. And we try to stay on this one doc. And so we can keep track of everyone in what they're doing…"

Ivy, when asked if the tools helped everyone in the group be responsible for their work, shared " I'll say yes because we're able to see each other's progress. So, even if I didn't start, they will still start. So they would see, or they would remind me 'Oh you didn't start' and then I'll do my work and that's how we kept each other updated."

Samson explained "...we use Google Docs to put in our information and give it to one person so they could copy and paste it on the blog." An example of this is seen in Figure 13 below. The participants composed their paragraphs and created their layout on Google Docs before pasting into the Blogger tool.

**Figure 13**

*Google Docs Draft for Blogger*



# THE UNIVERSITY OF TAMPA

## " In God We Trust"

## Population and Demographics

Tampa State University has an acceptance rate of 49% which ranks us at #13 for the lowest acceptance rate in the United States. There are approximately 8,895 students enrolled in Tampa. 90.6 percent of these students are enrolled full-time. There are three most common races in Tampa state. Ranking in first with a total of 5,257 students are "white" people. Ranking in second with a total of 1,103 are Hispanic/ Latinos. Ranking in third with a total of 470 is "African Americans". For more information on population and demographics visit us here at TSU.

## Athletics

Our sports vary from lacrosse, golf, rowing, swimming, track, beach volleyball, etc. Tampa State caters to students seeking a high-level competition, an experience worthwhile, and succeeding both on and off the field. Our staff and director understand that not all students will excel in the classroom. We believe that the field is also

Another factor of the theme Building Dynamics was the categorization of establishing a group leader. From the participants feedback, they shared that there was a member(s) in their group who would be the unspoken leader. This person would initiate the document/blog/site for their tool. Furthermore, it became clear that this same member would review the work of the other members before it was cut and pasted into the tool. Hence, there was some sort of system to check the quality of work, which also allowed the group to ensure that all group members did their part.

This form of leadership was further showcased when Ivy noted "Usually, I'll start the document, I'll share it with them and I'll be in the group chat to start. I would suggest looking up some sort of stuff, whatever sources they had on their end they just put it in and then I'll edit it." This unconfirmed leadership was also evident when Ally shared how she takes initiative, "I told them I gave them options and they just agreed with anything." This was more high at the beginning of the implementation period as the group was just starting to work together on Google Docs. As the study progressed, the group continued to seek approval from their group "leaders" for permission to post or edit their pages on Blogger and Wikidot.

For the second theme, Building Group Communication, this derived from two categories: Group Communication and Interacting through the Web Tool. This can be seen in Table 4.17. For this theme, the participants shared that the tools helped them communicate with each other. Samson shared "It was easy to like, communicate with the chat feature" and continues, "Especially when you are in, like a crowded place, and you can just use the chat feature."

**Table 20**

*Theme 2 - Building Group Communication*

| Theme | Categories | Codes |
|---|---|---|
| Building Group Communication | Group communication | Helped communication - in and out of class |
| | | Helped build communication |
| | | Communicating with each other |
| | | Tracking changes |
| | Interaction through web tool | Chat feature encouraged discussion |
| | | Did not have to meet in person often |
| | | Interacted more through web tool |
| | | Used one web tool to communicate |
| | | Mostly used the chat feature |

Moreover, the participants also shared that the tool allowed them to interact with each other. This was due to the different features of the tools, but this was especially helpful using Google Docs to communicate with each other. The Google Docs chat feature was shared to encourage discussion amongst the group and it allowed them an additional platform to share ideas and discuss group decisions. Ryan voiced, "Also within Google Docs, there is a messaging or this tool that we can use to communicate with each other. And we can easily just type in-communicate with our group members." However, this was not the case with Blogger and Wikidot as both tools did not have a chat feature.

Participants were asked how they decided to begin their assigned task where Britney shared, "So, um, we did not want to use any social media so we did want to use Google Docs, in terms of communicating and who is the source of communication. Also because some were able to enter that site by tapping on the link that we provided."

Ally shares, "On...we have a group chat on the chat feature, and so we discussed it and we go over it and they tell me if they agree on the site or the source I sent" on the tool Google Docs. This was also the case when moving forward with the next two tools, as all groups used Google Docs to prepare their writing for Blogger and Wikidot. This may be due to the feature on Google Docs of sharing real-time editing and equal access for all group members. This pattern of discussion was seen across all participants as it appeared that communication was a key requirement to complete the group project.

The third theme for RQ3 is Providing Peer Support, which stemmed from the categories Supporting One Another and Keeping Tabs on Individual Progress. This theme and categories derived from the codes are outlined in Table 21.

**Table 21**

*Theme 3 - Providing Peer Support*

| Theme | Categories | Codes |
|---|---|---|
| Providing Peer Support | Supporting one another | Sets assignment as priority |
| | | Tool helped us work together |
| | | Working together |
| | | Helped productivity |
| | | Provided base for work |
| | | Helped get work done |
| | | Help each other |
| | | Nice working together |
| | Keeping tabs on individual progress | Watches each other's progress |
| | | Tool tracked progress of each person |
| | | Tool showed updates |
| | | Nonworkers held accountable |
| | | Made sure everyone did their part |

Participants relayed that they were able to provide support for each other through the use of the tools features. Nathan shared,

Google Docs is extremely easy. It was really easy to use, because it's nice knowing that you can be working on one thing while your other group mates are also on that same document going over stuff, too. And then as you're typing in, you're able to edit their stuff, see if they need any fixes, like grammatical errors, or if they need to add more information, and they can do the same for you. So yeah, Google Docs was really easy for that.

In addition, participants shared that they were also able to help each other by keeping tabs on each other's progress. Samson when asked if one the tools were easy to use he replied

It was easy to use. Because it would have much problems because like, you could see what your other people are using. To review that you have to wait for, like that person to edit it. And then you can edit it, like it was kind of easy, all you had to do was like, take your information. And it's, like, already there like you could just see other people working together, you know.

All tools required peer support to assist group members with using the tool more proficiently. As Samson (positive feedback) and Nathan (below neutral) shared similar feedback about using the tools and giving/getting peer assistance. In the beginning, it seemed support was needed as participants were unclear how to maximize the features of Google Docs to be used for the specific writing task. For Blogger and Wikidot, peer support was needed because the interfaces and functions were vastly different from what most students were familiar with using.

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However, throughout the use of all tools, group members relied heavily on each other to complete the assigned tasks.

The fourth interview theme for RQ3 is Experiencing a Learning Curve. This is rooted in the categories in Table 22. Despite the many codes for each category, the overall theme originates from learning the tools and learning from the mistakes of using the tools.

**Table 22**

*Theme 4 - Experiencing a Learning Curve*

| Theme | Categories | Codes |
|---|---|---|
| Experiencing a Learning Curve | Tool disadvantages | Lost data |
| | | Used one web tool |
| | | Would get locked out of tool |
| | | Not able to share web tool |
| | | Hard to access web tool |
| | | Hard to paste information |
| | | One web tool did not help group |
| | Experimenting and problem solving | Had to experiment |
| | | Need for tutorial |
| | | Figuring it out |
| | | Group confusion |
| | | Easy to use with easy format |
| | | Easier if experienced |
| | | More time on exploring tool |
| | | Became problem solvers |
| | | Used one web tool for drafting |
| | | Learned not to fully rely on certain features and to have backup |
| | Tools help group work | Changed perception of group work |
| | | Able to finish all assignments in short amount of time |
| | | Share resources through links |
| | | Tool was easy for group collaboration |
| | | One web tool helped group |
| | | Appreciated autosave |

Like in many cases, there are advantages and disadvantages and that is the same case for using web tools. In this study, the participants shared some cons of using the web tools for collaborative learning. One disadvantage was that only one tool had an autosave function, which was Google Docs and the first tool in the implementation period. Because of this, the participants became dependent on this autosave feature and when using Blogger and Wikidot, they lost some of their work because they did not click on the save buttons "publish". Britney shared, "So that really helped us, especially with autosave. And we had a problem of saving our work ourselves."

Another problem was that some tools made it harder to share editing privileges and at the start of the document, some group members were locked out of the project. This was most prominent when using Blogger. Invitations for the group members had to be resent multiple times before this issue was resolved. In addition, another con was the feature to cut and paste information. This was a problem mostly seen when using Wikidot because the layout is based on code programming.

Nathan shared "Wikidot? Kind of inconvenient but it was okay, because we had to have one person putting in information at all times. Another person can't edit it because it's locked in here. So we had to do separate Google Docs and ask if we're already given permission to copy and pasting that." While this was a minor setback with Wikidot and in some cases Blogger (as an editor), the groups were able to utilize Google Docs to overcome that challenge.

Overall, the participants had to work around issues to redress any setbacks from learning how to use the tools. The participants had to "experiment" when using the tool features to see

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what worked in their favor and what did not work. Nathan voiced, "...The brochure for us, it was- it was hard in the beginning, because we all never made a brochure before. And then we, we did sort of like what we did for we get out, we're just experimenting, we're figuring out how to work with everything." This experimentation was more prominent in Blogger and Wikidot as participants did not seem to have familiarity with tools similar to these two. Most participants were able to use Google Docs more easily as they had a history of using similar tools in the past. Figure 14 showcases a finished example of a brochure created from group 4.

Some groups opted to search for additional video tutorials to research how to use the tools' features properly. The participants relayed that the tools in general were not hard to use, but if they had more time to explore and learn the feature, they believe the tools would be easier to employ. Because of the ease of use for Google Docs, most groups utilized Google Docs for drafting as a means to put all ideas and writing together prior to inputting their research into Blogger and Wikidot. This was also due to the fact that it allowed the participants to back up their writing in case they lost their work or forgot to push publish. Hence, problem solving was a prominent factor in completing the assignment using these web tools.

**Figure 14**

*Group 4 Google Docs Brochure Student Example*



Nathan relayed,

I'll probably share advice, not the greatest of advice but I'd probably say, if you don't

understand it completely, I think it's best to watch a tutorial, write notes, and just really

look into it. Because when we're doing, when we're writing down notes in tutorials, or

blogger and wikidot, we thought we knew exactly what we were doing until we actually

got on it. And then when we were experimenting with it, we had no idea what we were

doing. So basically, it's like watching the tutorial, and actually watch the tutorial. And I

say like, certainly good thing, we're like, get on like a tab, redo tabs, and then just look at

the tutorial. And then go back to the other tab just in case you don't know what you're

doing at all.

Despite the learning curve, the participants shared that the tools assisted with group work.

This was due to the fact that the tools cut down the usual work load that can be found in

traditional group projects. The participants shared that the "sharing" feature to work

collaboratively on a single document/template was the most effective way to complete the group

assignment. This was due to the easy share feature and the autosave feature. Because of the  ease

of use of Google Docs for drafting, the participants felt that using the tool made completing the

assignment easier and faster. This pattern continued for Blogger and Wikidot because as

mentioned, the groups continued to use Google Docs as a platform to put their writing together

before moving the content to Blogger or Wikidot. This allowed the groups to review their work

before clicking publish for Blogger and Wikidot, which promoted group decision making.

However, the learning curve was more prominent for Blogger and Wikidot as feedback from

Nathan (below neutral) and Ally (below neutral) both shared similar comments about the tools

being more difficult to use than Google Docs. In addition to the excerpts above, Ally shared

"Wikidot and Blogger was a little bit more complicated than the Google Docs. So we mainly use

Google Docs to communicate." Hence, further tutorials may need to be given for all participants

to utilize Blogger and Wikidot more effectively.

The final theme from the interviews for RQ3 is Using Tool Features for Productivity.

Findings are shown in Table 23.

