ENVIRONMENTAL FACTORS AND GOOGLE DOCS USE IN MONMOUTH COUNTY MIDDLE SCHOOLS

By

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Abstract

When the Soviet Union launched Sputnik in 1957, it forced Americans to examine the state of science and technology at home. Almost ten years later in 1983, the A Nation at Risk Report showed that schools were still failing in many areas including technology. The No Child Left Behind Report released in the early 2000s confirmed that educational technology was still not meeting expectations. Today, even minimum wage jobs require students to be proficient in the use of technology, and yet research indicates that technology in schools is used mostly for low level applications (administrative purposes, word processing, drill and kill activities, etc.). The burning question is why have new technologies not diffused effectively through schools?

This study was designed to use diffusion theory to explain variation in use of Google Docs in Monmouth County, New Jersey. It examined such environmental factors as communication channels, time, class size, computer access, decision method, and method of learning. The data was collected using an on-line survey and 35 of the 53 middle schools in Monmouth County, New Jersey participated. Fifty-five percent of the teachers in participating schools completed the survey. Regression analysis was used to examine the data and the results demonstrated that time and collective decision method were statistically significant factors in determining teachers' level of use of Google Docs. When results from this study were combined with results from Tetreault's work (in press), findings indicated that personal characteristics of teachers are more important than environmental factors.

Dedication

This dissertation is dedicated to my family.

To my husband H. Jay Wisnicki M.D., my soul mate, for his dedication, love, and

support, to my children Henry and Haley for being my inspiration, and to my parents Barbara

and Terry Kraft for stressing the importance of education and for telling me that anything is

possible with enough hard work and commitment.

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Introduction

For graduating secondary-level students to survive in the current work force, they must have strong technological skills. Even minimum wage jobs, like a McDonalds cashier or a gas station attendant, require employees that can handle computerized registers and machines. There has been a lot of pressure on schools to integrate technology into instruction to provide students with the skills necessary to become productive members of society; finally, that integration may be occurring.

The desire to integrate technology into education is not a new idea. When the Soviet Union launched Sputnik in 1957, it had an alarming effect on the United States public. Americans felt forced to examine the state of science and technology education at home. In the years to follow, reports on the status of public education in the United States (A Nation at Risk – 1983, Behind, N.C.L., 2002 & No Child Left Behind – 2001, Gardner, 1983) indicated that the schools in America were failing. As states began to develop educational standards, technology in schools became a focus because many reformers believed that technology - specifically, technology clusters (Rogers, 2003) including the hardware and software required to run a computer and connect it to the Internet - had the power to increase teacher productivity and transform teaching and learning. At the national level, the International Society for Technology in Education (ISTE) responded with national standards and guidelines for educators: National Educational Technology Standards (NETS)-Students, NETS-Teachers, NETS-Administrators (International Society for Technology (ISTE), 2007a, 2007b, 2007c).

Politicians, parents, and the general public have placed the incorporation of technology into education at the forefront of the educational reform movement. Cuban (2001) reported that

the way schools made progress in this incorporation of technology during the early 1980s was to

acquire more computers to decrease the student to computer ratio. Access to computers has

increased substantially and Internet connectivity within schools has also improved dramatically -

97% of teachers had one or more computers located in the classroom every day, and Internet

access was available for 93 % of teachers (Gray, Thomas, Lewis, Tice, 2010). Clearly, access to

technology has increased; however, increasing the number of computers within schools or the

number of Internet-connected classrooms has not transformed education in the way that public

officials, policy makers, parents, and corporate executives had hoped. Research overwhelmingly

showed that increased access has not had a dramatic and positive effect on student achievement

(Clausen, 2007; Cuban, 2001; Cuban, Kirkpatrick, & Peck, 2001; Honan, 2010; Kurt, 2010;

Littrell, Zagumny & Zagumny, 2005; Miranda & Russell, 2011; O'Dwyer, Russell, & Bebell,

2005; Ozgun-Koca, Meagher, Edwards, 2009/2010; Zhao, Pugh, Sheldon, & Byers, 2002).

      Instead, research indicates that technology in schools is used mainly for administrative

purposes, as an instructional aide in the classroom, for teachers' personal productivity, for

educational games, for word processing, and for drill and practice activities, (Kurt, 2010; Litrell,

et al., 2005; Oliver, 1994). If one considers the use of technology in schools through the lens of

Bloom's taxonomy (a framework for categorizing educational goals developed by Benjamin

Bloom in the 1950s), it becomes clear that most technology use in classrooms occurs at the

knowledge level and rarely reaches the top levels that require higher order thinking skills -

synthesis and evaluation. The goal in education is to have students participate in activities that

require knowledge integration and deeper understanding - skills from the top levels of Bloom's

Taxonomy.

Why has technology not diffused through schools the way everyone had hoped?

Unfortunately research shows that education does not change quickly. Lortie (2002) states,

"Education does not change at a rapid pace – the major structures in public education are much

the same today as … in 1975." Rogers (2003) references Paul Mort who pointed out that, "The

average American school lags 25 years behind best practice (Mort, 1953)." The gap between

best practice and what is happening in schools is highly disappointing, and yet, a reality.

Perhaps understanding how an innovation successfully diffuses through schools could assist

schools with adopting best practices more rapidly and in a sustainable way.

Research on the diffusion of innovations started during the 1940s and 1950s with Everett

M. Rogers. Everett M. Rogers is generally credited as the creator of the *Diffusion of Innovations*

Theory; this general diffusion model has been used to examine how an innovation is adopted in a

social system.   "*Diffusion* is the process by which an innovation is communicated through

certain channels over time among the members of a social system*" (Rogers, 2003, p.35).

Rogers' model can assist educators by providing a framework of understanding to assist with the

successful adoption of a new innovation.

Research Overview

The purpose of this study was to uncover the patterns of use of one specific technology

and use diffusion theory to explain the variation in use. When examining technology use in

today's society, a new trend busting its way into organizations and people's homes are cloud

based collaboration tools. In the past, sharing documents was achieved through a variety of

inefficient and often inconvenient methods: "snail" mail, flash drives, trading diskettes, etc.

Large companies were able to achieve collaboration, but they had to invest in expensive business

networks. Email has made it easier, faster, and cheaper to share information, but it does not

allow collaboration in real time. Now, there are numerous cloud based collaboration tools such

as Dropbox, Box.net, Skype, Microsoft Office 365, and Google Docs that allow anyone in the

world with internet access to share information and collaborate easily and inexpensively in real

time. Large organizations have adopted these new methods of communication rapidly and

individuals are starting to use these technologies for both personal and professional use.

These cloud based collaboration tools are also making their way into schools. Using

cloud based collaboration tools can assist educational institutions in a variety of ways. It is

common knowledge that the main goal of schools is to promote student achievement and

produce productive members of society. Students today must be able to function in our new

technological age. Cloud based collaboration tools allow seamless communication from

administrators to administrators, administrators to teachers, teachers to teachers, teachers to

students, and students to students. For example, administrators in one district can share

curriculum materials with someone on the other side of the world in real time. Teachers can

develop lesson plans together to produce the best lessons for students. Teachers and students can

co-edit essays to improve students' writing skills. The opportunities for amazing things to

happen through instant, remote collaboration are endless. Students also need to be familiar with

how to operate in this real time, virtual world because they will inevitably be required to do so

when they eventually join the work force.

We were challenged with the task of choosing one specific technology to examine for this

study. Since cloud based collaboration tools are a current trend, we decided to focus on one of

the cloud based collaboration tools currently available, Google Docs. Google Documents (also

known as Google Docs, or Docs for short) is a program that is currently making its way into

schools. We informally surveyed teachers and administrators in Monmouth County and found

many districts where individual teachers were using Google Docs to collaborate both with

colleagues and students and other districts that were using Google Docs district wide. It is an

ideal technology to study in that it incorporates traditional elements of technology (it is a

productivity suite of software) and modern elements (it is cloud-based, and it incorporates

elements of social media); also, it is free for education, and can be deployed by an individual

teacher, across a single class, or throughout an entire school or district. This study used diffusion

theory to explain the variation of the use of Google Docs in middle school teachers in Monmouth

County New Jersey as well as identified the important environmental factors that have

influenced the use of Google Docs.

This study began with a conceptual framework outlining the factors that affect the pattern

of use of Google Docs. Next, an examination of the relevant research which supports the reasons

why these factors were chosen and how they relate to the use of Google Docs is included. Then,

a review of the methodology to be used in gathering data about the uses of Google Docs in

schools is provided. The results are then presented, followed by a discussion of the implications

and significance of the study. The goal of this study was to use diffusion theory to help identify

variables that would explain the variation in Google Docs use of the participants in the sample.

The results of this study added to the body of research in the area of educational leadership and

accountability and educational technology.

For the purpose of this study, the term "technology" referred to the "technology clusters"

(Rogers 2003) of a computer, an internet connection, and the software required to access the

internet. A technology usually has two components: "(1) a *hardware* aspect, consisting of the

tool that embodies the technology as a material or physical object, and (2) a *software* aspect

consisting of the information base for the tool" (Rogers, 2003, p. 13). This study examined the

patterns of use of Google Docs as a technology in middle school classrooms in Monmouth

County, New Jersey.

The study analyzed how communication channels, decision method, method of learning,

and environmental barriers (independent variables) affect the patterns of use of Google Docs

(dependent variable) in middle school classrooms in Monmouth County, New Jersey.   The

diagram below offers a visual representation of the study's conceptual framework.
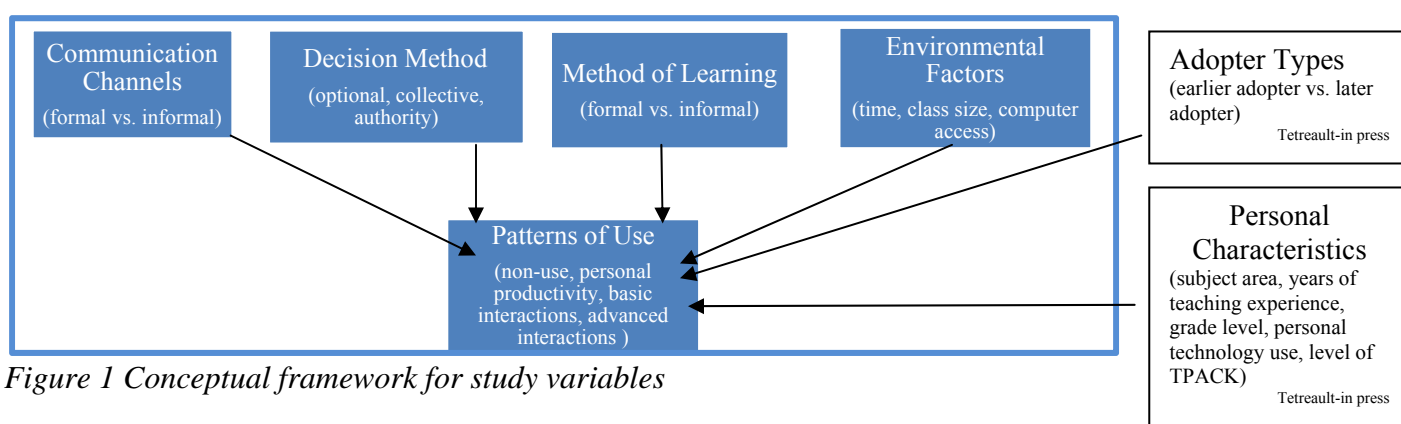
Figure 1 Conceptual framework for study variables

The framework in *Figure 1* suggests that there are a variety of factors that influence an

individuals' level use of Google Docs. The factors included in this study fall into four

categories; communication channels, decision method, method of learning, and environmental

factors. Personal characteristics and adopter types are also factors and can impact patterns of

use; see Tetreault (in press) for a study containing these factors. This study will examine the

specific research questions listed below:

1) What types of communication channels are associated with highest level of professional

    use of Google Docs? I examined formal and informal communication channels to see

how they affect patterns of use; Non-Use, Personal Productivity, Basic Interactions, and

Advanced Interactions.

2) What decision methods are associated with the highest level of professional use of

Google Docs? I examined optional, collective, and authority driven decision methods to

see how they affect patterns of use; Non-Use, Personal Productivity, Basic Interactions,

and Advanced Interactions.

3) What methods of learning are associated with the highest level of professional use of

Google Docs? I examined formal and informal methods of learning to see how they

affect patterns of use; Non-Use, Personal Productivity, Basic Interactions, and Advanced

Interactions.

4) What environmental factors are associated with the highest level of professional use of

Google Docs? I examined time, class size, and computer access to see how they affect

patterns of use; Non-Use, Personal Productivity, Basic Interactions, and Advanced

Interactions.

Review of Literature

The following literature review will discuss the patterns of use of Google Docs and the

Diffusion of Innovations Theory (Rogers, 2003). It will explain how Diffusion of Innovations

(Rogers, 2003) serves as the framework for this study as well as identify and describe the six

independent variables studied; communication channels, decision method, method of learning

and the environmental factors of time, class size and computer access.

Patterns of Use

 Although many sources are pushing for greater integration of technology, it is important to

consider which specific technologies are being adopted for use in the classrooms. Donald Ely

(1995) discovered that students in schools were using computers for educational games, word

processing, and for drill and practice activities. Thirteen years later, Lynette Gorder (2008)

noted that technology was still being used in classrooms for low level technology activities, and

not activities that require knowledge integration and deeper understanding.

Denton, Davis, Strader, & Jessup (1999) found that the most common applications teachers

used were email and the Internet. This study examined teacher use of Google Docs (one specific

technology). It was interesting to see if a decade after technology made its way into schools,

teachers have expanded their technological horizons and are using a program like Google Docs

to improve instruction for their students.

In developing the level of use categories for this study, many models were examined; Hall,

Wallace, and Dossett's (1973) - CBAM, Moersch's (1995) - LoTi, Oliver's (1994) work on

classroom technology use, and Russell, O'Dwyer, Bebell and Tao's (2007) work on classroom

applications of technology to name a few. The Concerns-Based Adoption Model (CBAM),

developed by Hall et al. (1973), was considered because it contains a levels of use scale based on

theoretical concepts that apply specifically to the adoption of an innovation. This scale has eight

levels and is shown in Table 1.

Table 1 *Concerns Based Adoption Model – CBAM*

CBAM	
I. Non-Use	No action is being taken with respect to the innovation.
II. Orientation	The user is seeking out information about the innovation.
III. Preparation	The user is preparing to use the innovation.
IV. Mechanical Use	The user is using the innovation in a poorly coordinated manner and is making user-oriented changes.
V. Routine	The user is making few or no changes and has an established pattern of use.
VI. Refinement	The user is making changes to increase outcome.
VII. Integration	The user is making deliberate efforts to coordinate with others in using the innovation.
VIII. Renewal	The user is seeking more effective alternatives to the established use of the innovation.

Hord & Hall, 1986, p. 93

Moersch (1995) reviewed CBAM and altered it to create the LoTi framework – Levels of

Technology Use. This framework is well known within educational technology. There are also

7 levels to the LoTi: nonuse, awareness, exploration, infusion, integration, expansion, and

refinement.

In 1994, Oliver studied first year teachers that graduated from a Western Australian

University. He asked beginning teachers to report on how they used computers in their

classrooms according to the practical applications defined below.

- administrative use – as a marks book, for record keeping, reporting etc.

- teaching use - as an instructional aide in the classroom

- personal productivity – to create teaching materials, for lesson planning, lesson

  programming and so forth (Oliver, 1994, p. 79)

After analyzing the survey data, Oliver (1994) reported that the new teachers used computers

at least two hours a week. The amount of time they used computers as administrative aids and

personal productivity tools, far exceeded the time spent on using computers as instructional

aides.

In 2007, Russell, et al., (2007) surveyed 2,864, K-12 teachers about their technology use.

Instead of using a pre-existing scale, teachers were asked to complete a survey about their

technology use and specify if the technology in their classroom was used for delivering

instruction, email, for professional purposes, for preparing lessons, or for teacher-directed use of

technology during class time (Russell, et al., 2007). The categories used by Russell, et al. (2007)

were practical applications of technology, and not generic, theoretical categories.

Some research in the area of technology use creates theoretical scales to examine how

teachers use technology (LoTi, CBAM), where other researchers decided to look at practical

applications of technology in the classroom (Russell et al. (2007) and Oliver (1994)). In

developing the patterns of use for this study, we looked at the CBAM levels in coordination with

the use of Google Docs and developed the eight levels below.

Table 2 is a representation of the eight levels of use defined above with regard to the use

of Google Docs. An examination of the Table 2 revealed 4 theoretical levels for *patterns of use*;

Non-Use (Non-Use, Orientation, Preparation) where the user is not using the innovation,

Personal Productivity (Mechanical Use), Basic Use (Routine) where the user is using the most

basic functions of the innovation, and Advanced Use (Refinement, Integration, and Renewal),

where the user is using the innovation in an in depth, best practice way.

