Wright State University
CORE Scholar

Browse all Theses and Dissertations | Theses and Dissertations

2012

A Study Of Public School Employees' Adoption Behavior Regarding Technological Innovations

Kimberly S. Snyder
Wright State University

Follow this and additional works at: https://corescholar.libraries.wright.edu/etd_all

 Part of the Educational Leadership Commons

Repository Citation
Snyder, Kimberly S., "A Study Of Public School Employees' Adoption Behavior Regarding Technological Innovations" (2012). *Browse all Theses and Dissertations*. 561.
https://corescholar.libraries.wright.edu/etd_all/561

This Thesis is brought to you for free and open access by the Theses and Dissertations at CORE Scholar. It has been accepted for inclusion in Browse all Theses and Dissertations by an authorized administrator of CORE Scholar. For more information, please contact corescholar@www.libraries.wright.edu, library-corescholar@wright.edu.

A STUDY OF PUBLIC SCHOOL EMPLOYEES' ADOPTION BEHAVIOR REGARDING TECHNOLOGICAL INNOVATIONS.

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts

By

KIMBERLY SUE SNYDER
B.S., Wright State University, 1985

2012
Wright State University

WRIGHT STATE UNIVERSITY

GRADUATE SCHOOL

May 20, 2012

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Kimberly Sue Snyder ENTITLED

A study of public school employees' adoption behavior regarding technological innovations BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Arts.

_____

Jill Lindsey, Ph.D.
Thesis Director
Chair, Leadership Studies
in Education and Organizations
College of Education and Human Services

Committee on Final Examination

_____

Suzanne Franco, Ed.D, Chair

_____

Marguerite Veres, MAS

_____

Susan Berg, Ph.D.

_____

Andrew T. Hsu, Ph.D.
Dean, Graduate School

ABSTRACT

Snyder, Kimberly. M.A. Department of Leadership Studies in Education and Organizations, College of Education and Human Services, Wright State University, 2012. A study of public school employees' adoption behavior regarding technological innovations.

Within with the five technological innovation adopter categories, there are potential technology users who resist adoption (Joseph, 2010). Using Survey Monkey™, during the 2011-12 school year non-certified public school employees in urban, suburban, and rural Midwestern areas were surveyed about their adoption patterns and their use of technology in the workplace. This non-experimental, descriptive study determined the distribution of 44 non-certified public school employees among adopter categories regarding technological innovation designed to improve workplace efficiency. This study also examined responses to determine differences among characteristics of those in each of the adoption categories. Respondents self-identified as members of only three of the five categories of adoption. Descriptive statistics of the responses indicated that there are no differences in the characteristics among the categories of adoption behavior self-reported by the respondents.

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

Table Page

I: INTRODUCTION TO THE STUDY

Introduction

Introducing technological innovation into the workplace can prove to be both exciting and stressful to employees and executives. Technological innovation can provide higher productivity and profit margins but can become a financial burden to an organization at the same time. With thousands of technological innovations being introduced each year, executives must examine advantages, disadvantages, costs to purchase and maintain innovations and then decide which innovations to adopt.

Innovations can be met with varying degrees of acceptance by employees. Technology-minded employees may be eager to learn about and accept an innovation, while less tech-savvy employees may be anxious regarding a change. Individuals in the workplace can be categorized in terms of their willingness to adapt to and accept new technology. Rogers (1995) defined five adopter categories regarding the length of time to adopt new technology: innovators, early adopters, early majority, late majority, and laggards. In any group of potential technology users, those who resist technological innovation will always exist. Understanding the reasons for resistance will empower organizations to mitigate the resistance (Joseph, 2010).

In recent times businesses have embraced technological innovation, usually being the first to adopt due to the impact on profit margins and industry competition. One such innovation involves the use of 3D printing technologies that speed new products from

prototype design to manufacturing. Competition is a driving force among companies; technological innovation can provide the edge companies need to survive.

Similar to the business workplace, educational settings also embrace technological innovation; innovation adoption by school districts occurs at a slower pace due to financial limitations. Educators are frequently the subject of research studies regarding innovation adoption (Gillard, 2004; Gillard, Bailey, & Nolan, 2008); individuals in education are uncomfortable with change and gravitate towards non-adoptive tendencies (Gillard, 2004). This study collected data from non-certified employees in an educational setting to identify technological innovation adoption behavior and to better understand their motives for adoption. Study results provide administrators information to mitigate resistance to technological innovation.

Statement of the Problem

Within the five technological innovation adopter categories, there are technology users who resist adoption (Joseph, 2010). There are two forms of resistance to innovation: active and passive. Active resistance includes those individuals who reject or postpone the innovation adoption. Passive resistance can occur if an individual is unaware of the innovation or shows disinterest to a known innovation. This study examined the characteristics of non-certified school employees, their reasons for adopting, and types of resistance to technological innovations. Preferred training options of non-certified employees with regard to technological innovation were also studied.

Assumptions

The following assumptions were developed for this study: (1) participants have made a decision to adopt a technological innovation during current or past employment; (2) participants are not licensed or certified teachers; (3) participants possess the ability to use an online survey tool; and (4) participants will be honest in their survey responses.

General Research Hypotheses

This study determined how non-certified public school employees in urban, suburban, and rural Midwestern areas were distributed among adopter categories regarding the adoption of technological innovation designed to improve workplace efficiency. This study also examined the characteristics of respondents to identify differences among the categories of adoption.

Research Question: For non-certified employees of public school districts in urban, suburban, and rural Midwestern areas, what are the characteristics associated with the five categories of adopters?

Hypothesis: There are differences in characteristics among members of the five categories of adoption behavior.

Null Hypothesis: There are no differences in characteristics among members of the five categories of adoption behavior.

Significance of the Study

This study provides school administrators and Information Technology (IT) educators additional insight into non-certified employee characteristics that are associated

with categories of technological innovation adoption. Better understanding of employees' reasons for adopting technological innovation will aid in developing plans to mitigate resistance to adopting technological innovation.

Scope

The scope of this study is limited to non-certified employees of public school districts in urban, suburban, and rural Midwestern areas during the 2011-2012 school year. The population does not include licensed or certified teachers. Adopter categories are self-reported. Participants vary in their exposure to technological innovation. The size and setting of the school district determine the number of innovations and the amount of pressure placed on employees to adopt technological innovations. The results of this survey cannot be generalized among school districts nationwide because each state endorses different technological innovations and uniquely provides technological support to school districts.

Definition and Operational Terms

Active Resistance: occurs when individuals make a purposeful decision not to adopt an innovation (Joseph, 2010).

Dormant Non-Adopters: individuals who refuse to adopt an innovation just as their organization refuses adopt an innovation (Zhou, 2008).

Early Adopters: individuals who are second to adopt an innovation and serve as role models regarding technological innovations (Rogers, 1995).

Early Majority: individuals who fall in the middle of the adopter categories and make deliberate, calculated decisions regarding innovations (Rogers, 1995).

Functional Barriers: include financial limitations such as cost which affect the decision to adopt or not adopt an innovation (Joseph, 2010).

Herding Behavior: occurs when individuals make decisions based on others' opinions rather than based on one's own ideas and opinions (Banerjee, 1992).

Informational Barriers: include lack of knowledge about an innovation and its benefits which affect the decision to adopt or not adopt an innovation (Joseph, 2010).

IT (Information Technology) Educators: those who teach theory classes and those who teach hands-on application classes regarding information technology (Gillard, 2004).

Innovators: individuals who are first to adopt an innovation and are intrigued by technology. They are able to learn innovations on their own (Rogers, 1995).

Laggards: individuals who are last to adopt an innovation and have no interest in using an innovation. They must be convinced and sometimes forced to adopt an innovation (Rogers, 1995).

