

How Does Mindset Affect A Teacher's Implementation of EdTech Systems?

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Overview

Across the United State (U.S.) and other countries around the world, large sums of money are invested to integrate new technologies in schools. (Al-Zaidiyeen, Mei & Fook, 2010) With public schools making up the majority of K-12 educational institutions, tax payers' dollars bare much of the burden to fund the increasing cost of technology integration in education (NCES, 2013; Jonhson, 2011) In the U.S., spending on educational technology (ET) is estimated to be over \$6.7 billion, with K-12 education consuming over \$5 billion of the total expense. (Mccandles, 2015 & Kleiman, 2000) Additionally, U.S. private sector investment in ET continues to move in an upward trend, with expenses estimated to reach over \$2.5 billion annually. (Wan & McNally, 2015) While this data show that ET expense will continue to rise at a steady pace (NASBO, 2015), the need to assess and measure the success and impact of these educational technologies, is a growing topic. (Johnstone, 2010) An important question to this growing topic is how teachers' impact the success of educational technology systems in the classroom. (Zhao, 1999; Lu & Overbaugh, 2009; Johnstone, 2010)

Statement of the Problem

Johnstone (2010) stated that a critical variable that affects the use and success of ET system is the people using the system. Within a classroom, the people directly affecting the use and success of ET systems are teachers. (Rehmat & Bailey, 2014) With massive investments in ET systems, it is argued that schools, teachers and administrators do not know the true cost of ET systems. (Johnstone, 2010) Furthermore, many studies have been carried out to determine the salient factors to implementing ET systems in the classroom. (Zhao, 1999; Lu & Overbaugh, 2009) However, rapidly changing technologies and other educational priorities, create an ever-changing educational landscape that presents challenges to determining success factors of ET systems that have stood the test of time. (Rehmat & Bailey, 2014; Zhao, 1999) With many variables related to implementing

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successful ET systems, understanding why teachers fail to utilize ET systems in the classroom continues to be a problem many researchers try to explain.

Review of Literature

Implementation of ET systems has been studied in various formats with wide ranging data and scope. (Helms, 2016) Similarly, there have been numerous studies carried out on the effects of mindset and intended outcomes. (Mindsetkit.org, 2015) Additionally, there have been numerous studies conducted related to, identify teachers' impact on ET use in the classroom, teachers' attitudes and perspectives towards classroom ET, cost of ET, and factors that promote the development successful ET systems. For example, Jerad Cox et al., (2013) studied teachers desire to improve their classroom environment through innovation. This study discussed the topic of teachers having control over technology innovation and their attitudes toward implementing systems. Although this study focused on teachers, attitudes and technology integration in the classroom, it did not specifically focus on teacher's mindset and how mindsets affect teachers' implementation of classroom ET system implementation.

Naser Jamil Al-Zaidiyeen (2010) conducted a closely aligned studied of teacher's attitudes towards the use of Information and Communication Technologies (ICT) in the classroom. The study surveyed over 650 teachers across the country, Jordan, by random selection. The teachers were asked various questions to reveal perspectives and attitudes towards ICT. The outcome of this data was used to study the correlation of teachers' attitudes and perspectives regarding ICT in the classroom. Al-Zaidiyeen's findings suggested that there is a positive relationship between teachers' attitudes towards ICT and its use in the classroom. (Al-Zaidiyeen, Mei & Fook, 2010) Other related studies include: Yong Zhao's (1999), study of conditions for technology innovation; Ruiling Lu's (2009), study of school environment and technology implementation in K-12 classrooms; Anne Kosh's (2012), evaluation of pre-service teachers' ability to implement classroom technology based

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on their experiences, and Abeera Rehmat's (2014), study of technology integration in a science classroom and pre-service teachers' perception.

Although these studies revealed that a teacher's attitude and perspective regarding ET systems do indeed have a positive effect on technology use in the classroom, not all studies focused on whether the ET systems use in the classroom were successful. Additionally, the aforementioned studies covered a diverse scope and did not discuss the impact of teachers' mindsets on ET systems in the classroom. Furthermore, a number of studies that focused on mindset are quantitative and did not consider common themes across participants. This review of literature, along with deep searches for qualitative studies that focused specifically on how teachers' mindsets impact the implementation of ET systems in the classroom, produced limited content. This suggests that there is a gap in literature specific to the combination of the two central topics this study aims to understand.

Purpose of the Study

Mariam (2016) defines mindset as a particular way of thinking: a person's attitude or set of opinions about something. Carol Dweck is a famous Development Psychologist who studied the impact of mindset and its correlation to achieving success in an educational setting. (Carol Dweck, 2015) Dweck's decades of research on mindset, show that a person's mindset is a great predictor of future success. (Baer, 2014) Dweck's research showed that those who believe they could develop certain skills or produce certain results, out performed those who believed they could not. (Dweck, 2015) Similarly, Stewart Woodcock and Wilma Vialle (2016) study of pre-service teachers, found that teachers' beliefs shaped their attitudes and had a direct connection between those that produced high student achievement and those that did not.

