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# Instructional Technology Resistance Levels Among University Faculty

Katie Glaze

*Eastern Illinois University*

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Instructional Technology Resistance Levels among University Faculty

by

Katie Glaze

Submitted in Partial Fulfillment of the Requirement for the Degree of

Master of Science

In the Graduate School, Eastern Illinois University

Charleston, Illinois

October 2012

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ABSTRACT

The purpose of the study was to contribute to a better understanding of resistance to instructional technology among university faculty. Siegel's (2008) Resistance to Instruction Technology questionnaire was employed to full-time faculty members working at a mid-west regional state university. Results from 226 respondents (37% of population) reported low levels of technology resistance. Further, respondents gave insight to their perceptions, attitudes, and actual use of instructional technology. Finally, recommendations for practitioners related resistance to instructional technology were discussed.

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## CHAPTER 1

### INTRODUCTION

#### Nature of the Study

Technology is all around us. Computers have grown in popularity and so has the use of information technology in our everyday lives (Davies, Korte, & Lavin, 2010).

Organizations use technology as a time saving agent to help simplify the work they complete on a daily basis (Goodman & Reddy, 1990). Technology provides the power to increase productivity on tasks such as output, file organizing, planning for a meeting and communicating with employees. According to Fenner, Goodman, and Griffith (1990), technology is a system made up of components that involve the act of changing an object from one state to another. Technology can be a machine in a factory producing goods at a high rate or a computer in an office.

Technological advances are evolving, leading to the integration into academic institutions (Klemz, Murphy, & Young, 2003). Technology in academia can be broken down into two categories: 1) educational technology, and 2) instructional technology (Lee & Winzenried, 2009). Richey (2008) defined educational technology as “the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (p. 24). Educational technology is not cheap. In 2005, an estimated \$5.15 billion was spent by U.S. higher-education institutions on technology (Market Data Retrieval, 2005). More recently, an estimated \$8.1 billion was spent on educational technology products for the 2010-2011 school year (O’Hanlon, 2009).

Educational institutions have been using educational technology to enhance instruction. Lee and Winzenried (2009) defined instructional technology as a device used by teachers to instruct students in a more stimulating manner. According to Kurzweil (2007), “We are doubling the rate of technological innovation every ten years” (p. 19). In the 1990s, the use of audio and video as instructional technology to enhance learning became more prevalent in the classroom (Lee & Winzenried, 2009). Moving forward to the 2000s, technology was growing rapidly in the classroom and computers were incorporated into the daily teaching lessons (Lee & Winzenried, 2009). Computers were not the only advancement in the classroom. In the mid 2000s, the Internet began to rise in popularity and was accessible on many computers in school classrooms (Lee & Winzenried 2009). Since then, educators are implementing more and more technology into the classroom.

Technology enhanced classes have grown rapidly within the past five years due to students becoming more involved with technology (Davies et al., 2010). Instructional technology can be used to motivate and actively involve students; therefore, enhancing the outcome of student learning (Klemz et al., 2003). Instructional technology programs have become quite popular during the last decade and with the continuous change in software, many are having a hard time grasping the new concepts or appear to have difficulty in changing their ways (O’Hanlon, 2009).

In order for people to want to change, they must first know the benefits of the change on their lives (Craine, 2007). People resist technology for a number of reasons. One reason is because they do not want to adapt to a new way of doing things (Craine, 2007). When people are used to doing things a certain way or they are in their “comfort zone” it

can be quite difficult to sway them in a different direction (Craine, 2007). According to Joseph (2010), age, technological complexity and income are a few factors that inhibit technology adoption. When implementing technology, it is important to remember and understand the individual needs of the user (Joseph, 2010). The age of an individual adopting technology plays an important role in the way they perceive the technology and its use. If the individual has never encountered the particular technology before, they may not be aware of its advantages and could possibly refuse to use it (Joseph, 2010).

Resistance to use technology is an issue happening in the workplace, school and at home (Craine, 2007). People are now having to use technology in their daily lives to stay in touch with the world around them. Just like anything else, technology is ever changing and improving by the minute. Keeping up with the advancements of technology is just one reality people face. According to Dias (1999) barriers in the changing process are ease of use, opportunity to use, perceived usefulness, support, time, and motivation.

### Purpose of the Study

The purpose of this descriptive study is to contribute to a better understanding of resistance to technology. More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty employed at one mid-west regional state university.

### Statement of the Problem

What is the level of resistance among faculty at one mid-west regional state university?

### Research Questions

These specific research questions were deduced from the purpose of the study:

1. What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
2. What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
3. What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
4. What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
5. How many times does faculty at one mid-western university's utilize instructional technology per semester?
6. How many times does faculty at one mid-western university's utilize instructional technology per week?
7. Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week (two-tailed t-test)?

H<sub>0</sub>: There is no statistically significant difference

between low resistance and high resistance with respect to technology usage per week).

HA: There is a statistically significant difference between low resistance and high resistance with respect to technology usage per week.

#### Limitations/Delimitations of the Study

Factors affecting the generalizability of the results include:

1. Respondents to the instructional technology questionnaire hold various levels of education and experience in technology; therefore, have various levels of knowledge about different forms of instructional technology.
2. Respondents to the instructional technology questionnaire hold differing roles in the university.
3. This study only collected data from one mid-west regional state university full-time faculty members.
4. This study only measured current instructional technology use.

#### Significance of the Study

According to Dias (1999), resistance to instructional technology is a significant issue for educational institutions. Although instructional technology is an important part of many educational institutions in the U.S., faculty are not fully taking advantage of the resources and resisting adoption (O'Hanlon, 2009). According to Grable, Overbay, and Patterson (2009) educators are being asked to integrate instructional technologies into their classrooms and the capacity for them to adapt is crucial. It has been found that perceived usefulness and perceived ease of use of a technology positively influences attitude and intention to use a technology (Lee & Stoel, 2003). Letting the individual know about the benefits and ease of use could help sway them to use the technology by

changing their attitude about the product. Individuals must also implement and immediately use the technology in order to make a lasting impression (Dias, 1999).

This study contributes knowledge to technology professionals by adding to the existing resistance to technology literature and attempts to identify reasons for resistance to technology adoption among mid-west university faculty. The study attempts to obtain answers regarding faculty's perceptions of technology adoption as it relates to perceived ease of use, perceived usefulness, opportunity to use, and perceived organizational support.

#### Definition of Terms

**Educational technology:** The study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Richey, 2008, p. 24).

**Instructional technology:** A device used by teachers to instruct students in a more stimulating manner (Lee et al., 2009). Some instructional technology examples would be Microsoft Office, Smart Boards and WebCT.

**Internet:** A computer network consisting of or connecting a number of smaller networks, such as two or more local area networks connected by a shared communications protocol (Oxford English Dictionary, 2012).

**Resistance:** The primary drive to keep things the same over time (O'Neill, 2001).

**Resistance to instructional technology instrument:** An instrument scale used to measure resistance of instructional technology adoption (Siegel, 2008).

**Resistance to technology:** Vested interest of past capital in machinery, skills, and ideas dealing with technology (Bauer, 1997).

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Technology: A system made up of components that involve the act of changing an object from one state to another (Fenner, Goodman, & Griffith 1990).

## CHAPTER 2

### REVIEW OF LITERATURE

#### Introduction

The purpose of the study is to explore resistance to change as it relates to technology. To better understand technology resistance, this chapter will be divided into four sections. First, technology will be defined. Second, educational and instructional technology will be described. Third, resistance to change will be discussed. Fourth, resistance to change in technology will be explained. Finally, descriptions of current resistance to instructional technology studies will be provided.

#### Technology Defined

Technology is a system made up of components that involve the act of changing an object from one state to another (Fenner, Goodman, & Griffith 1990). According to Kurzweil, technology is growing rapidly in its innovations and some are having a hard time keeping up (Kurzweil, 2007). Kurzweil (2007) states, “The telephone took fifty years to be adopted by a quarter of the US population, the cell phone did that in just seven” (p. 19). In this day and age, technology is all around us and the younger generation is becoming more tech-savvy than they were over ten years ago, which is leading to technology being integrated into the classroom (Schrodt & Witt, 2006). To follow is a subsection describing technology as it relates to academic institutions.