Late Majority: individuals who are next to last to adopt an innovation and are skeptical and must be convinced to adopt (Rogers, 1995).

Non-Adopters: individuals who refuse to adopt an innovation (Gillard, 2004; Gillard, Bailey, & Nolan, 2008).

Passive Resistance: occurs when individuals either are aware of an innovation but show no interest in it, or when individuals have no knowledge of the innovation (Joseph, 2010).

Resistant Non-Adopters: individuals who resist an innovation even though their organization has adopted the innovation (Zhou, 2008).

Technological Innovation: tools that provide some degree of benefit for potential adopters, and usually have two components: computer hardware and computer software (Rogers, 1995).

Summary

Chapter II contains the review of literature related to technological innovation adoption and resistance behavior. Chapter III contains the methods used to design the research survey and conduct the research. Chapter IV contains the results of the survey including figures and tables. Chapter V contains the summary of the research, conclusions drawn from survey results, and recommendations for additional research.

II: REVIEW OF THE LITERATURE

When organizations adopt a technological innovation, employees' attitudes towards the innovation begin to develop before the innovation is implemented. Employees first become aware of the innovation, and then attitudes are formed regarding adoption. Those who choose to adopt will implement the innovation and then validate their decision by utilizing the innovation (Hsu & Sharma, 2010).

Successful innovation adoption within an organization begins with learning about the innovation. Organizational members learn about the potential benefits of the innovation and the potential barriers. Learning about an innovation can be facilitated through a discourse of community learning with business partners, media, and universities. Organizational learning occurs as employees participate in learning about and learning-by-doing (Wang & Ramiller, 2009). During the organizational learning process employees learn about the innovation and training takes place, after which learning-by-doing begins.

Information Technology (IT) educators are similar to the general population in that some adopt innovation early while others postpone adoption and wait for feedback from the early adopters. It is commonly felt that IT educators cannot be laggards (those who are last to adopt an innovation) but must be leaders in adopting innovations. Because organizational leaders must approve software and hardware purchases before

individuals are permitted to use them, IT educators cannot adopt an innovation until their organization adopts the innovation first (Gillard, 2004; Gillard, Bailey, & Nolan, 2008).

Adopters

Technological innovation adoption research labeled adopters into five categories: innovators, early adopters, early majority, late majority, and laggards (Rogers, 1995). Innovators, early and early majority adopters will readily adopt an innovation while late majority and laggards will exhibit resistance behavior. Early adopters value ease of use, while late adopters value usefulness and convenience of usage (Kim, Mirusmonov, & Lee, 2009).

Zhou (2008) classified technological adopters into two categories: voluntary adopters and forced adopters based on when innovation adoption occurs. If individuals adopt an innovation before their organization promotes the innovation, they are classified as voluntary adopters; forced adopters are those who adopt after their organization promotes an innovation. When an organization makes an innovation available, employees are expected to use it. Even if the organization does not pressure its employees, the expectation to use the innovation exists. For example, Zhou (2008) examined Chinese journalists' adoptive behavior regarding the use of the internet and discovered that half of the respondents adopted internet usage before their news organization, while 42.4 percent adopted the internet after their organization. Zhou determined, based on survey responses, that voluntary adopters began using the internet before their organization. Voluntary adopters valued the use of the internet and felt the innovation was popular in

society. The remaining forced adopters believed the internet would improve job performance (Zhou, 2008).

Resistance

Individuals who are resistant to technological innovation display different levels of resistance: active resistance and passive resistance. Active resistance involves deliberately rejecting an innovation or delaying adoption until a change takes place with regard to the innovation, such as price. Passive resistance can happen when individuals either have no knowledge of the innovation or have no opinion or are indifferent (Joseph, 2010). An example of active resistance to an innovation based on price is the decision to delay the purchase of an iPhone. Apple lowered the price to attract more active resisters.

Barriers affecting resistance are functional, psychological, and informational. Functional barriers refer to financial limitations such as cost. The above example regarding the iPhone described a functional barrier. Psychological barriers appear when individuals fear the innovation is risky or conflicts with prior beliefs and value systems. Regarding the iPhone, individuals who purchased an iPhone experienced issues such as dropped calls and missed emails. Those issues created risks for potential buyers, thus creating psychological barriers. Information barriers relate to the lack of knowledge about an innovation and its benefits, such as new software. An individual experiencing cell phone issues may not realize an operating system update to resolve the issue is available as a free download on the manufacturer's website. With the availability of information on the internet, the information barrier is the easiest barrier to overcome (Joseph, 2010).

Late Adopters

Late adopters, individuals who do not readily adopt a technological innovation, form opinions about an innovation with regard to the ability of that innovation to provide a better way to do a job, difficulty in learning to use it, availability to try it first, and the perceived benefits it can provide (Hsu & Sharma, 2010). An example is the person who has researched word processing software and has decided that "Brand A" provides the most benefits for the best price. Even with that information available, potential adopters are susceptible to opinions of others. Regarding the previous example, after talking to several friends who own "Brand B" word processing software, the person decides to purchase "Brand B" instead of "Brand A" based on friends' opinions. Making a decision based on others' opinions rather than based on one's own ideas and opinions is described as herding behavior (Banerjee, 1992). Herding behavior has both positive and negative effects regarding technological innovation in the workplace. Individuals can be resistant to change, and those who oppose an innovation can influence others to also resist. Herding behavior can provide positive effects when adopters in an organization influence others to adopt a technological innovation. To reduce herding behavior, organizational members can ensure employees learn about an innovation and then provide proper training.

Training

Access to training can be a contributing factor to adopter status. There are many types of training, but it is unclear whether or not one training method provides a higher

rate of innovation adoption. In a study of school teachers who participated in professional development activities, 93 percent of the teachers participated in an "Informal dialogue to improve teaching" and 81percent participated in "Courses and workshops." Approximately 35 percent participated in "Individual and collaborative research" and "Mentoring and peer observation". Most teachers stated that more professional development was needed, but it was unclear if any one activity had a greater impact on the teachers' professional development or that participants would take the information back to the classroom and practice what was learned (OECD, 2009). To increase technological innovation adoption, organizational leaders can provide different types of training methods and more training opportunities in response to the needs of the different categories of technology adopters.

Summary

There are five adopter categories: innovators, early adopters, early majority, late majority, and laggards. Innovators, early and early majority adopters will readily adopt an innovation while late majority and laggards will exhibit resistance behavior. Potential technological innovation adopters in the late adopter group are easily influenced by others and can exhibit active or passive resistance behavior. Functional, psychological, and informational barriers contribute to resistance behavior. Hsu & Sharma (2010) documented that steps can be taken to mitigate resistant behavior. Joseph (2010) determined that education can demonstrate the value of the innovation and training can

help mitigate resistance to the innovation. This study examined the differences among the characteristics of the five adopter categories.

III: METHODOLOGY AND DESIGN

Introduction

There are two types of employees in a public school setting: certified and non-certified. Certified employees are teachers and administrators, those who possess a Teaching License or Certificate. Non-certified employees are support staff such as secretaries, cafeteria workers, building aides, bus drivers, and custodial workers. Non-certified school employees include the use of technology tools among their skills to help schools do the work of educating K12 students. Generally, a non-certified school employee uses technology for communication, data collection, and required local or state reports. As with all technological tools, there are frequent updates and sometimes overall replacements of technology tools for the purposes listed above. Non-certified school employees' responses to the innovations or replacements can be classified into adopter categories. Of the five adopter categories, late adopters and laggards display resistance behavior (Joseph, 2010). There are two forms of resistance to technological innovation: active and passive. This study examined the characteristics of adopters to determine the differences among the categories of adoption behaviors.