**Table 23**

*Theme 5 - Using Tool Features for Productivity*

| Theme | Categories | Codes |
|---|---|---|
| Using Tool Features for Productivity | Encouraging work productivity | Able to peer review and edit <br> Web tool format is easy <br> Able to submit their data <br> Simple to use |
| | Slowing down progress | Difficulty sharing information individually <br> Took turns pasting information <br> Only one person was editing <br> Only one person had access <br> Able to work without the whole group |
| | Comparison of three web tools | Increased difficulty for last two web tools <br> One web tool allowed communication <br> Some of the tools were similar <br> Easily inputted information in one web tool |
| | Students' thoughts | Able to easily paste information <br> Began as confusing and then became easy <br> Helped in composing research |

The tools that were introduced to the participants were used to compose their assigned

projects; however, the productivity using the web tools varied among the groups. Some

participants were encouraged to work with the web tools, they were able to peer edit and submit

their data. The web tools' format was easy to understand and was simple enough for beginners to

use for their assignment. However, despite the productivity among some of the participants,

others found it hard to work with web tools. Some found it hard to share information, and while others were able to work simultaneously on their own devices, other students had to wait their turn on a shared device. Not everyone had access to the documents, and so one person had to edit at a time which led to the idea that the web tools were not as convenient as others had experienced.

The experience of using the tools for productivity was different for each participant. Some participants who had below neutral responses were still able to work the tools proficiently. Nathan (below neutral) shared,

I think the only problem I had throughout working was me assuming that they already knew the features like in Google Docs or Blogger, I thought it was self explanatory to me, cause you could just kind of maneuver your way through it easily. I think that's if you grew up with technology and learn how to manage them but I had to teach one of my members how to change your font or to minimize the text and something like that. Small stuff like that I took for granted, and that's what took up the majority of our time. So I have to set aside time to be like "oh this how you do this, this is how you put in pictures..".

This ability to use the tools productively was further evidenced by Britney who relayed "Blogger was slightly difficult because we keep forgetting to update our blog, and it just- all our information just started disappearing when the Blogger site would crash or the laptop would die. So all our information would be gone if we did not update it."

Overall, the participants had different perspectives about each web tool. One web tool,

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Google Docs, was much easier to use than the other two tools Blogger and Wikidot. The

participants were also able to identify similarities among the three web tools. The web tools were

helpful even though there were times where the tools were difficult to use. The participants were

able to use each tool to successfully complete their projects.

**RQ4: Perceptions of Using Web 2.0 Tools for Collaborative Learning**

The participants' interviews were also used to answer RQ4: What are the student's

perceptions of using Web 2.0 tools for collaborative learning? There were a total of four themes

derived from the codes and categories using MAXQDA. These themes were Encourages

Teamwork, Preference Dependent on Usability, Tools Make Learning Convenient and Tools are

Useful Once Familiarity is Established. Each theme will be described in the following

paragraphs beginning with Theme 1 shown in table 24.

**Table 24**

*Theme 1 - Encourages Teamwork*

| Theme | Categories | Codes |
|---|---|---|
| **Encourages teamwork** | Group support | Nice helping each other |
| | | Tool helped group work hard |
| | Helpful features | Tools are helpful for projects |
| | | Help with organization |
| | | Great for students |
| | | Does not need to worry about lost data |
| | | Individual work was easy |

Teamwork was highly suggested within group tasks for better results, especially in

situations where individuals would not be able to complete them alone. For this theme the

participants shared that the web tools encouraged exactly that. Some participants shared that although there were some delays in progress, especially when it came to becoming familiar with the web tools, the tools initiated group support.

Ivy (neutral) explained, "I'd always message them and remind them. So I go check it if they do it. If not, I have to do it. I have to ask them to remember- I trust and I know that they will do the work." When asked to explain further, Ivy shared "I think the web tools help. I'd understand more, tools helped me understand more and to help my group."

When asked if handling the project would be different without the tools she replied " The difference will be I can't check if they're actually doing it. So yeah, with the web tools I can check their progress in real time. 'Oh you didn't turn this in, I really need you to turn this in' and they will be like 'Oh, I thought I did' 'Well I don't see it on my end'. So it gives them no choice but to do the work."

The sharing feature promoted the distribution of individual tasks and also allowed them to watch the progress of the overall assignment, Ryan stated, "We always checked on Google Docs to see if one of our group members were inputting their information and we'd always make sure that we complete we have at least a paragraph of information inputted into Google Docs." This was a group strategy that not only helped identify missing work and helped hold each student accountable but also, learning the importance of each responsibility.

However, despite starting from learning the basics or confirming if each member completed their tasks, the student commitment to learning with web tools encouraged teamwork. Nathan revealed, "The tool is -  they really helped to stay productive, especially Blogger.

Because Blogger was, like, was, like, it was a struggle for us at first. But seeing everyone worked on every single one of them, getting all the paragraphs done, and all their stuff like that really helped me like, believe that. Yeah, they're all being productive. They're all trustworthy, too," and Ally, who had a similar opinion, shared "I'd say the Blogger, the Blogger was a nice- I loved the Blogger, and it was good working with my group because that's when they log into Blogger and actually put in the time and work to submit their information from the task."

Overall, the participants found the use of web tools to encourage teamwork. This was seen across the board for all participants and all three tools. As seen in the comments above, the tools allowed them to determine who contributed to the group task and who did not or who may or may not have made errors. Because Google Docs was used for all three tool implementations, the participants were able to divide the task among themselves and then collectively check each other's work. Teamwork was still necessary for Blogger and Wikidot as the tools required consistent communication to ensure that the writing was saved, published, or shared properly. In all, the participants were able to work together and assist each other to use the tools to complete the group tasks.

Table 25 shows the themes, categories and codes for Theme 2. Participants were asked their thoughts on each web tool, and they shared their feedback on which tools they preferred the most and the tools they found the most difficult to operate. For the students, among the three, Google Docs was the most preferred.

**Table 25**

*Theme 2 - Preference Dependent on Usability*

| Theme | Categories | Codes |
|---|---|---|
| Preference dependent on usability | Wikidot challenging | Confusing layout |
| | | Wikidot difficult for group work |
| | | Stressful to figure out |
| | Google docs easy | Easy to use |
| | | Features were helpful |
| | | Blogger and Google docs no problem |
| | Blogger mixed review | Blogger is somewhat user friendly |
| | | Blogger good for groups |
| | Overall Thoughts | Program was motivational and helpful |
| | | Overthinking led to complications |
| | | Assignment would be hard without tool |
| | | Some web tool is easier than the other |

Samson, compared Google Docs with Blogger,, "So we didn't really have to talk much, each had to take in what our thoughts was, like, what we're going to do. And for Blogger it's kind of difficult because we couldn't share, couldn't get into the editing. So, took us like almost a week trying to like, share with our group the information we needed,." and then he continued to share a memorable experience with the tool, "Google Docs was the most memorable because it was the most easiest one that we can edit a brochure and it was nice" insisting that it was a great tool for their group project.

On the other hand, some of the participants found Wikidot difficult to understand or operate as a group as it limited group collaboration. Ally reveals, "Wikidot was difficult, because we have to take turns putting in our information and it was also hard trying to give my group's information too." and then describes the tool as 'old fashioned,' "Yeah, it's very hard to add

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photos and it's like old-fashioned...Wikidot," possibly because of its unfamiliar format. When Ryan was asked about his take on the tool he also shared a similar experience, "Wikidot? The fact that only one person could edit at a time. Like we have to have a separate Google Docs. So you have to go back and forth. They will be like 'Oh I need to type that' like 'Okay I need to go back'', revealing that his group had to use another web tool to assist in the completion of the assignment involving Wikidot. Figure 15 displays an example of student work completed using Wikidot to write about the University of Cornell.

Blogger, however, did not receive as many comments as Wikidot or Google Docs, in comparison to the other two tools, Blogger had some disadvantages and some advantages. Ivy shared both her dislikes and likes for the tool, "Oh, I like how there is a lot of themes in Blogger that you can use to decorate, what I didn't like is I get to publish it for it to save, I thought that was really inconvenient. When it came to publishing, sometimes it wouldn't show on their end 'cause the wifi cut out so we have to redo it…" admitting that although there were several options for editing to choose from, there were some difficulties that were inconvenient.

Although the students preferred one tool over the others, it did challenge them to discover new formats and new ways of learning, Ryan explains, "I used, I just researched and it wouldn't, I didn't have the tools to help me gather all this information and have it stored in one place. Once I used three web tools, it was easier for me to be able to understand what I was researching."

**Figure 15**

*Wikidot-University of Cornell Student Example*
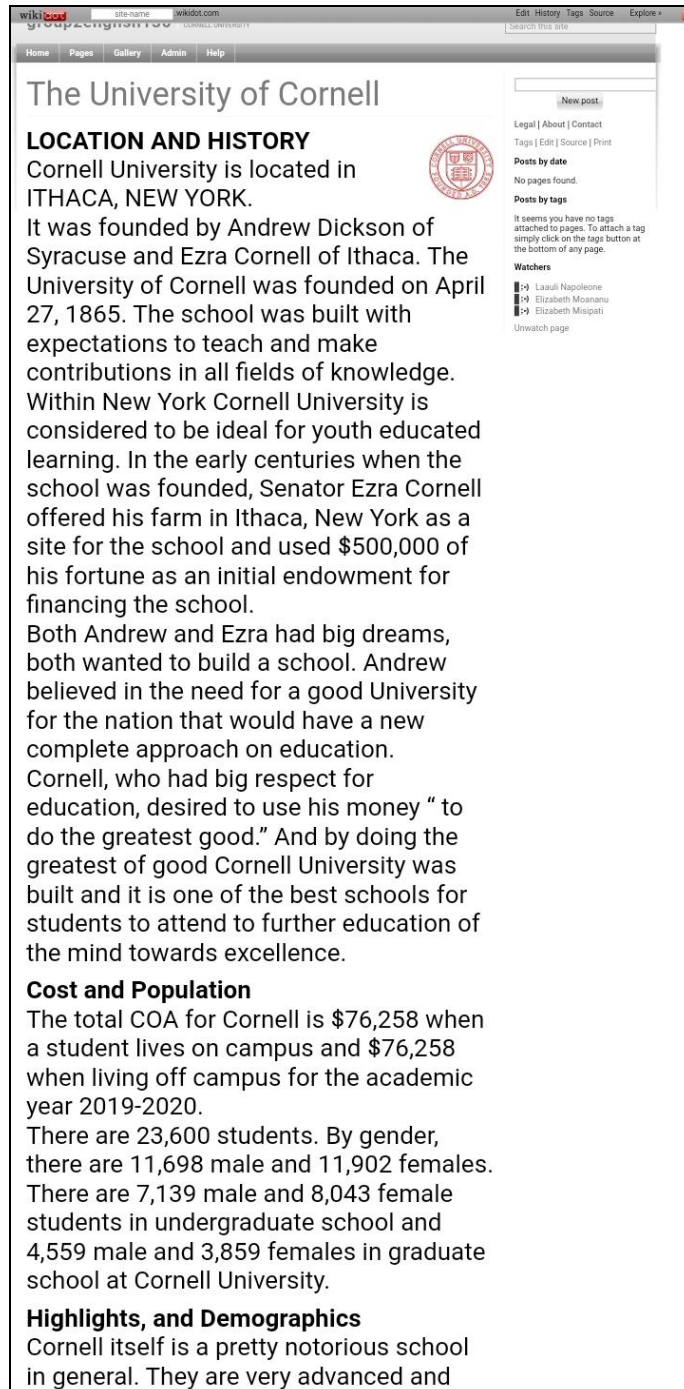
Overall, there were mixed reviews about using the tools, and the participants shared that their personal preference was based on the usability of the tools. As seen in the comments above, participants such as Ryan, who demonstrated average ability for all tools, and Samson, who demonstrated high ability for all tools, relayed that there were difficulties in using Blogger and Wikidot for their projects. Google Docs for all groups was easier to use and allowed them to edit simultaneously, but with the other two tools, there were limitations in that aspect.