Table *2 An Analysis of Google Docs Using CBAM*

Docs CBAM:	
I. Non-Use	Teacher is not using Docs.
II. Orientation	Teacher is learning about the existence of Docs.
III. Preparation	Teacher is considering how one might use Docs.
IV. Mechanical Use	Teacher is starting to utilize basic features of Docs to become familiarized with the system as a precursor to classroom implementation.
V. Routine	Teacher is starting to utilize Docs as a classroom tool in a basic fashion; use of Docs' basic features has become routine for the teacher, but use within the classroom is an exception to normal classroom practice at this point as teacher considers how the use of Google Docs fits within content and pedagogy.
VI. Refinement	Teacher regularly utilizes Docs within the classroom as part of normal instruction, is determining how to best refine the use of Docs to match the goals of instruction.
VII. Integration	Teacher is looking for new ways to utilize Docs; is taking advantage of the collaborative features both to communicate with colleagues and encouraging students to communicate and collaborate with each other.
VIII. Renewal	Having explored all the options available via Docs, teacher is considering whether Docs is the best tool to help increase student outcomes.

It is important to look at how teachers are practically using Goggle Docs in their middle

school classrooms. Steve Tetreault (research partner) met with a group of teachers from several

New Jersey districts that profess to use Google Docs in a best practice way. His conversation

with those individuals resulted in the implementation configuration map (ICM) shown below in

Table 3 that lays out the theoretical progression from least-use of an innovation to best practices

with an innovation. Table 3 is an ICM concerning the use of Google Docs.

Table 3 *Implementation Configuration Map (ICM) and the Use of Google Docs*

A. (Best Practices)	B.	C.	D.	E.	F.	G. (Least Use)
Teacher and Student: Teacher uses auto-grading forms to assess students and auto-email student responses Students utilize teacher provided Google Form to reflect and self-assess on work done at the end of a project. **Teacher and Admin:** Policy, procedures, and/or curriculum developed in conjunction with other schools and/or districts	**Teacher and Student:** Students utilize collaborative features of Google Docs to work on projects Teachers can assess or survey students using Google Forms **Teacher and Teacher:** Teachers utilize collaborative features of Google Docs with colleagues in other schools and/or districts to create resources	**Teacher and Student:** Teacher participates in dialogue with students about class work via Google Docs Students are encouraged to share work with each other to get and provide peer feedback Teachers gather information from students via Google Forms **Teacher and Teacher:** Teachers utilize collaborative features of Google Docs with building colleagues to share resources **Teacher and Admin:** Teachers utilize collaborative features of Google Docs with building colleagues to review and amend curriculum	**Teacher and Student:** Teacher collects assignments via Google Docs Teacher shares class notes, other files with students **Teacher and Teacher:** Teacher shares notes, other files with colleagues **Teacher and Admin:** Department meeting notes, memos shared	**Teacher and Student:** Teacher introduces students to Google Docs, allows students to use it for school-related work **Individual:** Teacher uses Google Docs to access files from various locations	**Individual:** Teacher uses productivity tools in Google Docs	**Teacher and Other:** Teacher views a file or document shared by someone else via Google Docs ("Forced" interaction with Google Docs)

The ICM identifies a variety of Google Docs uses as well as who is using the innovation

(teacher, colleagues, administrators). When reading the Table 3 from left to right, column A

represents the highest level user of Google Docs. Each column thereafter represents users with

less mastery and understanding. For example, a user from column C has mastery of all the skills

and used listed in columns D, E, F, and G. Table 4 represents a generalized list of the use

patterns identified in the innovation configuration map.

Table 4 *Google Docs Implementation Configuration Map Patterns of Use Correspondence to
CBAM Levels of Use*

ICM Section	Patterns of Use	Corresponding LoU
A	Altering the functions of Docs via pre-written or custom software scripts; Encouraging students to self- or peer-assess shared work; Collaborating across districts or schools to create consensus guidance (policy, procedure, curriculum)	VI (Renewal)
B	Project-based learning requiring online collaboration between students	V (Integration)
C	Collaboration within school; student polling/assessment via Forms	IV-B (Refinement)
D	Dissemination and sharing of information within school	IV-A (Routine)
E	Personal use as file storage/transfer	III (Mechanical Use)
F	Personal use as productivity tool	II (Preparation)
		III (Mechanical Use)
G	"Forced" interaction with Docs when viewing a file another user shared	I (Orientation)
		II (Preparation)
		III (Mechanical Use)

After reviewing CBAM (*Table 1*), Docs CBAM (*Table 2*), ICM (*Table 3*), and Docs ICM (*Table
4),* we defined four patterns of use for this study.

1) **Non-Use –** Docs is not used at all.

2) **Personal Productivity** - Utilizing Docs as a storage tool (F, G). Users create and/or curate a
   collection of materials for themselves. This type of use requires no interaction between users and
   is essentially a *simple substitution of computer technology for physical artifacts* such as
   photocopies and word processors, paper and pencils, and/or folders and file cabinets.

   a. Example – using Docs to store personal documents

3) **Basic Interactions** - Utilizing Docs to increase productivity (C, D, E). Users are starting to
   interact with a collection of materials and other local users. This type of use begins to take
   advantage of computing technology by encouraging interaction between users, but does not

require interactions, and tends to focus on *activities that could be reproduced with other technologies*, even technologies as simple as pencils and paper, with minimal change in the speed or structure of the communication.

    a.   Example – using Docs to share documents with others

4) **Advanced Interactions** - Utilizing Docs to transcend physical and chronological bounds (A, B). Users are moving beyond the confines generally imposed by the structure and style of the school system. This type of use requires interaction between users in order to extend learning beyond the bounds of the classroom, furthering users' understanding and education. Due to their instantaneous nature, and the fact that they are unbounded by time or location constraints, these interactions can combine aspects of various technologies.

    a.   Example – using Docs to co-edit shared documents in real time

Diffusion of Innovations

Historically schools are known as institutions that change slowly (Lortie, 2002 & Rogers, 2003). Studying how innovations are successfully adopted would be extremely helpful in causing a paradigm shift in the way that schools change practice by adopting new innovations. Rogers (2003) defined the pioneering diffusion study by examining the hybrid seed corn experiment conducted by Ryan and Gross in Iowa in 1943. Lioa (2005) indicated that this study revealed how social change could be examined by analyzing how an innovation (hybrid seed) was adopted. That is, diffusion is shaped, in part, by the environment.

Understanding how social change occurs is critical to changing practice in schools. *Diffusion of Innovation* theory has been applied to understand changing practices in numerous fields of study such as anthropology, sociology, public health, marketing, management, economics, and geography. It has also been applied to the field of education. Rogers' (2003) *Diffusion of Innovation* model was used as the basis of the study. Rogers (2003) professes that if individuals within the social system see an advantage to adopting an innovation, an innovation is compatible with the individuals' current practices, an innovation does not appear too complex to learn, the individuals can try out-the innovation with little or no risk (trialability), and the

individuals observe others adopting the innovation, the individuals are most likely to try the

innovation. The first step is learning that the innovation exists. Rogers speaks a great deal about

this and coined the term *communication channels*. Communication channels are, "…the means

by which messages get from one individual to another. Mass media channels are more effective

in creating knowledge of innovations, whereas interpersonal channels are more effective in

forming and changing attitudes toward a new idea, and thus in influencing the decision to adopt

or reject a new idea" (Rogers, 2003, p. 36). When deciding to try an innovation, an opinion from

a like-minded friend within a common environment is more apt to influence an individual than

scientific research (Rogers, 2003).

The diffusion process begins when an individual first becomes aware of an innovation.

Analyzing the time it takes for someone to learn about an idea, think about the innovation, decide

to use it, actually use it, and tell others about it, will indicate how quickly or slowly an

innovation has diffused. This process asks one to look at the five conceptual steps in the

diffusion process: knowledge, persuasion, decision, implementation, and confirmation (Rogers,

2003). Simply put, this process begins by examining how people become aware of an innovation

(*communication channels*), how they decide to use the innovation (*decision method*) and then

how they learn to use (*method of learning)* the innovation. Once an individual is comfortable

and knows how to use an innovation, he/she can move on to the last two steps; implementation

and confirmation.

Communication Channels

Understanding both the complexities and intricacies of a social system within an

environment is imperative when examining how innovations diffuse into a system. In order for

an innovation to diffuse properly through an environment, effective communication channels

must be in place to spread the word about the innovation. Opinions from like-minded friends

within the environment seem to have the most influence (Rogers, 2003) on successful diffusion.

Rogers (2003) believes that individuals that are homophilous (similar in certain attributes such as

beliefs, education, social status, etc.) communicate and trust each other more than individuals

that are heterophilous (different in the attributes listed above). Schools often are made up of

mostly homophilous (similar in certain attributes such as beliefs, education, social status, etc.)

individuals.

Rogers (2003) also identifies the concepts of *opinion leadership* and *critical mass* when

conceptualizing about communication channels. Opinion leadership is the idea that one

individual is able to informally influence the attitudes and behaviors of others repeatedly,

(Rogers, 2003). Reaching the critical mass, "… occurs at the point at which enough individuals

in a system have adopted an innovation so that the innovation's further rate of adoption becomes

self-sustaining" (Rogers, 2003, p. 363). When examining communication channels, it is

important to understand who holds the key to opinion leadership. Convincing those individuals

to adopt an innovation is critical to swinging the critical mass in a social system. This study

examined if individuals became aware of Google Docs in a formal or informal way. Formal

methods in a school district can include from a supervisor/administrator and from a professional

development experience. Informal methods can include a teacher's own research, from a friend,

and/or from a work colleague.

Decision Method

Once an individual becomes aware of an innovation, the next step is the decision to use it.

When examining the social system and how individuals make decisions, Rogers (2003) identifies

three types of decisions individuals make with regard to new innovations; *optional innovation-*

decisions, collective innovation-decisions, and *authority innovation decisions.* "Optional

innovation-decisions are choices to accept or reject an innovation that are made by an individual

independent of the decisions of the other members of a system", as opposed to collective

innovation-decisions, which are "choices to adopt or reject an innovation that are made by

consensus among members of the system", or authority innovation-decisions, which are "choices

to adopt or reject an innovation that are made by a relatively few individuals in a system who

possess power, status, or technical expertise" (Rogers, 2003, p 28).

The type of decision to use an innovation has an impact on how well the innovation

diffuses. Rogers (2003) postulates that authority decisions spread through organizations the

fastest. Rogers (2003) studied how new ideas manifest themselves and are transmitted (diffusion

of innovations) and found that, "collective and authority decisions are more common than

optional decisions in... schools" (Rogers, 2003, p. 29). However, other researchers suggest that

optional decision changes, driven from the "bottom up" rather than from the "top down", are

more effective in educational institutions (Nichols, 2008; Salmon, 2005).

The idea that the diffusion of technology in schools could be flowing from the "bottom-

up", rather than from the "top-down", is intriguing. This study gathered data about what types of

decision method (*optional, collective, authority)* teachers employed when deciding to use Google

Docs professionally and see how it affects their patterns of use.

Method of Learning

In order for a teacher to successfully implement any technology, she must know how to

use the technology and feel comfortable using it. How are teachers learning about how to use

technology in schools? Formal distribution methods could include information from an

administrator/supervisor and professional development workshops, while informal methods

could be learning from a teacher's own research, from a friend, and/or from working with friends

and colleagues. Schools are typically slow to change and it's difficult to get teachers to

implement new ideas within their classroom. Getting teachers to try new technologies is even

more difficult because, "…it takes considerably longer to learn about using technology for

personal use than it does to learn a new teaching model. It is estimated that more than 30 (hours)

of training and experience are necessary to see actual adoption of new technologies (Mehlinger,

1997)" (Schrum, 1999, p. 3).

     Teachers learn formally about technology education in their undergraduate preparation

courses. "Kent and McNergney (1999) report that the teacher certification process in more than

32 states in the United States include an explicit technology requirement" (Kohler & Mishra,

2005, p.94). However, the, "… Office of Technology Assessment found that a majority of

teachers felt inadequately trained to use technology resources (OTA, 1995)", (Schrum, 1999,

pg.1). In order for teachers to implement technology successfully within their classroom, they

need both formal and informal methods of learning that show teachers exactly how to use the

specific innovation (technology) with their students. McKenzie notes that, "Becker's research

points to the need to do much more than teach technology skills to teachers", (McKenzie, 2001,

pg.4). Teachers must be convinced of the value of engaging students in high order thinking

activities that use new technology tools (McKenzie, 2001 & Rogers, 2003) so they will be

motivated to implement the new technology into their teaching practices.   McKenzie (2001)

outlines a successful technology training model that combines both formal and informal training

of teachers. Teachers would attend workshops and then be involved with study groups and

curriculum development/invention teams. Technology coaches would also be available to assist

the teacher teams. These peer groups would then apply the formal training to develop standards

based units, including technology lessons, that can actually be used with their students. This

combination of formal and informal learning would have the best chance of diffusing new

technology innovations (McKenzie, 2001). This study examined how teachers learn to use

Google Docs (formally or informally) and if the method is associated with their patterns of use.

Environmental Factors

Factors that influence the use of technology fall within two categories; environmental

factors and personal characteristics. Research on environmental factors focuses on the barriers

that prevent the effective use of technology in schools and examines how information about

technology is disseminated. An early barrier to the effective implementation of technology in

schools - access to hardware, software, and Internet connectivity - appears to have been

overcome with the assistance of federal funding and the rapid purchasing of equipment and

software. Research has identified other barriers such as *time* (Bauer & Kenton, 2005; Goos &

Bennison, 2008; Clausen, 2007; Cuban, 2001; Honan, 2010; Litrell et al., 2005; Wallace, 2004),

equipment (Bauer & Kenton, 2005), *student skill level* (Bauer &Kenton, 2005), *teacher skill level*

(Bauer & Kenton, 2005), *scheduling* (Bauer & Kenton, 2005), *software* (Bauer & Kenton, 2005),

Internet issues (Bauer & Kenton, 2005), *class size* (Bauer & Kenton, 2005), *effort expectancy*

(Birch & Irvine, 2009), *self-efficacy* (Oliver & Shapiro, 1993), and the *complexities of schools* –

students, teachers, principals, parents, community, district administration, governments, and

understanding change (Fullen, 2007).

Personal characteristics of teachers are another important set of factors to consider.

Examining a teacher's number of years teaching, subject area, personal use of technology, and

knowledge regarding how to successfully use technology in the classroom could help uncover

which teachers are best situated to be implementers of new technologies. These teachers can

then be used as trainers and role models to help their less proficient colleagues. However, as the

study of both environmental and personal factors is beyond the scope of this study, the focus of

this piece was environmental factors, leaving personal factors to others (Tetreault, in press).

Time seems to be the most prevalent environmental barrier identified (Goos & Bennison,

2008; Clausen, 2007; Cuban, 2001; Honan, 2010; Litrell et al., 2005).   Teachers view

technology lessons as something "extra" they must teach along with the many core items in the

curriculum they often do not have time to cover before the end of the school year. In addition,

scheduling difficulties can also be related to "time." Most classrooms are not equipped with

enough computers for all students to use them simultaneously for a whole class technology

lesson. Therefore, teachers need to schedule time in a computer lab or with a traveling "mobile"

computer lab in order to instruct a whole class technology lesson. These labs, whether fixed or

mobile, are usually available to the entire school, and scheduling time to use them is not an easy

task. Teachers who are unfamiliar with the technology also may view the time required for

training as an investment they are unwilling or unable to make in light of other time-intensive

pressures, such as the requirements to complete other curricular goals.

Growing class size (Bauer & Kenton, 2005) is also a factor that concerns teachers. With

budget cuts always happening, a rise in class size has put extra pressure on teachers. Having

more students to instruct is already a difficult task. Teachers may be reluctant to investigate new

technologies with students in fear that they will need to provide individual attention to students

who are not technology savvy. In addition, class size can impact time barriers - most classrooms

are not equipped with enough computers for all students, so teachers are then back to the issue of

scheduling time in a computer lab/mobile lab and juggling schedules with colleagues to allow the

use of a lab that may not have enough resources for a larger class.

As stated above, access to computers has dramatically increased and Internet connectivity

within schools has also improved dramatically. Nationally, the computer to student ratio was at

92:1 in 1983-84, but was reduced quickly to 6:1 in 1999 (Cuban, 2001). Russell et al., (2003)

noted that between 1995 and 2001, federal expenditures in educational technology increased

from $21million to $729 million; this led the student-to-computer ratio to drop from 9:1 in 1995

to 4:1 nationally by 2001. Internet connectivity within schools has also improved dramatically,

to the point that 95% of classrooms across the nation report having Internet access (Gray et al.,

2010).

This study focused on the environmental factors of time, class size, and computer access

affecting the use of technology in middle schools in Monmouth County and if they were

associated with the patterns of use of Google Docs.