Research Design

This is a non-experimental, descriptive study that examines the characteristics of adopters in a public school setting regarding the adoption of technological innovation

designed to improve workplace efficiency. The results of this study document the differences among adopter categories.

Population and Sample

The target population consisted of non-certified public school employees in urban, suburban, and rural Midwestern areas of the participating districts. The population did not include licensed or certified teachers. The study did not involve any risk to the subjects.

Instrumentation

The instrument used in this study was a 16-question survey made available to participants in Survey Monkey™. Participants provided responses to multiple choice questions with Likert Scale responses. Using a rating scale respondents were asked to rank five reasons for adopting a technological innovation from 1st to 5th in terms of personal importance. The reasons available were *Easy to use*, *Easy to learn*, *Contributes to productivity*, *Technology support readily available*, and *Used by colleagues*. In addition, respondents ranked four technology training options from 1st to 4th in terms of personal preference. Training options available were *Formal training in a lab setting – one time*, *Formal training in a lab setting – on-going as needed*, *Informal training by colleagues*, and *Self-training – using documentation provided by innovation developers*. Formal, or synchronous, training in this study consists of an instructor who provides training and direction to participants. On-going as needed represents training that is

available as often as requested by participants. Open response questions were used for respondents' innovation examples, choice explanations, and comments.

Research literature was used to guide the terminology included in the survey questions. The first survey draft consisted of 10 questions. The survey was pilot tested with employees who were similar to the targeted population regarding work with public schools. The second survey draft clarified the rating scale questions and included open response questions. The second pilot test indicated that the 16 survey questions were clear.

The survey questions are listed in Appendix A.

Data Collection

In October 2011 an email was sent to public school district superintendents in urban, suburban, and rural Midwestern areas requesting permission to invite non-certified employees to participate in the online survey. A reminder was sent in November 2011. The superintendent email can be found in Appendix B. For each district that granted permission, district employee lists were compared to a list of non-certified employees. Any licensed or certified employee was removed. Email addresses of non-certified employees were obtained with the district's permission. A link to the 16-question online survey was emailed to the non-certified employees in November, 2011. The participant email can be found in Appendix C. In February 2012 reminder emails were sent to the non-certified public school employees. The survey was closed in March 2012.

Summary

Using Survey Monkey™, non-certified public school employees in urban, suburban, and rural Midwestern areas were asked to complete a questionnaire during the 2011-2012 school year. This study investigated what percentage of non-certified public school employees in the urban, suburban, and rural Midwestern areas labeled themselves into the five categories of adopters regarding the adoption of technological innovation designed to improve workplace efficiency. This study also examined the characteristics of adopters to determine the differences among the categories of adoption behaviors.

IV: RESULTS

This study determined what percentage of public school employees in urban, suburban, and rural Midwestern areas labeled themselves into the five categories of adopters regarding the adoption of technological innovation designed to improve workplace efficiency. Characteristics of adopters were compared to determine the differences among those who categorize themselves as those who *readily adopt*, those who *adopt*, and those who *usually adopt*. Hypothesis: There are differences in characteristics among members of the five categories of adoption behavior. Null Hypothesis: There are no differences in characteristics among members of the five categories of adoption behavior.

Demographic Descriptive Data

An email requesting permission to survey non-certified employees was sent to 30 public school superintendents in urban, suburban, and rural Midwestern areas. Sixteen superintendents responded with permission and one superintendent denied permission. Emails were sent to 255 non-certified employees of the participating districts; within the email was a hyperlink to the survey. Forty-four or eighteen percent of non-certified employees participated in the survey. Respondents' age and gender totals and percentages are in Table 1.

Table 1

Demographics of Respondents by Age and Sex

	Age				Total
Gender	22-34	35-44	45-54	55-64	
Male	0	2 (5%)	1 (2%)	1 (2%)	4 (9%)
Female	2 (5%)	6 (14%)	16 (36%)	16 (36%)	40 (91%)

Fourteen respondents have worked in a public school system sixteen to twenty years. Eleven have worked in a public school system eleven to fifteen years. Eight respondents selected six to ten years, and eight selected twenty-one or more years in a public school system. Three respondents have worked three or fewer years in a public school system. The respondents represented rural, suburban and urban districts. Twenty-one were from rural school districts, seventeen from suburban districts and six from urban districts. Respondents were asked to rank themselves regarding technological adopter status. Fifteen respondents selected *I readily adopt*, twenty-two selected *I adopt*, and seven chose *I usually adopt*. Two other rankings were available but not selected: *I adopt only when forced* and *I do not adopt*. See Figure 1.

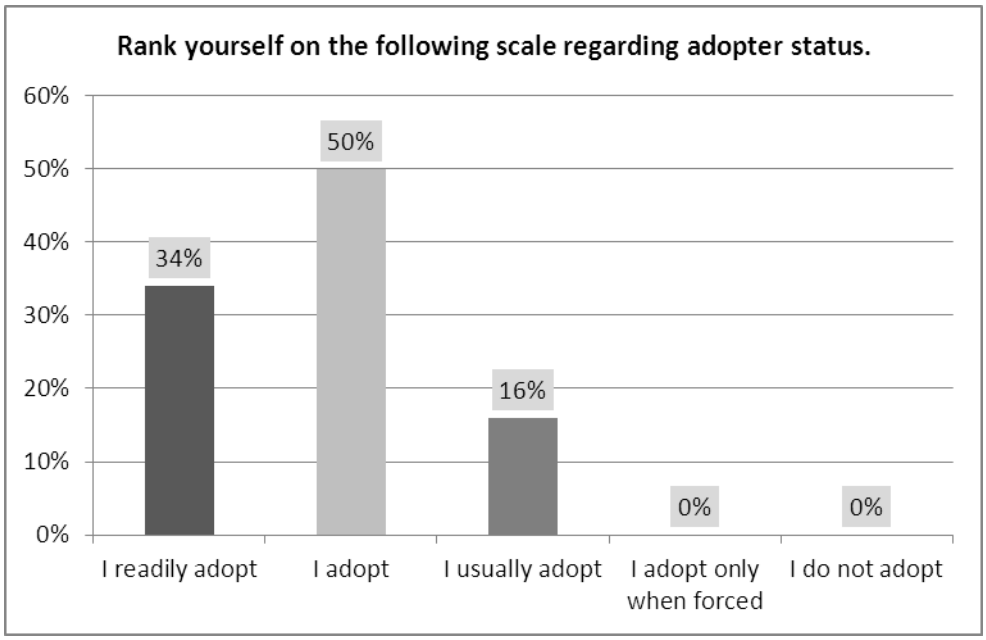

Figure 1. Respondents' self-reported adopter category

Respondents were asked to provide an example of a technological innovation that was adopted in their workplace. Apple Tablet, point of sale system for food service, texting, Smartboard, iPhone, library automation, digital video camera, and student software are examples of responses. Respondents were also asked to provide an example of a technological innovation that was not adopted. Facebook, smart phone, GPS, Playstation 3, Microsoft Access, and webinars are examples of innovations not adopted. When asked if they had ever been influenced by a colleague to adopt or not adopt a technological innovation, 25 respondents chose *yes* and 12 chose *no*.

Respondents were asked to rank order five reasons for adopting a technological innovation from 1st to 5th in terms of personal importance. *Contributes to productivity*

was chosen most often as a 1st choice (53%); the majority of respondents (72%) chose *Used by colleagues* as their 5th choice. See Figure 2.