Table 26 shows the categories and codes used to create Theme 3.

**Table 26**

*Theme 3 - Tools Make Learning Convenient*

| Theme | Categories | Codes |
|-------|-----------|-------|
| Tools make learning convenient | Sharing | Convenient for sharing with members |
| | | Links would help share resources |
| | | Convenient "save" feature |
| | | Easy to insert pictures |
| | Tool convenience | Able to paste work easily |
| | | Convenient to show progress |
| | | Able to keep track of workers |
| | Progress tracking | Can see who has incomplete work |
| | | Review and editing feature helped |
| | Specific features | Editing was easy |
| | | Able to communicate through tool |
| | | Features caught students' attention |

In this theme the participants shared how the tools made learning more convenient, they shared personal favorite features and how those features helped them complete their group assignment. One of these features was the ability to preview and edit the document on separate devices simultaneously, Ryan comments, "With our group, some strategy of using Google Docs

really helped us to be independent and doing our part of the task.", and shared how simple it was to complete his portion using the tool, " I just pasted a copy of all my information from Google Docs, and I just put it into Wikidot". Samson, when asked for his overall opinion on Google Docs, shared the same enthusiasm, "I liked Google Docs was - and it's free to use, not like the Word you have to pay. And Google Docs is like, is like, the Word but it's free. And has almost all of the features you need as a student. And it's kind of nice, because like, if you exit out, it's like, all your work is already automatically saved," finding the autosave convenient along with the availability of the web tool for students online.

Overall, the participants mostly agreed that the web tools made learning convenient. Participants with high ability like Samson relayed a positive review of using tools like Google Docs because not only was it free but it also had features such as the autosave that minimized work for the user. This was also the case for participants with lower ability to use the tools, where Ally shared "Since we've used Google Docs, we knew that it was much easier, or if it efficient for us to be able to complete our task." This also carried on to both Blogger and Wikidot and this was further relayed by Ally "Blogger was- Blogger and- Blogger was easy, because we had Google Docs." In all, the participants found the tools to have a positive impact and supported working together as a group. Table 27 demonstrates Theme 4 components.

Several students had a difficult time understanding the formats when first introduced to the tools. Participants shared their experience of getting familiar with the tools. After a while of struggling with her group, Ivy reveals, "I think after that whole hiccup with learning how to actually minimize text and all those small things that they didn't know how to do and they saw

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that it was similar to every other assignment that we did. It just got easier, the more assignments

that we did.", sharing that practicing with the tools and exploring different formats is how their

group managed to get familiar.

**Table 27**

*Theme 4 - Tools are Useful Once Familiarity is Established*

| Theme | Categories | Codes |
|---|---|---|
| Tools are useful once familiarity is established | Building familiarity | Explored tool |
| | | Some are still not use to web tools |
| | | Workshop would be useful for students |
| | | Introduce first, explore after |
| | | Con: Needs internet |
| | | Publishing to save is not convenient |
| | Discovered obstacles | Students start over because of lost data |
| | | Hard to access |
| | | One tool did not help at all |
| | | Did not encourage collaboration |
| | | Difficult without autosave |
| | Usefulness | Easier after learning how to use web tool |
| | | Great for projects |
| | | Familiar format for tools |
| | | Easy to use |
| | | May look complicated but is easy |

Some of the participants also believed that patience was what they needed to understand

the tools and the initial belief that it was difficult was what intimidated them at first, "I'd like to

share that each web tool, we had some sort of problem but in the end it all became easy,

especially Blogger when we found out that it was actually really simple to use when we just

made it difficult." shared Britney, on her take on getting familiar with web tools. However,

despite struggling with a new learning device, Ryan advised that "They might look complicated

at first, but once you get the hang of it, it'll be really easy" in hopes of encouraging future users that these tools were a great help once a familiarity was established.

Overall, the participants found the tools to be useful once they were familiar with using them. For Google Docs, there were a few times they had to undo a few actions but the history tracking and the undo button feature allowed all participants of all learning abilities to make changes and corrections easily. However, for Blogger and Wikidot, the participants' feedback indicated that these tools required more time and effort to master. This was particularly true for Wikidot as almost all participants shared that the layout of the tool was not as easily understood. This could be due to the fact that Google Docs and Blogger are similar to that of a Word document, which the participants are familiar with already. However, in all, the participants found it easier to use the tools in this order: Google Docs, Blogger, and Wikidot.

**RQ5: Beliefs of Web 2.0 Tools for Collaboration Influenced Their Learning**

In this portion, participants shared more about their personal beliefs about using the web tools for collaborative learning and how they believed the tools influenced their learning. Table 28 shares the first theme for RQ5.

As the students worked with web tools, they became more familiar and more determined to use it to their full advantage; the participants shared how using web tools left a positive impression of their learning experience. Britney admitted that despite their different methods of work, the web tools did motivate her group to work harder, "So overall, the web tools kind of motivated them to do their part of the work differently but they still did it".

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**Table 28**

*Theme 1 - Positive Effect on Learning*

| Theme | Categories | Codes |
|---|---|---|
| Positive effect on learning | Provided a base for learning | Used tools as a base for learning |
| | | Helped understand how tools can be used for learning |
| | Better understanding of the tools | Able to understand the tools more |
| | | Tool familiarity helped learning |
| | Positive influence | Influenced learning in a positive way |
| | | Want to use in the future |
| | Pride in the work produced | Proud of the work done |
| | | Did better than expected |

Some of the participants shared that despite their judgment, the web tools assisted them in a proud submission, Nathan proudly stated "Like, despite that I sort of felt really confident working on the Wikidot. It was exactly-it was the complete opposite of what I thought it was going to be because the layouts were really different and stuff like that. But I was able to. Yeah, I was able to understand it more and learn how to do it. So if I were to make one, I know what I'm doing now-", also implying that the web tools will also be used for future projects. Overall, as Ryan claimed "It was fun working with these tools." The web tools created a positive learning experience for all the participants in completing their assignments.

Another example of this is from Samson, who shared "We mainly used it for an outline like used it as a base for, for everything actually, for all three of the tasks for the brochure for the Blogger, and even the Wikidot. We used it for everything. It was a really big- it helped us a lot. " In this case, the participants were able to use the tools to make their group work easier than using

traditional methods that do not promote same-time editing. This was further evidenced by Ryan who shared "It was easy to use. Because it would have much problems because like, you could see what your other people are using. To review that you have to wait for like that person to edit it. And then you can edit it, like it was kind of easy, like all you had to do was like, take your information." This was in reference to using the tool Blogger, as it allowed a person to edit one section at a time.

Overall, it was clear that the participants across the learning spectrum were able to use the tools to their benefit. Based on the quotes mentioned above, there were several codes that indicated a positive effect for all participants. This included: tool familiarity helped learning, want to use in the future, proud of the work done, and did better than expected. Despite the differences in learning abilities, all groups and all participants were able to successfully complete the final products using the tools. The participants were able to share their work with the rest of the class, the teacher, and the researcher to showcase their positive learning outcomes.

In this theme the participants shared how the web tools assisted in group collaboration, as it promoted communication and group effort. The chat feature in Google Docs allowed the students to share their opinions without having to meet in person, "Now we use that to communicate. Yeah, it's mostly on the thing (referring to chat feature)" Ally confirmed, when asked about their method of group discussion. Table 29 shares the second theme for RQ5.

**Table 29**

*Theme 2 - Assists in Group Collaboration*

| Theme | Categories | Codes |
|---|---|---|
| Assists in group collaboration | Positive features | Able to track progress |
| | | Able to work out of school |
| | | Peer edit and peer reviewUsed links to share resources |
| | | Able to share documents easier |
| | Good for collaboration | Simultaneously work on different devices |
| | | Easy for collaboration |
| | | Web tool encouraged interaction |
| | | Able to review without being together |
| | | Working together on how to use web tools |
| | Promotes communication | Allowed communication and discussion |
| | | Able to communicate |
| | | Able to discuss through chat feature |
| | | Able to freely share thoughts |

Another appreciated feature that the participants mentioned was being able to view the updates of their document through the web tool, Britney shared " I liked that Google Docs showed the changes and who made the changes". These features assisted in group collaboration as it helped students monitor progress and continue to work together.

Britney further shared,

I did not like how Blogger kept messing with us, especially when we would automatically get locked out Blogger and we did, we didn't update our work or we would forget to update our work. But I also like how Wikidot showed us who made changes- it did not show us who made the changes but it showed the changes that were made unlike Google Docs, it showed the changes and who made the changes.

Another indication of the webtools providing assistance with collaboration was from Ivy who shared "Um Google Docs is easy and very helpful because it all our work typed in, we can edit each other's work and all our information together, and we can also chat on the- and decided to discuss what to put in our work." Ivy further shared that "If you're working in a group, it's gonna be very challenging trying to get the tools are very helpful. " Hence, the tools seem to serve as a positive platform for group work.

Overall, the participants found the web tools to assist in collaborating as a group. This could be seen in some of the codes mentioned above, which include but are not limited to: able to track progress, able to work out of school, peer edit and peer review, used links to share resources, and able to share documents easier. This could be seen for all participants as all had the chance to work together using the tools to complete the tasks. While the feedback was positive for all tools, Google Docs had the most positive features to promote group learning.This was also evidenced by the fact that the groups continued to use this tool to complete the remaining writing tasks for Blogger and Wikidot. Table 30 shares the third theme for RQ5.

**Table 30**

*Theme 3 - Promotes Individual Initiative*

| Theme | Categories | Codes |
|-------|-----------|-------|
| Promotes Individual Initiative | Showcases individual initiative | Initiative to remind members of tasks<br>Starting templates<br>Person shares the document for everyone to access<br>Helped with learning about assignment |
| | Allows individual work | Does not need everyone present to work<br>Open to anyone in group<br>Access work anywhere |

As the participants shared more about the web tools, they revealed that the web tools also promoted individual initiative, where students took their own action in pushing the group's effort. Ivy stated, "Again, I had to make the Blogger and then share it with them. I told them, like in person when we're next to each other, or when I share it here and they get the access to some of it", sharing insight about how one of the assignments started off. Usually, this is how individual initiative began, when one person volunteered to start the document when the others were unwilling. The sharing feature allowed students to monitor the overall progress of their project, as some participants mentioned, assisted in discovering missing portions of the assignment, and students also took the initiative of giving out reminders to the rest of the group if there were any.

Ally voiced, "The tool helped me collaborate with some of my group members, they actually- all three of us- it was only me and one girl who actually put in all the work and I had to like, remind my other group members over again so they can actually do it" and then continued "I'd always message them and remind them. So I go check it if they do it. If not, I have to do it. I have to ask them to remember. I trust and I know that they will do the work". Although taking initiative took  confidence, these individuals played an important role in pushing team momentum.

In all, the participants found the web tools to assist in promoting personal responsibility and initiative. Due to some of the features, two of the three tools, Google Docs and Wikidot, allowed users to see who made changes and when the changes were made. Although Blogger did

not have this feature, it still gave the participants the chance to be in charge of their own editing

and to paste into the blog post one by one. However, because all groups used Google Docs as a

"base" for all their writing for all tools, each group member was able to contribute and double

check to see if their peers did their work as well. Based on the quotes above, the participants

used this method to ensure each group member did their part and if they did not, they would give

encouragement and reminders to do so.