Methodology

This chapter presents the methods utilized for this study. It begins with a review of the conceptual framework for the study and then describes the population and sample, the instrumentation and measures, the recruitment procedures, as well as how the data was analyzed. This quantitative study used a self-created survey instrument to determine how patterns of professional use of one specific technology, Google Docs, were related to communication channels, decision method, method of learning, and the environmental factors of time, class size, and computer access. The dependent variable was the level of use of Google Docs and the independent variables were communication channels, decision method, method of learning, and environmental factors. *Figure 1* represents the hypothesized relationships between the independent and dependent variables.

Population/Sample

We were interested in studying a population of middle school teachers that service students of a variety of races, ethnicities, and socioeconomic backgrounds. Rather than choosing an individual school to study, we decided to survey an entire county in the state of New Jersey to allow for a more heterogeneous student population. Monmouth County, New Jersey was chosen since it contains many middle schools with a variety of socioeconomic classifications, it has a diverse student population, and it has districts that are currently using Google Docs. The population for this study was all teachers in grades 6th, 7th and 8th in Monmouth County, New Jersey regardless of subject area, gender, age, and/or ethnicity.

Monmouth County contains 43 school districts with 53 schools that have students in grades 6, 7 and 8, including one charter school. In New Jersey, schools are classified into District

Factor Groups (DFGs) that give an approximation of a district's socioeconomic status; DFG -A

represents the neediest districts, and DFG – J represents the wealthiest. Districts in Monmouth

County are classified by DFGs as follows: 4%-A, 4%-B, 14%-CD, 8%-DE, 14%-FG, 30%-GH,

30%-I, 6%-J, (New Jersey Department of Education, 2004). The student population in

Monmouth County is 72% White, 11.9% Hispanic, 9.1% Black, 5.7% Asian, .9% "Two or More

Races", .2% Hawaiian Native, and .1% Native American. The percentage of students that

participate in the free lunch program is 16.5%, 21.2% are in the reduced lunch program, 2.8%

are LEP (Limited English Proficiency), and .02% are considered migrant, (New Jersey

Department of Education, 2012). In addition, middle schools in Monmouth County are

configured in many different ways (7th & 8th, 6th 7th, & 8th, etc.). All schools with teachers in

grades 6, 7, and/or 8 were invited to participate in this study.

Instrumentation and Measures

In order to collect data for this study, we developed a survey (Appendix A) that was

administered to respondents online using survey distribution software called Qualtrics.

Appendix B contains a description of each survey question as it relates to the variables in this

study. Other data collection methods such as field experiments, case studies, and archival

records were considered, but not chosen since surveys are a very efficient way to reach the most

people in a larger population. Teacher responses to the survey questions provided raw data about

both the independent and dependent variables in this study. The variables were analyzed in the

Data Analyses section in the following ways.

- Independent Variables:
  - Communication Channels – Teachers defined their communication channels
    for hearing about Google Docs as formal or informal.

- o Decision Method – Teachers classified how they came to the decision to use

  Google Docs as optional, collective or authority driven.

- o Method of Learning – Teachers described their method of learning how to use

  Google Docs as formal or informal.

- o Environmental Factors - Teachers quantified how time, class size, and

  computer access served as barriers to the implementation of Google Docs for

  instruction.

- Dependent variable: Patterns of Use – Teachers recorded how frequently they use

  Google Docs in a variety of ways. We then used this information to create a Google

  Docs Use Score (GDUS) for each respondent.

In order to assess the readability and technological functionality of the survey prior to survey

administration, two pilots were run. We were available during the pilots either in person or by

using "Google Hangout", a live, face-to-face, chat application available through Gmail. When

selecting teachers for the survey pilot, we were careful to choose participants who would not be

involved in the actual survey. The first pilot took place on February 27, 2013 at the Indian Hill

grade school in Holmdel, NJ. Thirteen teachers in grades three through five with varied years of

teaching experience, subject areas taught, and levels of use of Google Docs participated in this

pilot. Since this study surveyed teachers in sixth, seventh, and eighth grades, these particular

teachers were not included in the actual survey. The teachers met with us in the computer lab

and then took the survey on line. Respondents were timed and the following data was collected:

Shortest response time: 2 minutes, 38 seconds
Longest response time: 11 minutes, 52 seconds
Average response time: 5 minutes, 30 seconds

The pilot survey ran smoothly and after the survey was completed online, survey respondents

were given a paper copy of the survey and asked to provide the us with any information about

questions that were difficult to understand as well as issues they had with the digital

administration of the survey. No difficulties were witnessed by us or reported by the

respondents.

The second pilot took place on March 6, 2013 at the Eisenhower Middle School in

Wyckoff, New Jersey. This school is not in Monmouth County, and is therefore outside the

target population area. Nine teachers in grades six through eight, also with varied lengths of

teaching experience, subject areas taught, and levels of use of Google Docs, participated in this

pilot. The teachers met with us in the library with their school provided laptops and took the

survey on line. Respondents were timed and the following data was collected:

Shortest response time: 4 minutes, 59 seconds
Longest response time: 7 minutes, 35 seconds
Average response time: 6 minutes, 26 seconds

This pilot survey also went well. After the survey was completed online, survey respondents

were given a paper copy of the survey to analyze. One respondent asked if question #9 (How did

you come to the decision to use Google Docs?) referred to using Google Docs personally or

professionally. We added "for professional use" to the question to clarify. A couple of other

minor wording issues were resolved, but no other difficulties were observed by us or reported by

the respondents.

Recruitment Procedures

Schools were selected by obtaining a list of all middle schools in Monmouth County from the

Monmouth County Superintendent's office and comparing that list with a list of middle schools

from the New Jersey's State Department of Education's website. Discrepancies were then

rectified by searching individual school websites to determine if schools contained 6th, 7th and 8th

grade teachers. We personally contacted all schools to solicit accurate demographic information

(school, name, address, principal email, number of teachers/grade levels, etc.).

After the research proposal and survey were approved by Rutgers' IRB (see Appendix C), I

contacted the Monmouth County Superintendent of Schools to ask for assistance with getting

Monmouth County Superintendents to sign permission forms (Appendix D). Forms were

distributed at a monthly Superintendent's roundtable meeting on February 22, 2013. We

contacted the Superintendents that did not sign the permission form at the meeting by email, by

phone and/or even in person to solicit their participation.   Out of the 43 districts in Monmouth

County, 25 Superintendents granted permission for us to survey their teachers. This provided

access to 35 schools, and based on school personnel's self-reported staffing numbers,

approximately 1790 teachers.

After gaining permission for district participation, we mailed all principals in participating

districts a letter explaining the study (see Appendix E) along with a $5 Dunkin Donuts gift card

as an incentive and to thank them for their participation. The letter explained that the first 30%

of schools to respond with 75% or more responses to the survey would receive a $100 donation

to the school.

A week later, digital surveys were emailed to the principals (see Appendix F for the email) to

distribute to their teachers. The survey link was emailed to all building principals where the

district superintendent granted permission for the study to take place. All teachers in grades 6, 7

and/or 8 were asked to participate regardless of their subject area, age, race, ethnicity and/or

gender. Survey participation was voluntary, and to protect the anonymity of participants,

respondents were not asked to report any personally-identifying information. This virtually

eliminated the chance of any negative repercussions to survey participants as well as improved

the probability that respondents would report truthful answers. Data from Qualtrics revealed that

the average time it took respondents to complete the survey was 9 minutes.

We monitored Qualtrics daily to see how teachers were responding to the digital survey and

continuously contacted principals by email, phone, and in person to encourage as much teacher

survey participation as possible. We decided to award $100 to all schools with more than 75%

participation, rather than just to the first 30% who achieved the goal to encourage as much

participation as possible. 10 schools surpassed the 75% response rate and they were awarded

$100. The schools/districts are listed in Table 5.

Table 5 *Schools Awarded $100*

District	*School*
Avon-By-The-Sea	Avon Elementary School
Farmingdale Board of Education	Farmingdale Elementary
Hazlet Township Public Schools	Cove Road Elementary, Hazlet Middle School
Highlands Elementary	Highlands Elementary
Holmdel Township School District	William R. Satz School
Keansburg School District	Joseph R. Bolger Middle School
Oceanport School District	Maple Place School
Shrewsbury Boro School District	Shrewsbury Boro School
Spring Lake Boro	H.W. Mountz Elementary

The sample for this study included all schools in Monmouth County with 6th, 7th and 8th

grade students where the Superintendent granted permission for the teachers to participate; 35

schools (including one charter school) within 25 districts. In total, the schools sampled yielded

987 total responses. Of those 987 total responses, certain responses were excluded from the

sample before the statistical analysis was conducted for various reasons. Table 6 describes the

exclusion types and reasons for exclusion.

Table 6 *Exclusion types*

Factor Analysis Exclusions for Question 14	Description of Exclusion	# of exclusions
Exclusion 1	Respondents who did not answer any questions	6
Exclusion 2	Respondents who disagreed with survey protocols	2
Exclusion 3	Incomplete surveys	134
Exclusion 4	Paper copy responses overlap with on-line responses	5
Exclusion 5	Paper copy responses with multiple answers for single item	2
Exclusion 6	Missing required data	34
Exclusion 7	District not approved for survey participation	1
Exclusion 8	Paper survey with errors (claimed non-use, but completed use questions)	2
Exclusion 9	Respondents who have not heard of Google Docs	122
Exclusion 10	Respondents who do not use Google Docs professionally	259
Exclusion 11	GDUS = 0	8

After excluded responses were removed, the final sample for this study consisted of 412 teachers representing districts from all DFGs (see Figure 2). This sample is fairly representative of (23%; 412 out of 1794) of the population.
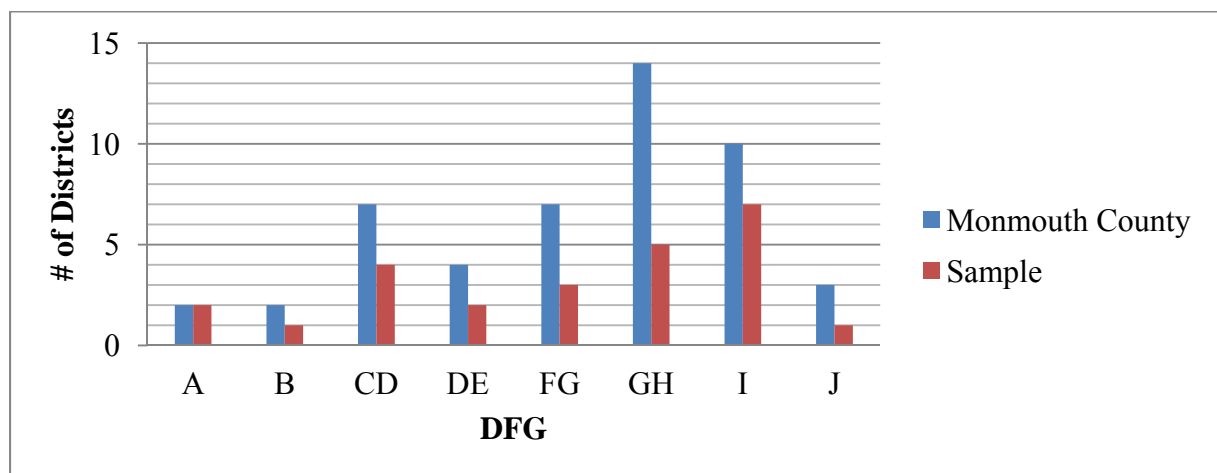
Figure 2 Participating Districts by DFG

The first groups of excluded responses (exclusions 1-8) were a result of problematic responses. Surveys that that were incomplete or completed incorrectly were all excluded.

For the one respondent from a district with no permission, we assumed the teacher incorrectly

selected his/her district since districts with no permission did not have access to the survey, but

still did not include the responses from this teacher in the final data set. The last group of

exclusions represented teachers who either have never heard of Google Docs and/or did not use

it professionally. The final data set for statistical analysis consisted of 412 valid responses. An

analysis of the years of experience data revealed that a large percentage of respondents were in

the middle of their professional careers. However, a large number of respondents reported

having more than thirty years of experience. See Figure 4 for a histogram of the number of years

teachers in the sample have been teaching. As for the subjects the respondents taught, the

sample had a good mix of subject areas represented. A frequency distribution table about the
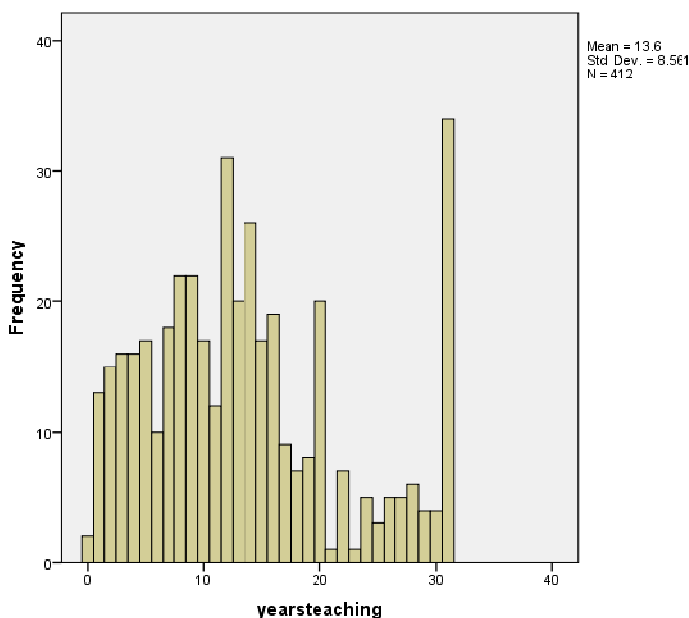
subjects taught by respondents is displayed in Table 7.

Figure *3 Histogram of # of years teaching*

Note: For average # of years teaching, respondents that selected more than 30 years were coded as 31 years.

Table *7 Frequency Distribution Table of Subject Areas*

	# of teachers
Language Arts/English teachers	124
Social Studies/History teachers	74
Science teachers	71
Mathematics teachers	91
Visual and Performing Arts teachers	34
Technology teachers	26
Special Education Teachers	79
Health and Physical Education teachers	16
World Language Teachers	22
"Other Subjects" teachers	49

Note: For the number of teachers in each subject area recorded above, teachers can be listed more than once if they teach more than one subject area.

Data Analysis

The data collection process for this study ended on June 28, 2013 with the closing of the online Qualtrics survey. Responses were exported from Qualtrics into Excel, and the first step in the data analysis for this study was to determine a pattern of use scale for respondents. As previously mentioned, there were four typologies of use: non-use, personal productivity, basic interactions, and advanced interactions. To categorize each respondents into a type of use, question 14 in the survey asked respondents to rate 11 uses of Google Docs items on a 5 point scale: "Never", "Rarely (1-2 times per year)", "Sometimes (once a month)", "Regularly (once a week)", or "Frequently (daily)". This question was structured so that the first 3 items of question 14 (14 a, b, c) described the "Personal Productivity" or the least-complex level of use, the next four items (14 d, e, f, g) related to "Basic Interactions", the intermediate level of use that builds on skills from the earlier level, and the last four items (14 h, i, j, k) dealt with "Advanced Interactions, the Google Docs use level of highest complexity that builds on skills from the previous two levels. Averages were created for each type of actual use (personal, basic, and

advanced) and these averages indicated 74.0% of teachers surveyed used Google Docs

personally the most, 15.1 % used it in a basic way the most, and 0.7% reported that the use

Google Docs in an advanced way the most. The additional 10.2% of the teachers surveyed used

Google docs in mixed ways (personal/basic/advanced, personal/basic, basic/advanced). This

suggested that respondents generally use Google Docs more for personal productivity purposes

than for interactions with others, whether on a basic or advanced level.

In order to run regression analyses on the data, the first hurdle was to determine if all 11

items in question 14 were necessary for consideration. Factor analysis (Appendix G) was used to

make this determination. The data set for the factor analysis included the 412 valid responses

from this survey (as identified after removing participants based on exclusion types identified in

Table 6). Table 8 shows the component matrix that was produced by SPSS for the factor

analysis.

Table *8 Component Matrix for Factor Analysis of Question 14*

Component Matrix

	Component	
	1	2
Basic Use #3	.790	-.168
Basic Use #1	.772	-.093
Basic Use #4	.740	.408
Basic Use #2	.732	-.302
Personal Use #3	.730	-.360
Advanced Use #2	.728	.165
Advanced Use #1	.690	.534
Advanced Use #3	.676	-.353
Personal Use #2	.673	.136
Advanced Use #4	.659	.531
Personal Use #1	.636	-.478

The component matrix specified that everything loaded higher (greater than 0.5) on

component 1 than on component 2. This indicated that all 11 items were important in measuring

one component (dimension or factor). Since all 11 items of question 14 needed to be considered

when developing a level of use scale, we analyzed a variety of mathematical ways to produce a

Google Docs Use Score (GDUS) for each respondent. We began by reexamining the structure of

question 14 with goal of giving each respondent a GDUS score. We were cognizant of the fact

that items included in the personal use section required the least amount of technical knowledge

while items in the advanced interaction required the highest. In order to accurately include this

while creating a GDUS score for each user, we used averages and weighting to develop the

GDUS score for each respondent.