#### Educational and Instructional Technology

According to Richey (2008) educational technology is “the study and ethical practice of facilitating learning and improving performance by creating, using and managing



appropriate technological processes and resources” (p. 24). Academic institutions use educational technologies everyday to enhance learning in the classroom and their use has increased dramatically (Lee & Stoel, 2003). According to Dias (1999), educational technology “enriches the activity and enables students to demonstrate what they know in new and creative ways” (p. 11). Educational and instructional technology is used by educators around the globe to help connect students to a different way of learning new ideas (Lee et al., 2009). Instructional technology is a device used by teachers to instruct students in a more stimulating manner (Lee et al., 2009). Instructional technologies are being integrated into many classrooms to expand educational capabilities (Klemz et al., 2003). It has been found that software such as Blackboard or WebCT is effective in enhancing students’ performance (Klemz et al., 2003). According to Davies, Korte, and Lavin (2010) instructional technology will “improve the course, engage the students, and enable them to learn more” (p.2). According to Schrodtt and Witt (2006), instructional technology promotes educational effectiveness and is an innovative way to enhance classroom delivery methods. In addition, students believe the instructors’ use of technology in the classroom has a positive impact on their learning because they take better notes and learn more from the course (Davies et al., 2010).

#### Resistance to Change

According to Sevcik (2004), resistance will not stop the innovation, but in fact slow down the process. Sevcik (2004) uses an example of the British Navy when they were trying to adopt a new cure for the disease scurvy. People did not want to adopt the citrus as a cure and use it on patients so it was put on hold. Over two hundred years later, the cure received full adoption (Sevcik, 2004). If they would have adopted the cure years

earlier, hundreds of people could have survived from the illness. In this instance, the resistance to a new innovation in the medical realm led to a slower advancement process in a cure that involved saving lives and could have potentially been beneficial to the economy at the time (Sevcik, 2004). As you can see, people resist change and have done so for many decades. Resistance to change occurs in many places and has for many years (Dent & Goldberg, 1999). According to Dent and Goldberg (1999) “the notion of resistance to change is credited to Kurt Lewin” (p. 29). Lewin’s idea of resistance to change is much different than how we perceive it today because he was looking mainly at the ‘individual’ and not at the factors involved in the change (Dent & Goldberg, 1999). In 1948, the first known published material about overcoming resistance to change was by Coch and French (1948) and discussed how resistance to change is based on frustration of the individual with strong forces from a group to change (Dent & Goldberg, 1999). We now know that resistance to change involves mainly the individual, but also the people involved and the way the change is being introduced them (Siegel, 2008).

#### Resistance to Technology

According to Berry (2006), resistance to a change in technology is not based on a lack of information, but instead is based on the individuals’ fear of the technology. The fear that Berry (2006) speaks of comes from the individuals anxiety of not wanting to do something wrong or being afraid of learning the new technology. Berry believes there is a Google divide between the ages of people in the workforce (Berry, 2006). There are two sides to the Google divide and they are the pre-Google side and the post-Google side. The pre-Google side is made up of the older generation of workers and the post-Google side is the new and incoming generation of workers. According to Berry, the pre-Google

side should be taking a cue from the post-Google side because they are the voices and minds of tomorrow.

According to Joseph (2010), workers who are in the position to use technology in the workplace will either adopt or not adopt the technology and calls them “adopters or non adopters of the technology” (p. 144). He has found the non-adopters who resist have probably never tried to use the technology or do not know enough about it to become interested (Joseph, 2010). Joseph states some of the resisters do not use the technology at first because they are waiting for the outcome to see if it is worth their time to try to learn how to use it (Joseph, 2010). Some of the non-adopter populations resist the technology because they do not even know what it is or how to use it (Joseph, 2010). According to Joseph, there are many reasons people resist technology. One barrier in people not wanting to adapt is because of the change in layout and systems that they are accustomed to (Joseph, 2010). Once people step out of their comfort zone into something new, they tend to feel uneasy. As technology progresses, changes to the interface or layout must be made in order to look fresh and new. When people are faced with having to use software that has been updated to a new look, they become frustrated because they have relearn where all the functions are and feel overwhelmed. In addition, some resisters of technology feel it costs too much money to obtain and maintain technology software and programs. Another barrier some resisters feel is a confliction with their values and using the technology (Joseph, 2010). Joseph calls this a psychological barrier because the resister believes using the technology is risky and they will usually not adopt. Lack of information is another reason why people resist technology (Joseph, 2010). If the individual knows nothing about the technology or what it is used for, it is likely they will

not seek out to use the technology and therefore not adopt. Changing the way people normally complete work can have a huge impact on their attitudes towards using the new technology. Informing the individual about the technology before it is implemented can help the employee adjust to their new working environment and software (Joseph, 2010).

According to Davis, there are ways to determine an individual's feelings and perceptions towards technology (Davis, 2004). Computer anxiety is one way to evaluate the attitudes of others and this can be done by measuring their level of fear towards using the computer. People who have computer anxiety are not willing to implement a new technology into their daily life, let alone use a computer (Davis, 2004). Computer confidence is the level someone is willing to use a new technology. Readiness for change is a huge factor when measuring resistance to change because if the person is not ready to move forward, they will resist the change (Davis, 2004). Davis believes if someone has tried using technology in the past and it has never worked out for them, they will be less likely to adapt to the new technology. Motivation is also a key factor when measuring resistance to change because if the person is not motivated to implement the new technology, then they have no driving force behind them to do so (Davis, 2004).

According to Craine, the steps taken when implementing a new technology innovation should be taken seriously and a strategic plan should be put into place (Craine, 2007). Many do not think of the emotional side effects that occur when innovations are abruptly put into place without instruction, training or ample time to become prepared for the change. As I mentioned before, when a change arises in technology, it affects people's way of thinking and feeling. People become uneasy and feel as though they have no control over the change. According to Craine there are four steps in the cycle of change

that people face (Craine, 2007). The beginning stage is the comfort zone and this is the state people are in before they take on a big change. In this stage people are usually happy with what they are doing and do not want to try something different. The next stage is the no zone and this occurs when people are being faced with having to make a change. This stage is called the no zone because people usually respond by saying no to the change they are about to encounter. The no zone stage begins in shock, denial, anger and ends in resentment towards the change (Craine, 2007). To calm down while in this zone, it is best to identify how you feel about this change and why, then turn those emotions into a feeling of opportunity coming your way. The next stage in change is the chasm stage. The chasm stage is the middle ground where people have gone forward, know they cannot go back to how it was and wonder how they will achieve success in the future. During this stage some people may develop a form of depression because they do not know where they are going and it makes them tense. Some people try a bargaining method during this stage, hoping they can go back to the comfort zone they once enjoyed. Also, during this stage people feel anxiety towards the future of their jobs and how the technology change relates to their job performance (Craine, 2007). The last stage in the change cycle is the go zone. In this stage, everyone that is involved with the change is prepared to move forward. Steps in this stage include acceptance of the change and excitement to implement the change into their daily work schedule (Craine, 2007). People will go through all of these stages when faced with a big change, but like anything else, each individual will move at a certain pace depending on their outlook.

According to Brown, Chervany and Reinicke (2007), when implementing a new technology innovation into the workplace, having top management on board with the

process plan is a must. Having the leaders involved will strengthen the outcome of the change. Brown, Chervany and Reinicke also believe that communication and knowledge on the technology innovation are two important factors what can make or break the implementation (Brown et al., 2007). Communication within the organization or workplace will help keep employees up to speed on the upcoming advancements and workers can discuss how they feel about the innovation. If the employees are informed about the new technology and its benefits, then they will more than likely adopt to the change quicker than someone who knows nothing. Every employee involved in the technology innovation should know what they are going to be learning and why it is important (Brown et al., 2007). This will help them see how they fit into the picture and how learning the new technology can be helpful to them. Training employees is a procedure that makes all of the difference when innovating new technology. If the employees understand and know how to use the new program or software properly, then they will have a better chance of grasping and implementing the new technology (Brown et al., 2007).

