Google Docs in the Classroom

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Abstract
The flexibility and practical use of Google Docs in the classroom is reviewed. Pre-service teachers using Google Docs were surveyed and implications for teaching and learning are explored.

1. Introduction
Many teachers and collegiate programs realize the increasing relevance of technology in the classroom and in everyday life. Students are often seen embracing Facebook, texting, and YouTube; however, many times teachers are unsure how to harness this technology effectively in the classroom. New skills may be needed from teachers to adapt to this new way of learning. Schools seem hesitant to utilize technology within the core academic practice (Collins and Halverson, 2009). The Net Generation continually suggests the need for freedom, customization, collaboration, entertainment, speed, and innovation within their learning experiences (Tapscott, 2009). Google Docs is one Web application that has the potential to assist teachers and students address this new way of learning.

Google Docs allow teachers and students to create, edit, and collaborate on documents through this Web-based tool. It provides easy access to documents, spreadsheets, and presentations anywhere, anytime on the Web. During the course of a semester pre-service teachers utilized Google Docs within an educational technology course. Pre-service teachers embraced the flexibility of Google Docs as they managed to create, edit and submit assignments. Survey findings of pre-service teachers indicated a desire to learn more about Google applications and showed a strong interest toward the collaborative nature of this tool. A number of implications are drawn, highlighting how Google Docs could be used in the classroom.

2. Background
Teachers often require group efforts from students and many times these efforts include project-based or problem-based learning. Problem-based learning provides pre-service teachers with opportunities to collaborate and produce curriculum-based products. This process allows skills such as collaboration, communication, and critical thinking to flourish. It is important for students to have the best opportunities and learn to ask questions that stretch the use of technology (Boyer Commission, 1998). The University of Delaware's Institute for Transforming Undergraduate Education reveals the need to transform courses that exemplify effective techniques for active learning and the use of technology in the classroom. Google Docs allows for both of these. Pre-service teachers were given the opportunity to use Google Docs over the course of a semester.

2.1. Classroom Background
The course focused on a 21st century learning environment that emphasized problem based learning, integration of technology and Google applications. Pre-service teachers explored the use of Google Docs collaboratively within the framework of a problem. Wong, (2006, p. 230) explains the added value of a collaborative environment, "Fortune's one hundred best companies to work for have demonstrated that these companies possess a positive, cooperative culture that enhances job satisfaction and contributes to productivity." The desire to provide an authentic and relevant experience for pre-service teachers signified the need to move away from the traditional lecture approach of teaching to one that provided active engagement for students. White (2002) makes clear, "content remains important, but emphasis shifts more to the process" (p. 69). Traditional school curricula, emphasizing rote learning and static skills, must be altered (Ball, 1994). By harnessing new technologies and staying devoted to the strength of collaboration there is an authentic change in the learning environment from one of individual thinking to an integrated thinking process within groups.

Google Docs gave pre-service teachers the ability to test out the collaborative features while pursuing an authentic problem within the course. The first reaction to the collaborative features was one of intrigue and uncertainty. The obvious playful nature of the feature allows users to see changes made in real time. Pre-service teachers began to gradually shift beyond the newness of this feature to the strengths each individual brings to the collaborative process. Two key trends revealed in the 2011 Horizon Report (Johnson, Adams, & Haywood, 2011) support revisiting the way student projects are structured and to reflect on collaboration and the use of cloud-based resources within learning environments. The Horizon Report is a research project that continues to document the emerging technologies that are likely to have an impact of teaching and learning.

Fiechtner and Davis (1992) investigated why groups fail. They surveyed students on a variety of factors related to structure and function of groups. Students in large groups (eight in this case) focused on the difficulties of scheduling meetings. The flexibility of Google Docs made busy schedules and long distances non-existent issues within the collaborative groups. Interest among the groups was high and ownership of the process was apparent. Pre-service teachers quickly became comfortable with the environment and began to rely on themselves and one another for a deeper experience.