Step #1 – Determine categorical averages and then weight them:
(14a + 14b + 14c)/3 = (A), and (A) x 1 = Personal Weighted Average
(14d + 14e + 14f + 14g)/4 = (B), and (B) x 2 = Basic Interactions Weighted Average
(14h + 14i + 14j + 14k)/4 = (C), and (C) x 3 = Advanced Interactions Weighted Average

Step #2 – Determine GDSUS by summing weighted averages:
[(A) x 1] + [(B) x 2] + [(C) x 3] = GDUS

The GDUS scale ranges from 0 to 24. The steps below were followed to assign a GDUS score
for each respondent. Table 9 provides some examples of actual GDUS score calculations.

Table 9 *Creation of GDUS Scores*

#	14a	14b	14c	Personal Avg.	14d	14e	14f	14g	Basic Avg.	Basic Avg. x 2	14h	14i	14j	14k	Advanced Avg.	Advanced Avg. x 3	GDUS Score
5	2	2	0	1.3	0	0	0	0	0.0	0	0	0	0	0	0.0	0.0	1.3
9	2	2	2	2.0	0	2	0	0	0.5	1	0	0	0	0	0.0	0.0	3.0
10	3	2	2	2.3	4	2	4	0	2.5	5	0	3	0	0	0.8	2.3	9.6
12	3	2	2	2.3	3	2	1	1	1.8	3.5	0	1	1	2	1.0	3.0	8.8
13	3	4	3	3.3	2	3	2	1	2.0	4	0	1	0	1	0.5	1.5	8.8
16	2	2	3	2.3	2	4	1	1	2.0	4	1	0	0	0	0.3	0.8	7.1
17	2	2	1	1.7	1	2	1	1	1.3	2.5	1	1	1	1	1.0	3.0	7.2

Once a GDUS score was assigned to each respondent, it was time to select the appropriate

statistical methodology to assist with answering the research questions. The research questions

posed by this study were:

1) What communication channels are associated with the highest level of professional use of

    Google Docs?

2) What decision methods are associated with the highest level of professional use of

    Google Docs?

3) What methods of learning are associated with the highest level of professional use of

    Google Docs?

4) What environmental factors are associated with the highest level of professional use of

    Google Docs?

A variety of statistical methods were examined to determine the best regression equation

as well as answer the research questions. This study investigated the relationship between many

quantitative variables. Mertler & Vannatta (2013) recognize that there are three statistical tests

that address this type of research; bivariate correlation and regression, multiple regression, and

path analysis. Bivariate correlation and regression involves only two quantitative variables, ,

multiple regression analyses encompass several independent quantitative variables, and path

analysis analyzes the direct and indirect effects among several variables (Mertler & Vannatta,

2013). This study design included one dependent variable and multiple independent variables,

some of which were dummy-coded, so bivariate correlation and regression were not appropriate.

Multiple regression analysis was an appropriate method to find the most parsimonious

model in order to assist with answering the research questions posed by this study. This study

was exploratory in nature and had many independent variables and so "stepwise" multiple

regression was a good choice for this investigation. Mertler and Vennata (2013) indicate that a

stepwise method of multiple regression can help to "determine which specific IV's [independent

variables] make meaningful contributions to the overall prediction" (168). A stepwise selection

method performs tests to determine if the additional variables entered into the analysis contribute

to the overall analyses (Mertler, 2013; Kutner, Nachtsheim, Neter, & Li., 2005; Kleinbaum,

Kuper, Nizam & Muller, 1998). Running stepwise regressions in SPSS is an efficient method of

analyses because the computer runs all the iterations and produces a final model.

In order to determine the final regression model, data from the survey needed to be

converted into numeric data so it could be analyzed using SPSS. Communication channels

(survey question #9), decision method (survey question #11), and method of learning (survey

question #12) were all nominal data and were dummy coded into 0's, and 1's. Table 10 shows

the dummy coding patterns. Time, class size, and computer access were Likert scale items and

the values reported by the respondents were entered directly into SPSS. Once all the data were

ready, numerous regression analyses were run to find the best model.

To select the final model, all independent variables were analyzed in relation to the

dependent variable (use of Google Docs as part of teachers' professional practice). To input the

data, the information was imported into SPSS from Excel. A number of regressions were run

through stepwise analysis to determine the most parsimonious final model.

Table 10 *Dummy Coding Patterns*

Independent Variable	*Coding Pattern*
Communication Channels	0=informal 1=formal
Time, Class Size, Computer Access	0=0 1=1 2=2 3=3 4=4
Decision Method	1,0=optional 0,1=collective 0,0=authoritative
Method of Learning	0=informal 1=formal

As explained in the literature review, the factors that influence the use of technology fall

within two categories; environmental factors and personal characteristics. The above

methodology describes how the data analysis was conducted on the environmental factors

identified by this study. Personal characteristics of teachers are another important set of factors

to consider and were examined by Tetreault (in press). Data for Tetreault's study were obtained

from the same survey and sample, but his research focused on the survey questions that

examined the personal characteristics and adopter types of respondents. Specifically, he studied

subject area, years of teaching experience, grade level, personal technology use, and level of

Technological, Pedagogical, and Content Knowledge (TPACK). It was interesting to see how

the regression model changed when both the statistically significant variables from this study and

the statistically significant variables from Tetreault's model were combined.

To select a final model for both the environmental factors and personal characteristics, the

statistically significant personal factors from Tetreault's work were added to the statistically

significant environmental characteristics from this study in an attempt to provide the most

complete picture possible of what factors are most significantly correlated with the GDUS score

of respondents. Since personal characteristics are believed to be more of a predictor in

technology use than environmental factors, the personal characteristics were entered first. When

all variables were combined, the environmental factors identified as statistically significant in

this study were no longer significant.

Results

This chapter presents the results of this study. It reports descriptive statistics and regression

analysis results using both tables and narrative form. As explained in the methods chapter,

various regression analyses were run to determine the final equation that explains the effects of

both the environmental characteristics and personal factors on the GDUS score of teachers that

participated in this study.

The first regression analysis examined collective and authoritative decision methods along

with communication channels, time, class size, computer access, and method of learning in

relation to the GDUS score for each respondent. Table 11 provides descriptive statistics about

the 412 teachers (n=412) in the final data pool and valid responses from teachers who know

about Google Docs and use it professionally. The mean for communication channels was 0.505.

Since formal communication channels was dummy coded as "1" when running the data, this

means that 50.5% of the respondents learned about Google Docs formally and 49.5% learned

about it informally.

Table 11 *Descriptive Statistics for the Sample*

	% of responses
Formal Communication Channels	50.5%
Informal Communication Channels	49.5%
Authoritative Decision Method	41.7%
Collective Decision Method	22.6%
Optional Decision Method	35.7%
Formal Method of Learning	42.0%
Informal Method of Learning	58.0%

Time, class size and computer access were recorded on a Likert scale from 0-4 and so the

means of 2.053 for time and 2.189 for computer access are in the middle and this indicated that

that on average respondents felt these items were somewhat of a barrier to their implementation

of Google Docs professionally. However, a mean of 1.451 for class size showed that

respondents did not feel like it was much of a barrier. As for decision method the means

revealed that out of the respondents who use Google Docs professionally, 22.6% decided to do

so collectively (with other colleagues and friends), 41.7% chose to use it because a supervisor or

administrator required her to do so, and 35.7% of the respondents made the decision to use

Google Docs on their own. The mean for formal method of learning was 0.420, so 42% of

respondents had a formal method of learning, while 58% had an informal method. Table 12

shows a correlation matrix among the environmental factors in this study. Many statistically

significant relationships were found. Since the research questions in this study focused on the

professional use of Google Docs, we examined the statistically significant correlations found

with regard to the GDUS; time ($r = -.159$, $p = .001$), collective decision method ($r = .106$, p

$= .016$), and class size ($r = -.087$, $p = .038$). P values less than 0.05 were considered statistically

significant throughout this study. However, the magnitudes of these correlations were not strong

because the Pearson's correlation coefficients were all close to zero. The negative Pearson

correlation coefficients for time and class size indicated that there was a negative association

between these variables and the GDUS score meaning as one went up, the other went down.

Table 12 *Correlation Among Environmental Factors and GDUS*

	GDUS
Time	-.159*
Collective DM	.106*
Method of Learning	.059
Comm. Channels	.007
Class Size	-.087*
Computer Access	-.025
Optional DM	-.055

* $p < .05$

To address the research questions presented in this study, I used stepwise linear regression. For the first step, I entered the one variable anticipated to be the most significant according to research, time, in comparison to the GDUS score. The next step added in the decision method believed to be significant, collective decision, and the last step examined all the independent variables presented in this study. Table 13 presents the regression results. The first step (Model 1) produced $R^2 = .025$, indicating only 2.5% of the variation of the Google Docs score was explained by just time. Adding in collective decision model resulted in $R^2 = 0.038$ (Model 2). The last step that contained all the independent variables (Model 3) and it improved the explained variation of the Google Docs score to 4.5% ($R^2 = 0.045$), but the other variables added in were not statistically significant.

Model 2 was chosen as the final model. It encompassed the statistically significant environmental factors that influence the GDUS score for participants in this study; time (p=.001) and the collective decision method (p=.021). Based on the results from this study, the final model equation for the Google Docs Use Score (GDUS) was:

$$\widehat{GDUS} = 7.351 - 0.551X_1 + 1.227X_2$$

X_1= time
X_2= collective decision method

Table 13 *Regression of Environmental Factors*

Predictors		β	t	Sig.	R^2
1	(Constant)	7.598	18.763	.000	
	Time	-.563	-3.257	.001	
					.025
2	(Constant)	7.351	17.641	.000	
	Time	-.551	-3.362	.001	
	Collective Decision Method	1.227	2.313	.021	
					.038
3	(Constant)	7.293	11.134	.000	
	Time	-.546	-3.076	.002	
	Collective Decision Method	1.138	1.936	.054	
	Method of Learning	.886	1.577	.116	
	Communication Channels	-.424	-.748	.455	
	Class Size	-.109	-.566	.572	
	Computer Access	.060	.370	.711	
	Optional Decision Method	-.173	-.312	.755	
					.045

Note: β = Unstandardized coefficients and the dependent variable was the GDUS.

The ANOVA Regression shows the significant predictive power of the model. The ANOVA

Regression p-value for model 2 equals .000 (less than the significance level of .05), model 2 had

significant predictive power. Since the coefficient for time was negative, this means for every

increase on the time Likert scale there was a decrease on the GDUS scale.   This implied that as

teachers perceived their time commitment increasing, their Google Docs Use Score decreased.

The coefficient for time (β=-0.551) indicated that for every increase of one on the time scale, the

GDUS score decreased by approximately 0.6. The positive coefficient for a collective decision

method (β=1.227) indicated that when teachers decided together with colleagues and friends to

use Google Docs, the GDUS score was higher than when the decision was on their own

(optional), or when a supervisor/administrator required them to use it (authoritative).

Out of the 6 environmental factors tested in this study, two of them were considered

statistically significant. These two variables explain only a small portion of the variation of the

GDUS score for teachers in this study (R^2 = .038). In an attempt to discover additional variables

to explain the variation of the GDUS score for teachers in this study, the statistically significant

personal characteristics from Tetreault's (in press) study were added to the statistically

significant environmental factors from this study. Stepwise linear regression was used once

again to combine all the variables. For the first step (Model 1), I entered all of the statistically

significant personal factors from Tetreault's study (TPACK Score, innovator type-innovator,

innovator type-early adopter, innovator type-early majority, number of types of technology used

professionally, decision method-optional, subject taught-mathematics, subject taught-visual or

performing arts, years of experience). The next step (Model 2) added in the statistically

significant environmental characteristics from this study (time and collective decision method).

Table 14 presents the regression results. The first step suggested more of an effect of the persona

factors than the environmental factors since approximately 22% (R^2 = .221) of the variation of

the Google Docs score was explained by the personal characteristics listed. Adding in the

environmental factors of time and collective decision method in the next step slightly improved

the effect on the variation of the Google Docs score (R^2 = .228).   However, when time and

collective decision method are added to the personal characteristics in Model 2, they were no

longer statistically significant.

Table 14 *Regression of Personal and Environmental Factors*

Predictors		β	t	Sig.	R^2
1	(Constant)	-1.733	-1.270	.205	
	TPACK	.160	3.631	.000	
	Innovator	4.467	4.600	.000	
	Early Adopter	2.597	4.495	.000	
	Early Majority	1.862	3.367	.001	
	# of types of tech used	.549	3.345	.001	
	Decision Method-Optional	-1.568	-3.396	.001	
	Subject taught-Math	-1.846	-3.765	.000	
	Subject taught-Vis/Perf Arts	-1.593	-2.158	.032	
	# yrs teaching	.053	2.201	.028	
					.221
2	(Constant)	-.803	-.545	.586	
	TPACK	.153	3.462	.001	
	Innovator	4.429	4.517	.000	
	Early Adopter	2.401	4.013	.000	
	Early Majority	1.689	3.060	.002	
	# of types of tech used	.514	3.104	.002	
	Decision Method-Optional	-1.524	-2.966	.003	
	Subject taught-Math	-1.782	-3.632	.000	
	Subject taught-Vis/Perf Arts	-1.633	-2.209	.028	
	# yrs teaching	.056	2.319	.021	
	Time	-.285	-1.833	.068	
	Collective Decision Method	.218	.401	.688	
					.228

Note: β = Unstandardized coefficients and the dependent variable was the GDUS.

Model 1 was chosen as the final model. Since the ANOVA Regression p-value for model

1 equals .000, model 1 had significant predictive power. Based on the results from this study and

Tetreault's study, the final multivariate regression equation for the Google Docs Use Score

(GDUS), was:

$$\widehat{GDUS} = -1.733 + .160X_1 + 4.467X_2 + 2.597X_3 + 1.826X_4 + .549X_5$$

$$- 1.568X_6 - 1.846X_7 - 1.593X_8 + .053X_9$$

- X_1 = TPACK Score

- X_2 = Innovator Type: Innovator

- X_3 = Innovator Type: Early Adopter

- X_4 = Innovator Type: Early Majority

- X_5 = Number of types of technology used (Professionally)

- X_6 = Decision Method: Optional

- X_7 = Subject taught: Mathematics

- X_8 = Subject taught: Visual or Performing Arts

- X_9 = Years of teaching experience

The positive coefficients for TPACK, innovator, early adopter, early majority, number of types of technologies used, and number of years teaching indicated that a rise or fall in those variables also meant a rise and fall in the GDUS score. The negative coefficients for an optional decision method and teachers that taught mathematics and visual and performing arts point to an inverse relationship.

Discussion

This chapter discusses the implications of the results of the study as well as the overall

significance of the research. It also includes study limitations as well as suggestions for future

research, policies and procedures. The purpose of this study was to uncover the patterns of use

of one specific technology. In particular, this study analyzed how communication channels,

decision method, method of learning, and environmental barriers affect the patterns of use of

Google Docs. The intent was to understand how one particular technology diffused or did not

diffuse through a sample of middle school teachers and to use that information to help

practioners effectively implement other technology initiatives in schools.

Implications

Rogers' (2003) Diffusion of Innovations research identified communication channels,

decision methods and method of learning as important factors to the dispersion of innovations.

Many other researchers identified time, class size, and computer access as significant factors

affecting the diffusion of new technologies into schools. This study identified time and a

collective decision method as statistically significant. It is logical that a collective decision

method was statistically significant in the sample surveyed. Teachers in middle schools often

work in teams and when the "team" decides to do something, all teachers usually work together

to successfully implement a new innovation. The fact that time was statistically significant

suggests that if people perceive that something will be a huge time commitment, they may not

engage in the activity. In this case, if teachers perceive that learning to use and/or using Google

Docs will require a great deal of their time, their inclination to use Google Docs in a

sophisticated way (a high GDUS score) is unlikely. Educators often feel pressed for time with

all the initiatives that are placed on them and the results of this study with regard to how time

affects the GDUS are not surprising.

Even though this study resulted in collective decision method and time being statistically

significant, the results were inconclusive because these two statistically significant variables

explained only a small portion of the variation of the GDUS score (R^2 = .038). Therefore there

are no recommendations for practice. Since prior research produced strong evidence of the

importance of time on the diffusion of new innovations, it is surprising that less than 4% of the

variance in use of Google Docs was explained by time and collective decision method in this

study. Perhaps the questionable results were attributed to the innovation studied (Google Docs),

the survey design, the sample studied, and/or the fact that I only examined quality of use and not

whether responders were users of Google Docs or non-users.