According to Soper, everyone involved in a new technology innovation will be affected in some way (Soper, 2004). All employees have some opinion towards technology and that affects the way they behave when a change occurs. Soper believes having the senior leaders involved will help create a shared vision amongst the whole organization or workplace (Soper, 2004). Leaders need to take part in developing the new innovation plan so that they can also track its success. If the leaders are implementing the technology innovation, they should be able to make sure it keeps working. According to Soper, people often resist what they do not know (Soper, 2004).

When people are challenged by learning a new technology, they feel as though their job is at risk. People become overwhelmed with thoughts of an increased workload which in turn makes the job less enjoyable for them (Soper, 2004). Pushing training on employees could benefit the organization by encouraging employees to learn the new technology. If the employee is prepared when the technology is implemented, they will feel more at ease with their work. Soper's research found a positive relationship between the employee's perception of the new technology and management's support in producing a program to help implement the technology (Soper, 2004). Soper believes organizations who do not overcome resistance to information technology change before the implementation arises will indeed be in for a rude awakening (Soper, 2004).

### Resistance to Instructional Technology

Although instructional technology may create a positive learning environment for students, there are a significant number of teachers who are resisting instructional technology (O'Hanlon, 2009). According to Dias, instructional technology is not like any other tool (Dias, 1999). An overhead projector or a blackboard may take little to no training for a teacher to operate, but instructional technology involving computers and other accessories may need more instruction to use (Dias, 1999). Educators use different kinds of instructional technologies for teaching their students such as PowerPoint, but some educators are not utilizing these tools (Davies et al., 2010). According to O'Hanlon, teachers should be introduced to using the instructional technology slowly and must be aware of the benefits to them and their students (O'Hanlon, 2009). According to Lee and Stoel, perceived usefulness and perceived ease of use strongly influences attitude toward the instructional technology (Lee et al., 2003) In a more recent study, Bruner,

Clark, Kulviwat, Kumar, and Nasco found the perceived usefulness of a technology has a positive effect on the individuals' attitude and perceived ease of use (Bruner, Clark, Kulviwat, Kumar, & Nasco, 2007). Having supportive teachers one another help with the advancements along the way will help make the process run smother (O'Hanlon, 2009). According to Dias, barriers to instructional technology integration include time, training, resources and support (Dias, 1999). Asking teachers to completely change the way they teach students can be difficult. Instructional technology acceptance can occur over time with frequent use and experience (Lee et al., 2003). Some educators have taken advantage of using instructional technology as a time saving device to help them become more organized and have more engaging and focused lectures (Davies et al., 2010). According to Davies, Korte, and Lavin (2010) "technology may enhance the classroom and engage today's student more effectively, most do not believe it replaces the need for a structured, content-driving learning process that is grounded in theory" (p.2).

### Summary of Chapter 2

Chapter two defined technology and reviewed relevant literature. Descriptions of the role educational and instructional technologies play in institutions were discussed. The background of resistance to change was explained along with resistance to technological change. Current studies about Instructional technology were described.



## CHAPTER 3

### RESEARCH METHODOLOGY

#### Introduction

The purpose of the study is to contribute to a better understanding of resistance to technology. More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty employed at a mid-west regional state university. The study employed a one-shot posttest design. Data for this descriptive and correlational study were collected through a questionnaire. The following research questions and hypothesis guide the study:

1. What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
2. What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
3. What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
4. What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
5. How many times does faculty at one mid-western university's utilize instructional technology per semester?

6. How many times does faculty at one mid-western university's utilize instructional technology per week?
7. Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week?

H<sub>0</sub>: There is no statistically significant difference  
between low resistance and high resistance with respect  
to technology usage per week.

H<sub>A</sub>: There is a statistically significant difference  
between low resistance and high resistance with respect  
to technology usage per week.

Chapter Three describes the methods and procedures used to conduct this study. Specifically, the chapter includes: research methods, participants, data collection instrument, data collection procedures, and statistical procedures used to analyze the data.

### Research Method

Due to the nature of this study, descriptive and correlational data were collected from the population using a web-based survey. A web-based survey was used in this study to ensure research validity and by documenting responses in an efficient way. According to Alessi and Martin (2010), "User-friendly software has streamlined the questionnaire design process and simplified the process of collecting and inputting data" (p.122). Further, this study used descriptive analysis to gain knowledge about a specific phenomenon or population, which is one mid-west regional state university full-time faculty and resistance to technology. According to Sloman (2010):

Descriptive analysis involves the direct observation of target behavior in natural context to gather information on contiguous and potentially relevant environmental events, in the absence of experimental manipulation. That is, descriptive analyses identify events that are correlated with the occurrence of some target response. (p. 20)

Correlational studies measure or observe the relationship between two variables. Correlational research was used in this study to examine the relationship between technology perception, attitude and actual use as it relates to technology resistance.

#### Participants

The participants identified for this study consist of one mid-west regional state university full-time faculty. Individuals from each department on campus were asked to participate in this study. According to the university employees 2010 fact sheet, out of 1,718 full-time staff, there are 613 faculty members including chairs of each department (Planning and Institutional Studies, 2010). All 613 full-time faculty members were asked to participate in this study. Participants completed Siegel's (2008) Resistance to Instructional Technology instrument consisting of questions about their perceptions, attitudes, and actual use of instructional technologies. Further, participants were asked about their department, years within the university, gender and age (Appendix A).

#### Instrumentation

One data collection instrument was used for this study. It contains five sections including a demographic section. The instrument was adopted from Siegel's (2008) dissertation entitled *Accepting Technology and Overcoming Resistance to Change using the Motivation and Acceptance Model*. Faculty members were given a survey asking

questions about their perceptions and attitudes towards instructional technology. More specifically, the perceived ease of use, perceived usefulness and perception of organizational support towards instructional technology was measured. Permission to utilize the instrument was obtained by contacting Daniel Siegel (Appendix B).

The following is the summary of constructs measured by Siegel's (2008) Resistance to Instructional Technology instrument. The instrument measures seven constructs: 1) perceived usefulness, 2) perceived ease of use, 3) attitude toward technology, 4) perception of organizational support, 5) actual usage of technology, 6) familiarity of technology, and 7) amount of usage of technology.

#### *Perceived Usefulness Instrument*

The perceived usefulness section measures faculty's perception of the usefulness and level of serviceability or utility of the instructional technology. Questions 1, 2, 4, 5, 6, 8, 9, and 20 address this section and answers were used for research questions 1 and 2. Perceived usefulness was measured by eight items using a 5-point Likert scale with 1 as "Strongly Disagree", 2 as "Disagree", 3 as "Neither Agree nor Disagree", 4 as "Agree", 5 as "Strongly Agree", and N/A as "Not Applicable."

#### *Perceived Ease of Use Instrument*

The perceived ease of use measures faculty's perception of how easy it is to use the instructional technologies and the perception of their own personal technological capabilities compared to how difficult they think instructional technologies are to use. Questions 7, 14, 15, and 26 address this section and answers were used for research questions 1 and 3. Perceived ease of use was measured using four items using a 5-point

## Instructional Technology Resistance Levels among University Faculty 25

Likert scale with 1 as “Strongly Disagree”, 2 as “Disagree”, 3 as “Neither Agree nor Disagree”, 4 as “Agree”, 5 as “Strongly Agree”, and N/A as “Not Applicable.”

### *Attitude Toward Instrument*

The faculty’s attitude towards instructional technology measures how they feel about or towards instructional technology. Questions 10, 12, and 17 address this section and answers were used to answer research question 1. Attitude was measured by three items using a 5-point Likert scale with 1 as “Strongly Disagree”, 2 as “Disagree”, 3 as “Neither Agree nor Disagree”, 4 as “Agree”, 5 as “Strongly Agree”, and N/A as “Not Applicable.”

### *Perception of Organizational Support Instrument*

The perception of organizational support measures the faculty’s perception of how supportive the university is toward the respondent’s use and implementation of instructional technologies. It also measures how faculty perceives the university’s support for students in the use of instructional technology. Questions 11, 13, 16, 18, 19, 21, 22, 23, 24, 25, 27, 28, and 29 will address this section and answers were used for research questions 1 and 4. Perception of organizational support was measured by thirteen items using a 5-point Likert scale with 1 as “Strongly Disagree”, 2 as “Disagree”, 3 as “Neither Agree nor Disagree”, 4 as “Agree”, 5 as “Strongly Agree”, and N/A as “Not Applicable.”