In summation, the six participants from the interviews had various views on using the

Web 2.0 tools during this study period. However, in most cases as described above, the

participants shared positive attitudes about the web tools' features. Certain tool features such as

autosave and synchronous typing allowed the participants to work well together and complete

the assigned writing tasks. Some participants felt that some tools were easier than others and this

was mostly the case of Blogger and Wikidot being harder to utilize than Google Docs. Overall,

the participants shared that collaborative writing tasks were easier to complete than if they had

done them without the use of the web tools.

**Triangulation**

For this study, I used triangulation of three different data collection methods:

observations, post surveys and interviews. The observations were used to answer RQ1 and RQ2.

Based on the findings, the students interacted well with each other and the tools. Working

together, the students supported each other, completed group and individual tasks, shared

resources and made group decisions. In addition, some technical issues caused delays but were

overcome with minor adjustments. For the surveys and interviews, these two methods were used

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to answer RQ3, RQ4 and RQ5. Both methods confirmed that the web tools had a positive impact on student learning. For both, the students relayed that the tools encouraged participation and helped them learn individually and with the group. Most felt that the tools made the learning more effective and convenient. The findings also indicated that the tools assisted with group work with the emerging themes which indicated personal accountability, group responsibility and communication. Themes from all three data collection methods note the positive effect the tools had on student learning in small groups which include individual initiative, encouragement for teamwork , and tool feature convenience. However, findings show that web tools do influence collaborative learning in a positive way if familiarity for the tools is established and if technical issues are resolved. In all, the triangulation of data confirmed that the web tools had a positive impact on student learning in small groups.

## Summary

In all, the participants were able to complete the collaborative writing tasks in their small groups while using the three Web 2.0 tools. Throughout the implementation period, the participants were able to demonstrate their baseline competency in using the three web tools: Google Docs, Blogger and Wikidot. The completed writing tasks completed in the study were a brochure using Google Docs, blog posts using Blogger, and a website using Wikidot. The participants were able to complete their assignments by working collaboratively in their small groups, providing peer assistance with the tools and the writing, and building a team dynamic of roles in their small groups. Together, the participants were able to overcome technical challenges

which included resetting passwords and dealing with slow internet connections. Participant

perceptions showed that the tools made learning more convenient, encouraged teamwork, and

built team communication. In general, there was a majority of positive feedback from the

participants relaying that they had productive experiences using the three web tools. However,

there was also negative feedback in terms of usability and experiencing a learning curve. While

the tool features made completing the task easier, participants expressed that some tools were

harder to use than others and learning how to use the tools proficiently is necessary to effectively

employ the web tools. Overall, the participants shared that the use of the Web 2.0 tools had a

positive impact on their learning and allowed them to work collaboratively and cooperatively

while building their writing skills and proficiency in technology.

# CHAPTER 5. DISCUSSION AND CONCLUSIONS

The purpose of this qualitative case study was to determine the influence of Web 2.0 tools on collaborative learning for secondary education students in American Samoa. This study allowed me to gain a better understanding of the participants' experience and perceptions through observations, semi-structured interviews, and post surveys. Using the three tools, the participants were able to complete their collaborative writing task while I analyzed if there was an impact on how the participants learned using the tools, how the participants learned working in small groups, and their perceptions of their experience of using the tools. After analyzing the data from the observations, surveys and interviews, I used the research questions to identify the key findings. In this chapter, I share the key findings, connections to the conceptual framework, connections to the literature reviewed and implications of the findings for future practice. I conclude Chapter 5 with expanding on the limitations of this study, note the areas for future research, and provide a summary.

## Key Findings and Connections to the Conceptual Framework

The key findings in this section include how web tools supported collaboration, teamwork, communication and group accountability, how web tools supported learning, how web tools promoted personal accountability and how technical difficulties interfered with the learning process. Each topic will be summarized below.

## Finding 1: Web Tools Supported Collaboration, Teamwork, and Communication

After analyzing the data, the research findings supported the idea that the web tools supported collaboration, teamwork, and communication. Web tools supported collaboration through features that enabled interaction in different ways than can be found in traditional discussion. As participants worked individually on their own devices, they were also communicating with their partners through text. This allowed individuals to freely express their thoughts with less pressure than experienced in traditional discussion. Another convenient feature was being able to share hypermedia links that supported research that the group was conducting. This served a purpose as participants viewed sources that others were using or referencing in the collaborative work. Another factor was the feature to co-edit at the same time because it did not limit who could complete the work during the given class time. Using the web tool to track history changes and individual tasks allowed members to check on the progress of each other's work. These features align with Gibson's Affordance Theory (1986) in which the web tools provided a supplemental learning environment that was beneficial to the learners. Hence, the affordances of technology allowed the learners to utilize the tools' features using their designed function (Conole & Dyke, 2004). Overall, web tools served a purpose in collaboration as they encouraged participants to not only participate in person, but from a distance as well.

Kidd and Keengwe (2010) also found teamwork was encouraged through web tools as they offered participants the benefit of exchanging ideas. As participants were able to express themselves through web tools, they were also able to share their own concepts by sharing documents, media, and viewpoints which is important in teamwork, especially virtually (Kidd &

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Keengwe, 2010). In the current study, participants used web tools to discuss different ideas and encourage others to continue to work at their own pace. In addition, it also served as a platform for group members to remind each other about their assigned tasks if members forgot or became sidetracked. One of the web tools' strong points was enabling discussion, sharing sources and ideas. This aligns with the Modes of Discourse (van Aalst, 2009) in which collaborative tools serve as an alternative learning platform by allowing group members to share their knowledge with each other and work together to post information and discuss critical issues (Cattafi & Metzner, 2007). As the concept of collaboration was encouraged through the web tools, users were also encouraged to pitch in towards teamwork through interactive discussion.

Communication was a key point within a strong group, without it there would be no cooperation or compromise. Fortunately web tools provided access to communication through text for members to discuss even when not together. The participants felt that the benefit of using web tools for collaborative work allowed them to share inquiries and opinions, also allowing them to comment on each other's work, promoting discourse and communication (Ochs, 1990). In alignment with the three Modes of Discourse (van Aalst, 2009), the use of collaborative tools furthers the enhancement of peer interaction and group work while simultaneously encouraging the distribution of knowledge and information amongst the group (Lipponen, 2002). As participants not only worked on their own portions, they communicated how to improve as a whole, a benefit that web tools can provide as they enable partners to provide feedback and comment on grammar errors. This was due to the availability of a chat feature in which the participants could communicate with each other to complete the group assignment. These

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technology affordances (Mesgari & Faraj, 2012) such as low cost, ubiquity, and ease of use have made Web 2.0 technologies more attractive than traditional tools (Ajjan & Hartshorne, 2008). With this, links, pictures, and questions were shared with each other to get group opinion and make group decisions. This was one of the most convenient aspects of a web tool as it encouraged members to communicate with each other, despite the difference in location, and also encouraged members to continue to improve along with the assistance of other participants. As participants grew into the idea that they are able to communicate freely through web tools, they also gathered the courage to be more active through virtual collaboration.

As participants continued to work through web tools with their partners, they built a sense of accountability. They became accountable for the sources that they shared and the portions of work that they were assigned through compromise. The quality of collaboration is heavily dependent upon the individual's knowledge of collaborative skills and the potential affordances technology can provide for collaborative learning (Brodahl et al., 2011). Other researchers have shared that one of the main benefits of web tools is that they are able to carry on that accountability in their own homes, a concept that the participants fancied as it enabled them to work as a group and not need to gather as one (Marchegiani, 2017). Students can work through web tools with or without their teacher (Hudson, 2018). As participants take action in their own spaces and away from their partners, they develop accountability for how they are able to cooperate within a group and their own responsibilities. This accountability is due to the fact that many Web 2.0 tools such as blogs and wikis have been coined "social software" as they have the ability to enhance collaborative dimensions within and beyond the classroom (Parker &

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Chao, 2007). Social software promotes powerful information sharing through collaborative features and amplifies cognitive reflection and knowledge construction (Jonassen, Peck & Wilson, 1999), which was shown in this study and aligned with the three Modes of Discourse (van Aalst, 2009) and learning through ZPD (Vygotsky, 1978).

Overall, web tools supported learning collaboratively and individually as they provided features that enabled group interaction and productivity. It also encouraged teamwork as the active participation in collaboration encouraged members to express themselves and accept feedback. As communication is one of the key points of good teamwork, the web tools provided features for members to communicate with each other such as commenting, virtual texting, and editing. Particularly, web tools, such as wikis, have been known to promote knowledge construction (Boulos, Maramba, & Wheeler, 2006). Participants also gained a sense of accountability as the web tools allowed them to work individually with the idea of cooperation with others in mind and responsibility in their own work. To conclude, the web tools provide affordances through convenient features that allow students to work freely and cooperatively to discuss knowledge and construct new knowledge.

### Finding 2: Web Tools Were Perceived to Support Learning

Another finding from this study was that the participants found web tools to support learning. Web tools can support modern learning as they provide assistance for students to learn through features that allow them to interact, research, and compose their work together. In this study, the web tools allowed students to not only work together but also help themselves by learning with the help of their peers or the internet. Through discourse and peer guidance, groups

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were able to create products through collaborative writing drafts and through the exploration of the tool features. As students learned to explore the web tools, users gained help from other users who assisted them with research and editing their work. Vygotsky's (1978) Zone of Proximal Development (ZPD) conveys the social characteristics of learning as it emphasizes the ability of an individual to complete tasks with the guidance of a more knowledgeable person (Brodahl, Hadjerrouit, & Hansen, 2011). This emphasizes that a student is able to learn on their own but they are able to go beyond their limitations if they are guided through interaction with a more well-versed individual or peer (Brodahl et al., 2011). Hudson (2018) similarly found Web tools encouraged users to work together in learning new things, more advanced students assisted those in need of help and the new information could be passed along the way such as through different texts or grammar. This was found to be true in this study and the participants benefited from using the web tools as they encouraged individuals to work in ways they might have not done in person. Due to the Technology Affordances (Mesgari & Faraj, 2012), Web 2.0 technologies like blogs and wikis have become increasingly popular in learning environments (Brodahl et al., 2011).

Web tools provide features that allow students to interact with each other and give each other feedback. Feedback is important as it will help students improve their writing. The web tools give access to students to give feedback through comments or suggestions posted under certain work. Through Vygotsky's (1978) concept, the socio-constructivist learning theory is essentially a collaboration theory as it emphasizes the roles of language and culture in human interaction and collaboration (Brodahl et al., 2011). In the groups in this study, it was easier for

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participants to review each other's work and note whether or not it was complete or if it needed

improvement. Such guidance was given through the commenting or suggesting features and also

through communication in the chat box. To put it simply, users may enjoy web tools because of

the ability to express themselves freely without the pressure that they may have felt in a

classroom.

The simple layout of the web tools are also another reason as to why students were able

to learn with web tools. The web tools provided similar editing features that made collaborative

writing easier than it would be in a traditional setting. Features such as the font options (style,

size, highlight, and color), columns, headings, and more allowed the participants to control the

visual layout of the writing. This seemed to work well as the participants did not have to delay

their work by interchanging traditional writing tools and/or the use of shared paper. As students

worked together through web tools, they were able to interact with their peers and be

professional learners by providing suggestions and assisting one another and manipulating the

tool layout and text features. Hence, in alignment with Vygotsky's Zone of Proximal

Development (Vygotsky, 1978), the web tools supported learning as they allowed participants to

work together in small groups to maximize their learning experience and promote group

effectiveness through peer assistance and guidance. From the perspective of Social

Constructivism (Vygotsky, 1978), learning is an active process that takes place through

interaction in social environments where learning occurs through knowledge sharing and

collaboration in real life settings  (Brodahl et al., 2011). In this study, the learners played an

active role in their group work and extended their experience of collaborative learning through

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peer interaction. The students with more knowledge in using web tools were able to advance through their individual learning and then also assist their peers in completing their tasks. This finding supports the idea that students learn best by doing and by teaching others through discourse (van Aalst, 2009), especially in close proximity to each other (Vygotsky, 1978).