When combining this study with Tetreault's work (in press), the results are more significant

and have greater implications for policy and practice. The fact that when the two studies were

combined, nine of the personal characteristics studied (TPACK, number of types of technologies

used, subject taught–mathematics, subject taught-visual/performing arts, innovator, early

adopter, decision method-optional, early majority, and number of years teaching) remained

statistically significant, while none of the environmental factors remained statistically significant,

says a great deal about what was important when diffusing Google Docs into middle schools in

Monmouth County, New Jersey. The fact that personal factors carried more weight than

environmental ones is not surprising. Research supports the fact that the teacher and his/her

intentions are the most important factor in technology adoption in schools (Zhao & Cziko, 2001;

Hu, Clark, & Ma, 2003). Mumtaz (2000) states,"…there are many factors teachers face that

influence their take-up of ICT (information and communications technology). Veen (1993)

showed that teacher factors far outweighed the institutional or school factors" (Mumtaz, 2006, p.337). The combination of this study and Tetreault's work (in press) supports the same conclusion that personal characteristics are more important than environmental factors.

When combining studies, an interesting discovery was made in the area of decision method. There were three types of decision methods explored; optional, collective and authoritative. An examination of environmental characteristic yielded statistical significance for collective decision making, while the data for personal characteristics indicated statistical significance for optional decision making. The variable decision method was included in both studies because it can be regarded as either an environmental factor or a personal characteristic. Authority decision method is clearly environmental since an outside force is making the decision and optional decision is a personal factor. Collective decisions can be considered a combination of both environmental and personal. It makes sense then that collective decision method was statistically significant in the environmental factor study, while optional decision method came up as statistically significant in the personal characteristics study.

Other studies should be conducted to further investigate if environmental factors (especially time) are important to the use of new technologies in schools since this study was not consistent with other research. It would also be interesting to explore what other personal factors are influential in affecting teachers' professional use of educational technology. Once there is a strong body of literature to provide definitive information about why teachers do or do not adopt new technologies, practioners can use this information to help with the successful diffusion of technology into schools. In addition, this study only examined middle school teachers in Monmouth County, New Jersey who are using Google Docs for professional use. Repeating this

study with other grade levels, in other counties, and/or other states could also provide valuable

information about Google Docs use patterns.

It would also be interesting to look at the data collected by this study that was not analyzed in

this dissertation. For example, the research posed by this study focused only on teacher using

Google Docs professionally. Examining the data collected from the teachers who have never

heard of Google Docs and those that don't use it professionally, could be helpful in determine

what factors led to non-use.

Significance

This study is important because the public is still waiting for a "revolution" in education

that was promised by the arrival of computer technology in the 1980's. This "revolution" has yet

to occur. Perhaps a better understanding of how modern technology is diffusing through schools

will lead to improved methods of distribution of technology within schools and a greater

adoption of technological-based practices by teachers. The combination of results from this

study and Tetreault's work (in press) confirmed what other researchers have professed; personal

characteristics of teachers are more important than environmental factors to the successful

adoption of educational technology in schools. This tells school administrators and educational

policy makers that they need to focus on the teachers' characteristics and their needs when trying

to implement new technologies in schools. Successful adoption of new technologies in schools

could then subsequently lead to the "revolution" in education that we have been waiting for.

Limitations of the Study

This study had some limitations for consideration. The first set of limitations focuses on

the self-created survey for data collection. All data analyzed for this study was self-reported data

and reflects teachers' perceptions. This data may not accurately reflect the current practices of

the teachers surveyed and therefore results could be skewed. Additional studies with other

methodologies to collect data that are not self-reported should be conducted to either validate or

refute the findings of this study.

A limitation of this study was the survey design. Over 900 teachers participated in the

study and approximately 400 of them were eliminated from the data analysis portion of this

study because they either never heard of Google Docs and/or did not use it professionally. The

survey design forced participants to skip to the end of the study if they answered that they never

heard of docs and/or don't use it professionally. Therefore for those 400 plus respondents, no

data was available for the environmental factors studied. Future researchers should gather data

in a way that allows them to better glean information about non-users and what effects there lack

of interest the use of Google Docs professionally.

In addition, the dependent variable for this study was the GDUS score. The GDUS score

was calculated based on respondent's answers to question 14 on the survey. Question 14 asked

teachers to rate how frequently they use Google Docs in a variety of ways. The choices provided

were "Never", "Rarely (1-2 times per year)", "Sometimes (once a month)", "Regularly (once a

week)", and/or "Frequently (daily)". This is a subjective scale and teachers may or may not have

reported accurate responses. Also, the descriptions of use could have been confusing to some

readers and caused erroneous responses. The information from this question was converted to a

numeric GDUS score by grouping responses to the descriptions and weighting them in such a

way that made sense to us. Other researchers could interpret the data another way and obtain

different GDUS scores, and possibly alter the results of this study. In addition, the survey design

only allowed for the GDUS to measure degree of use and it was not possible to report variation

between users and non-users.

Other limitations of the study are that the population was limited to middle school teachers in Monmouth County, New Jersey. The findings presents are only applicable to the population studied. This study should be re-run in other grade levels, and in other counties and states to have more generalizable results.

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Appendix A - Sample of Survey Instrument
Diffusion of Google Docs in Monmouth County Middle Schools

This survey is part of a study by Rutgers doctoral students of the diffusion of Google Docs in

Monmouth County, New Jersey schools. Your responses to this survey will help us to learn about the

factors involved in the successful diffusion of technologies within schools, and may provide guidance to

school administrators' future plans regarding the implementation of new technologies.

With minor exceptions, this survey contains only quick-answer, multiple-choice responses. We estimate that you should be able to complete the survey in approximately 10 minutes. Your responses to this survey will be kept strictly confidential and will only be reported at the aggregate. The results will never be reported in any way that would permit any response to be associated with a specific individual.

After completing the survey, you will be assigned an identification number that will correspond to your responses so that your identity is not linked to your responses. Information gathered from the survey will be kept confidential and will be used only for the purpose of this project by the study authors. Because the information you provide in this study is strictly confidential, there will be essentially no risk from your participation. All study data will be kept for 7 years after the completion of the study and then will be destroyed.

The information you provide in this study will enhance our ability to understand the diffusion of technology through schools. Information learned will be shared with participating districts. This survey will be distributed to approximately 800 participants. All participants, regardless of gender, age, or ethnicity, are encouraged to respond. Your participation in this study is completely voluntary, and you may stop taking the survey at any point.

If you have any questions concerning this project, please feel free to contact the Principal Investigator, Dr. William Firestone, or the Rutgers University's Institutional Review Board using the following contact information:

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Thank you for your time and patience in completing this survey. Please read each question and the possible responses carefully, and then fill in the requested information or mark the appropriate check boxes.

NOTE: Once the survey is begun, you cannot return to previous questions, so please be thoughtful with your responses.

By selecting "Agree," you will be agreeing to the conditions of the survey. Once you have made your choice, click on the   forward arrow located toward the lower-right of the screen.

❍ Agree

❍ Disagree

If Disagree Is Selected, Then Skip To End of Survey

1. Please choose the name of your school district.

- ○ Asbury Park
- ○ Atlantic Highlands
- ○ Avon Borough
- ○ Belmar Borough
- ○ Colts Neck Township
- ○ Deal Borough
- ○ Eatontown Borough
- ○ Fair Haven Borough
- ○ Farmingdale Borough
- ○ Freehold Borough
- ○ Freehold Township
- ○ Hazlet Township
- ○ Henry Hudson Regional
- ○ Holmdel Township
- ○ Howell Township
- ○ Keansburg Borough
- ○ Keyport Borough
- ○ Little Silver Borough
- ○ Long Branch Borough
- ○ Manalapan-Englishtown Regional
- ○ Manasquan Borough
- ○ Marlboro Township
- ○ Middletown Township
- ○ Matawan-Aberdeen Regional
- ○ Millstone Township
- ○ Monmouth Beach
- ○ Neptune City
- ○ Neptune Township
- ○ Ocean Township
- ○ Oceanport Borough
- ○ Red Bank Borough
- ○ Rumson Borough
- ○ Sea Girt Borough
- ○ Bradley Beach
- ○ Shrewsbury Borough
- ○ Spring Lake Borough
- ○ Spring Lake Heights
- ○ Tinton Falls
- ○ Union Beach
- ○ Upper Freehold Regional
- ○ Wall Township
- ○ West Long Branch
- ○ Academy Charter

❍ Hope Academy Charter

2. Please type the name of your school in the box below.

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┌─────────────────────────────────────────────────┐
│                                                   │
└─────────────────────────────────────────────────┘
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3. How many years have you been teaching? Please count year one as your first full (Sept. – June) year of teaching.
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ 11
- ❍ 12
- ❍ 13
- ❍ 14
- ❍ 15
- ❍ 16
- ❍ 17
- ❍ 18
- ❍ 19
- ❍ 20
- ❍ 21
- ❍ 22
- ❍ 23
- ❍ 24
- ❍ 25
- ❍ 26
- ❍ 27
- ❍ 28
- ❍ 29
- ❍ 30
- ❍ More than 30 years

4. What subject area(s) do you teach? Please choose all that apply.

❑ Language Arts/English
❑ Social Studies/History
❑ Science
❑ Mathematics
❑ Visual and Performing Arts
❑ Technology
❑ Special Education
❑ Other _____
❑ Health and Physical Education
❑ World Language

5. Which grade(s) do you teach? Please choose all that apply.

❑ 6
❑ 7
❑ 8

6. Of the following technologies, which do you use on a regular basis for PERSONAL USE (that, is not counting your use for professional or school-related reasons) and/or for PROFESSIONAL USE (as part of your professional practice with colleagues or students)?
Please select all that apply.

	Personal Use	Professional Use
Productivity software (e.g., Microsoft Office [Word, PowerPoint, Excel, etc.], Open Office, Google Docs, etc.)	❑	❑
Email	❑	❑
Text messaging via cellular/smart phone	❑	❑
Instant or text messaging online via computer	❑	❑
USB storage device (e.g., portable hard drive or "thumb drive", a.k.a.: memory stick, pen drive)	❑	❑
Cloud-based storage (e.g., Dropbox, Bitcasa, iCloud, Box,SkyDrive, Google Docs/Drive, etc.)	❑	❑
Social media (e.g., Twitter, Facebook, Google+, etc.)	❑	❑
Online video chat/conferencing (e.g., Skype, Facetime, G+ Hangouts, etc.)	❑	❑

7. Please enter the name of any software, other than Google Docs, that you use for PROFESSIONAL use (as part of your professional practice with colleagues or students) that allows you to do any or all of the following:

- cloud-based storage
- document creation
- document sharing
- social media
- online video/chat

8. Please choose the answer which best matches your reaction to each statement. (Items adapted from Survey of Preservice Teachers' Knowledge of Teaching and Technology [Schmidt, et al., 2009].)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I can learn technology easily.	○	○	○	○	○
I frequently play around with technology.	○	○	○	○	○
I know about technologies that I can use for understanding and doing my subject area.	○	○	○	○	○
I can choose technologies that enhance the content of a lesson.	○	○	○	○	○
I know how to choose technologies that enhance students' learning for a lesson.	○	○	○	○	○
I can adapt the uses of technologies I learn about or am familiar with to different teaching activities.	○	○	○	○	○
I can teach lessons that appropriately combine my subject area, technologies, and teaching approaches.	○	○	○	○	○

9. How did you first hear about Google Docs (also known as Google Drive, Google Apps for Education, or Google Apps)?
○ I have not heard of Google Docs.
○ Informally (self-taught; friend or colleague gave me tips; etc.)
○ Formally (from a supervisor/administrator; during a professional development experience/class/training; etc.)
   If I have not heard of Google ... Is Selected, Then Skip To End of Survey

10. To what degree is each of the following items a barrier to increasing your professional use of Google Docs?

	Not a barrier at all: 0	1	2	3	MAJOR barrier to implementation: 4
Time	○	○	○	○	○
Class size	○	○	○	○	○
Computer access	○	○	○	○	○

11. How did you come to the decision to use Google Docs for professional use? (Note: "Google Docs" includes any or all of the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)

❍ I don't use Google Docs professionally.

❍ I decided to do so on my own.

❍ I and other colleagues/friends made the decision together.

❍ A supervisor/administrator required me to use it/It was implemented by the district, and I was required to start using it.

If I don't use Google Docs Is Selected, Then Skip To End of Survey

12. How were you trained in the use of Google Docs? Please choose the answer which best represents the main method of learning used to gain information about how to use Google Docs. (Note: "Google Docs" includes any or all of the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)

❍ Informally (self-taught; friend or colleague gave me tips; etc.)

❍ Formally (attended PD experience/class/training, etc., either in or out of district)

13. How would you characterize yourself as a Google Docs user?

❍ I was the first in my school/district to use Docs.

❍ I decided to start using Docs after someone showed it to me, but before most others.

❍ I decided to start using Docs at about the same time that a noticeable group of others started to use it.

❍ I decided to start using Docs after most others were using.

❍ I was forced to start using Docs because almost everyone else was using (group pressure) or because of official policy.

14. Please check off how frequently you use Google Docs in each of the following ways. (Note: "Google Docs" includes the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)

	Never	Rarely (1-2 times per year)	Sometimes (once a month)	Regularly (once a week)	Frequently (daily)
I have viewed a file or document created and shared by someone else via Google Docs ("Forced" interaction with Google Docs).	○	○	○	○	○
I have transferred files from one location to another via upload to/download from Google Docs for my own use (not shared with others).	○	○	○	○	○
I have used productivity tools in Google Docs - creating word processing documents, spreadsheets, slide show presentations - for personal use (not shared with others).	○	○	○	○	○
During school hours I have introduced students to Google Docs and/or allowed students to use it for school-related work and/or collected assignments via Google Docs.	○	○	○	○	○
During school hours I have shared files (notes, outlines, documents, spreadsheets, etc.) with others (students, colleagues, administrators, etc.).	○	○	○	○	○
During school hours I have utilized the collaborative features of Google Docs (synchronous editing, instant messaging, etc.) or encouraged others to utilize those features (student-to-teacher, student-to-student, teacher-to-teacher, etc.) to get or give feedback or to work on group materials.	○	○	○	○	○

	Never	Rarely (1-2 times per year)	Sometimes (once a month)	Regularly (once a week)	Frequently (daily)
I have used Google Form to gather information from students during school hours.	○	○	○	○	○
I have had students utilize a Google Form rubric to reflect on and self-assess work done at the end of a project.	○	○	○	○	○
I have required students to utilize collaborative features of Google Docs to work on projects outside of classroom hours.	○	○	○	○	○
I have utilized collaborative features of Google Docs with colleagues in other schools and/or districts to create resources, either during or after school hours.	○	○	○	○	○
I have used Google Form to create auto-grading quizzes, etc., to assess students and/or to auto-email responses to a form.	○	○	○	○	○

Appendix B - Annotated Survey

Use of Google Docs in Monmouth County Middle Schools

This survey is part of a study by Rutgers doctoral students of the diffusion of Google Docs in Monmouth County, New Jersey schools. Your responses to this survey will help us to learn about the factors involved in the successful diffusion of technologies within schools, and may provide guidance to school administrators' future plans regarding the implementation of new technologies.

With minor exceptions, this survey contains only quick-answer, multiple-choice responses. We estimate that you should be able to complete the survey in approximately 10 minutes. Your responses to this survey will be kept strictly confidential and will only be reported at the aggregate. The results will never be reported in any way that would permit any response to be associated with a specific individual.

After completing the survey, you will be assigned an identification number that will correspond to your responses so that your identity is not linked to your responses. Information gathered from the survey will be kept confidential and will be used only for the purpose of this project by the study authors. Because the information you provide in this study is strictly confidential, there will be essentially no risk from your participation. All study data will be kept for 7 years after the completion of the study and then will be destroyed.

The information you provide in this study will enhance our ability to understand the diffusion of technology through schools. Information learned will be shared with participating districts. This survey will be distributed to approximately 800 participants. All participants, regardless of gender, age, or ethnicity, are encouraged to respond. Your participation in this study is completely voluntary, and you may stop taking the survey at any point.

If you have any questions concerning this project, please feel free to contact the Principal Investigator, Dr. William Firestone, or the Rutgers University's Institutional Review Board using the following contact information:

Dr. William Firestone, Principal Investigator
Rutgers University Graduate School of Education
10 Seminary Place, New Brunswick, NJ
Tel: 732-932-7496 x 8231
Email: william.firestone@gse.rutgers.edu

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research & Sponsored Programs
3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 732-932-0150 ext. 2104
Email: humansubjects@orsp.rutgers.edu

Thank you for your time and patience in completing this survey. Please read each question and the possible responses carefully, and then fill in the requested information or mark the appropriate check boxes.

NOTE: Once the survey is begun, you cannot return to previous questions, so please be thoughtful with your responses.