### *Actual Use Instrument*

The actual use of instructional technology measures whether or not the faculty member is currently using the instructional technologies. Question 3 addresses this section and the answer was used for research question 1. Actual use was measured by

using one statement which is “I use instructional technology” with the choices of “yes” or “no.”

*Familiarity Instrument*

The familiarity instrument measures which variety of functions faculty utilize when using instructional technology. Questions 30-37 address this section and answers were used for research question 1. The respondents were asked if they use: “WebCT,” “Microsoft Office,” and “Smartboard.” Familiarity was measured by five items: “Web CT Gradebook,” “Microsoft Word,” “SmartBoard,” “WebCT File Manager,” and “Microsoft PowerPoint.”

*Amount of Actual Use Instrument*

The amount of actual use measures the frequency of instructional technology use by the respondents. Questions asked how often the respondent uses instructional technologies on a daily or weekly basis: “Less than once a week,” “About once a week,” “2 to 3 times a week,” “4 to 6 times a week,” “About once a day,” and “Several times a day.” This portion also asked the number of times instructional technology is used during the semester: “More than twenty times a semester,” “Ten to twenty times a semester”, “Five to nine times a semester,” and “One to four times a semester.” The approximate amount of time spent during each use of instructional technology: “Less than 15 minutes,” “Between 15 and 30 minutes,” “Between 31 and 45 minutes,” “Between 46 and 60 minutes,” and “More than 60 minutes.” Questions 38-40 address this section and answers were used for research questions 1, 5, 6, and 7.

### Demographics Instrument

The demographics instrument measures the characteristics of the respondents. The descriptive information about respondents was measured by five items which are age, gender, length of time they have worked at Eastern Illinois University, department and ethnicity. Questions 41-45 address this section.

### Data Collection

Data for this study was collected during the spring of 2012. In accordance with university regulations, approval from the Institutional Review Board (IRB) was obtained to complete this study on campus (Appendix C). The web-based survey participants completed was created with Survey Central. Next, the email addresses of my human subjects were obtained by using the faculty and staff online directory. An email message was sent to participants describing the purpose of this study and requesting their approval to participate for zero compensation. At the bottom of the email, a link to the web-based survey was provided for the participants to select and open (Appendix D). Once the link was opened, participants were directed to another page that contained the survey. Participants had two weeks to complete the survey. One week after the survey was sent out, participants were notified with a second email message to complete the survey (Appendix E). The maximum time to complete the survey was two weeks and two days. Once the survey was completed, answers to the questions in the survey were calculated and the list with the faculty members' names was shredded.

### Treatment of the Data

After survey answers from faculty members were collected, the data was entered into SPSS. Analysis was done further by using t-tests and descriptive statistics.

	Research Question	Data Analysis Technique
1	<p>What is the level of resistance to instructional technology as measured by Siegel's (200X) Resistance to Instructional Technology instrument among one mid-western university's faculty?</p>	<p>Descriptive Statistics</p>
2	<p>What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?</p>	<p>Descriptive Statistics</p>
3	<p>What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?</p>	<p>Descriptive Statistics</p>



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4	<p>What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?</p>	Descriptive Statistics
5	<p>How many times does faculty at one mid-western university's utilize instructional technology per semester?</p>	Descriptive Statistics
6	<p>How many times does faculty at one mid-western university's utilize instructional technology per week?</p>	Descriptive Statistics
7	<p>Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week?</p>	Independent T-test

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### Summary of Chapter 3

Chapter three described the research methods and procedures used to accomplish the study. Research questions, participants, data collection procedures, and data analysis procedures were outlined. The results of the analysis will be reported in Chapter four.

## CHAPTER 4

### RESULTS

#### Introduction

The purpose of the study is to contribute to a better understanding of resistance to technology. More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty employed at a mid-west regional state university. Data collected for this study were obtained using an online survey reported from 226 full-time faculty members. The information collected from completed surveys was utilized to address the following research questions:

1. What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
2. What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
3. What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?
4. What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?

5. How many times does faculty at one mid-western university's utilize instructional technology per semester?
6. How many times does faculty at one mid-western university's utilize instructional technology per week?
7. Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week?

H<sub>0</sub>: There is no statistically significant difference between low resistance and high resistance with respect to technology usage per week.

H<sub>A</sub>: There is a statistically significant difference between low resistance and high resistance with respect to technology usage per week.

Chapter four begins with the description of population characteristics, followed by the statistical analysis of data to address each research question. The chapter concludes with a summary of the findings.

#### Population Demographic Data

The population identified for this study consisted of full-time faculty members employed at one mid-west regional state university. All full-time faculty members were sent an email (prepared by the researcher) requesting their participation in this study. The email explained the purpose of the study and included the link to the web-based survey at the bottom of the message. Out of 613 full-time faculty members, 226 (37%) completed the web-based survey.

## Instructional Technology Resistance Levels among University Faculty 33

Demographic data was collected from each respondent and participants were asked to identify their gender, age, ethnicity, department, and the number of years they have been employed at one mid-west regional state university. The data in Table 2 summarizes these data by presenting the number and percentage for each category. Of the 226 participants, (n=120, 53%) were male, (n=106, 47%) were female. The range of participants' ages was 50 years to 60 years or higher (n=127, 56%). The ethnic makeup of the population largely consisted of Caucasian (n=212, 94 %). The majority of participants (n=150, 66%) indicated they have been employed at the mid-west regional state university for over six years. Table 3 shows the number of respondents from each department. Education (n=26, 12%) and Technology (n=21, 9%) showed the highest involvement.

Table 2

*Respondent Demographics*

Gender	Number (N=226)	Percent
Male	120	53.1
Female	106	46.9
Age	Number (N=226)	Percent
20 – 30	7	3.1
31 – 40	39	17.3
41 – 50	53	23.5
51 – 60	78	34.5
Above 60	49	21.7
Ethnicity	Number (N=226)	Percent
Asian	5	2.2
African American	9	4.0
Caucasian	212	93.8
Time Employed	Number (N=226)	Percent
Less than 1 year	7	3.1
1 to 3 years	28	12.4
4 to 6 years	41	18.1
Over 6 years	150	66.4

## Instructional Technology Resistance Levels among University Faculty 35

Table 3

*Respondent Departments*

Department	Number (N=226)	Percent
African American Studies	5	2.2
Art	9	4.0
Biological Sciences	13	5.8
Business	16	7.1
Communication Studies	9	4.0
Communication Disorders	5	2.2
Chemistry	3	1.3
Counseling	5	2.2
Education	26	11.5
Economics	4	1.8
English	15	6.6
Family Consumer Sciences	9	4.0
Foreign Language	3	1.3
Geology	6	2.7
Health Studies	4	1.8
History	7	3.1
Journalism	9	4.0
Kinesiology	12	5.3
Library	5	2.2
Math	10	4.4

## Instructional Technology Resistance Levels among University Faculty 36

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Music	2	0.9
Philosophy	2	0.9
Physics	3	1.3
Political Sciences	2	0.9
Psychology	8	3.5
Sociology	5	2.2
Technology	21	9.3
Theatre	3	1.3
Continuing Education	5	2.2



## Reliability of the Data

The instructional technology web-based survey consists of five sections including a demographic section. The instrument was adopted from Siegel's (2008) dissertation entitled *Accepting Technology and Overcoming Resistance to Change using the Motivation and Acceptance Model*. Four scales were used in this survey to measure perceived usefulness, perceived ease of use, attitude toward regarding instructional technology, and perception of support. In the survey, perceived usefulness had eight items, perceived ease of use had four items, attitude toward regarding instructional technology had three items, and perception of support had thirteen items. An internal consistency reliability test for these four scales was conducted based on items that were in the survey. The reliability test was performed in SPSS v19 using the Scale Reliability Analysis function. Table 4 provides the results of the reliability testing in this study. Table 5 provides the results of the reliability testing in Siegel's study.