**Finding 3: Web Tools Promoted Personal Accountability**

As users learned how to use the web tools, they also reached points where they learned that there are features that the web tools provided that may need a bit more attention. Fageeh (2011) noted that as students get familiar with web tools, they develop a sense of responsibility over the digital practice, which results in the freedom of literary expression. This was found to be true in this study and the participants learned that the tools allowed them to make instant changes within their group writing. There were trials and errors for the participants to learn what to do and what not to do in order to use the tools for their benefit. With this, participants learned to be wary of the changes they made so that it did not negatively affect their group work.

Additionally, the web tools promoted personal accountability and allowed the participants to track their individual progress. Using one platform or one tool to serve as a base of their group work helped participants note which group member was in charge of which task. Individually, the participants had their own roles to fulfill to ensure the success of the group writing assignment. Each person could track the progress of their group members and the participants could see examples of what the collaborative writing looked like and then make adjustments on their end. This pattern of increased contribution can be found in various studies. For example, in a study conducted by Rienzo and Han (2009), researchers found that using Google Docs in a

management course with 400 plus students to be beneficial and anticipated collaboration levels to increase. Similarly, a study conducted by Tsoi (2010) concluded encouraging and positive results with the integration of collaborative activities mediated by Web 2.0 technology, such as blogs and wikis. In all, this study's findings show that web tools assisted in promoting individual initiative and accountability where the participants tracked their own contributions to the group task and provided updates to track the contributions of their group members.

**Findings 4: Technical Issues Interfered with the Learning Process**

The research findings supported the concept that technical issues interfere with the learning process. Such technical issues include the lack of strong internet connection, access to email accounts, and access to working devices. I found that the participants were eager to work together and use the tools for the collaborative writing tasks, but these technical issues caused difficulties. The most prominent issue was the lack of strong internet connection to support a class size of 15 students to be online simultaneously. This caused several delays in the group work and limited the amount of progress a group member could make in the allotted time. Despite there being the school wifi and personal Mifi devices, there were several cases in which the participants had to seek the assistance of the class teacher to get connected. Technical issues also extended to class devices. It was minimal but there were times when the participants had to switch out their devices and seek an alternative device to complete their work. Due to access constraints, implementing educational technology successfully is not feasible if the school does not possess enough computers and/or fast and reliable internet connection (Johnson, Jacovina, Russell, & Soto, 2016). Furthermore, inconsistent computer access makes technology integration

much more difficult as the students do not have routine access to hardware, software, and internet connection; whereas, all three are necessary to integrate technology (Johnson et al., 2016). In all, these technical issues caused difficulties in the learning process.

One of the most common reasons as to why participants face difficulty in trying to cooperate with web tools is due to the fact that not all are familiar with web tools. In a study conducted by Yu, Lohr, and Cheng (2004), the researchers explored the facilitation of online instruction and found that students perceived technical difficulties and the lack of computer knowledge to diminish their experience in using web tools. In this current study, some users had difficulty trying to gain access to the web tools, while others had difficulty getting familiar with the basics. Although the participants had a tutorial session for each tool, there were several times that they needed additional assistance. In some cases, the participants sought assistance from the teacher but more often, the participants relied on additional online resources and their group members to provide clarity. As more time was spent on trying to learn more about the web tools, less time was used to complete the group task. It was concluded that the tool implementation could have run more smoothly if all students were familiar with the web tool and had basic computer skills. In all, there are plenty of reasons as to why web tools can be a great asset in academic learning. This study's findings show there are issues that can interfere with the learning process, such as the need for tool familiarity and technical problems stemming from the lack of consistent internet connection.

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# Connection to the Research Literature

The findings in this study are similar to those discussed in the Literature Review in Chapter 2. This study's findings touch base on topics of Chapter 2 such as collaborative learning, web tools for collaborative writing, the use of web tools for collaborative learning, and student perceptions of web tools.

## Collaborative Learning

Collaborative learning becomes an interesting concept where different individuals come together to compose a product through a certain task or tasks. This is when students of different learning paces work towards the same goal (Gokhale, 1995), which could involve comprehension, problem solving, or composition (Smith & MacGregor, 1992). Within this study, the participants were mostly different in their learning styles and had to work collaboratively to get the task completed. This is where students are able to touch upon their own skills and combine it with others so that they can move forward together. As they work collaboratively and build their own skills towards their academic pursuits, they can have their instructor become their guide or an assistant when needed (Marchegiani, 2017). Literature suggests collaborative learning allows students to bring out their own potential and share it with others, while also moving forward in their academic goals as a team. This was true in this study as the participants shared their thoughts and supported each other to complete each writing task.

There are characteristics of collaborative learning that make it more preferable than individual learning among students. Slavin (2008) shared that motivation, social cohesion,

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development, and cognitive elaboration are four theoretical viewpoints he proposes to explain

the educational benefits of cooperative learning (Judd, Kennedy, & Cropper, 2010). In this study,

the participants worked collaboratively and cooperatively interchangeably as they alternated

between working together and working independently. The collaboration or the company of

others can simply encourage others to work.

In a study conducted by Gullillem (n.d.), members of the group continued to be active in

the collaboration and individuals motivated others to cooperate and create genuine content using

the web tool Wiki. Based on my study, this was found true because the web tools supported

learning and encouraged teamwork and communication. Small group learning activities that are

well-designed foster an active and comfortable learning environment with opportunities for peer

interaction (Agnihotri, 2019). Overall, the findings in this study show that collaboration and

cooperation with responding peers created a fun learning experience and helped students remain

active in their academic goals. Hence, findings of this current study seem consistent with

research where the assignment of group work keeps the participants engaged with each other and

in the task.

The idea of collaborative learning is an interactive experience that allows students to take

over while the teacher can be on standby to supervise or to assist. It is an inventive way to shift

the attention away from the teacher and onto the students, who are in charge of building

knowledge by conceiving ideas, putting them into words, and submitting them to peer comments

and reactions (Marchegiani, 2017). In this study, the participants were the sole creators of the

content produced together. The participants used their research, their own knowledge and their

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own skills to assist each other and complete the given task. The opportunity to take charge

themselves may have encouraged students to be more active in their academic goals with the

help of others, sharing ideas and collaborating together could be more preferable than the

individual quiet study time. Active engagement, practice opportunities, and feedback should all

be part of a student's learning experience (van Diggele, Burgess, & Mellis, 2020), and this is

what collaborative learning process provided for the study's participants.

**Web Tools for Collaborative Writing**

Through research findings, web tools supported the idea of writing improvement,

especially collaborative writing among students. Students develop their writing skills by

participating in writing dialogues with their peers, professors, native speakers, and others (Lint,

2017). This aligned with this study's findings as the web tools provided a platform for the

participants to assist each other with the writing task. Web tools can provide these features as

anyone can have access to web tools and are able to communicate to those who are involved

within the assignment. Listyani (2021) shared that the two important elements in writing are

self-confidence and motivation. At the end of this study, the participants displayed more

confidence in their writing ability and web tool skills as they were able to build familiarity over

time. This was developed or could be encouraged when one has peers to provide them feedback

for improvement and communicate to assist towards their academic goal of becoming better in

writing.

Researchers conclude that web tools do play a role in extending a student's ability to

write as it allows them to adjust to new information and new improvements (Listyani, 2021).

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Within this study, the participants were able to view each other's work at all times and they could evaluate the quality of their own writing. Contrastly, reported in another study, web tools allow users to view the work of others, but not all students are comfortable with the idea as they find it a bit intimidating that they are required to respond to other people's work and that people would have to also look at theirs (Caspi & Blau, 2009). However, for my study, this was not the case because one of the most helpful features of web tools for collaborative writing was being able to share feedback with each group member and receiving their feedback as well. Giving positive criticism is another technique to support students' motivation (Listyani, 2021). Findings from this study confirm that to be true and that was seen through the team communication via chatbox and commenting/suggesting features. Web tools [blogs] improved writing ability more effectively than traditional learning venues in one study (Özdemira, 2015). Based on this study's findings, a student willing to take in feedback and improve their writing will find web tools helpful as it does encourage students to communicate with each other towards improvement.

Collaborative writing using web tools is a good way to receive feedback and help others improve by giving back comments as well. Writing using web tools is preferable to many students of this digital age, as they become more familiar with their own devices they start to slowly get the hang of web tools and their capabilities in the educational field. Unlike traditional ways of teaching writing skills, blogging allows students to engage in discourse, engagement, communication, and debate before beginning to write (Alsamadani, 2017). In this study, interaction was strongly encouraged through web tools, and students began to learn on their own

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with the assistance of their teacher or peers. To put it simply, web tools can help advance writing in ways that traditional learning may not be able to do in the same way.

## Use of Web Tools for Collaborative Learning

Collaborative learning continues to evolve as modern technology advances in the era of working from home or from a distance, and especially working simultaneously without having to share a pen and paper. State-of-the-art technology functions as a productive platform for academic purposes in the digital age. The learning process has been successfully changed thanks to digitization (Alsamadani, 2017). Technology, according to the literature, allows users autonomy and a variety of interactive online tools with which to communicate, share, and contribute to a project's content (Hudson, 2018). For this study, the use of collaborative writing tools Google Docs, Blogger, and Wikidot provided the participants with the means to contribute equally and to complete the group task at their own pace. In addition, web tools are similar to handwritten journals, and this could be the reason as to why users enjoy web tools as they allow them to express and connect over ideas and share them with others (Yunus, Tuan, & Salehi, 2013). In this study, findings are consistent with previous research as the participants had the opportunity to connect with each other and share their ideas freely.

These features are discussed throughout an experimental class (Wu, 2015) hosted in which the observation, which was partially inspired by Warschauer's idea of Computer-Mediated Communication (1997), shares that web tools enable collaboration as it consists of "text based-interaction, many-to-many communication, time-and-place independent communication, long distance exchanges, and hypermedia links" (Wu, 2015, p. 96). This is consistent with this

study's findings as the features of the web tools enabled communication, teamwork and group accountability. Participants used text interactions to confirm their work with each other and to ask for assistance if needed. This could be done whether or not the participants were physically near each other and it provided an extended learning platform outside of the classroom. With web tools and their helpful features, students were able to learn collaboratively with their peers while also advancing their own skills in modern technology.

Web tools assist with collaborative learning as it provides the features for a group to come together and put in their own input of the given assignment. Participants are able to work in their own space, and are granted the ability to edit and work together simultaneously (Brodahl et al., 2011). In this study, participants were able to contribute to the writing task regardless if they were physically in the classroom and if one was absent, they were able to use the web tools to complete their work. Researchers believe that due to the ability to access documents or the internet along with others simultaneously and from a distance, users are encouraged to engage in a new type of learning (Fageeh, 2011). In sum, the web tools in this study assisted the participants in the classroom and collaborative learning was still possible from their own homes.