In a response to the survey question, Do you think it is important to integrate technology into the curriculum? If so, which of the Google Applications, if any, would be useful in integrating technology into the curriculum? One pre-service teacher wrote in the survey,

> I think if we are doing collaborative work, and in the appropriate grade level to promote strong literacy, then Google Docs and Presentations would be great to integrate in the classroom. The students need to learn to work together, not just being beside each other, since most international and national business is conducted via Internet.

Google Docs is particularly well suited to classroom use.

2.2. Google Docs

Google Docs is a Web-based office suite, similar to Microsoft Office or Open Office. The Google Docs suite includes the following: Documents, Presentations, Spreadsheets and Forms. Google Docs allows students to easily store their documents in the "cloud." When a file is stored in Google Docs, it is not actually stored on the local computer; it is stored on Google's servers. A file is saved continually preventing a loss if the user's computer crashes or dies. The user only needs a computer with an Internet connection to access and edit the file. The user's files are easily accessible, which reduces the need for disks or flash drives. All that is required to utilize Google Docs is to set up a Google account that provides the user with a login.

Unlike traditional desktop applications such as Microsoft Office and Open Office, when Google Docs is used the application "lives" on the server. Program updates are gradual as opposed to massive version leaps. Users see new features as Google develops them. These continued updates keep the office suite current. The ability to upload a Microsoft or Open Office document into Google Docs allows for versatility within the suite. Users can also download files from Google Docs in a variety of formats such as PDF, RTF, Word, and Excel.

2.3. Collaboration

Google Docs allows users within the Google Suite to communicate and collaborate on projects. This feature is easily accessed through a shared dropdown box that allows the user to designate different types of permissions for the document, spreadsheet, or form created. Once the names and e-mails are entered, the owner is able to give editing rights to the document. An additional feature gives the user an option of choosing individuals from a contact list. Once permissions to edit a file are given, then multiple authors can make modifications and creations within the file. Authors are able to view other collaborators' edits in real time. Each author's name is visible when typing. A chat box integrated within Google Docs provides collaborators the ability to discuss the project while concurrently working on the document. This is a timely method for gathering individual thoughts and ideas related to a mutual project.

A revision history within Google Docs allows the user to move to any point in the document's history and see the changes made, the date, and the author's name. This feature gives the authors an opportunity to compare two versions of the document and revert to a previous version if needed. The revision history provides up-to-date documentation of the authors' contributions. This free Web-based service allows students to store, share, and create a variety of assignments.

Disadvantages of Google Docs are heavy reliance on the online environment when meeting face to face might be advantageous for a group project. Some better known programs may have more features than Google Docs and an Internet connection is needed to access Google Docs.

2.4. Forms

Google Forms is a part of the Google Docs suite. The user is able to easily create a form or a survey. The form or survey can include different types of questions such as paragraph text, multiple choice, checkboxes, and drop down lists with options. Within the questions the user is able to select an option that makes the questions required before submission. The forms or surveys are attractive and easy to complete with the use of themes and section headers. An edit confirmation box is available to the creator that allows a personal message sent to the participants.

Forms can be sent by e-mail or embedded into a website or blog. Data provided by the participants is automatically added to a spreadsheet in Google Docs with a timestamp. A summary of responses provided in a chart format provides information to the author. This information could include a wide range of data depending on the questions formulated. The data collected can be shared with collaborators.

3. Theoretical Framework

An effort was made to understand the flexibility and practical use of Google Docs utilized in an education technology course. A survey explored pre-service teacher's use of Google Docs and its perceived use in an elementary classroom. Many studies in the past have shown that teachers use technology in ways that are consistent with their pedagogical beliefs (Dwyer, Ringstaff, & Sandholtz, 1990; MacArthur & Malouf, 1991; Robblee, Garik, Abegg, Faux, & Horwitz, 2000). Another finding alludes to the relationship between teachers' beliefs as it relates to predictions about their use of technology.