Table 4

*Internal Consistency Reliability Testing Instrument*

Measurement Scales	Cronbach's Alpha	<i>M</i>	<i>SD</i>
Perceived Usefulness	.87	19.54	4.11
Perceived Ease of Use	.16	12.23	2.42
Perception of			
Organizational Support	.66	49.4	5.94
Attitude Toward	.72	12.27	1.92

Table 5  
*Internal Consistency Reliability Testing Instrument (Siegel)*

Measurement Scales	Cronbach's Alpha	<i>M</i>	<i>SD</i>
Perceived Usefulness	.97	5.05	6.77
Perceived Ease of Use	.93	4.71	5.69
Perception of			
Organizational Support	.88	11.76	4.67
Attitude Toward	.99	3.37	4.50

#### Research Question Results

The specific purpose of this study was to identify resistance to technology levels among faculty at a mid-west regional state university.

*Question 1: What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?*

The frequency of the level of resistance to instructional technology measured in this study can be found in Table 6. Out of 226 respondents, the majority (193, 85%) indicated to be in the low- resisters category.

Table 6

*Resistance to Instructional Technology Levels*

Resistance Levels	Range	Number (N=226)	Percent
Extreme Resisters	0 - 62	8	3.5
Resisters	63 - 84	9	4.0
Low-Resisters	85 – 115	193	85.3
Adopters	116 – 121	14	6.1
Non-Resisters	122 – 145	2	0.9

*Question 2: What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?*

The frequency of faculty's perceived usefulness of instructional technology measured in this study can be found in Table 7. The majority of respondents (171, 75.7%) indicated they use the computer to solve complex tasks, (186, 86.7%) found instructional technology to be useful, over half (157, 69.4%) found instructional technology to increase productivity, (161, 71.2%) found instructional technology improves quality of work, (191, 84.5%) found instructional technology beneficial, (136, 60.2%) say their use of instructional technology is voluntary and (187, 82.7) say they use instructional technology as a tool.

## Instructional Technology Resistance Levels among University Faculty 40

Table 7

*Perceived Usefulness*

I use the computer to solve

complex tasks	Number (N=226)	Percent
Strongly Disagree	10	4.4
Disagree	17	7.5
Neither Agree nor Disagree	26	11.5
Agree	87	38.5
Strongly Agree	84	37.2
Not Applicable	2	0.9

I find instructional

technology useful	Number (N=226)	Percent
Strongly Disagree	1	0.4
Disagree	8	3.5
Neither Agree nor Disagree	14	6.2
Agree	102	45.1
Strongly Agree	94	41.6
Not Applicable	7	3.1

Instructional technology

increases my productivity	Number (N=226)	Percent
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## Instructional Technology Resistance Levels among University Faculty 41

Strongly Disagree	5	2.2
Disagree	20	8.8
Neither Agree nor Disagree	37	16.4
Agree	83	36.7
Strongly Agree	74	32.7
Not Applicable	7	3.1
<p style="margin-left: 40px;">Instructional technology improves my quality of work</p>		
	Number (N=226)	Percent
Strongly Disagree	7	3.1
Disagree	11	4.9
Neither Agree nor Disagree	40	17.7
Agree	107	47.3
Strongly Agree	54	23.9
Not Applicable	7	3.1
<p style="margin-left: 40px;">Instructional technology is beneficial</p>		
	Number (N=226)	Percent
<hr/>		

## Instructional Technology Resistance Levels among University Faculty 42

Strongly Disagree	2	0.9
Disagree	3	1.3
Neither Agree nor Disagree	25	11.1
Agree	117	51.8
Strongly Agree	74	32.7
Not Applicable	5	2.2

My use of instructional

technology is voluntary

	Number (N=226)	Percent
Strongly Disagree	2	0.9
Disagree	23	10.2
Neither Agree nor Disagree	8	3.5
Agree	136	60.2
Strongly Agree	53	23.5
Not Applicable	4	1.8

I do not use instructional

technology as a tool

	Number (N=226)	Percent
Strongly Disagree	127	56.2
Disagree	60	26.5
Neither Agree nor Disagree	11	4.9
Agree	14	6.2
Strongly Agree	9	4.0
Not Applicable	5	2.2

*Question 3: What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?*

The frequency of faculty's perceived ease of use of instructional technology measured in this study can be found in Table 8. A majority of respondents (186, 82.3%) indicated they find computers easy to use, (129, 57.1%) have contacted online or tech support when they use instructional technology, (136, 60%) found learning to use instructional technology easy, over half (142, 62.8%) say they do not become confused when using instructional technology, (181, 80.1%) say they have been offered training to use instructional technology, and (125, 55.3%) found instructional technology easy to use.

Table 8

*Perceived Ease of Use*

Computers are easy to use	Number (N=226)	Percent
Strongly Disagree	4	1.8
Disagree	12	5.3
Neither Agree nor Disagree	24	10.6
Agree	104	46.0
Strongly Agree	82	36.3
I have contacted online or tech support when I use instructional technology	Number (N=226)	Percent

## Instructional Technology Resistance Levels among University Faculty 44

Strongly Disagree	7	3.1
Disagree	33	14.6
Neither Agree nor Disagree	21	9.3
Agree	129	57.1
Strongly Agree	24	10.6
Not Applicable	12	5.3
Learning to use instructional technology was easy for me		
	Number (N=226)	Percent
Strongly Disagree	6	2.7
Disagree	41	18.1
Neither Agree nor Disagree	33	14.6
Agree	95	42.0
Strongly Agree	41	18.1
Not Applicable	10	4.4
I often become confused when using instructional technology		
	Number (N=226)	Percent



## Instructional Technology Resistance Levels among University Faculty 45

Strongly Disagree	36	15.9
Disagree	106	46.9
Neither Agree nor Disagree	36	15.9
Agree	35	15.5
Strongly Agree	4	1.8
Not Applicable	9	4.0
I was offered training to use		
instructional technology	Number (N=226)	Percent
Strongly Disagree	6	2.7
Disagree	11	4.9
Neither Agree nor Disagree	20	8.8
Agree	138	61.1
Strongly Agree	43	19.0
Not Applicable	8	3.5
Instructional technology is		
easy to use	Number (N=226)	Percent
Strongly Disagree	3	1.3
Disagree	31	13.7
Neither Agree nor Disagree	42	18.6
Agree	125	55.3
Strongly Agree	21	9.3
Not Applicable	4	1.8

*Question 4: What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?*

The frequency of faculty's perceived organizational support of instructional technology measured in this study can be found in Table 9. Less than half (100, 44.2%) say their supervisor encourages them to use instructional technology, (123, 54.5%) indicated their immediate supervisor uses instructional technology, (136, 60.2%) say their supervisor does not require them to use instructional technology, half of the respondents (116, 51.3%) indicated their students have the resources and help they need to use instructional technology, less than half (104, 46.0%) reported their students find instructional technology easy to use, (108, 47.8%) reported students like instructional technology, (132, 58.4%) reported their students find instructional technology useful, and (109, 48.2%) reported their students are good at using instructional technology.

Table 9

*Perceived Organizational Support*

My supervisor encourages  
me to use instructional  
technology

	Number (N=226)	Percent
Strongly Disagree	10	4.4
Disagree	23	10.2
Neither Agree nor Disagree	49	21.7
Agree	100	44.2
Strongly Agree	22	9.7
Not Applicable	22	9.7

My immediate supervisor  
uses instructional  
technology

	Number (N=226)	Percent
Strongly Disagree	6	2.7
Disagree	22	9.7
Neither Agree nor Disagree	39	17.3
Agree	86	38.1
Strongly Agree	37	16.4
Not Applicable	36	15.9

My supervisor does not  
require me to use  
instructional technology

Number (N=226)                      Percent

Instructional Technology Resistance Levels among University Faculty 48

Strongly Disagree	4	1.8
Disagree	35	15.5
Neither Agree nor Disagree	31	13.7
Agree	96	42.5
Strongly Agree	40	17.7
Not Applicable	20	8.8
My students have the resources and help they need to use instructional technology	Number (N=226)	Percent
Strongly Disagree	3	1.3
Disagree	23	10.2
Neither Agree nor Disagree	43	19.0
Agree	116	51.3
Strongly Agree	33	14.6
Not Applicable	8	3.5
My students find instructional technology easy to use	Number (N=226)	Percent
Strongly Disagree	1	0.4
Disagree	28	12.4
Neither Agree nor Disagree	63	27.9
Agree	104	46.0