In another example of using web tools for collaborative writing, [Blogs] can help students build a learning community by giving them ownership over their own learning, a legitimate voice, and a genuine and possibly global audience for their work (Downes, 2009). This was found to be true in this study implementation because the participants created their own content and products using the web tools. Students can not only collaborate with their peers in Wiki, but they can also see the work of others and remark on it using the Wiki commenting tool (Yusop &

Basar, 2017). According to a study of individuals using Microsoft Word, students may receive the benefit of improvement through feedback from other users (Yusop & Basar, 2017). While the participants did not use Microsoft Word, the web tools had similar features for word processing and allowed the participants to do the same. Whether through Google Docs, Blogger, and Wiki, the participants in this study provided feedback to each other on a consistent basis. With features that allow students to communicate and provide feedback to each other, their learning extends as they continue to share their own skills and gain more from their peers.

As participants become more familiar with the web tools, some still face a hard time t as one of the participants of the observational study shared that "Too many participants in the review weren't familiar with wiki. Again it worked out as a doubling up of work for me as even if I used wiki myself other participants weren't familiar with it so I still had to use my old format" (Bruen, Fitzpatrick, Gormley, Harvey, & MacAvinney, 2010, p. 16). This was somewhat consistent with this study's findings where participants had some difficulties using the tools to their benefit. There was a need for additional peer assistance to close the learning gap between those who were more proficient in using technology than those who were not. However, it differed in this study because despite the difficulties and learning gaps, all participants were still able to contribute their portions and each group completed the learning tasks. Hence, participants shared that although the web tools have its benefits, when it comes to collaboration, the familiarity of devices play an important role in keeping the ball rolling, otherwise it would be more work for those who are familiar.

Collaborative learning with web tools is an advancement in academic learning as it allows students to access a myriad of resources that can support their educational learning. In one study conducted by Brodahl, Hadjerrouit, and Hansen (2011), some users felt that the web tools did not provide enough features to meet their expectations and also interfered with collaboration at some points. However, from my study's finding, this was only partially true. While there was a need for more tool familiarity, the findings indicated that the participants found the tools and their features to have a positive effect on their learning. Not only were they allowed to access plenty of academic sources and features, but they also were able to communicate with their peers and work with them from a distance. Research findings suggest that, while web tools [wikis] allow students to become more autonomous, they also benefit from providing and receiving peer input (Alshumaimeri, 2011). Yet, tools such as wikis make it possible to increase transparency so that group members could work faster on their individual tasks while still maintaining engagement in the group (Bruen et al., 2010). In this study, the web tools were effective in collaborative learning as they allowed students to conduct their own research and present it to the group for others to look over as well. While web tools may take some time for many to get used to, once students become familiar they will be able to compose quality work easily.

**Student Perceptions of Web Tools**

This study's findings appear to have positive student perceptions of web tools. Although there are a great number of qualities that web tools have that can assist with collaborative learning, collaborative writing, and learning in general, it is important to keep note of what the users think of web tools in the working environment. There could be features that the students

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may dislike from the web tools or find inconvenient, or there could be features that they would appreciate or find useful throughout their educational learning. In this study, students found Blogger and Wikidot to be more difficult to master, but mostly found all tools to assist with their learning in a positive manner. In a study by Yusop and Basar (2017) students shared that the impressions of the benefits of Wiki [web tool] for collaborative assignments are crucial to consider because if they believe that online collaboration does not aid their learning, they may feel burdened when given a task connected to it and may not participate in the activities. In a study conducted by Yu, Lohr, and Cheng (2004), researchers noted student perceptions of their experience with online learning, where the students shared their appreciation for the technology affordances such as convenience, ease of communication and flexibility. The structure of web tools, such as wikis, allow groups to aggregate a wide range of knowledge and enables individuals to work across tasks, building the momentum of the project progress (Bruen et al., 2010). In my own findings some participants needed additional assistance to work the more difficult tools. Hence, this study's feedback included participants recommending that tool familiarity is necessary in order for tools to be used successfully in learning activities. Once that is achieved, the findings indicate that the overall consensus was that despite the difficulties, the students perceived the tools to be helpful, especially when working in small groups.

## Theory Implications

The research findings suggest that web tools have a positive impact on collaboration for secondary education students in American Samoa. As previously mentioned, this study was

based on three theories: Social Constructivism (Vygotsky, 1978), Modes of Discourse (van Aalst, 2009), and Technology Affordance Theory (Gaver, 1991).

This study's findings suggest that web tools add to the scope of Vygotsky's Social Constructivism in which peers demonstrated positive outcomes from working together. Pertaining to the Zone of Proximal Development, the participants in this study seemed to perceive working together as more optimal than working alone, as they were able to share screens and discuss potential issues with each other. Vygotsky's ZPD refers to "collaboration with more capable peers" (Vygotsky, 1978, p. 86) and in this study, there were participants who were unspokenly chosen as the group leaders. Participants were observed to look for guidance or approval from a specific individual in their group and would make decisions based on their feedback. Participants were observed to rely on each other whenever one encountered difficulties, which included technical difficulties with the Internet connection or with the laptop and also difficulties with using the web tools. This extended from face to face discussions and guidance and also to guidance on the tool features when working remotely. Working together in their small groups, the participants were able to co-construct their collaborative writing to complete the task of using the tools.

In addition, the findings show evidence of the modes of discourse, including knowledge sharing, knowledge construction, and knowledge creation (van Aalst, 2009). During the intervention, the participants were seen to share numerous discussions about the content of their writing task and the use of the web tools. This also extended to discussion on how to maximize the tools' features to the group's benefit. This indicates that the transmission of knowledge was

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shared amongst the group members, and it was observed that the groups used discussion to problem solve whilst working on the assigned tasks. In turn, discussions turned into the production of writing and together the small groups used their shared knowledge to construct writing content of their own understanding. In this, the participants were able to construct three different writing products using paraphrased information of their own understanding. Hence, the restructuring of the participants' knowledge resulted in the creation of the final products of a brochure, blog posts and a website.

Furthermore, the participants' survey and interview feedback indicated positive outcomes through the affordances from the web tools. The environmental factors (Gibson, 1986) and the elements from technology (Hutchby, 2001) allowed for the participants to utilize the web tools to their advantage. Specifically, the participants shared that the tools' features allowed them to work more efficiently and collaboratively. Some features include but are not limited to the autosave feature and chat feature on Google Docs, collaborative editing tools on Blogger, and the history tracking on Wikidot. These features also allowed the extension of the learning environment in which participants could contribute from outside of the classroom. These features allowed for more collaboration to occur as the tools promoted accountability in allowing for all members to contribute to the writing products from their own devices and at their own pace. In this study, the participants were observed to gain a better understanding of the ease of use for each tool and also the limitations of using technology which is aligned with previous findings (Gaver, 1991; Mesgari & Faraj, 2012).

## Implications for Practice

Educators and rural educational institutions can learn from the findings of this study and consider the integration of web tools for collaborative learning. Currently, web technologies can be found in numerous classrooms across different grade levels; however, in more rural areas like American Samoa, the integration of web tools can be very limited. Due to recent events, there has been a sense of urgency to employ web tools in regular education, so there is a need for more practices to be implemented across the education system. Specifically,  ASDOE (2021, para. 1) revised the territory's vision statement as "All students are empowered with 21st Century literacy and cultural values to achieve success and resilience in diverse life settings." Hence, this study has demonstrated that using web tools for secondary education students can be helpful and engaging for collaborative learning in American Samoa.

To note, there was also feedback which addressed the need to take care when implementing web tools. When asked if there were any additional comments about using the web tools for learning, one participant shared "I think it's necessary to have a separate step-by-step session dedicated solely to teaching kids how to use the functions of certain web tools and be comfortable with it." While this study included a tutorial lesson for all participants, there seemed to be a need for more of a breakdown for each tool so that each participant could gain more expertise. Depending on the difficulty of each tool, perhaps two full lessons could be dedicated to tool tutorial sessions prior to shifting to the assignment. With proper facilitation, web tools can

be integrated into daily lessons to maximize the learning experience to build collaboration, cooperation and communication.

Based on this study's findings, more teachers can integrate web tools for small group learning. Based on the observations, participants found using the tools easier when they were working in a group as it allowed them to talk to each other. Peer guidance allowed the participants to feel more comfortable using the tools and gave each participant the opportunity to review each other's contributions to the assignment. This led to confirmation of the work that was being done on a collaborative level. The incorporation of web tools in small group learning can potentially increase the effectiveness of collaborative work and allow for all members to contribute inside and outside of the classroom. This is especially important if there are regular absences for medical purposes, family matters, or more. Participants are still able to contribute to the group assignment as the web tools are not bound by space and time.

Furthermore, with the integration of web tools, teachers could more regularly use technology in the classroom for college and career readiness. When asked for any additional feedback, one participant noted that "Web tools are really helpful for me and I know it can really help me in the future when I am in college or at any University." This is indication that 21st learning is needed for these students to flourish in various college and/or career settings. While web tools have become more and more prominent, participants may not be "digital natives" and tools familiarity and digital literacy must be emphasized. Regardless of their future choice of employment or education, having a basic understanding of web tools is a necessary foundation.

Another practice teachers can employ is sharing the implementation strategy of web tools with other teachers and administrators. Because 21st century education is pertinent, it would be in the best interest of all educators to successfully implement web tools into learning on a regular basis. Because most web tools are free and most schools have email domains, teachers can employ web tools without too much hassle as the students can use their school accounts. With this, the teachers and administrators can work together to foster mastery of specific tools that can be introduced and developed over the course of the four year high school requirements. Web tools that have easier functionality can be introduced first and the more difficult tools can be used in the upper grade levels. Tools can also be used to house resources for all grade levels and content areas, which can promote vertical and horizontal alignment of the curriculum.

The last practice recommended would be to normalize technology integration by providing sufficient devices and stable internet connections. For this study, it was only possible due to prior planning and additional purchasing of portable wifi devices by the researcher. Even with this preparation, there were still difficulties. Hence, it is imperative that schools, particularly rural and low income schools, have enough laptops for each student so that they can be more familiar with the device features and also familiar with going online to access web tools. More resources should be put into securing reliable internet for all school settings so that learning is not stunted and the participants and teachers are not discouraged in using web tools. If 21st century learning is to occur, the provision of resources should be prioritized for the school and the school systems, as this type of learning should be supported for the students.

# Challenges Encountered

While conducting this study, there were several challenges I encountered. One main challenge was the connectivity for Wifi. Prior to the implementation period, I attempted to mitigate this problem by working with the school administration and the education information technology department. After several weeks of discussion, the technology team verified that the school wifi was competent and working. In addition, I purchased two portable mifi devices, and I also worked with the classroom teacher to use her portable mifi as well. Each mifi should have been able to allow up to ten devices to connect at a time. Despite this preparation, internet connection was an issue every day of the implementation period. There were several times the participants had to ask to be reconnected to the portable mifis or they just lost connectivity in the middle of working on the assignment. With this challenge, I was frustrated because I had tried to prevent such issues from occurring and yet it was still a prominent problem. Hence, this issue could have had negative effects on the perceptions the participants had from working with the web tools.

A second challenge that I encountered was creating accounts for the web tools. For Google Docs and Wikidot, the participants were able to create their own accounts using their school email addresses. However, when it came to Blogger, the tool would not accept the school domain. As such, the participants had to use their personal email accounts. This was an unforeseen challenge as I was under the impression that any email would be accepted. This made

things a bit difficult because it forced the participants to go back and forth between the tools and their email addresses which caused a bit of confusion and delay.

Another challenge of this study was the difference in participants' skill level when using technology. There were participants who were able to use the tools with little to no assistance, but on the other hand, there were also participants who struggled with simple tasks such as logging into their email accounts. This was alarming because as 12th grade students, the participants should have the bare minimum knowledge to at least know how to do the basic tasks. The vast differences in skill made it difficult for participants to work on the given task while using the web tools.