Variables & Categories	#	Survey Question	Question Choices	Response Coding
Informed Consent		By selecting "Agree," you will be agreeing to the conditions of the survey. Once you have made your choice, click on the forward arrow located toward the lower-right of the screen.	Agree Disagree	Disagree = no survey
District ID	1	Please choose the name of your school district.	*Drop-down list of Monmouth County districts with middle school grade levels*	A=1, B=2, CD=3, DE=4, FG=5, GH=6, I=7, J=8
School ID	2	Please type the name of your school.	*(Text box to enter school names)*	
Variable (Independent): Personal Characteristics Category: Years of experience	3	How many years have you been teaching? Please count year one as your first full (Sept. – June) year of teaching.	*Drop-down menu listing numbers from 0 to 30, and "More than 30 years"*	Use the number as reported

Variable (Independent): Personal Characteristics Category: Subject area	4	What subject area do you teach? If more than one, please choose the area you feel is your main responsibility.	Language Arts Social Studies/History Science Mathematics Visual and Performing Arts Technology Special Education Health and Physical Education World Language Other (write-in box)	Use the subject as reported
Variable (Independent): Personal Characteristics Category: Grade Level	5	Which grade(s) do you teach? Please choose all that apply.	6 7 8	Use the grades as reported
Variable (Independent): Personal Characteristics Category: Type of personal technology use	6	Do you use any of the following technologies on a regular basis for PERSONAL USE (that, is not counting your use for professional or school-related reasons)? Please select all that apply. Answers may apply to use at home or in other non-school related venues	*(Respondents can select neither, either, or both check boxes)*	More "Yes" selections = greater personal technology use
	6a	Productivity software (e.g. Microsoft Office [Word, PowerPoint, Excel, etc.], Open Office, Google Docs, etc.)	Personal Use Professional Use	No =0 Yes = 1
	6b	Email	Personal Use Professional Use	No =0 Yes = 1

	6c	Text messaging via cellular/smart phone	Personal Use Professional Use	No =0 Yes = 1
	6d	Instant or text messaging online via computer	Personal Use Professional Use	No =0 Yes = 1
	6e	USB storage device (aka: memory stick, pen drive, thumb drive)	Personal Use Professional Use	No =0 Yes = 1
	6f	Cloud-based storage (e.g. Dropbox, Bitcasa, iCloud, Box, SkyDrive, Google Docs/Drive, etc.)	Personal Use Professional Use	No =0 Yes = 1
	6g	Social media (e.g., Facebook, Twitter, Google+, etc.)	Personal Use Professional Use	No =0 Yes = 1
	6h	Online video chat/conferencing (e.g. Skype, Facetime, G+ Hangouts, etc.)	Personal Use Professional Use	No =0 Yes = 1
	7	Please write the name of any software, other than Google Docs, that you use for PROFESSIONAL use that allows you to do any or all of the following: cloud-based storage, document creation, document sharing, social media, online video chat	*(Text box to responses)*	
	8	Please choose the answer which best matches your reaction to each statement. (Items adapted from Survey of Pre-service Teachers' Knowledge of Teaching and Technology [Schmidt,		More responses of "Agree" or "Strongly agree" = More TPACK

		et al., 2009].)		
Variable (Independent): Personal Characteristics Category: TPACK - Technological Knowledge (TK)	8a	I can learn technology easily.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
Variable (Independent): Personal Characteristics Category: TPACK - Technological Knowledge (TK)	8b	I frequently play around with technology.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
Variable (Independent): Personal Characteristics Category: TPACK - Technological-Content Knowledge (TCK)	8c	I know about technologies that I can use for understanding and doing my subject area.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree

Variable (Independent): Personal Characteristics Category: TPACK - Technological-Content Knowledge (TCK)	8d	I can choose technologies that enhance the content of a lesson.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
Variable (Independent): Personal Characteristics Category: TPACK - Technological-Pedagogical Knowledge (TPK)	8e	I know how to choose technologies that enhance students' learning for a lesson.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
Variable (Independent): Personal Characteristics Category: TPACK - Technological-Pedagogical Knowledge (TPK)	8f	I can adapt the uses of technologies I learn about or am familiar with to different teaching activities.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree

Variable (Independent): Personal Characteristics Category: TPACK - Technological, Pedagogical, and Content Knowledge (TPACK)	8g	I can teach lessons that appropriately combine my subject area, technologies, and teaching approaches.	Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree	1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree
Variable (Independent): Communication Channels Category: Formal v. Informal	9	How did you first hear about Google Docs (also known as Google Drive, Google Apps for Education, or Google Apps)?	I have not heard of Google Docs. Informally (self-taught; friend or colleague gave me tips; etc.) Formally (from supervisor/ administrator; during a professional development experience/class/ training, etc.)	<u>Dummy Coding:</u> Excluded: I have not heard of Google Docs. 0= Informally (self-taught; friend or colleague gave me tips; etc.) 1= Formally (from supervisor/ administrator; during a professional development experience/class/ training, etc.)
Variable (Independent): Environmental Barriers	10	To what degree is each of the following items a barrier to increasing your professional use of Google Docs?		Higher rating of category = greater perception as barrier to implementation

Variable (Independent): Environmental Barriers Category: Time	10a	Time	Not a barrier at all: 0 1 2 3 MAJOR barrier to implementation: 4	0 = Not a barrier at all 1 = 1 2 = 2 3 = 3 4 = MAJOR barrier to implementation
Variable (Independent): Environmental Barriers Category: Class Size	10b	Class Size	Not a barrier at all: 0 1 2 3 MAJOR barrier to implementation: 4	0 = Not a barrier at all 1 = 1 2 = 2 3 = 3 4 = MAJOR barrier to implementation
Variable (Independent): Environmental Barriers Category: Computer Access	10c	Computer Access	Not a barrier at all: 0 1 2 3 MAJOR barrier to implementation: 4	0 = Not a barrier at all 1 = 1 2 = 2 3 = 3 4 = MAJOR barrier to implementation
Variable (Independent): Decision type/method Categories: Optional, Collective, Authority	11	How did you come to the decision to use Google Docs for professional use? (Note: "Google Docs" includes any or all of the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)	I don't use Google Docs professionally. (non-use) I decided to do so on my own (optional) I and other colleagues/friends made the decision together. (collective) A supervisor or administrator required me to use it/It was implemented by the district, and I was required to start using it (authoritative)	Dummy Coding: **Regression #1** Excluded: non-use 0 0 = optional 0 1 = collective 1 0 = authoritative **Regression #2** Excluded: non-use 0 1 = optional 0 0 = collective 1 0 = authoritative

Variable (Independent): Method of Learning Categories: Informal, Formal	12	How were you trained in the use of Google Docs? Please choose the answer which best represents the main method of learning used to gain information about how to use Google Docs. (Note: "Google Docs" includes any or all of the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)	Informally (self-taught, friend or colleague gave me tips, etc.) Formally (attended PD experience, class, training, etc., either in or out of district)	Dummy Coding: 0= Informally (self-taught, friend or colleague gave me tips, etc.) 1= Formally (attended PD experience, class, training, etc., either in or out of district)
Variable (Independent): Level of Innovativeness Category: Adopter type	13	How would you characterize yourself as a Google Docs user?	I was the first in my school/district to use Docs. I decided to start using Docs after someone showed it to me, but before most others I decided to start using Docs at about the same time that a noticeable group of others started to use it. I decided to start using Docs after most others were using. I was forced to start using Docs because almost everyone else was using (group pressure) or because of official policy.	Dummy Coding: 0 0 0 0= I was the first in my school/district to use Docs. 1 0 0 0= I decided to start using Docs after someone showed it to me, but before most others 0 1 0 0= I decided to start using Docs at about the same time that a noticeable group of others started to use it. 0 0 1 0= I decided to start using Docs after most others were using. 0 0 0 1= I was forced to start using Docs because almost everyone else was using or because of official policy.

Variable (Dependent): Patterns of Use	14	Please check off how frequently you use Google Docs in each of the following ways. (Note: "Google Docs" includes the following applications: Document, Spreadsheet, Presentation, Form, Drawing, Collection)		Greater types and frequencies of use = closer to "Advanced Interactions" typology
Variable (Dependent): Patterns of Use Category: Personal Productivity	14a	I have viewed a file or document created and shared by someone else via Google Docs ("Forced" interaction with Google Docs).	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Personal Productivity	14b	I have transferred files from one location to another via upload to/download from Google Docs for my own use (not shared with others).	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)

Variable (Dependent): Patterns of Use Category: Personal Productivity	14c	I have used productivity tools in Google Docs - creating word processing documents, spreadsheets, slide show presentations - for personal use (not shared with others)	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Basic Interaction	14d	During school hours I have introduces students to Google Docs and/or allowed students to use it for school-related work and/or collected assignments via Google Docs.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Basic Interaction	14e	During school hours I have shared files (notes, outlines, documents, spreadsheets, etc.) with others (students, colleagues, administrators, etc.)	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)

Variable (Dependent): Patterns of Use Category: Basic Interaction	14f	During school hours I have utilized the collaborative features of Docs (synchronous editing, instant messaging, etc.) or encouraged others to utilize those features (student-to-teacher, student-to-student, teacher-to-teacher, etc.) to get or give feedback or to work on group materials.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Basic Interaction	14g	I have used Google Form to gather information from students during school hours.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Advanced Interaction	14h	I have had students utilize a Google Form rubric to reflect on and self-assess work done at the end of a project.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)

Variable (Dependent): Patterns of Use Category: Advanced Interaction	14i	I have required students to utilize collaborative features of Google Docs to work on projects outside of classroom hours.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Advanced Interaction	14j	I have utilized collaborative features of Google Docs with colleagues in other schools and/or districts to create resources, either during or after school hours.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)
Variable (Dependent): Patterns of Use Category: Advanced Interaction	14k	I have used Google Forms to create auto-grading quizzes, etc., to assess students and/or to auto-email responses to a form.	Never Rarely (1-2 times/year) Sometimes (once a month) Regularly (once a week) Frequently (daily)	0=Never 1=Rarely (1-2 times/year) 2=Sometimes (once a month) 3=Regularly (once a week) 4=Frequently (daily)

Appendix C – Rutgers IRB Approval Forms

Attachment 7

Sample of Survey Instrument

Diffusion of Google Docs in Monmouth County Middle Schools

This survey is part of a study by Rutgers doctoral students of the diffusion of Google Docs in Monmouth County, New Jersey schools. Your responses to this survey will help us to learn about the factors involved in the successful diffusion of technologies within schools, and may provide guidance to school administrators' future plans regarding the implementation of new technologies.

With minor exceptions, this survey contains only quick-answer, multiple-choice responses. We estimate that you should be able to complete the survey in approximately 10 minutes. Your responses to this survey will be kept strictly confidential and will only be reported at the aggregate. The results will never be reported in any way that would permit any response to be associated with a specific individual.

After completing the survey, you will be assigned an identification number that will correspond to your responses so that your identity is not linked to your responses. Information gathered from the survey will be kept confidential and will be used only for the purpose of this project by the study authors. Because the information you provide in this study is strictly confidential, there will be essentially no risk from your participation. All study data will be kept for 7 years after the completion of the study and then will be destroyed.

The information you provide in this study will enhance our ability to understand the diffusion of technology through schools. Information learned will be shared with participating districts. This survey will be distributed to approximately 800 participants. All participants, regardless of gender, age, or ethnicity, are encouraged to respond. Your participation in this study is completely voluntary, and you may stop taking the survey at any point.

If you have any questions concerning this project, please feel free to contact the Principal Investigator, Dr. William Firestone, or the Rutgers University's Institutional Review Board using the following contact information:

Dr. William Firestone, Principal Investigator
Rutgers University Graduate School of Education
10 Seminary Place, New Brunswick, NJ
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Email: william.firestone@gse.rutgers.edu

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research & Sponsored Programs
3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 732-932-0150 ext. 2104
Email: humansubjects@orsp.rutgers.edu

APPROVED

APR 2 4 2013

Approved by the
Rutgers IRB

Diffusion of Google Docs in Monmouth County Middle Schools

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Email: humansubjects@orsp.rutgers.edu

Thank you for your time and patience in completing this survey. Please read each question and the possible responses carefully, and then fill in the requested information or mark the appropriate check boxes.

APPROVED

APR 2 4 2013

Approved by the
Rutgers IRB

MEMORANDUM

TO: Principal Investigator

FROM: IRB Administrators: Michelle Gibel; Margie Cooper

SUBJECT: IRB Policy Regarding the Use of Stamped Consent Forms

The Institutional Review Board for the Protection of Human Subjects (IRB) implemented a policy in April 2000 whereby investigators are required to have subjects sign consent forms which indicate the approval and expiration dates on the form. This procedure is recommended by the Office for Human Research Protections, the federal agency that oversees human subject protections compliance, and is mandated by the Rutgers University IRB.

Attached is the Notice of Approval for your research protocol, (Protocol and Title are referenced on the notice) and a copy of the current IRB-approved version of the informed consent document that must be used. The original should be retained for your files.

You are required to use only the current, IRB-approved consent form when obtaining informed consent. However, the IRB allows you to choose one of two methods to provide a *"dated"* copy of the consent form to subjects:

1) You may either copy the original of the stamped consent form, and use the copies, OR
2) You may type the approval and expiration dates on the bottom of each page of an un-stamped version of the approved consent forms and use copies of those documents. If you choose to type the dates on an un-stamped copy, the following statement should be used: *"This informed consent form was approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects on (Date); approval of this form expires on (Expiration Date) ."*

If you have any questions regarding this policy, you may contact an IRB Administrator: 848-932-0150 (main line) or contact either: Michelle Gibel at 848-932-4058 or gibel@grants.rutgers.edu; Margie Cooper at 848-932-4018 or margaret.cooper@rutgers.edu .

Thank you for your continuing cooperation.

X:\HS\IRB\Consent Form Use Documents\Consent Form Use Document FY2012_ April 2013.doc

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

April 25, 2013   **P.I. Name:** Firestone
                                                           Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

Notice of Exemption from IRB Review

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Exemption Date: 4/24/2013   **Exempt Category:**   1

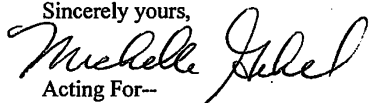This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **None**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

May 7, 2013   **P.I. Name:** Firestone
                                                                    Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

<u>**Notice of Exemption from IRB Review**</u>

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 5/07/2013   **Exempt Category:**   1

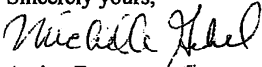This exemption is based on the following assumptions:

- **This Approval** – The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 5/07/2013 for Addition of Sites: Oceanport, West Long Branch**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

[signature]

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

May 9, 2013   P.I. Name: Firestone
                                                                           Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

                          <u>Notice of Exemption from IRB Review</u>

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 5/09/2013   **Exempt Category:**   1

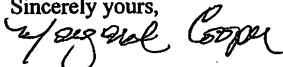This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 05/09/2013 for Addition of**
                              Stephanie Wisnicki as Study Coordinator

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

                                                                cc: Stephanie Kraft Wisnicki

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

May 24, 2013   P.I. Name: Firestone
                                                                    Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

Notice of Exemption from IRB Review

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 5/24/2013   Exempt Category: 1

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 5/24/2013 for Addition of Site: Middletown Township Public Schools**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

                                                    cc: Stephanie Kraft Wisnicki

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

June 7, 2013   P.I. Name: Firestone
                                                         Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

<u>**Notice of Exemption from IRB Review**</u>

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 6/4/2013   **Exempt Category:**   1
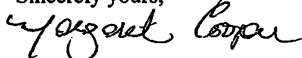
This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 6/4/2013 for Addition of Research Site: Avon School District;**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

                                        cc: Stephanie Kraft Wisnicki

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

June 10, 2013   **P.I. Name:** Firestone
                                                     Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

<u>**Notice of Exemption from IRB Review**</u>

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 6/6/2013   **Exempt Category:**   1

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 6/6/2013 for Addition of Research Site: Millstone Township School District;**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

cc: Stephanie Kraft Wisnicki

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

June 19, 2013   P.I. Name: Firestone
                                                          Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

Notice of Exemption from IRB Review

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 6/19/2013   **Exempt Category:**   1

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 6/19/2013 for Addition of Research Site: Asbury Park School District;**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

                                                          cc: Stephanie Kraft Wisnicki

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

June 19, 2013   P.I. Name: Firestone
                                                          Protocol #: E13-714

William A. Firestone
Graduate School of Education
10 Seminary Place
College Avenue Campus

Dear William Firestone:

<u>Notice of Exemption from IRB Review</u>

Protocol Title: "Diffusion of Google Docs in Middle Schools"

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Amendment to Exemption Date: 6/17/2013   **Exempt Category:**   1

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form (s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: **Administrative Amendment to Exemption Granted on 6/17/2013 for Addition of Research Site: Union Beach School District;**

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Acting For--
Dr. Beverly Tepper, Ph.D.
Professor
Chair, Rutgers University Institutional Review Board

                                                  cc: Stephanie Kraft Wisnicki

Appendix D – Signed Permission to Conduct Research

Permission to Conduct Research

Email to <u>swisnickj@gmail.com</u> OR fax to: 212-504-7905

I (name)___*CHRISTOPHER ALBRIZIO*___ Superintendent of Schools for the (school district)___*Avon*___ School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

___*Christopher Albrizio*___   *3 VUNE 13*

Signature of Superintendent   Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts, and identify the important environmental and personal factors that have influenced that diffusion. The study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there are significant correlations between the patterns of use and any personal or environmental factors.