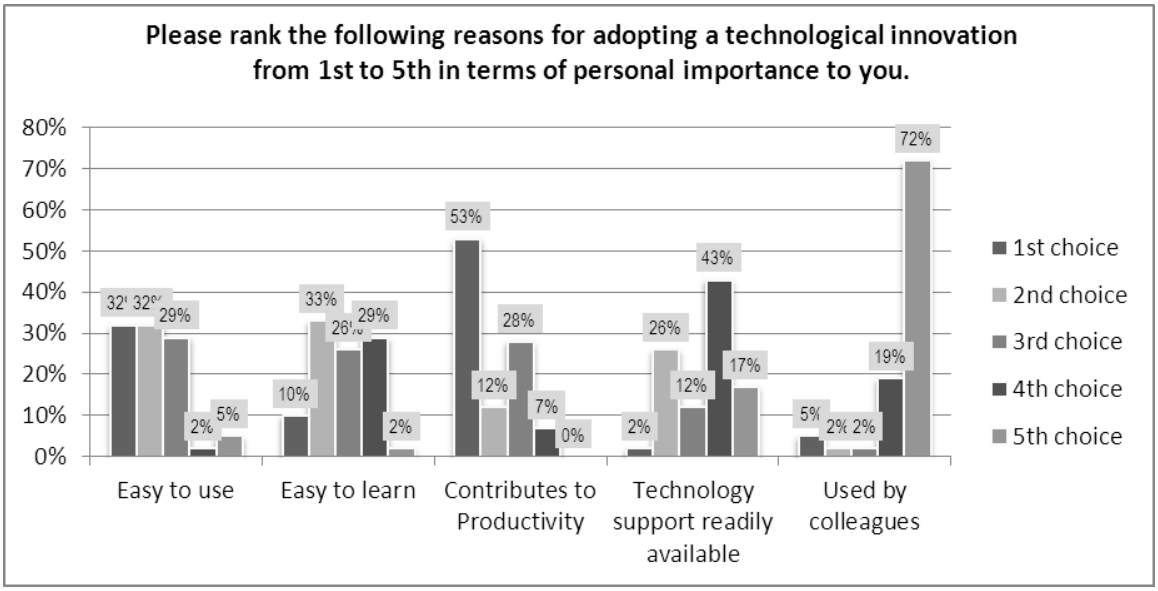

Figure 2. Reasons for adopting a technological innovation

Sample respondent responses regarding reasons why *Contributes to productivity* was most important include "It needs to serve a purpose", "Productivity/job sharing responsibilities require this", and "Doing more with less is 1st priority". Sample respondent responses regarding why *Used by colleagues* was least important include "Just because someone else is doing it is not a good justification", "My peers may not have the same needs as I do", and "Although having colleagues who use the same technology means I can learn from them and with them it is not the only reason I get on board or decide to use a certain program". Additional comments regarding adoption or non-adoption can be found in Figures D.8, D.9, and D.10 in Appendix D.

When asked to rank order four training options in terms of personal preference, fifty-seven percent ranked *Formal training in a lab setting – on-going as needed* as their 1st choice. *Self-training – using documentation provided by innovation developers* was most often ranked 4th (Figure 3). Sample respondent reasons for choosing *Formal training in a lab setting – on-going as needed* as a 1st choice training option include "Ongoing support is key", "That is the way I learn best", and "I am a hands on learner therefore having formal training in a lab setting is great for me. I can ask questions and get answers to my problems right away. On-going training is great because technology is always changing". Sample respondent reasons for selecting *Self-training – using documentation provided by innovation developers* as a 4th choice training option include "I do not like to read instructions. If all else fails, I read the documentation", "More difficult...no one to answer questions", and "Human interaction is best for me. Sometimes the documentation can be a little hard to understand". Additional comments regarding training options can be found in Figures D.11, D.12 and D.13 in Appendix D.

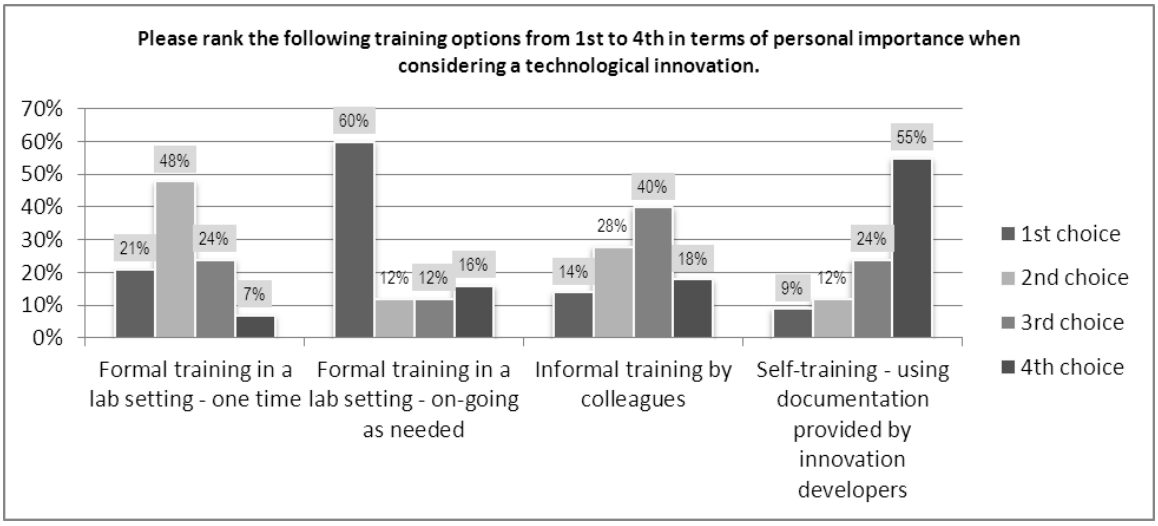

Figure 3. Preferred Training options

Results of testing research hypothesis

Non-certified employee responses indicated that there are no differences in the characteristics among the categories of adoption behavior self-reported by the respondents. Therefore the null hypothesis was accepted. What follows are the descriptive statistics to support this decision.

Respondents were distributed between three of the five categories of adopters: *I readily adopt*, *I adopt*, and *I usually adopt.* No respondents identified themselves as *I adopt only when forced* or *I do not adopt*. The majority (40) of all three adopter status groups were female. There were 2 males in the *I adopt* and *I usually adopt* adopter status groups. See Figure 4.

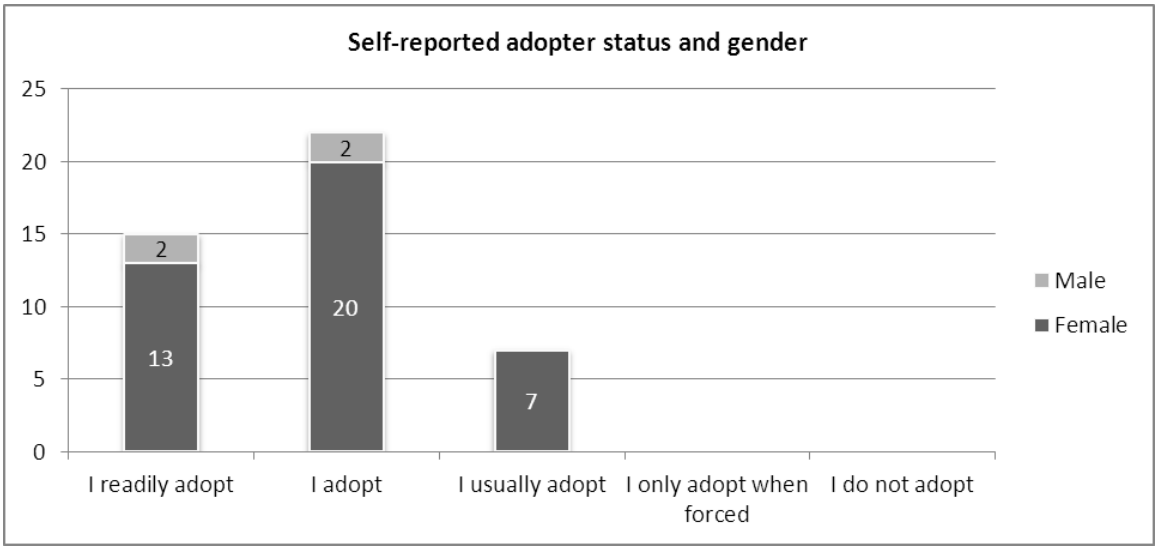

Figure 4. Respondents' self-reported adopter status and gender

The majority (41%) of the respondents who chose *I adopt* as their adopter category were in the 55-64 age group, while 47 percent who indicated *I readily adopt* were in the 45-54 age groups. The majority (86%) of respondents who selected *I usually adopt* were evenly divided between the 45-54 and 55-64 age groups. One *I usually adopt* respondent chose the 22-34 age group. See Figure 5.