Instructional Technology Resistance Levels among University Faculty 49

Strongly Agree	21	9.3
Not Applicable	9	4.0
My students like instructional technology		
	Number (N=226)	Percent
Strongly Disagree	1	0.4
Disagree	5	2.2
Neither Agree nor Disagree	74	32.7
Agree	108	47.8
Strongly Agree	32	14.2
Not Applicable	6	2.7
My students find instructional technology useful		
	Number (N=226)	Percent
Disagree	2	0.9
Neither Agree nor Disagree	56	24.8
Agree	132	58.4
Strongly Agree	32	14.2
Not Applicable	4	1.8
My students are good at using instructional technology		
	Number (N=226)	Percent

## Instructional Technology Resistance Levels among University Faculty 50

Strongly Disagree	2	0.9
Disagree	24	10.6
Neither Agree nor Disagree	59	26.1
Agree	109	48.2
Strongly Agree	29	12.8
Not Applicable	3	1.3

*Question 5: How many times does faculty at one mid-western university's utilize instructional technology per semester?*

The frequency of faculty's perceived organizational support of instructional technology measured in this study can be found in Table 10. A majority of respondents (184, 81.4%) indicated they use WebCT, Microsoft Office, SmartBoards and other instructional technology more than twenty times a semester, respondents indicated they use instructional technology for more than sixty minutes (74, 32.7%), and between fifteen and forty five minutes (86, 38.1%) each time used.

Table 10

*Amount of Actual Use per Semester*

Instructional technology use per semester:	Number (N=226)	Percent
More than 20 times a semester	184	81.4
10 to 20 times a semester	17	7.5
5 to 9 times a semester	10	4.4
1 to 4 times a semester	15	6.6
Time spent each use:	Number (N=226)	Percent
Less than 15 minutes	31	13.7
Between 15 and 30 minutes	49	21.7
Between 31 and 45 minutes	37	16.4
Between 46 and 60 minutes	35	15.5
More than 60 minutes	74	32.7

*Question 6: How many times does faculty at one mid-western university's utilize instructional technology per week?*

The frequency of faculty's perceived organizational support of instructional technology measured in this study can be found in Table 11. Half of the respondents (117, 51.8%) indicated they use WebCT, Microsoft Office, SmartBoards and other instructional technology several times a day.

Table 11

*Amount of Actual Use per Week*

I use instructional technology:	Number (N=226)	Percent
Less than once a week	24	10.6
About once a week	20	8.8
2 or 3 times a week	17	7.5
4 to 6 times a week	28	12.4
About once a day	20	8.8
Several times a day	117	51.8

*Question 7: Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week?*

The frequency of faculty's perceived organizational support of instructional technology measured in this study can be found in Table 12. Data analysis shows there is a statistically significant difference between low resistance and high resistance with respect to technology use per week.

Table 12

*Independent Sample T-Test*

T-Test for Equality of Means	<i>t</i>	<i>df</i>	<i>M</i>
Equal Variances Assumed	9.084	8	4.75
Equal Variances not Assumed	19.00	7.00	4.75



### Summary

This chapter provided data collection results for the seven research questions that serve as the purpose of this study: a) What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?, b) What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?, c) What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?, d) What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty?, e) How many times does faculty at one mid-western university's utilize instructional technology per semester?, f) How many times does faculty at one mid-western university's utilize instructional technology per week?, g) Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week? Statistics are based on feedback from a web-based survey of 226 (N) full-time faculty members from one mid-western university.

## CHAPTER 5

### SUMMARY, CONCLUSIONS, AND RECCOMENDATIONS

#### Introduction

The nature of this study was to determine resistance to instructional technology levels of full-time faculty at a mid-west regional state university. In the previous chapter, results of data collection were documented. Chapter five will focus on a discussion of the results, a review of limitations, and a proposal of recommendations.

#### Summary

##### *Purpose of the Study*

The purpose of this descriptive study is to contribute to a better understanding of resistance to technology. More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty employed at one mid-west regional state university.

##### *Significance of the Study*

This study contributes knowledge to technology professionals by adding to the existing resistance to technology literature and attempts to identify reasons for resistance to technology adoption among mid-west university faculty. The study obtained answers regarding faculty's perceptions of technology adoption as it relates to perceived ease of use, perceived usefulness, opportunity to use, and perceived organizational support.

##### *Procedures*

The instrument used to collect data was adopted from Siegel's (2008) dissertation entitled *Accepting Technology and Overcoming Resistance to Change using the Motivation and Acceptance Model*. The population for this study consisted of 613 full-

time faculty members from one mid-west regional state university. To achieve participation, this researcher sent an Initial Email to Population (Appendix C) to all 613 participants. The text explained the research project, provided the web-link to the survey instrument, date to respond by, and invited faculty to participate. Participants were notified with a Follow-Up Email to Population (Appendix D) one week after surveys were sent. The text encouraged faculty, who had not yet completed the web-based survey, to participate. At the conclusion of data collection, the population (N) consisted of 226 (37%) full-time faculty members.

#### *Analysis of Data*

Data from this study was collected through an Internet based survey developed in the Eastern Illinois University computer application Survey Central. Data results were analyzed using descriptive statistics (mean, frequency, and percentages). All statistics were generated using the statistical software program SPSS version 19.

#### Findings

The following are the findings revealed after statistical analysis was conducted on the data received from the survey instrument.

Out of 226 respondents, 120 (53%) were male and 106 (47%) were female. One hundred and eighty (80%) respondents indicated they were 40 years or higher. Two hundred and twelve (94 %) respondents indicated themselves as Caucasian; 9 (4%) African-American; and 5 (2.2%) Asian. One hundred and fifty (66%) respondents indicated they have been employed at one mid-west regional state university for over six years.

Research Question 1: What is the level of resistance to instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty? When completing the data collection survey, respondents reported about their perceptions, attitudes, and actual use of instructional technology. The majority of respondents (193, 85.3%) indicated to be in the low-resisters category with the other respondents indicating to be in four different levels: a) Extreme Resisters (8, 3.5%), b) Resisters (9, 4.0%), c) Adopters (14, 6.1%), and d) Non-Resisters (2, 0.9%). The resistance level scale was created from the total of all Likert scale questions. (Table 13)

Table 13

*Resistance to Instructional Technology Levels*

Resistance Levels	Range	Number (N=226)	Percent
Extreme Resisters	0 - 62	8	3.5
Resisters	63 - 84	9	4.0
Low-Resisters	85 - 115	193	85.3
Adopters	116 - 121	14	6.1
Non-Resisters	122 - 145	2	0.9

Research Question 2: What is perceived usefulness of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty? The majority of respondents (171, 75.7%)

indicated they use the computer to solve complex tasks, (186, 86.7%) found instructional technology to be useful, over half (157, 69.4%) found instructional technology to increase productivity, (161, 71.2%) found instructional technology improves quality of work, (191, 84.5%) found instructional technology beneficial, (136, 60.2%) say their use of instructional technology is voluntary and (187, 82.7) say they use instructional technology as a tool.

Research Question 3: What is perceived ease of use of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty? A majority of respondents (186, 82.3%) indicated they find computers easy to use, (129, 57.1%) have contacted online or tech support when they use instructional technology, (136, 60%) found learning to use instructional technology easy, over half (142, 62.8%) say they do not become confused when using instructional technology, (181, 80.1%) say they have been offered training to use instructional technology , and (125, 55.3%) found instructional technology easy to use.

Research Question 4: What is the perceived organizational support of instructional technology as measured by Siegel's (2008) Resistance to Instructional Technology instrument among one mid-western university's faculty? Less than half (100, 44.2%) say their supervisor encourages them to use instructional technology, (123, 54.5%) indicated their immediate supervisor uses instructional technology, (136, 60.2%) say their supervisor does not require them to use instructional technology, half of the respondents (116, 51.3%) indicated their students have the resources and help they need to use instructional technology, less than half (104, 46.0%) reported their students find instructional technology easy to use, (108, 47.8%) reported students like instructional

technology, (132, 58.4%) reported their students find instructional technology useful, and (109, 48.2%) reported their students are good at using instructional technology.