Figure 1. Conceptual framework for study variables
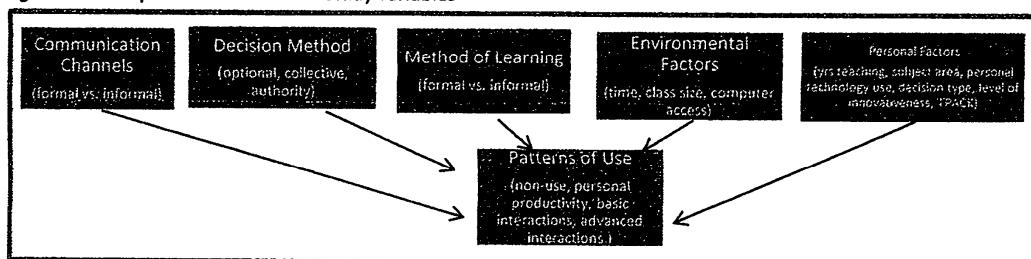

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County, New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)_____Joseph G. Majka, J.D._____ Superintendent of Schools for the (school

district)__Bradley Beach_____ School District grant permission for Stephanie Kraft

Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to

distribute an on-line and/or paper survey to all Middle School and High School teachers in my district

questioning how they use Google Docs for instruction. I understand that the responses of teachers will

be kept confidential. I will receive a report from the researchers that will share findings from the study

but that will only provide aggregate data. At no time will I receive information on individual teachers'

responses from Wisnicki and Tetreault.

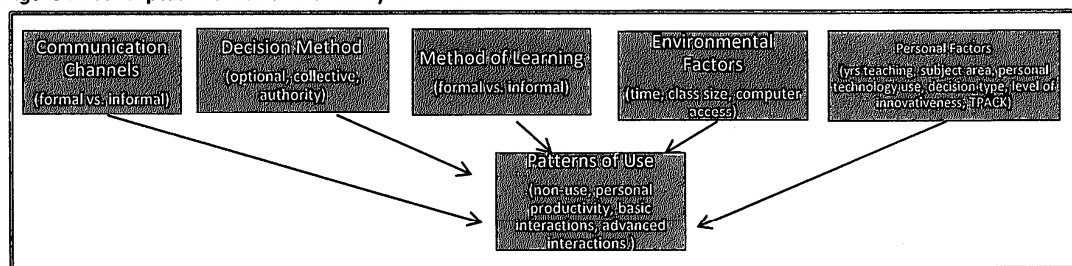_____   _____
Signature of Superintendent   Today's Date

Research Proposal Overview

The purpose of this study is to uncover the patterns of use of one specific technology (Google

Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts

and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
   County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name) <u>Fredrik Oberkehr, Ed.D.</u> Superintendent of Schools for the (school district) <u>Colts Neck Township</u> School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

Signature of Superintendent	Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts, and identify the important environmental and personal factors that have influenced that diffusion. The study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there are significant correlations between the patterns of use and any personal or environmental factors.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County, New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google Docs in middle schools in Monmouth County?
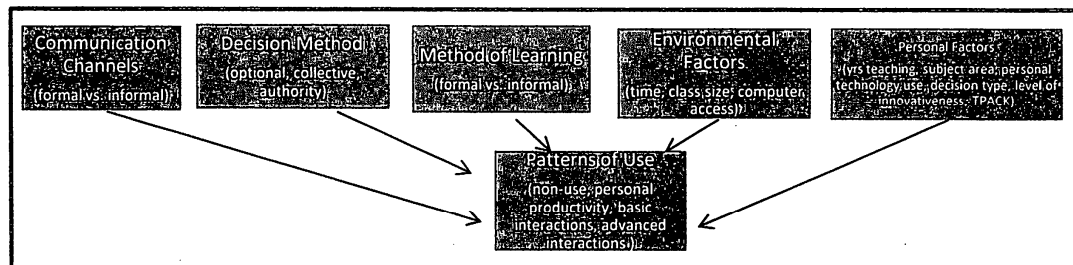
Permission to Conduct Research

I (name)_____*Cheri Crowl*_____ Superintendent of Schools for the (school district)___*Farmingdale*_____ School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

_____   ___*2/20/13*_____
Signature of Superintendent   Today's Date

Research Proposal Overview

The purpose of this study is to uncover the patterns of use of one specific technology (Google Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth County, New Jersey?
2) How does the innovation (Google.Docs) diffuse through schools/districts in Monmouth County, New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google Docs in middle schools in Monmouth County?
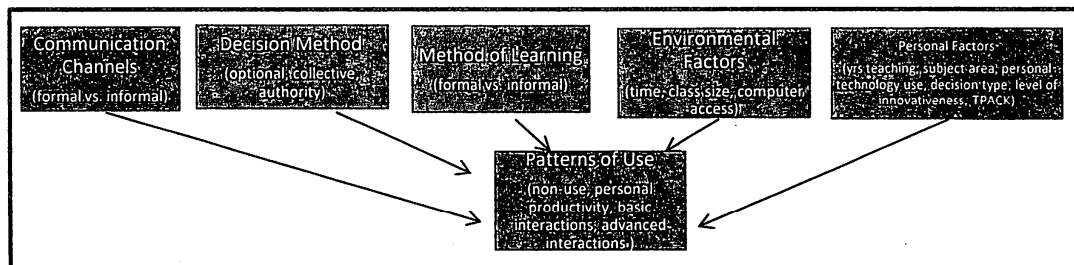
Permission to Conduct Research

I (name)___Elizabeth O'Connell___ Superintendent of Schools for the (school
district) Freehold Borough___ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data. At no time will I receive information on individual teachers'
responses from Wisnicki and Tetreault.

Signature of Superintendent Elizabeth O'Connell Today's Date Feb. 22, 2013

Research Proposal Overview

        The purpose of this study is to uncover the patterns of use of one specific technology (Google
Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts
and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
   County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
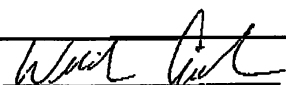   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)___ BeRNARd F. BrayeN, JR ___ Superintendent of Schools for the (school
district)___ HAzLET TWP. ___ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data. At no time will I receive information on individual teachers'
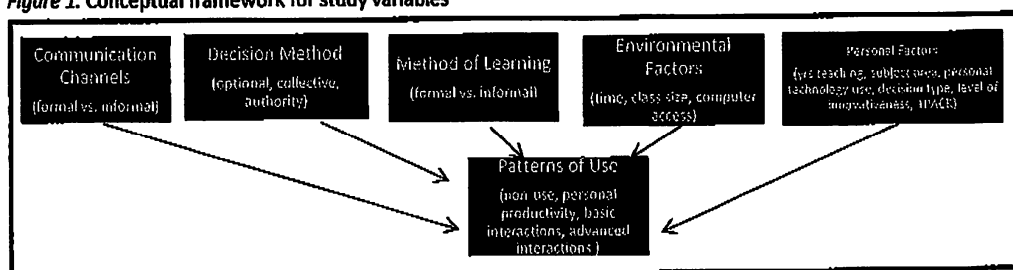responses from Wisnicki and Tetreault.

_____   2/22/2013
Signature of Superintendent   Today's Date

Research Proposal Overview

    The purpose of this study is to uncover the patterns of use of one specific technology (Google
Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts
and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
   County, New Jersey?
2) How does the innovation (Google.Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I, William Ciullo, principal of Highlands Elementary School, grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University, to distribute an on-line and/or paper survey to all elementary and special education teachers in my school, questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

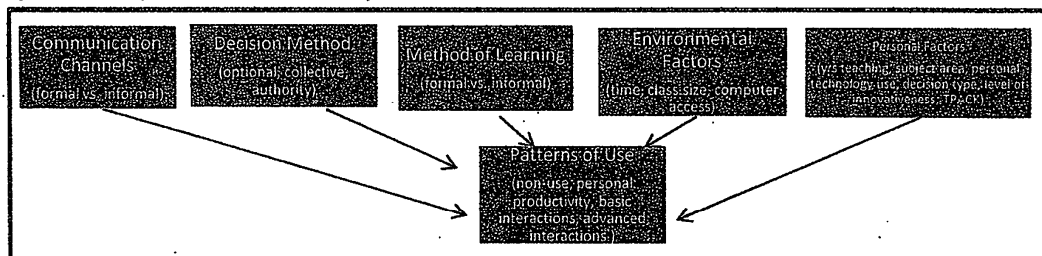Signature of Principal _____   Today's Date _April 16, 2013_

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts, and identify the important environmental and personal factors that have influenced that diffusion. The study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there are significant correlations between the patterns of use and any personal or environmental factors.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County, New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)___Barbara Duncan_____ Superintendent of Schools for the (school
district)___Holmdel_____ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data. At no time will I receive information on individual teachers'
responses from Wisnicki and Tetreault.

Barbara Duncan   2/23/13
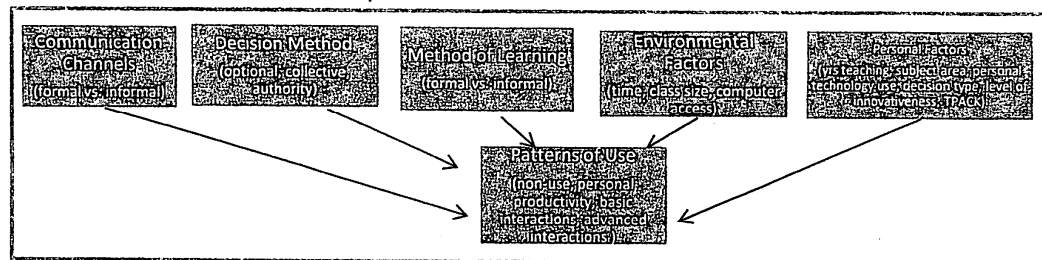_____   _____
Signature of Superintendent   Today's Date

Research Proposal Overview

The purpose of this study is to uncover the patterns of use of one specific technology (Google
Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts
and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
   County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)___*Enid Golden*_____ Superintendent of Schools for the (school
district)___*Howell Township*____ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data. At no time will I receive information on individual teachers'
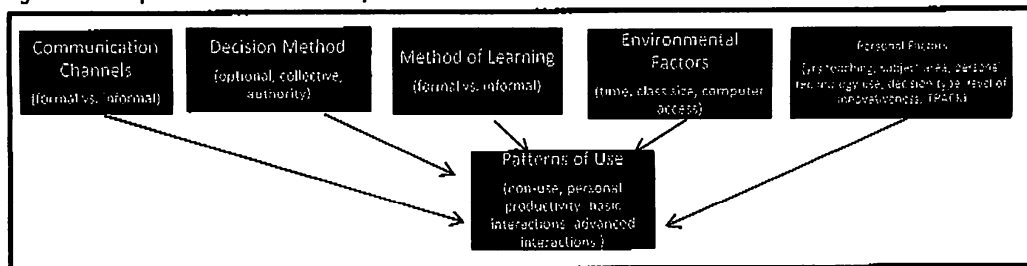responses from Wisnicki and Tetreault.

_____*Enid Golden*_____   _____2/28/13_____

Signature of Superintendent   Today's Date

Research Proposal Overview

     The purpose of this study is to uncover the patterns of use of one specific technology (Google
Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts
and identify the important environmental and personal factors that have influenced that diffusion.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
   County, New Jersey?
2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)_____*GEKALD   NokTH*_____ Superintendent of Schools for the (school
district)_____*LEAISBURG*_____ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data.   At no time will I receive information on individual teachers'
responses from Wisnicki and Tetreault.

_____   *3/26/13*_____
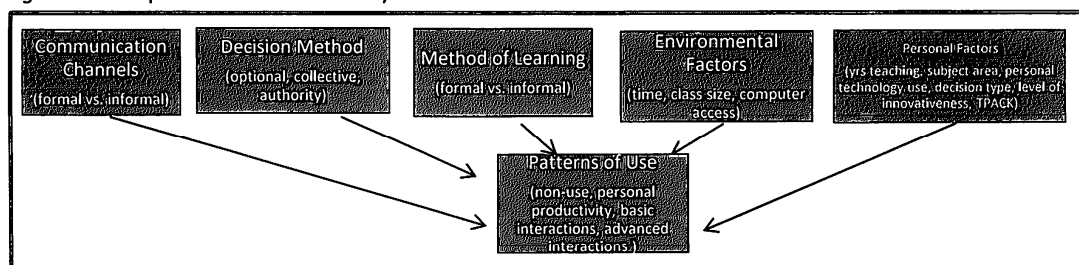Signature of Superintendent   Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts,
and identify the important environmental and personal factors that have influenced that diffusion. The
study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there
are significant correlations between the patterns of use and any personal or environmental factors.

Figure 1. Conceptual framework for study variables

This study will examine the specific research questions listed below:

1) What are the patterns of use of Google Docs of the teachers in middle schools in Monmouth
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2) How does the innovation (Google Docs) diffuse through schools/districts in Monmouth County,
   New Jersey?
3) What are the environmental factors that influence the diffusion of Google Docs in middle
   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name)____Carolyn M. Kossack_____Superintendent of Schools for the (school district)___Little Silver
School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of
Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle
School and High School teachers in my district questioning how they use Google Docs for instruction. I
understand that the responses of teachers will be kept confidential. I will receive a report from the
researchers that will share findings from the study but that will only provide aggregate data. At no time
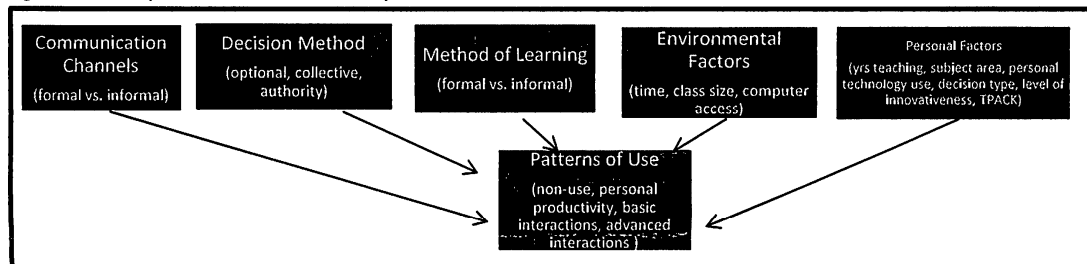will I receive information on individual teachers' responses from Wisnicki and Tetreault.

Signature of Superintendent   *Carolyn M. Kossack*   Today's Date 4/3/13

Research Proposal Overview

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   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name) _JOHN J. MARCIANTE JR Ph.D_ Superintendent of Schools for the (school district) _MANALAPAN-ENGLISHTOWN REG_.School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.
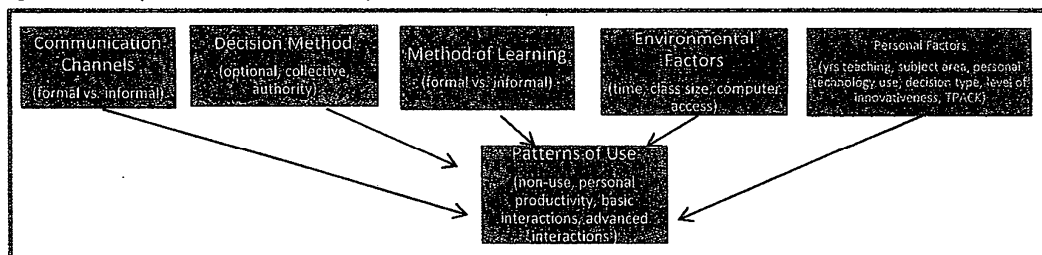
(signature)   _3/4/13_
_____   _____
Signature of Superintendent   Today's Date

Research Proposal Overview

The purpose of this study is to uncover the patterns of use of one specific technology (Google Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts and identify the important environmental and personal factors that have influenced that diffusion.
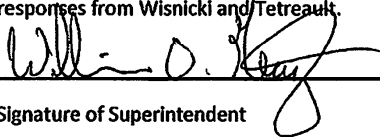
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Permission to Conduct Research

I (name) **DR. DAVID ABBOTT** Superintendent of Schools for the (school district) **MARLBORO** School
District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr.
William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School
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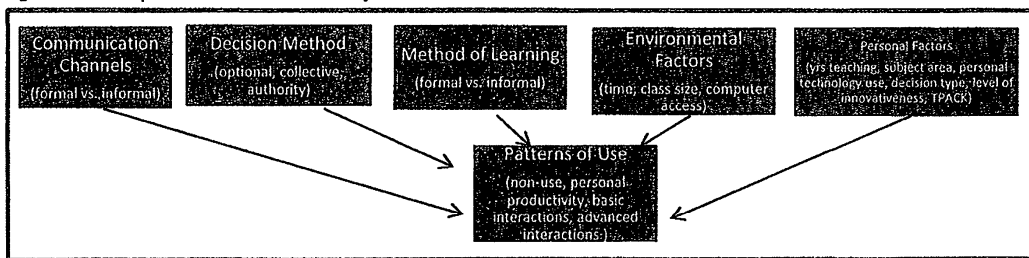will I receive information on individual teachers' responses from Wisnicki and Tetreault.