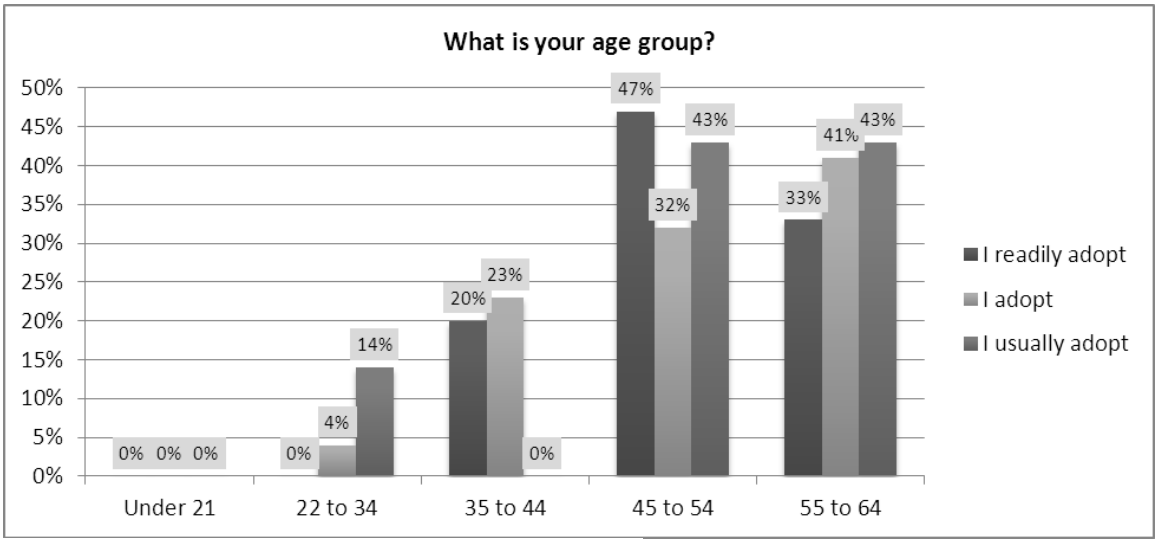

Figure 5. Respondent age by adopter category

The district type chosen most often was Rural (48%) followed closely by Suburban (38.5%). The majority of Rural school employees (16%) have been employed in a public school system for 16 to 20 years, while 14 percent of Suburban school employees chose 11 to 15 years. See Table 2.

Table 2

District type compared to years in a public school system

	Years in a public school system					
District Type	0 to 5	6 to 10	11 to 15	16 to 20	21 or more	Total
Rural	2 (5%)	3 (7%)	5 (11%)	7 (16%)	4 (9%)	21 (48%)
Suburban	1 (2%)	5 (11%)	6 (14%)	3 (7%)	2 (4.5%)	17 (38.5%)
Urban	0	0	0	4 (9%)	2 (4.5%)	6 (13.5%)
Total	3 (7%)	8 (18%)	11 (25%)	14 (32%)	8 (18%)	

All those who *usually adop*t indicated that they have been influenced by colleagues to adopt or not adopt a technological innovation; however, 41 percent of those who *adopt* and 20 percent of those who *readily adopt* responded that they had not been influenced by a colleague.

Those who *readily adopt* and *adopt* (82%) most frequently chose *Contributes to Productivity* as their reason for choosing to adopt a technological innovation. The 1st choice for those who usually adopt was *Ease of Use* (57%), when ranking reasons to adopt a technological innovation. *Used by colleagues* was the least frequently (5%) selected reason for adopting a technological innovation. See Figures 6 and 7.