Research Question 5: How many times does faculty at one mid-western university's utilize instructional technology per semester? A majority of respondents (184, 81.4%) indicated they use WebCT, Microsoft Office, SmartBoards and other instructional technology more than twenty times a semester, respondents indicated they use instructional technology for more than sixty minutes (74, 32.7%), and between fifteen and forty five minutes (86, 38.1%) each time used.

Research Question 6: Question 6: How many times does faculty at one mid-western university's utilize instructional technology per week? Half of the respondents (117, 51.8%) indicated they use WebCT, Microsoft Office, SmartBoards and other instructional technology several times a day.

Research Question 7: Question 7: Is there a statistically significant difference between low resistance and high resistance with respect to technology usage per week? Data analysis shows there is a statistically significant difference between low resistance and high resistance with respect to technology use per week. (Table 14)

Table 14

*Resistance Level / Weekly Usage T-Test*

Resistance Level	Number (N=226)	<i>t</i>	<i>df</i>
Non-Resisters	2	9.084	8
Extreme Resisters	8	19.000	7.000

## Discussion

Results for the first research question were produced by categorizing the participants' Likert scale scores into technology use levels on a weekly basis. Scores were placed into levels of technology use ranked from highest to lowest: Extreme resisters, resisters, low resisters, adopters, and non-resisters. Most of the respondents placed in the low-resisters category (193, 85.3%). (Table 15). The outcome to this research question somewhat matched my beginning predictions. I expected many of the participants taking the survey would test in the low-resisters category. I was surprised to find very low numbers of participants in the other categories. Finding show only two participants fell into the non-resisters category, fourteen participants in the adopters category, nine in the resisters category and eight participants in the extreme resisters category. I expected participants' technology use levels would be spread out more, instead of being clumped into one main category.

Table 15

*Resistance to Instructional Technology Levels*

Resistance Levels	Range	Number (N=226)	Percent
Extreme Resisters	0 - 62	8	3.5
Resisters	63 - 84	9	4.0
Low-Resisters	85 – 115	193	85.3
Adopters	116 – 121	14	6.1
Non-Resisters	122 - 145	2	0.9

The second research question sought to determine the perceived usefulness of instructional technology among faculty. Results for the second research question found well over half of participants' to believe computers and instructional technology are useful and use them as a tool. Many of the participants stated they use computers and find them useful. The results to this research questions came out as I predicted mainly because participants completed the survey on the computer and were using it as a tool.

The third research question sought to determine the perceived ease of use of instructional technology among faculty. Results for the third question found many to think computers and instructional technology are easy to use and over half say instructional technology is not confusing for them to use. Results to this research questions came out as I predicted.

The fourth research question sought to determine the perceived organizational support of instructional technology among faculty. Results for the fourth research question found less than half of participants' supervisors encourage them to use instructional technology and over half say their supervisor does not require them to use instructional technology. A little over half of participants' say their students have the resources and help they need to use instructional technology and less than half believe their students find instructional technology easy to use. The results from this research questions were surprising for me. I predicted many participants would indicate they receive some sort of motivation or support to increase technology use in their classroom or daily routine. Results show faculty are not receiving incentives they need to begin learning, incorporating, and using instructional technology. This may be resolved by discussing benefits and uses of



instructional technology with faculty in hopes they take the initiative to learn more.

Participants' also feel their students do not have the resources they need to use instructional technology. On campus, there are many resources for students, faculty and staff to obtain and learn about instructional technology. Classes and one-on-one training sessions are offered many times throughout the week, year round. Perhaps students and faculty do not know about these resources and need to be informed.

The fifth research question sought to determine how many times faculty utilize instructional technology per semester. Results for the fifth research question found well over half of participants' use WebCT, Microsoft Office, SmartBoards and other instructional technology more than twenty times a semester for anywhere from fifteen to forty-five minutes to sixty minutes each time used. Results for this research questions matched my expectations, although I was surprised to find that many participants indicated they use instructional for that length of time each used.

The sixth research question sought to determine how many times faculty utilize instructional technology per week. Results for the sixth research question found half of the respondents use WebCT, Microsoft Office, SmartBoards and other instructional technology several times a day. Results for this research question exceeded my expectations because I did not predict half would indicate they use instructional technologies several times a day.

The seventh research question sought to determine if there is a statistically significant difference between low and high resistance with respect to technology usage per week. Results for the seventh research question found there is a significant difference between low resistance and high resistance. Results for this research question were not surprising.

### Limitations/Delimitations of the Study

Factors affecting the generalizability of the results include:

5. Respondents to the instructional technology questionnaire hold various levels of education and experience in technology; therefore, have various levels of knowledge about different forms of instructional technology.
6. Respondents to the instructional technology questionnaire hold differing roles in the university.
7. This study only collected data from one mid-west regional state university full-time faculty members.
8. This study only measured current instructional technology use.

### Implications of the Study

The results from this study were intended to contribute to a better understanding of resistance to technology. This study contributed to the knowledge that instructional technology is being used inside and outside of the classroom amongst some faculty through mediums such as WebCt, Microsoft Office programs, SmartBoards and others. Faculty perceive computers and instructional technology as helpful tools that enhance the classroom experience. Most of the participants who responded indicated to fall in the low-resisters category.

### Recommendations for Practice

This study brings to light the possibility of a discord between faculty's perceptions of the benefits of instructional technology versus their use of technology for instruction. It is recommended that faculty become more involved in being informed of the benefits of instructional technology use within the classroom and seek training from an on-campus

training service or an online provider. To test if incorporating instructional technology into the classroom is effective, an evaluation can be created and sent out to survey the progress. I recommend on campus training services for faculty and students publicize their tool and resources in a manner where the whole campus community can know. It may be helpful to also inform department chairs of the tools and resources these services offer.

### Recommendations for Further Research

The findings of this study suggest the following concerns which suggest the need for further research.

1. A similar study should be conducted on a larger scale. The study should include both full time and part time faculty to accumulate a larger turnout.
2. Replicate the study surveying faculty from a different university with a larger population.
3. Instead of having the survey solely online as a web-based survey, distribute the survey through another medium that is not technology related. From my experience, the participants who do not use technology that often usually do not end up taking an online survey.
4. Extend the depth of this study to discover the learning style preference of participants. Asking more detailed questions about this topic may lead to further explanation as to why they use or do not use technology.
5. Using the data obtained in this study as a baseline, the study should be replicated in a time-series design to the same population to see if there is a change.

### Conclusion

The purpose of this research study was to contribute to a better understanding of resistance to technology. This research study collected data regarding participants' attitudes, perceptions and actual utilization of instructional technologies such as WebCT, Microsoft Office and SmartBoards. Data was collected through an online survey and analyzed using the statistical software SPSS, version 19. The result of the research revealed the predominant technology use level among faculty was in the low-resisters category and there is a significant difference between low resistance and high resistance with respect to technology usage per week. Recommendations for practice and further research were made based on the findings of this study.

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APPENDIX A:  
RESEARCH INSTRUMENT

Department: \_\_\_\_\_

**Resistance to Instructional Technology Survey**

**Instructions**

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

**1 = I Strongly Disagree** with this statement

**2 = I Disagree** with this statement

**3 = I Neither Agree nor Disagree** with this statement

**4 = I Agree** with this statement

**5 = I Strongly Agree** with this statement

**N/A = Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
1. I use the computer to solve complex tasks	1	2	3	4	5	N/A
2. I think that computers are easy to use	1	2		4		N/A
3. I use instructional technology			YES		NO	
4. I find instructional technology useful	1	2	3	4	5	N/A
5. Instructional technology	1	2	3	4	5	N/A