_____

Signature of Superintendent   Today's Date 2/22/13

Research Proposal Overview

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   schools in Monmouth County?
4) What are the personal characteristics of teachers that are associated with the use of Google
   Docs in middle schools in Monmouth County?

Permission to Conduct Research

Email form to :swisnicki@gmail.com or fax to 212-504-7905

I (name) _William O. George III, Ed. D._ Superintendent of Schools for the (school district) _Middletown Twp. Public Schs_ School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

_5/23/2013_

Signature of Superintendent   Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts, and identify the important environmental and personal factors that have influenced that diffusion. The study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there are significant correlations between the patterns of use and any personal or environmental factors.

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Permission to Conduct Research

I Scott Feder, Superintendent of Schools for the Millstone Township School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in my district questioning how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

6/5/13

Signature of Superintendent   Today's Date

Research Proposal Overview

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Figure 1. Conceptual framework for study variables

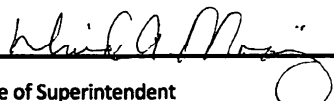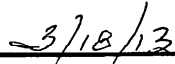This study will examine the specific research questions listed below:

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3) What are the environmental factors that influence the diffusion of Google Docs in middle schools in Monmouth County?

4) What are the personal characteristics of teachers that are associated with the use of Google Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name) David A. Mooij, Superintendent of Schools for the Neptune Township School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle School and High School teachers in the district ascertaining how they use Google Docs for instruction. I understand that the responses of teachers will be kept confidential. I will receive a report from the researchers that will share findings from the study but that will only provide aggregate data. At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

_____   _____3/18/13_____

Signature of Superintendent   Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts, and identify the important environmental and personal factors that have influenced that diffusion. The study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there are significant correlations between the patterns of use and any personal or environmental factors.
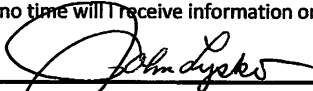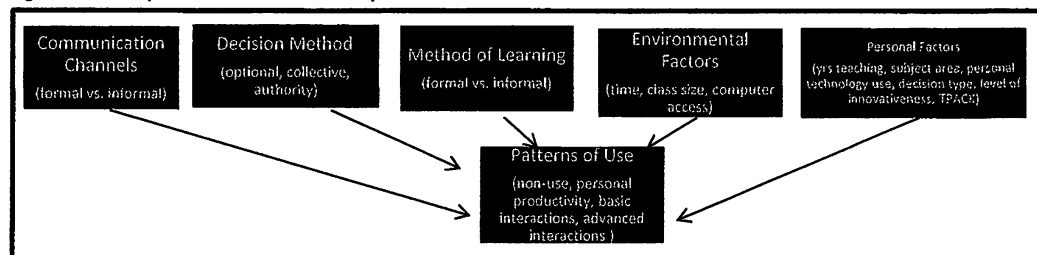
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Permission to Conduct Research

I (name) __John Lysko_____, Superintendent of Schools for the (school district)
__Ocean Twp. School District__Stephanie Kraft Wisnicki and Steve Tetreault, under the
direction of Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all
Middle School and High School teachers in my district questioning how they use Google Docs for
instruction. I understand that the responses of teachers will be kept confidential. I will receive a report
from the researchers that will share findings from the study but that will only provide aggregate data.
At no time will I receive information on individual teachers' responses from Wisnicki and Tetreault.

_____   __April 17, 2013_____
Signature of Superintendent   Today's Date

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts,
and identify the important environmental and personal factors that have influenced that diffusion. The
study will also attempt to uncover the patterns of use of Google Docs and attempt to determine if there
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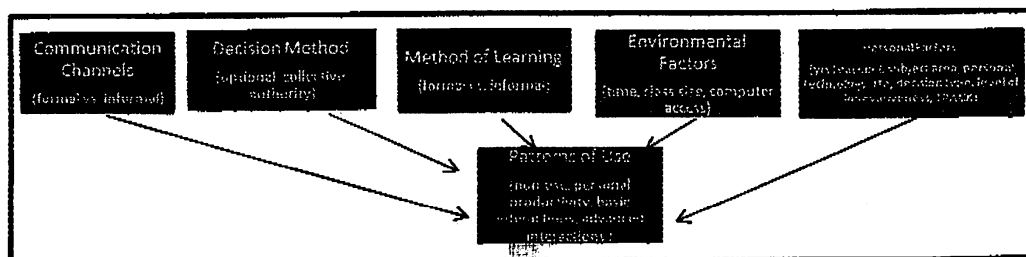
Permission to Conduct Research

I (name)___Andrew J. Orefice_____ Superintendent of Schools for the (school

district)__Oceanport_____ School District grant permission for Stephanie Kraft

Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to

distribute an on-line and/or paper survey to all Middle School and High School teachers in my district

questioning how they use Google Docs for instruction. I understand that the responses of teachers will
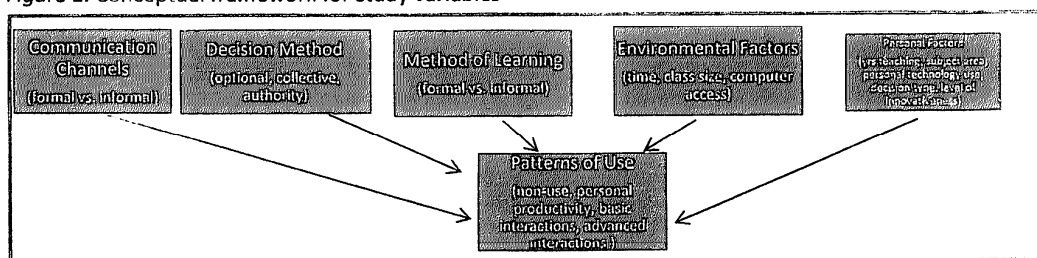
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_____   ___4/25/13_____

Signature of Superintendent   Today's Date

Research Proposal Overview

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Permission to Conduct Research

: (name)_____ Brent A. MacConnell _____ Superintendent of Schools for the

(school district) _____ SHrrws B-rg _____ School District grant permission for

Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone,

Rutgers University to distribute an on-line and/or paper survey to all Middle School and High

School teachers in my district questioning how they use Google Docs for instruction.

_____   30 APr. 13

Signature of Superintendent   Today's Date

Research Proposal Overview

The purpose of this study is to uncover the patterns of use of one specific technology (Google Docs). This study will examine how Google Docs, an innovation, has diffused through schools/districts and identify the important environmental and personal factors that have influenced that diffusion.

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Permission to Conduct Research

I (name) _John E. Boemann_ Superintendent of Schools for the (school
district)_Spring Lake_ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
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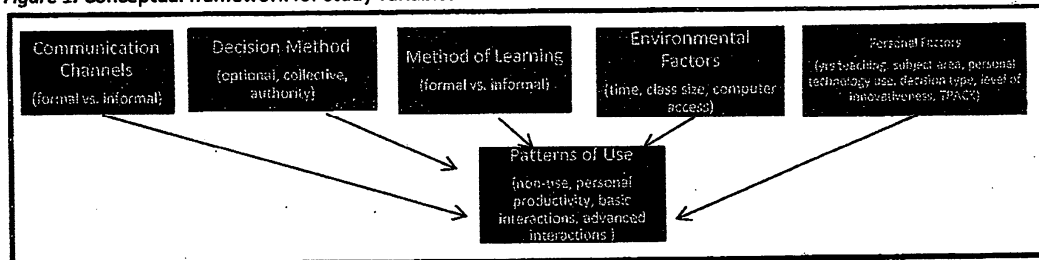responses from Wisnicki and Tetreault.

[signature]   _3/25/13_

Signature of Superintendent   Today's Date

Research Proposal Overview

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Permission to Conduct Research

I (name)_____*John Russo*_____ Superintendent of Schools for the
(school district)__*Tinton Falls*_____ School District grant permission for
Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone,
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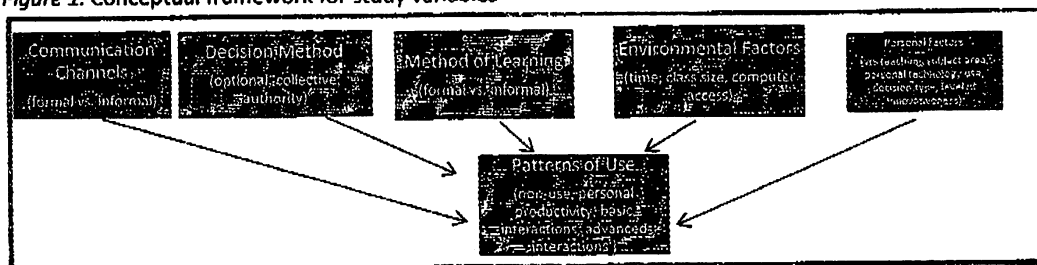
_____

Signature of Superintendent   Today's Date

Research Proposal Overview

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Permission to Conduct Research

Email to swisnicki@gmail.com OR fax to: 212-504-7905

I (name)_____Joseph J. Annibale_____ Superintendent of Schools for the (school

district)_____. Union Beach_____ School District grant permission for Stephanie Kraft

Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to

distribute an on-line and/or paper survey to all Middle School and High School teachers in my district

questioning how they use Google Docs for instruction. I understand that the responses of teachers will

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_____   June 13, 2013_____

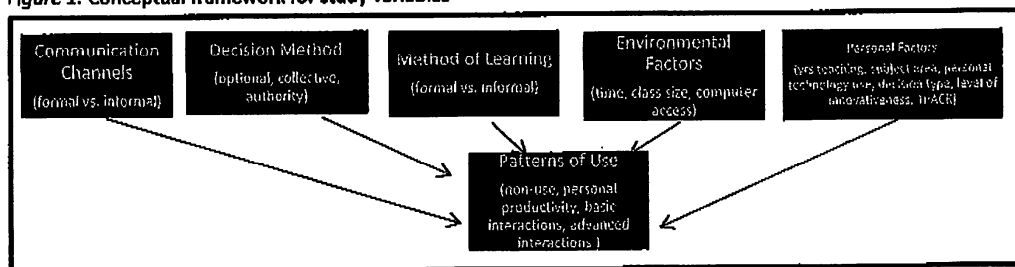Signature of Superintendent   Today's Date

Research Proposal Overview

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Docs in middle schools in Monmouth County?

Permission to Conduct Research

Email to swisnicki@gmail.com OR fax to: 212-504-7905

I (name)_____Richard Fitzpatrick___Superintendent of Schools for the (school
district)_Upper Freehold Regional_ School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
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_____   June 12, 2013

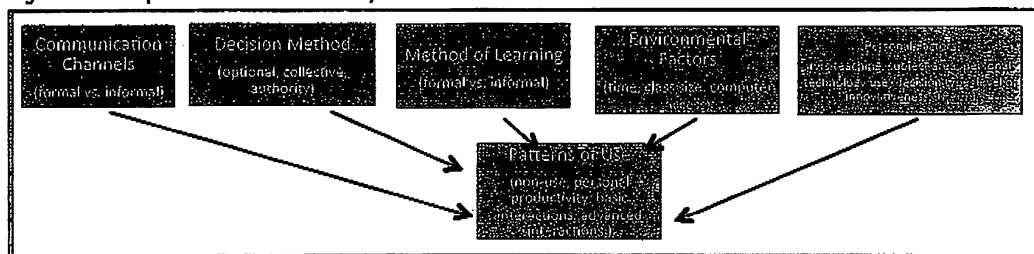Signature of Superintendent   Today's Date

Research Proposal Overview

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Permission to Conduct Research

Thomas Farrell

I (name) ~~Renee LaProto, Interim~~ Superintendent of Schools for the (school district) West Long Branch
School District grant permission for Stephanie Kraft Wisnicki and Steve Tetreault, under the direction of
Dr. William Firestone, Rutgers University to distribute an on-line and/or paper survey to all Middle
School and High School teachers in my district questioning how they use Google Docs for instruction. I
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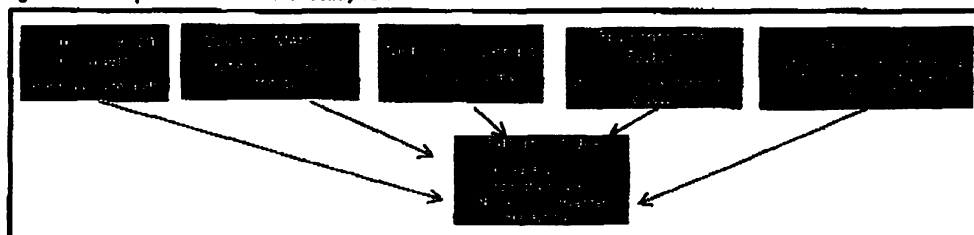
Signature of Superintendent *Farrell*   Today's Date 4/22/13

Research Proposal Overview

This study will examine how an innovation (Google Docs) has diffused through schools/districts,
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schools in Monmouth County?
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Docs in middle schools in Monmouth County?

Permission to Conduct Research

I (name) _Alexis C. Harris_____ Superintendent of Schools for the (school
district)_Hope Academy Charter School_School District grant permission for Stephanie Kraft
Wisnicki and Steve Tetreault, under the direction of Dr. William Firestone, Rutgers University to
distribute an on-line and/or paper survey to all Middle School and High School teachers in my district
questioning how they use Google Docs for instruction. I understand that the responses of teachers will
be kept confidential. I will receive a report from the researchers that will share findings from the study
but that will only provide aggregate data. At no time will I receive information on individual teachers'
responses from Wisnicki and Tetreault.

_Alexis C. Harris_____   _2/22/18_____
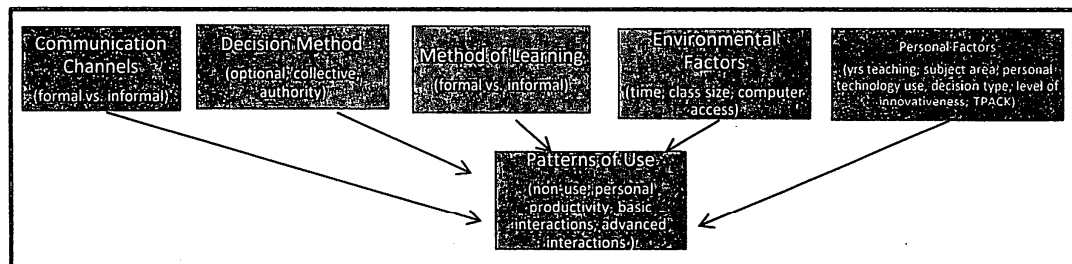Signature of Superintendent   Today's Date

Research Proposal Overview

   The purpose of this study is to uncover the patterns of use of one specific technology (Google
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   Docs in middle schools in Monmouth County?

Appendix E – Principal Letter Example

Steve Tetreault
Principal, William R. Satz School
24 Crawfords Corner Road
Holmdel, NJ 07733

March 23, 2013

Dear Principal Tetreault,

Win $100 for your school!

Please see the attached approval from Ms. Barbara Duncan, Superintendent of Schools (ACTUALLY ATTACH THE DISTRICT PERMISSION FORM), for your teachers to participate in our online survey about the use of Google Docs in Monmouth County Middle Schools. We are doctoral students at Rutgers University studying the environmental and personal factors associated with the use of Google Docs. Our hope is to identify diffusion patterns to help administrators successfully diffuse new technologies through their schools.

We will be reaching out to you via email next week with a link to the survey. At that time it would be greatly appreciated if you could forward the link to your teachers and ask them to complete the survey. The survey is VERY short and will take 5-10 minutes to complete. We are going to **donate $100 to the first 30% of schools with a 75% or higher response rate.**

We know you are very busy and so we really appreciate your kind assistance! Please enjoy a Dunkin Donuts treat on us.

Sincerely,

Stephanie Wisnicki & Steve Tetreault

Appendix F – Example of Email to Principal

Dear Principal Tetreault,

It's Stephanie & Steve again (doctoral students at Rutgers – Google Docs study) and it's time to **WIN $100 for your school** now! Please forward the attached link to <u>**ALL**</u> your 6th, 7th or 8th grade teachers (including special education and special subjects) and encourage them to complete the survey today.

insert link to survey

If you have any questions or problems, please email us or call us at:
Stephanie Wisnicki   swisnicki@gmail.com   732-567-2617
Steve Tetreault   STetreault600@gmail.com   908-692-8550
Have a great day!

Sincerely,
      Stephanie Wisnicki & Steve Tetreault