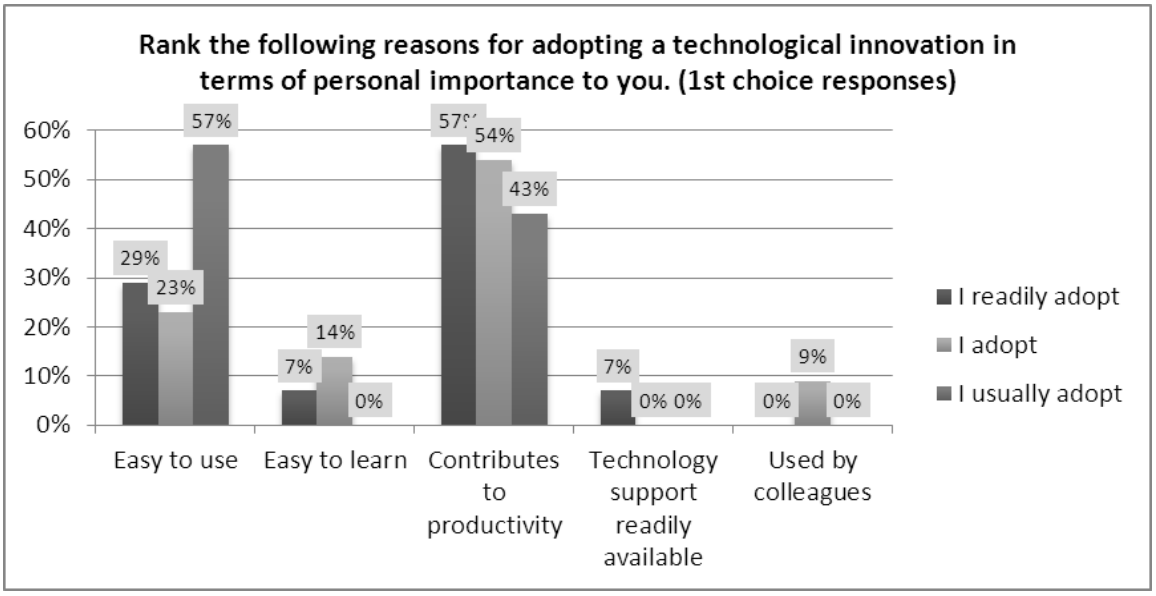

Figure 6. Reasons for adopting by adopter category – 1st choice

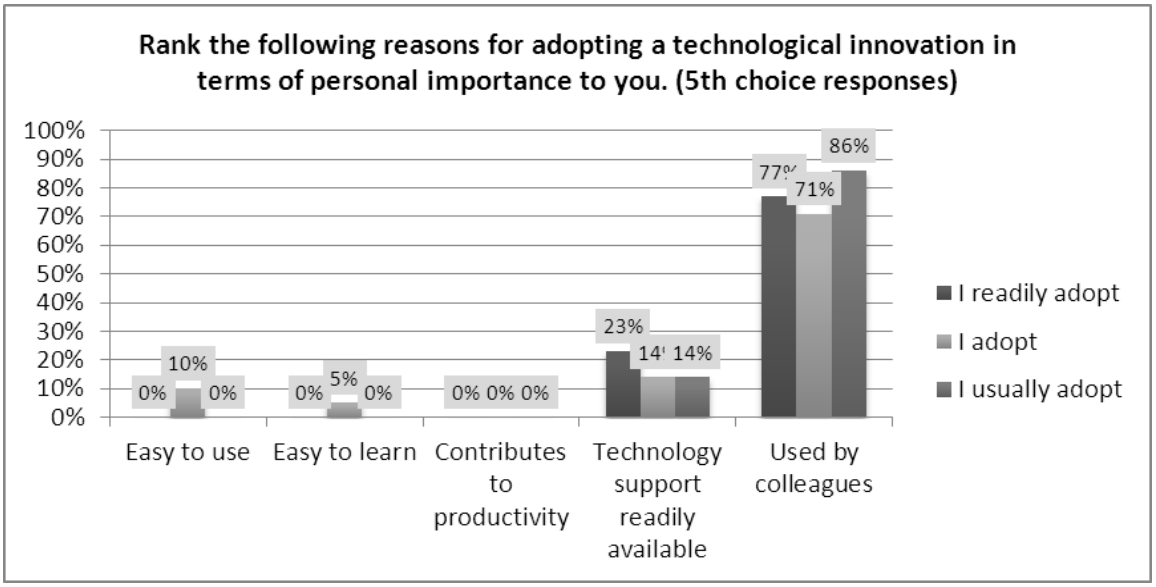

Figure 7. Reasons for adopting by adopter category – 5th choice

Most respondents (57%) preferred *Formal training in a lab setting – on-going as needed* and the least (9%) preferred *Self-training – using documentation provided by innovation developers*.

Summary

Emails were sent to superintendents in 30 public school districts in urban, suburban, and rural Midwestern areas requesting permission to survey non-certified employees. Sixteen superintendents responded with permission to recruit study participants within their districts and one denied permission. Emails were sent to 255 non-certified employees of the participating districts and 44 agreed to participate in an online survey. Survey responses determined what percentage of public school employees in urban, suburban, and rural Midwestern area labeled themselves into the five categories of adopters regarding the adoption of technological innovation designed to improve workplace efficiency. Characteristics of adopters were compared to determine the differences among those who categorize themselves as those who *readily adopt*, those who *adopt*, and those who *usually adopt*.

Most respondents (91%) were female aged 45 to 64 (73%), and most (52%) have worked in a public school district from 11 to 20 years. Most respondents (80%) are employed in rural and suburban school districts. Most respondents (64%) indicated that they had been influenced by colleagues to adopt or not adopt a technological innovation. The majority of respondents (52%) chose *Contributes to productivity* as their 1st choice reason for choosing to adopt a technological innovation, while *Used by colleagues* was chosen least often (5%). *Formal training in a lab setting – on-going as needed* was preferred (50%) as a training choice, while *Self-training – using documentation provided by innovation developers* was chosen least often (9%).

V: CONCLUSIONS, IMPLICATIONS, AND SUMMARY

This non-experimental, descriptive study examined the characteristics of adopters in a public school setting regarding the adoption of technological innovation designed to improve workplace efficiency. Within the five adopter categories, there are resistance behaviors regarding technological innovation adoption. This study examined the characteristics of adopters and their resistance behavior.

The instrument used was a 16-question survey available online in Survey Monkey™. Characteristics of adopters were compared to determine the differences among the respondents. Respondents self-reported that they were in three of the five adopter categories: those who *readily adopt*, those who *adopt*, and those who *usually adopt*. Descriptive characteristics indicate that there are no differences in the characteristics among the categories of adoption behavior self-reported by the respondents. Therefore we fail to accept the hypothesis that there are differences in characteristics among members of the five categories of adoption behavior.

Conclusions

Respondent comments indicate that an innovation is more likely to be adopted if the innovation is perceived to provide the means do a job more effectively. When considering a technological innovation 57 percent of the respondents value *Contributes to productivity* and 30 percent value *Ease of use*. These values align with Zhou's (2008) results based on a study of 813 subjects regarding technological innovation adoption. The author established that adopters valued ease of use and enhanced job performance.

Innovations that did not align with the stated values contributed to resistance behaviors related to psychological barriers. When introducing a technological innovation to employees, administrators can mitigate resistance related to psychological barriers by focusing on innovation features that support enhanced job performance and ease of use values (Joseph, 2010). Individuals will not deem an innovation as risky or believe that the innovation conflicts with prior beliefs and value systems if the innovation will provide value.

Herding behavior can affect an individual's decision about adopting a technological innovation. For example, voters are known to be influenced by opinion polls, a possible negative effect of herding behavior. With regard to technological innovation in the workplace, individuals who decide to use a new software program because co-workers are using it can be a positive effect of herding behavior. Banerjee (1992) documented that individuals being influenced by others does not necessarily imply that herding behavior will occur. The majority (73%) of respondents in this study reported that they had been influenced by colleagues to adopt or not adopt a technological innovation; however respondents did not indicate that *Used by colleagues* is the most important consideration when making a decision to adopt. A reason for the discrepancy in responses is captured in one respondent's comments: "I could be influenced by a colleague, but would make my own choice to fit my lifestyle." The comment reflects Banerjee's (1992) finding regarding reasons for resistance. Being influenced by

colleagues' adoption behaviors does not equate to herding; the respondents indicated that colleagues' behaviors would be used in their decisions to adopt or not adopt.

Fifty-seven percent of respondents prefer *Formal training in a lab – on-going as needed*; twenty percent prefer *Formal training in a lab – one time.* Based on findings in an international research survey regarding professional development, 81 percent of surveyed educators participated in courses and workshops for their professional development needs; 35 percent participated in individual research and peer observation as a means of professional development (OECD, 2009). Respondents in this study confirmed the OECD finding that formal training is preferred to self-training and learning from colleagues. Training minimizes resistance behaviors related to informational barriers. Administrators and those planning for technology training can ease employee resistance to adopting technological innovations and reduce informational barriers by providing training options that focus on the preferences of their employees: formal training.

Limitations

Sample size is a major limitation in this study. Half of the superintendents responded with permission to survey their non-certified employees. Of the 255 potential participants, 44 employees responded to the survey resulting in an 18 percent response rate. Due to the small sample size, there were not enough responses in the adopter categories to determine if the differences are meaningful. The results documented are

descriptive; statistical differences among group characteristics cannot be determined with the current sample size.

Three suggestions to increase the response rate follow:

- In addition to sending an email to superintendents, a phone call can ensure that the superintendent receives the email.
- The survey can be provided in paper form for those who are reluctant to use or do not have readily access available to new technology such as an online survey. Potential respondents may be more comfortable and more likely to participate if the online format is optional.
- Future research could use a large umbrella organization as a draw for more responses.

Five choices were provided for adopter categories as per Rogers (1995); respondents self-reported for three of the five. An online survey may not have been the best research tool to include the more hesitant technological innovation employees. The option to complete a paper survey instead of the online survey should be included in future research on this topic.

Open response questions provided insight to responses, but the comments cannot be used to determine group differences. To increase the usability of respondent comments regarding answering the research questions, common respondent replies from this study can be sorted or grouped to create a list of choices for respondents to select rather than rely solely on open responses. Open responses should also be provided in case the list of

choices does not capture all possibilities. Appendix D contains figures of open comments provided by respondents.

Future Research

Prior research regarding technological innovation adoption in the field of education has focused on certified school employees (OECD, 2009). This study focused on non-certified school employees. School administrators must make decisions regarding adopting technological innovations for the school district as a whole, both certified and non-certified. For that reason, future research regarding adoption of technological innovations in the realm of education should explore the adoption categories among certified and non-certified school employees.

Implications

The results of this non-certified public school employee study support findings from previous studies on general technological innovation adopter behavior. The following recommendations are provided for organizations considering embracing technological innovations.

Recommendation 1

When introducing a technological innovation to employees, organizational leaders should focus on innovation features that support enhanced job performance and ease of use values.