4. Procedure

To determine the flexibility and practical use of Google Docs, a survey was conducted during the spring 2009 semester. The participants in this study consisted of undergraduate students at a large university in the southeastern United States. Participation in the survey was completely voluntary and was open to students in four educational technology courses. In total, there were 100 pre-service teacher participants.

An online survey elicited information from pre-service teachers about the use of Google Docs. Some of the questions consisted of a series of items using a five point Likert-scale (strongly disagree to strongly agree) to examine factors related to Google Docs use on collaborative projects. Other questions explored Google Docs as it relates to other Google applications and its use in an elementary classroom.

Specifically, this study asked:

1. Which of the Google Applications that were introduced would you feel most comfortable using in an elementary classroom?
2. Is Google Docs an innovative and effective way to collaborate on projects?
3. Is the collaborative sharing feature in Google Docs something you would like to explore more?
4. Do you feel Google Applications is a beneficial and effective use of technology in an elementary classroom?

5. Findings

The first question examined which of the Google Applications pre-service teachers would feel most comfortable using in an elementary classroom. Pre-service teachers indicated a comfort level toward using Google Applications in an elementary classroom (Figure 1). In terms of selecting a Google Application, 50% selected Google Sites as an application they were most comfortable, 33% selected Google Docs, 11% selected Gmail, 4% selected Blogger, and 2% selected Picasa.

Pre-service teachers agree that Google Docs was an innovative way to collaborate on projects (Figure 2). Forty-six percent strongly agreed that using Google Docs was innovative and useful, 44% agreed that Google Docs was useful, 8% neither agreed nor disagreed, 1% disagreed, and 1% strongly disagreed.

Pre-service teachers expressed an interest in learning more about the collaborative sharing feature of Google Docs (Figure 3). Twenty-six percent strongly agreed that Google Docs was something they wanted to explore more, 50% agreed they were interested, 19% neither agreed nor disagreed, 2% disagreed, and 2% strongly disagreed.

Teachers will have to create a school environment that is different than the one they experienced (Sheingold, 1991). Within the above context pre-service teachers agreed that Google Applications is a beneficial and effective use of technology in an elementary classroom (Figure 4). Fifty percent agreed about the use of Google Applications, 49% strongly agreed, and 1% neither agreed nor disagreed.
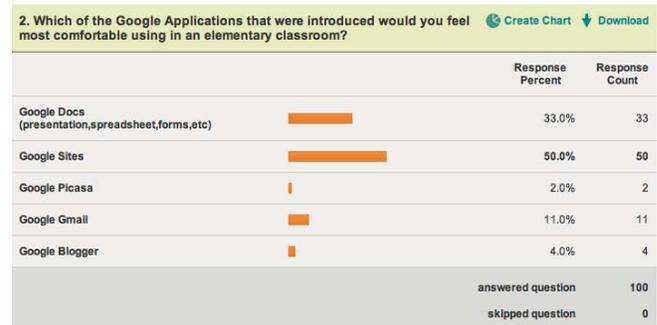

Figure 1. Which Google Applications would you feel most comfortable using in an elementary classroom?
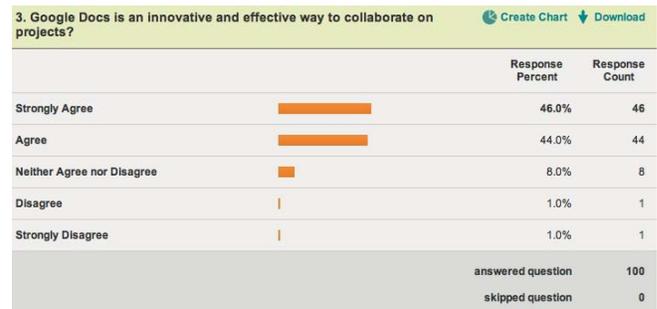

Figure 2. Google Docs is an innovative way to collaborate on project.