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increases my productivity							A
6. I do not use technology as an instructional tool	1	2	3	4	5		N/A
7. Interacting with instructional technology requires a lot of mental effort	1	2	3	4	5		N/A
8. Instructional technology reduces the time I spend on unproductive tasks	1	2	3	4	5		N/A
9. Instructional technology improves my quality of work	1	2	3	4	5		N/A
10. Instructional technology is beneficial	1	2	3	4	5		N/A
11. I have contacted online or tech support when I use instructional technology	1	2	3	4	5		N/A
12. All things considered, my using of instructional technology is good	1	2	3	4	5		N/A
13. My students have the resources and help they need to use instructional technology	1	2	3	4	5		N/A
14. Learning to use instructional technology was easy for me	1	2	3	4	5		N/A
15. I often become confused when I use instructional technology	1	2	3	4	5		N/A
16. My immediate supervisor uses instructional technology	1	2	3	4	5		N/A
17. Instructional technology is positive	1	2	3	4			N/A
18. My students find instructional technology easy to use	1	2	3	4			N/A
19. I was offered training to use instructional technology	1	2	3	4			N/A
20. Instructional technology meets my job-related needs	1	2	3	4			N/A
21. My students like instructional technology	1	2	3	4			N/A
22. My supervisor does not require me to use instructional technology	1	2	3	4			N/A
23. My use of instructional technology is voluntary	1	2	3	4			N/A
24. People who are important to me think I should use instructional technology	1	2	3	4			N/A
25. My students find instructional technology useful	1	2	3	4			N/A
26. Instructional technology is easy to use	1	2	3	4			N/A
27. Although it may be helpful, using instructional technology is certainly not	1	2	3	4			N/A

Instructional Technology Resistance Levels among University Faculty 71

compulsory in my job					
28. My students are good at technology	1	2	3	4	N/A
29. My immediate supervisor encourages me to use instructional technology	1	2	3	4	N/A

<b>I am familiar with the following instructional technology</b>		
30. WebCT	YES	NO
31. Microsoft Office	YES	NO
32. Smart Board	YES	NO

<b>I am familiar with the following instructional technology</b>		
33. WebCT Gradebook	YES	NO
34. Microsoft Word	YES	NO
35. Smart Board	YES	NO
36. WebCT File Manager	YES	NO
37. Microsoft Powerpoint	YES	NO

<b>Please select one response to the following questions:</b>
38. I use instructional technologies such as WebCT, Microsoft Office and Smart Boards:
Less than once a week
About once a week
2 or 3 times a week
4 to 6 times a week

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About once a day
Several times a day
39. My use with instructional technologies such as WebCT, Microsoft Office and Smart Boards during the semester would include:
More than twenty times a semester
Ten to twenty times a semester
Five to nine times a semester
One to four times a semester
40. When I use instructional technologies such as WebCT, Microsoft Office and Smart Boards, I usually use it for:
Less than 15 minutes
Between 15 and 30 minutes
Between 31 and 45 minutes
Between 46 and 60 minutes
More than 60 minutes

Please Circle one answer for each statement below.

<b>Please circle one response to the following questions:</b>
41. What is your age?
20-30
31-40
41-50
51-60
Above 60
42. What is your gender?
Male
Female
43. How long have you worked at EIU?

## Instructional Technology Resistance Levels among University Faculty 73

Less than 1 year
1 to 3 years
4 to 6 years
Over 6 years
44. What is your race?
Asian
African American
Hispanic
American Indian
Non-Resident Alien
White
No Response

Thank you for taking this survey!

APPENDIX B:  
PERMISSION TO USE INSTRUMENT EMAIL FROM DANIEL SIEGEL

On 11/5/11 2:01 PM, "K Glaze" <kjglaze@eiu.edu <<http://kjglaze@eiu.edu>> > wrote:

Hello Dr. Siegel,

My name is Katie Glaze and I am technology graduate student at Eastern Illinois University. I am in the process of writing my thesis and have recently read your dissertation "Accepting technology and overcoming resistance to change using the motivation and acceptance model". The focus of my study is to investigate the resistance to change as related to instructional technology adoption and I have found your dissertation to be quite helpful. I was wondering if I could have your permission to use the survey instrument that was used in your research to replicate the study at EIU.

Thank you,

Katie Glaze

---

On Sun, Nov 6, 2011 at 12:56 PM, Siegel, Daniel <dsiegel@fullsail.com> wrote:

Certainly!

Keep in touch! I would like to hear about your research. Do you need a committee member?

Dr. Dan

---

APPENDIX C:  
IRB CERTIFICATION OF EXEMPTION  
EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, IL.

March 13, 2012

Katie Glaze  
School of Technology

Thank you for submitting the research protocol titled, "Resistance to Instructional Technology" for review by the Eastern Illinois University Institutional Review Board (IRB). The IRB has reviewed this research protocol and effective 3/8/2012, has certified this protocol as Exempt from Further Review. The protocol has been given the IRB number 12-068. You are approved to proceed with your study.

The classification of this protocol as Exempt from Further Review is valid only for the research activities and subjects described in the above named protocol. IRB policy requires that any proposed changes to this protocol must be reported to, and approved by, the IRB before being implemented. You are also required to inform the IRB immediately of any problems encountered that could adversely affect the health or welfare of the subjects in this study. Please contact me, or the Compliance Coordinator at 581-8576, in the event of an emergency. All correspondence should be sent to:

Institutional Review Board  
c/o Office of Research and Sponsored Programs  
Telephone: 217-581-8576  
Fax: 217-581-7181  
Email: [eiuirb@www.eiu.edu](mailto:eiuirb@www.eiu.edu)

Thank you for your cooperation, and the best of success with your research.

Richard Cavanaugh, Chairperson  
Institutional Review Board  
Telephone: 217-581-6205  
Email: [recavanaugh@eiu.edu](mailto:recavanaugh@eiu.edu)

APPENDIX D:  
INITAIL EMAIL TO POPULATION

Dear Eastern Illinois University Faculty Member:

I am conducting a research study to examine resistance to technology use (IRB: 12-068). Conducting this research study partially fulfills my requirements for my Master's degree in Technology with an emphasis in training and development from Eastern Illinois University in Charleston, IL.

The purpose of this study is to contribute to a better understanding of resistance to technology. More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty.

I have posted a web-based questionnaire that I would like you to complete for this research project. The questionnaire is available now through April 26, 2012. I would ask that you respond anytime before the ending date. Completing the questionnaire should take no longer than 10 minutes. Your responses will be kept confidential and participants will remain anonymous. Your personal identity is NOT asked to be revealed or connected to your responses.

Informed consent will be indicated by your completion and submission of the questionnaire. After the answers are collected, the data will be entered into SPSS to be analyzed further. Participation is voluntary and I do not see any foreseeable risks for participating. Potential benefits subjects and society may receive as a result of participating in this research would be knowing more about perceptions and attitudes towards instructional technology and how they relate to actual use or non use of the technology. If you would like a copy of the study's results, please send me an email.

Your professional input is vital to the success of this research study. I urge you to take time out of your busy schedule to complete this questionnaire before April 26, 2012. If you have any questions or comments I may be contacted at [kjglaze@eiu.edu](mailto:kjglaze@eiu.edu). Thank you in advance for your help with this research project. To complete the survey, please click on the link below.

<http://www.eiu.edu/cats/tech/kjglaze/survey.php>

Sincerely,

Katie J. Glaze  
Graduate Student, Eastern Illinois University  
[kjglaze@eiu.edu](mailto:kjglaze@eiu.edu)

Dr. R. Lance Hogan, Assistant Professor  
Advisor, Eastern Illinois University  
[rlhogan@eiu.edu](mailto:rlhogan@eiu.edu)



APPENDIX E:  
FOLLOW-UP EMAIL TO POPULATION

Dear Eastern Illinois University Faculty Member:

I recently sent you an email requesting your participation in a research study being conducted by a graduate student at Eastern Illinois University. The purpose of this study is to contribute to a better understanding of resistance to technology (IRB: 12-068). More specifically, the focus of the study is to investigate the resistance of instructional technology among faculty.

If you have already responded to the questionnaire, thank you and please disregard this message. If not, I urge you to take a moment and answer the questions before April 26, 2012. Completing the questionnaire should take no longer than 10 minutes. Your responses will be kept confidential and your personal identity is NOT asked to be revealed or connected to your responses.

Your expertise, experience, and professional input are vital to the success of this research study. To complete the survey, please click on the link below.

Thank you,

Katie J. Glaze  
Graduate Student, Eastern Illinois University  
kjglaze@eiu.edu

Dr. R. Lance Hogan, Assistant Professor  
Advisor, Eastern Illinois University  
rlhogan@eiu.edu

<http://www.eiu.edu/cats/tech/kjglaze/survey.php>