Recommendation 2

To increase technological innovation adoption, organizational leaders should provide different types of training methods and more training opportunities for technology users.

Recommendation 3

To reduce herding behavior, organizational leaders should ensure employees learn about the specifics of an innovation and then provide proper training.

Recommendation 4

Organizational leaders and those planning for technology training can ease employee resistance to adopting technological innovations by providing training options that focus on the preferences of their employees: formal training.

Summary

The purpose of this study was to determine if there are differences in characteristics among the categories of adoptive behavior of non-certified public school employees. This non-experimental, descriptive study examined the survey responses of 44 adopters in a public school setting regarding the adoption of technological innovation designed to improve workplace efficiency. Descriptive statistics of the responses indicate that there are no differences in the characteristics among the categories of adoption behavior reported. Low response rate prevented further statistical calculations. Responses document that employees will adopt a technological innovation if the innovation

contributes to productivity. Also, regarding training for technological innovations, employees prefer formal training that is on-going as needed.

REFERENCES

Banerjee, A. (1992). A simple model of herd behavior. *The Quarterly Journal of Economics, 107*(3), 797-817. doi: 10.2307/2118364

Joseph, R. C. (2010). Individual resistance to IT innovations. *Communications of the ACM*, *53*(4), 144-146. doi: 10.1145/1721654.1721693

Gillard, S. (2004). IT educators and IT adoption. *Issues in Informing Science & Information Technology, 1*, 805-811.

Gillard, S., Bailey, D., & Nolan, E. (2008). Ten reasons for IT educators to be early adopters of IT innovations. *Journal of Information Technology Education*, *7*, 21-33.

Hsu, P. & Sharma, P. (2010). A systemic framework for sustaining technology integration in educational settings. *World Future Review*, *2*(1), 41-56.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, *26*(3), 310-322. doi:10.1016/j.chb.2009.10.013

OECD. (2009). *Creating effective teaching and learning environments: First results from TALIS*. OECD Publishing.

Rogers, E. M. (1995). *Diffusion of innovations*. New York: Free Press.

Wang, P., & Ramiller, N. C. (2009). Community learning in information technology innovation. *MIS Quarterly*, *33*(4), 709-734.

Zhou, Y. (2008). Voluntary adopters versus forced adopters: Integrating the diffusion of innovation theory and the technology acceptance model to study intra-organizational

adoption. *New Media & Society*, *10*(3), 475-496 . doi:

10.1177/1461444807085382

Appendix A

Technological Innovation Survey

TECHNOLOGICAL INNOVATION SURVEY
Thank you for participating in my graduate research project! The research topic is technological innovations in public schools.

The following survey is designed to collect feedback from public school employees in the urban, suburban, and rural Midwestern area. The survey should only be completed by employees who are NOT licensed or certified teachers. Please take a few minutes to complete the survey online as your responses are of great value to my research study. Completed surveys will be treated as confidential and no identifiable information will be collected.

Definitions to key terms in the survey:

Technological Innovation: tool that provides some degree of benefit for potential adopters, and usually has two components, computer hardware and computer software.

Adopt: to accept formally and add to your technological tools to use in your job.

1. I am . . .
    - Male
    - Female

2. What is your age group?
    - Over 18 but under 22
    - 22 to 34
    - 35 to 44
    - 45 to 54
    - 55 to 64
    - 65 and over

3. How long have you worked in a public school system, including previous employment in other public school systems?
    - 0 – 5 years
    - 6 – 10 years

- 11 – 15 years
- 16 – 20 years
- 20 or more years

4. Is the school district in which you are currently employed urban, suburban, or rural?

   - Urban
   - Suburban
   - Rural

5. Rank yourself on the following scale regarding adopter status.

   - I readily adopt
   - I adopt
   - I usually adopt
   - I adopt only when forced
   - I do not adopt

6. Give an example of a technological innovation you have adopted.

7. Give an example of a technological innovation you have not adopted.

8. Have you ever been influenced by colleagues to adopt or not adopt a technological innovation?

   - Yes
   - No

9. Please rank the following reasons for adopting a technological innovation from 1st to 5th in terms of personal importance to you. (1st is most important – 5th is least important)

   Easy to use
   Easy to learn
   Contributes to productivity
   Technology support readily available
   Used by colleagues

10. Regarding reasons for adopting a technological innovation, why did you rank the reason ranked 1st Choice as the most important?

11. Regarding reasons for adopting a technological innovation, why did you rank the reason ranked 5th Choice as the least important?

12. Please rank the following training options from 1st to 4th in terms of personal importance when considering a technological innovation. (1st is most important – 4th is least important)

    Formal training in a lab setting – one time
    Formal training in a lab setting – on-going as needed
    Informal training by colleagues
    Self-training – using documentation provided by innovation developers

13. Why did you rank the training option ranked 1st Choice as the most important?

14. Why did you rank the training option ranked 4th Choice as the least important?

15. Additional comments regarding adoption or non-adoption.

16. Additional comments regarding training options.

Appendix B

Superintendent Email

Dear "superintendent's name":

My name is Kimberly Snyder and I am working towards a Master of Arts in Educational Technology degree at Wright State University. One of the requirements for this degree is to complete a thesis which requires that I conduct a research project. The title of my thesis is "Adopters vs. Non-Adopters: Incorporating Technological Innovation in the Workplace".

The research for my thesis includes a survey of public school employees to collect feedback regarding technological innovations in public schools. An online survey containing 16 questions has been created to collect responses which will take approximately 16 minutes to complete. Participation in the survey is voluntary and anonymity will be maintained as no identifiable information will be collected. A copy of the survey has been attached.

I would like to email your non-teaching staff and invite them to participate in this research. Email addresses will be obtained through my employer, MDECA. Please feel free to contact me or my faculty advisor at the address listed below if you have any questions. A reply indicating your consent or refusal will be greatly appreciated.

Sincerely,

Kimberly Snyder
snyder@mdeca.org

Dr. Suzanne Franco, Advisor
suzanne.franco@wright.edu

Appendix C

Participant Email

Dear School Employee:

As a public school employee, you are invited to participate in a research project to collect feedback regarding technological innovations in public schools.

My name is Kimberly Snyder and I am working towards a Master of Arts in Educational Technology at Wright State University. One of the requirements is to complete a thesis which requires that I conduct a research project. An online survey containing 16 questions has been created to collect your responses which will take you approximately 15 minutes to complete; a link to the survey is provided below. The online survey will be available until March 15, 2012.

Participation in the survey is voluntary and your anonymity will be maintained as no identifiable information will be collected. There are no known risks and you will receive no direct benefit for your participation in this study. You are free to terminate participation at any time and without prejudice. Completion and submission of the online survey implies your consent to participate. If you have general questions about giving consent or your rights as a research participant in this research study, you can call the Wright State University Institutional Review Board at 937-775-4462.

http://www.surveymonkey.com/s/PWVGHDP

If you have any questions or concerns about the survey, please contact:

Kimberly Snyder
snyder@mdeca.org

Dr. Suzanne Franco, Advisor
suzanne.franco@wright.edu

Thank you in advance for taking the time to complete this survey and submit your information for this research initiative.