In addition, one more challenge from this study was the difference in the participants' skill level in writing. When implementing this study, I was under the impression that the participants would be competent in writing summaries. However, while observing the participants, it became apparent that was not the case. Several participants struggled to write short paragraphs and also had difficulty ensuring that their work was paraphrased correctly and not plagiarized. This came as a surprise because as a high school English teacher, I expected the participants to be mostly proficient in writing simple sentences summarizing information.

## Limitations

For this study, there were various limitations and one specific limitation was the small sample size. As there were only 15 participants in the study, the limitation is generalization as the research findings may not be applicable to larger audiences. The sample size also only catered to

12th grade students so the study may not be applicable to all grade levels of secondary education. Hence, the small sample size and limitation to one grade level in one school in a unique context restricts the generalizability of this study.

Another limitation was the use of semi-structured interviews. As the interviews were conducted, I observed that some of the participants seemed nervous and hesitant to answer. Hence, it is possible that the participants answered in a way that they felt would be more "acceptable" rather than what they felt about the actual experience using the web tools. While these interviews were conducted on a one-on-one basis, the participants may have felt pressured to adjust their responses, which may have affected the interview findings.

A third limitation is the potential for researcher bias. While I was not their classroom teacher, the participants knew of me and my reputation as a full time teacher at the school. This may have affected their behavior and their interactions with each other in the classroom. Perhaps having a researcher whom the participants do not know would allow them to act differently. In addition, while I was not their teacher, there was potential for bias as I also know of the participants at the surface level. I may not have taught them in the classroom, but working at the school, I have had a few passing interactions with a few of the students prior to the study. In all, this bias could have potentially affected the study.

A fourth limitation is the subjectivity of the observation findings. During the study, I attempted to report notes based on a 3rd person objective perspective. However, there is potential subjectivity in the reflective aspects of the observation. While I analyzed and reflected on the

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observations with as much neutrality as possible, my perceptions might not be the same as another researcher's perceptions, which could result in a limitation of this study.

The last limitation of this study is due to the study design, which is a qualitative case study. Such studies are limited due to the generalizability of the research findings. As mentioned before, the sample size makes it difficult to generalize to the holistic population of secondary education students in American Samoa. While the intent of the study was to determine the influence web tools had on collaborative learning, a case study does not determine the cause and effect of learning outcomes. Hence, this study is limited as it does not explore additional factors, which might be found using a different research method such as an experimental or quasi-experimental study.

## Recommendations for Future Research

In all, there are numerous recommendations for future research for this topic. The first recommendation is for the study to be repeated using a larger sample size as this study was limited to 15 participants. This could potentially be done as an explanatory research design to further explore theories related to both concepts of collaborative and cooperative learning in small group settings. There could be the use of different web tools as a comparison to provide further insight on the impact of web tools in group work.

Another recommendation is to use a similar if not unified writing task when using the web tools. Instead of changing the writing product from brochure to blog to website, the product could remain the same such as a reflective essay or a newsletter. With this, the study can be

implemented in various different content areas instead of just being limited to an English Language Arts classroom. Changing the product and the topic of the writing task can also be a means to further explore this study not only in the secondary level but also the primary level.

A final recommendation to further this study is to use artifacts as a means for data collection. For this study, observations, interviews and surveys were used, but artifacts could allow the researcher to showcase student learning. Artifacts could be beneficial to researchers who would like to replicate or modify the study because it displays the possible outcomes of the web tool product. Artifacts also provide a better visual of the learning process as it displays the outcome of the implementation period.

## Conclusions and Summary

The objective of this study was to determine the influence of Web 2.0 Tools on collaborative learning for secondary education students in American Samoa. Because there are very few studies on the impact of web tools in teaching and learning in the territory, I aimed to provide more insight into whether or not web tools could be used to benefit collaborative learning at the high school level in a remote rural school with ESL students. Hence, I have ascertained that the participants of this study benefited from using web tools in the classroom. With the findings from this study, I hope to provide helpful insight for teachers, school administrators and educational specialists of American Samoa and small island nations to improve classroom learning using web tools for the betterment of our students' education.

# APPENDIX A: AMERICAN SAMOA DEPARTMENT OF EDUCATION PERMISSION

## IRB Approval

AMERICAN SAMOA GOVERNMENT
Department of Education
Pago Pago, American Samoa 96799
(684)633-5237
(684)633-4240 FAX

APPLICATION TO CONDUCT REASEARCH STUDY

Date 5/6/2020

Name & Title of Applicant Sabrina Suluai-Mahuka

Address  P.O. Box 31 Pago Pago, AS 96799

Telephone  684-256-9239

Are you employed by American Samoa Department of Education? Yes

If yes, list school or department  Samoana High School

Is this part of your master's thesis _____ or Doctoral dissertation  Yes

If you are a student, write the name of your faculty supervisor  Dr. Christine Sorensen Irvine

Attach additional pages for the following questions, if necessary

1. What is the purpose of the study?_____

2. How will the study benefit American Samoa Department of Education?_____

3. Briefly Describe the Study's Procedure_____

4. What are you requesting from American Samoa Department of Education? _____

Approved by _____ 5/7/20
Director of Education

APPLICATION TO CONDUCT REASEARCH STUDY

Additional Questions:

1. What is the purpose of the study?
   The purpose of this qualitative case study is to better understand the influence Web 2.0 tools have on collaborative learning for secondary education students in American Samoa. While Web 2.0 tools are not a new topic in the education realm, these applications are still being explored within the ASDOE public school system. There are many benefits of using such tools, as they have been known to expand learning environments and promote student engagement. In addition, collaborative learning plays a pivotal role in most learning environments as teachers employ small group assignments on a regular basis. Ergo, I aim to explore the affordances Web 2.0 tools may provide to help build the communicative and collaborative skills of our local student population.

2. How will the study benefit American Samoa Department of Education?
   The study will benefit the American Samoa Department of Education as it assists in meeting the department's Goal #4: *All children will* be *provided opportunities* to *become proficient* in *the arts, **technology**, life skills, and other academic subjects.* In addition, in the unified lesson plans, the Student Learning Outcomes share the expectation that they should be able to *integrate tools to become better communicators.* Hence, this study will encompass a synthesis of meeting those objectives. In addition, there has always been a push towards differentiated learning and technology integration, and this study may provide further insight so that our local educators can explore how to use Web 2.0 tools to do so. The study will incorporate three different web tools and the students will be assigned to complete three different collaborative writing assignments while working in small groups. The study can assist students in developing their writing skills while simultaneously meeting their needs with 21$^{st}$ century learning. This study could also have a gargantuan effect on how teachers integrate technology to build their students writing and collaborative skills.

3. Briefly describe the study's procedure.

   The goal is to have the study completed over a 7-week period. The first six weeks will be broken down into three sections of two weeks to implement each of the three tools. The

7th week will be dedicated for participant interviews. I will work with another English teacher to implement the tools in their senior English course.

For this study, the participants will be introduced to the three different web tools, which are Google Docs, Blogger and Wikidot, that will be used for collaborative writing. The researcher will introduce each web tool during a tutorial session and will use slides and media clips to introduce the tool. The participants will be allowed to research additional tutorials and tips to assist them in becoming more familiar with the web tools. The students will be grouped into small groups of 3-4 to work together to complete a collaborative writing assignment that focuses on compiling information about their chosen colleges. Students will use their reading comprehension skills to cite and summarize information. The purpose of each assignment focuses on the key components of the ASDOE English curriculum, which are reading and writing. ASDOE graduates are expected to read information and cite evidence from the text, and the curriculum strongly encourages students to write fluently. Another aspect ASDOE promotes is college and career readiness, and the assignment allows the students to explore the background information of popular college choices. The students will meet during their regular English period, three times a week to complete the assignments. After each completed assignment, the students will share their work.

After each tool is implemented, the students will be asked to take a short survey to indicate their perceptions about the tool use in terms of collaborative learning. The survey will employ a 5-point Likert scale with a range from strongly agree to strongly disagree.

Once the six-week tool implementation is complete, the researcher will choose 6 students to complete the interviews. The students will be chosen based on their varied responses in the post survey to indicate a wider spectrum of their perceptions about how these tools may have influenced their learning.

4. What are you requesting from the American Samoa Department of Education?

I am requesting permission to conduct my study at Samoana High School in the Fall of 2020. Currently, I have passed my Proposal defense and aim to complete the IRB process as soon as possible.

# APPENDIX B: UH IRB APPROVAL

**UNIVERSITY**
*of* **HAWAI'I**
**MĀNOA**

Office of Research Compliance
Human Studies Program

| | |
|---|---|
| **DATE:** | August 24, 2020 |
| **TO:** | Irvine, Christine, PhD, University of Hawaii at Manoa, Department of Learning Design and Technology |
| | Suluai-Mahuka, Sabrina, M.Ed., College of Education, University of Hawaii at Manoa |
| **FROM:** | Rivera, Victoria, Dir, Ofc of Rsch Compliance, Social & Behavioral |
| **PROTOCOL TITLE:** | The Influence of Web 2.0 Tools on Collaborative Learning for Secondary Education Students in American Samoa |
| **FUNDING SOURCE:** | None |
| **PROTOCOL NUMBER:** | 2020-00484 |
| **APPROVAL DATE:** | August 24, 2020 |

## NOTICE OF APPROVAL FOR HUMAN RESEARCH

Under an expedited review procedure, the research project identified above was approved on August 24, 2020 by the University of Hawaii Institutional Review Board (UH IRB). The application qualified for expedited review under 45 CFR 46.110 and 21 CFR 56.110, Category 7. Per 45 CFR 46.109, **a Continuing Review is not required, however you may be requested to submit a progress report.**

This memorandum is your record of the IRB approval of this study. Please maintain it with your study records.

The Human Studies Program approval must be maintained for the entire term of your project. Please see guidance at Final Revisions to the Common Rule on the regulatory requirements for ongoing review and/or monitoring of research approved under an expedited review category.

If, during the course of your project, you intend to make changes to this study, you must obtain approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via the UH eProtocol application. If an Unanticipated Problem occurs during the course of the study, you must notify the Human Studies Program within 24 hours of knowledge of the problem. A formal report must be submitted to the Human Studies Program within 10 days. The definition of "Unanticipated Problem" may be found at: HSP Policies & Guidance Quicklink . The report form may be submitted via the eProtocol application.

You are required to maintain complete records pertaining to the use of humans as participants in your research. This includes all information or materials conveyed to and received from participants as well as signed consent forms, data, analyses, and results. These records must be maintained for at least three years following project completion or termination, and they are subject to inspection and review by the Human Studies Program and other authorized agencies.

**Study Closure:** Please notify this office when your project is complete. Upon notification, we will close our files pertaining to your project. Please contact this office if you have any questions or require assistance. We appreciate your cooperation, and wish you success with your research.

UH Human Studies Program, Office of Research Compliance
Office of the Vice President for Research and Innovation, University of Hawai'i, System
2425 Campus Road, Sinclair 10, Honolulu HI 96822
Phone: 808.956.5007 • Email: uhirb@hawaii.edu
https://www.hawaii.edu/researchcompliance/human-studies
An Equal Opportunity & Affirmative Action Institution

# APPENDIX C: PARENTAL CONSENT FORM

**University of Hawai'i**
**Parent/Guardian Consent for their Child to Participate in a Research Project**
Sabrina Suluai-Mahuka, Principal Investigator
Project Title: *The Influence of Web 2.0 Tools on Collaborative Learning for Secondary Education Students in American Samoa*

Talofa! My name is Sabrina Suluai-Mahuka. I am currently a PhD student at the University of Hawaii at Manoa and I am majoring in Learning Design and Technology. I am requesting your permission for your child to participate in my research project, which is exploring student collaborative learning  whilst using web tools. The results of this study will be used in a doctoral dissertation.