Teachers' beliefs about the value of computer use in a classroom directly affect their willingness to follow up with applications for instructional purposes (Dwyer, Ringstaff, &
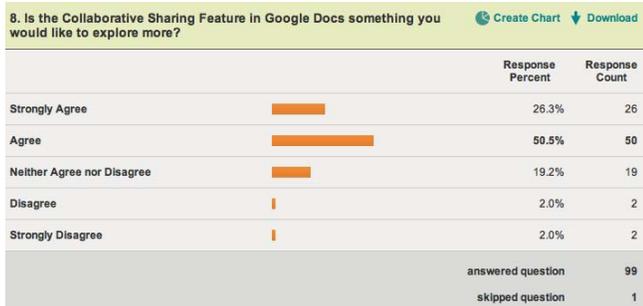
Figure 3. Like to explore collaborative sharing feature in Google Docs more?

Sandholtz, 1990; MacArthur & Malouf, 1991; Robblee, Garik, Abegg, Faux, & Horwitz, 2000). The findings suggest that pre-service teachers when exposed to a variety of Google Applications are influenced by the value they may exhibit in an elementary classroom. In particular, the findings indicate the importance of Google Docs as a collaborative tool when working on a group project.
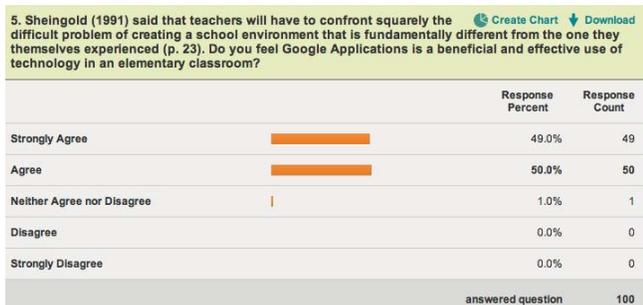

Figure 4. Is Google Applications beneficial and effective technology in an elementary classroom?

6. Implications

Standards in education have revolved around reading, writing, and basic arithmetic skills. These standards were expected in all classrooms and were expected in the workplace, regardless of type or level of academic degree. These skills were needed to perform the basic functions of communication. Without these skills, it was difficult to participate in any type of job, and was impossible to perform in any higher-level job or function. In today's world, these basic skills have been replaced (or more accurately - supplemented) by basic technological skills. Today, basic computing skills are expected in any position. Technology has become a new *de facto* communication tool. To participate in society, one is expected to have mastered basic communication skills. In the 21st century, these skills include technology.

Google Applications, particularly Google Docs, can assist pre-service teachers toward this shift in the learning environment. The results of this study indicate pre-service teachers desire to learn more about the collaborative nature of Google Docs while concurrently being supportive of the innovation it provides within group work. It is important to note that further research on faculty awareness of Google Applications and a desire to embrace this technology within the learning environment is needed. Research related to technology access and Web application training for faculty and pre-service teachers could provide insight and support for the rapid change in technology. Pre-service teachers are aware that the school environment is different than the one they experienced and recognize that Google Applications produce benefits and could provide effective use of technology in an elementary classroom. This cloud-based tool offers flexibility to pre-service teachers within the learning process. It enables the ability to connect with others in real time while taking ownership of their learning. This study serves as a starting point to further explore a variety of issues related to Google Docs and its use in the classroom.

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Becky enjoys teaching on ground and online to pre-service teachers. She co-presents with her son on the topics of technology as it relates to classroom instruction. She is particularly interested in Web 2.0., open source, and Google Applications within a problem-based learning environment.

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Eldridge is a professional technology specialist with a longtime interest in technology and its applications in the classroom. He has conducted training sessions for teachers in the area of podcasting and Google Docs, as well as creating websites for teacher consultants.