Sincerely,

Kimberly Snyder

Appendix D

Figures for the Open Response Question

Regarding reasons for adopting a technological innovation, why did you rank the reason ranked 1st Choice as the most important?
Productivity as I define it is being more efficient and having the necessary data/information/resources that are necessary to do my job well. Any type of technological innovation that helps me be more productive is going to be implemented for that reason and not for the others listed above.
Increased Productivity leading to increased student learning (hopefully) should be the number 1 goal.
Make my work more productive
It truly help us do our job better, and supplies us with more statistics at our finger tips.
That's the reason for purchasing on most things in my opinion
I am more motivated to learn if it is productive to my teaching.
It needs to serve a purpose.
If it is important to my job then I fell it is important to learn it.
Productivity/job sharing responsiblities require this.
Whatever makes my job easier and saves time and gives me a platform to share information with others has my attention.
The sake of technology for the sake of technology does not interest me. If it makes something less productive it is a waste of time and money
I feel that contributing to productivity is most important because it helps me to do my job better. Gaining this type of knowledge also puts me ahead of my colleagues that are slow to conform or learn something new.
If the innovation makes the productivity faster, then I have more time in my day to accomplish all of the other tasks that I am dealing with.
I don't think it is nessesary to use something for the cool factor or because other areusing it. It it improves life/work then it is worth while.
Want to make sure that it doesnt cause me to not be as productive
work is faster and easier
If technology does not increase productivity or make a job easier, why bother.
doing more with less is 1st priority
Overall it help to make my job easier, collection of information readily available.
The most important reason should be that it makes your job easier or the final product, ie. educating children better.

Figure 8. Reasons why 'Contributes to productivity' was ranked as 1st choice (not edited)

Regarding reasons for adopting a technological innovation, why did you rank the reason ranked 5th Choice as the least important?
"Just because someone else it doing it" is not a good justification.
It doesnt matter to me what others do.
I could be influenced by a colleague, but would make my own choice to fit my lifestyle.
My colleagues have no bearing on how I do my job that is why it is ranked no. 5. Howevere, it is nice to know that your colleagues are using the same program so they can help with trouble shooting.
I'm more interested in innovations that help ME
May of the changes we've implemented in my job didn't affect my colleagues.
I care what others are doing but I'm not a "follower" and will research what works for my situtation
I feel confident enough in my own decision and abilities to not rely on the use of colleagues for a new innovation.
My peers may not have the same needs as I do.
I am not influenced by what other people are doing--I don't need to learn something or do something just because someone else is doing it.
Although having colleagues who use the same technology means I can learn from them and with them it is not the only reason I get on board or decide to use a certain program.
I don't care who uses what. Just because a colleague uses it doesn't mean I have the same need for it.
If it increases MY productivity...it should not matter who else uses it.
Who uses it does not matter to me as long as the technological innovation works well for my job
I am the only librarian at my building, class structure is different than teachers.
doesn't matter who is using it
Although it is best if other colleagues use it, if it benefits the job I have been hired to do I will use it. In example: years ago the school purchased an attendance program - no one else used it but that was my job and it benefited me greatly.
n/a
What works for others is not ALWAYS the best for us.
if it is used by colleague good for reference but may not fit individual needs and must be tested
I care about my colleagues and I think they're amazing teachers, but I don't really care what kind of technology they may or may not be using. If they have something that's easy to use and it works, then I'm all for it.
Having someone else using this doesn't make it easier, unless they are willing to help instruct others.
If a technological innovation doesn't make the final product any better, it doesn't really matter to me who is using it.

It doesn't matter who else uses it as long as it helps me at my job.
That really has no influence on me

Figure 9. Reasons why Used by colleagues was ranked as 5th choice (not edited)

Additional comments regarding adoption or non-adoption.
If you want to succeed you have to be willing to adapt
I love to learn new things. It keeps the mind active and makes my job a lot easier.
In our world everything is replaced by something new constantly. We are a throwaway generation, we can't keep up with all the new updated items that come out.
I classify myself as willing to adopt but not always ready to adopt simply because at time market trends tend to push innovations into the forefront without a product being 100% ready for consumer use. It often pays to wait for a new product to have defects worked through and some improvisions in place before adopting the use for yourself. In the issue of non-adoption of smart phones, I believe the technology to be a fascinating and wonderful tool, but I'm simply more frugal in nature to upgrade at this point.
Technology is our future! Adopting new technologies is always welcome!
The technology must significantly improve productivity & make the job better/easier, to justify the time & effort to implement it.
We all adopt everyday, some things with proper instuction are easily accomplished, with out help they can be a source of frustration.,

Figure 10. Additional comments regarding adoption or non-adoption (not edited)

Why did you rank the training option ranked 1st Choice as the most important?
Subject to cost of training
Because continue training helps the user especiall y when a new version of the software is released.
formal training in a lab setting is preferred because it is hands-on with documentation to follow and questions can be asked and answered by others too
because sometimes I don't "get it" right away.
That is the way I learn best.
Because it takes more than one class and if you do not do it on a regular basis it is sooo easy to forget
I am a hands on learner therefore having formal training in a lab setting is great for me. I can ask questions and get answers to my problems right away. On-going training is great because technology is always changing.
I want to be trained by people who already know the system and are on hand for questions that can be answered immediately

Having the option for on-going training if needed is important for times when the innovation is more challenging to learn.
I like to be able to meet and then come back with questions.
On-going support is key.
I prefer ongoing training in a hands on environment. Too oftern a one-time training throws so much info at you that you can't retain it all.
Hands-on, continued training is key to retaining information and keeping up with your skills
The formal training is nice to have, but then being able to continue is a great benefit.
It is good to get the training first hand from someone that knows it and have the option to return if needed
On going training in any area is always needed
I think ongoing training is helpful due to getting trained prior and then as you go along
Because if it's a program with many components you will not be able to grasp everything in a one-time setting.
to get help when needed
Having ongoing support is important to me since problems do arise and finding the solution in a timely manner is important
For me, hands on is best, but one session can be overwhelming!
answering this question really depends on the tool but on-going support is plus
It's important to learn the skills necessary to complete the work the very first time, and to have the opportunity to learn it from a person whi is an expert in the field. All questions, incidents, and minutae can be attended to by that expert, and with practice and notes, I should easily be able to incorporate the techniques into my classroom.
On hands training is easier to understand and having on going help as needed adds to my ability to complete the jobs.
I like a lab format, I feel comfortable when I know that I canrely on additional training as needed

Figure 11. Reasons why Formal Training in a lab setting – On-going as needed was ranked as 1st choice (not edited)

Why did you rank the training option ranked 4th choice as the least important?
Subject to cost of training
I like self-training in some cases, if not too complicated, but prefer other type of training
when I learn I mostly need someone to show me.
I learn better by doing. Not reading a manual
No one can make heads or tails from reading because it makes it more complicated than it is

Human interaction is best for me. Sometimes the documentation can be a little hard to understand.
Self training doesn't always any questions I might have during the process
Self training is my least favorite way of learning something new.
They may not know my specific needs
I like the verbal interaction that occurs in a formal setting.
I learn best if someone takes me through the program. I am not so great at reading through a list of instructions the first time I must use a program, however I can and have.
More difficult...no one to answer questions.
I like hands on training.
I learn better in a more academic environment and by being shown.
I have a hard time focusing on text. Just show me an I pick it up quick.
Could be trained incorrectly or miss something important to help with the program.
Do better with guidance
that would be my least favorite way to learn
I do not like to read instructions. If all else fails, I read the documentation.
verbage is sometimes hard to follow in documentation
Trying to follow written out directions with no back up person to call if situations occur is very difficult to do on your own.
It's hard for me to "self teach"
I tend not to take the time to self train, I only learn on a need to use basis rather than take the time to learn everything

Figure 12. Reasons why Self-training – using documentation provided by innovation developers was ranked as 4th choice (not edited)

Additional comments regarding training options.
With all the budgets cuts going on in the school systems today I would gladly like to have some webinar's to keep myself updated.
For me, the best training is ongoing. First by the developer/producing company, then followed up by time with colleagues, good tech support, and good documentation.
Everyone need back up for preforming new ways of doing jobs. Without personal instruction some things are very had to comprend. With on hand training they become understandable and usually make a job easier.
I much prefer training in my own office environment, rather than a training lab

Figure 13. Additional comments regarding training options (not edited)