*What am I being asked to agree to?*
If you agree for your child to be in the study, I will observe your child and possibly interview your child once at the very end of the study. The interview would last about  30 -45 minutes. The interview questions will focus on their experience using the web tools while working with their peers. I will also be giving out a post survey, which will collect your child's opinion on how they felt about using web tools in collaborative learning.

*Taking part in this study is your choice.*
As the parent/guardian, you can choose to allow your child to take part in the study and you also can choose for your child to not take part in this study. If you give permission , I will also ask your child to agree to participate in this project. However, you and your child can also change your mind at any time and opt not to take part in this study. There will be no penalty or consequence to you or your child.

*Why is this study being done?*
The purpose of my research project is to investigate whether or not web tools influence student collaborative learning in small groups. I am asking for your child to participate in this project because he/she is a senior student enrolled in an English course at a public high school. I would like to find out if using web tools can help high school students learn.

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***What will happen if I decide to take part in this study?***
The study survey will be conducted at Samoana High School during instructional hours. All students will participate in collaborative activities using web tools in the class. If you and your child agree for your child to participate in the study, your student will be  observed while using the web tools for a writing task and will also be asked to respond to a short survey that should take less than ten minutes to compete. ,The observations will be conducted during your child's regular English class period on the days the tools are being used. During the observations, he or she will be observed while he/she works with her assigned group. This will take place in a full classroom. The survey will be completed through Google Form, where your child will use a classroom laptop or iPad to complete the survey. If you or your child decide not to participate in the study, your child will not be observed or asked to respond to the survey. However, they will still participate in the collaborative learning activity.

Your child may also be invited to participate in one of six interviews. If your child is selected to interview, you or he or she will still have the opportunity to decline.Your child and I will be the only ones in the room for the interview if he or she is selected.. With you and your child's permission, I will record the interview using a digital recording device. The recording will be used for my research purposes only, so that I may type down a written record of what we discussed during the interview.  An example of what type of questions I will ask is, *How do you think the XXX tool helped or did not help you collaborate*?

If you would like to see a copy of all of the questions that I will ask, please contact me via the phone number or email address listed near the end of this consent form.

***What are the risks and benefits of taking part in this study?***
I believe there is little or no risk to your child in participating in this project. There is a possibility your child may become uncomfortable or stressed by answering an interview or survey question or questions. If that happens, we will skip the question, take a break, or stop the interview or he or she can choose simply not to answer the survey question. Your child may also withdraw from the project altogether at any time.

There will be some direct benefit to your child by participating in this project as I hope to improve their collaboration skills and develop their skills in using web tools and in writing.  The results of this project might help me, other teachers, and researchers to better understand web tools for collaborative learning.

*Results of Research:*
The research results will be shared via my dissertation and if the results indicate that web tool use positively influenced  collaborative learning , results will be shared with the school.

*Privacy and Confidentiality:*
Any information that is obtained in connection with this study and that can be identified with your child, will remain confidential and will not be disclosed without your permission. All study data will be stored in a secure fireproof safe at my residence and kept on an external hard drive. My University of Hawai'i advisor and I will have access to the information.

Other agencies that have legal permission have the right to review research records. The University of Hawaii Human Studies Program has the right to review research records for this study.

*Future Research Studies:*
After I transcribe the interviews, I will destroy the audio-recordings. Identifiers will be removed from the research records. When I report the results of my research project in my paper, I will not use your child's name or any other personal information that would identify your child. Instead, I will use a pseudonym (fake name) for your child. If you would like a copy of my final report, please contact me at the number listed near the end of this consent form. Even after removing identifiers, the data from this study will not be used or distributed for future research studies.

*Compensation:*
There will be no compensation given for participation in this research study.

*Questions:*
If you have any questions about this study, please call or email me at (684) 644-2184 or ssuluai@hawaii.edu. You may also contact my advisor, Dr. Christine Sorensen Irvine , at (808) 956-3910 or sorens@hawaii.edu.

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.

If you agree to your child's participation in this project, please sign and date the following signature page and return it to: Sabrina Suluai-Mahuka, Samoana High School.

Keep a copy of the informed consent for your records and reference.

**Signature(s) for Consent**:

I give permission for my child to join the research project entitled, *The Influence of Web 2.0 Tools on Collaborative Learning for Secondary Education Students in American Samoa*. I understand that my child can change his or her mind about being in the study at any time. I understand that I may change my mind about my child being in the study at any time.

**Name of Child (Print):**  _____

**Name of Parent/Guardian (Print):**  _____

**Parent/Guardian's Signature:**  _____

**Date:**  _____

Faafetai tele lava!

# APPENDIX D: STUDENT ASSENT FORM

**University of Hawai'i**
**Child Assent to Participate in a Research Project**
Sabrina Suluai-Mahuka, Principal Investigator
Project Title: *The Influence of Web 2.0 Tools on Collaborative Learning r for Secondary Education Students in American Samoa*

As you know, my name is Sabrina Suluai-Mahuka, and I am inviting you to participate in my research study about how students use web tools to work together in small groups. As a graduate student with the University of Hawaii at Manoa, I am doing this research project to get my doctorate's degree. I want to learn more about how 12th grade students use web tools to complete a writing assignment while working with three to four of their peers. Your parent(s) know we are talking with you about the study. This form will tell you about the study to help you decide whether or not you want to take part in it.

**What is the key information about this research study?**
The following is a short summary of this study to help you decide whether you want to be a part of this study. You will be asked to interact with your peers in a small group assignment using three web tools to complete a writing task. While you are interacting, I, as the researcher, will take observation notes that describe what you are doing and how you are doing it. You also will be asked to complete a short post-survey that will ask you about your opinion on how the tools may or may not have influenced your behavior and learning while working with your group. At the end of the study, you may also be asked to participate in an interview, where your responses will be recorded on a digital device and later on written as a transcript.Only six students will be interviewed.  The research study is expected to be completed in six weeks.

**Why is this study being done?**
The purpose of the study is to see if web tools help students learn while working in small groups. The research can be used for future teachers and educators who may want to use web tools in their classroom.You are being asked to take part in the study because you fit the criteria, which is being a senior at public high school in American Samoa and being enrolled in a senior section of an English course.

**What are the benefits to me?**
Taking part in this study may help you improve your collaboration skills as well as develop your skills with using web tools and improve your writing. It will also help me learn whether or not web tools help students learn while working together in small groups.

**Are there any risks to me if I decide to be involved in this study?**
There are no foreseeable risks however some interview questions may be hard to answer. If there is any time you feel uncomfortable, you are allowed to say so without any consequences. You can choose to answer questions at your own pace or you can skip a question altogether. The same is true for the survey, you can choose not to answer any items. Overall, there should be no risks to you during this study.

**How will my information be protected?**
Your responses will be "confidential" where I will use a pseudonym during reporting of the data, and I will be the only person who knows who responded . The results of this study may be used in reports, presentations, or publications but your name will not be used. All the data will be stored on an external hard drive which will be locked in a fireproof safe at my residence. I will be the only person who will have access to this safe.

**Do I have to be in the study?**
No, you don't. While all students will engage in the collaborative activity as part of regular classroom instruction, you do not have to be part of the study. In other words, you do not have to be observed, answer a survey, or be interviewed if you do not want to. The choice is yours. Your participation in this study is completely voluntary. No one will get angry or upset if you don't want to do this. And you can change your mind anytime if you decide you don't want to be in the study anymore. This will not affect your grade in any way.

**What happens after the study?**
When I am finished with this study, I will write a report about what was learned. This report will not include your name or that you were in the study.

**What if I have questions?**
You can ask questions any time. You can talk to me, Sabrina Suluai-Mahuka and ask me any questions you have.

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 https://www.hawaii.edu/researchcompliance/information-research-participants for more information on your rights as a research participant.
Keep this copy of the informed consent for your records and reference.
Signing below means that you have read this form and that you are willing to be in this study.

*Name of Participant*:_____ *Signature of Participant*: _____
(To be written by child/adolescent)

Printed Name of Researcher: _____ Signature of Researcher: _____

_____
**_Date_**                                                              **_Time_**

**Original form to:**          **Copies to:**

Researcher File          Parents/Guardians

# APPENDIX E: OBSERVATION FIELD NOTES FORM

**Observation Field Notes**

Sabrina Suluai-Mahuka Principal Investigator

Project Title: *The Influence of Web 2.0 Tools on Collaborative Learning for Secondary Education Students in American Samoa*

| | |
|---|---|
| **Description of Activity**:<br>**Length of Activity**: | |
| **Descriptive Notes** | **Reflective Notes** |
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Note: Form Adapted from (Creswell, 2007, p. 137)

# APPENDIX F: INTERVIEW PROTOCOL

**Background Information**

1. Tell me about your background.
    a. What is your background in terms of using web tools?
    b. What is your background in taking online courses?
    c. What is your background in learning in groups?
2. Tell me about the course and the group work you did in this course.

**Interactions Regarding the Affordances**

3. How did your group use XXX tool to begin the group task(s)? Can you give me some examples?
4. How did your group decide to begin the task(s) this way?
5. How did you use XXX tool to communicate with other group members? Can you give me some examples?
6. How did your group decide to communicate this way?
7. How did you use theXXX tool to share resources with your group members? Can you give me some examples?
8. How did your group decide to share resources this way?
9. Was the XXX too easy or difficult to use? Please explain why or why not?
10. What is your most memorable experience in using XXX tool? Why is that experience memorable?
11. What did you like or not like about the tools? Google docs? Blogger? Wikidot?
12. How do you think the XXX tool helped or did not help you collaborate?
13. How do you think the tools helped or did not help you collaborate?

**Collaborative Learning**

14. Tell me about your group members and their work styles.
15. How did your group use the XXX tool to keep everybody productive? Can you give me some examples?

**Wrapping Up**

16. Overall, how would you describe this group collaboration experience using the XXX tool?

17. How did using the XXX tool affect your overall learning experience?
18. Overall, how do you think using these web 2.0 tools influenced your learning?
19. If another teacher were planning to use these tools in their classes, what advice would you give them?
20. Is there anything you would tell other students about your experience using these tools?
21. Is there anything that I did not ask but you'd like to share?

# Appendix G: Post Survey

All participants must have a signed parental consent form and student assent form before taking this survey. Survey results will be confidential and will have no bearing upon your course grade.

**Instructions:**

In this next survey, you are asked to rate the tool you worked with (Google Docs, Blogger, Wikidot) by agreeing or disagreeing with each statement. Please answer honestly. Your responses will not affect your grade in any way.

1. Your full name:
2. Using _____ helped my group members be responsible.
3. Using _____ helped keep me accountable to my team.
4. Using _____ encouraged me to participate in the learning activity.
5. The way _____ functioned made it easy to use for the learning activity.
6. I found _____ useful for this assignment.
7. I plan to continue using _____ in the future.
8. I think using _____ helped me learn.
9. I think using _____ helped me work more efficiently with my group.

Overall Questions (Given with the Wikidot survey)

10. I feel that using the web tools helped me contribute to completing the group task.
11. I feel that using the web tools while learning in a group helped me grasp the task better than learning independently.
12. I feel that using web tools is relevant to me as a 21st century learner.
13. Overall, I think using web tools supported my learning.
14. I would recommend using web tools in the classroom.
15. Any other comments you would like to make about using web tools for learning?

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