Teachers' knowledge and beliefs greatly impact their practice, learning, and ultimately their classroom. (Rehmat & Bailey, 2014) Therefore, the purpose of this qualitative study is to

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specifically focus on how the mindset of a teacher impacts successful implementation of ET systems in the classroom. This study will specifically aim to provide insight on how a teacher's mindset towards ET systems changes over time, affects his or her use of ET systems, and impacts the use of ET systems in the classroom. At this stage in the research, the impact of a teacher's mindset and her/his use of technology in the classroom will be generally defined as Dweck's Theory. (Dweck, 2015)

Research Questions

This qualitative research study aims to understand how mindset of a teacher impacts the successful implementation of ET systems in the classroom. To achieve this target, throughout this research study, selected teachers will be observed and asked various questions to uncover possible themes, trends, ideas, feelings and answers regarding the following overarching and sub-questions:

1. How does the mindset of a teacher impact successful implementation of ET systems in the classroom?
 - 1.1. How does past experiences of failed ET systems affect teacher's use of new technology systems and implementation?
 - 1.2. What factors contribute to the successes and challenges to teachers integrating ET systems in the classroom?
 - 1.3. How does a teacher's perspective of ET systems change over time?
 - 1.4. How does a teacher's understanding of ET systems affect his or her use and implementation of the ET systems in the classroom?

Significance of the Study

A considerable amount of public dollars are used to fund ET systems each year with limited results of success and true cost of these systems. (McCandles, 2015 & Kleiman, 2000) Teachers are essential components to the implementation of pedagogical systems in the classroom. (Rehmat & Bailey, 2014) Studies of mindset show that those with positive attitudinal mindsets are more likely

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to produce desired outcomes. (Dweck, 2015) Therefore, by understanding the mindset of teachers regarding ET systems, future administrators and teachers may gather invaluable pieces to the puzzle to better design ET systems that are successful and sustainable. Furthermore, improving ET use in the classroom will therefore improve the impact of financial investments in ET systems and overall education in the classroom. (Krueger, 2013)

Theoretical Framework

The theoretical framework that will guide this study is grounded theory coupled with constructivist principles. Grounded theory provides a different end-point by discovering a theory or theories grounded in information from participants. (Creswell, 2013 p.65) Similarly, the constructivists believe that meaning is derived from the deliberate studies of knowers in the world. (Schwandt, 2015 p. 265) Using grounded theory as a framework, detailed research will be gathered via interview questions and observations to uncover the meaning of this study. Utilizing constructivists' principles, this study will not impose a priori theory or assumption. The data gathered through this qualitative research process will be used to form categories, groups or common themes in the data collected from participants. (Lewis, 2015) As the categories, groups and themes develop, it is expected that the data collected from the participants will guided the research to its end-point to make assumptions, provide meaning and establish generalizations in an inductive manner. (Lewis, 2015; Creswell, 2013)

Statement of Resources

To successfully carry out this qualitative study, a number of resources will be needed. These resources, include but are not limited to; interview participants, to gather responses and information; coding software, to develop meaning of data through the construction of groupings, categories, and patterns, and a research professor, who will serve as an external auditor of the entire project to ensure validity. (Saldaña, 2015; Creswell, 2013 p.202) Additional resources may also include,

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Skype, Google Apps, email, mailings and other supplies and systems to administer this study. A detailed budget can be found in *Appendix A*.

Research Methodology & Interpretive Framework

Research Design

One of the most important components to conducting this study is gaining access to teachers in the classroom. To gain access to these teachers, it will be critical to identify various schools and seeking approval from gatekeepers, such as principals and other administrators. (Creswell, 2013 p. 187) The study will target a random sample of 20-30 teachers, in New York and New Jersey Publics schools, to reach a saturation point where no new information is being heard or observed. (DePaulo, 2000) In order to obtain access to these teachers, direct phones, email and proposals will be sent to principals and administrators of various schools in New Jersey.

As an educator for nearly a decade, I have experienced being in the classroom, using innovative ET systems and working with students with varying skills and abilities. These experiences have allowed me to understand the challenges and benefits ET systems can produce in a classroom. Taking these experiences and assumptions in mind, it is important to not impose personal thoughts and prior experiences on the participants as this may create bias and unreliable data, as the researcher. (Creswell, 2013, p. 188)

Research Methods and Approach

Observations and interviews will be the main research methods employed during this qualitative study. Prior to conducting this research study, all necessary steps will be taken to obtain permission from the Institutional Review Board. (Creswell, 2013 p.187) All participating teachers will be observed and interviewed. The observation process will include a full recording of the teacher's lesson. The purpose of each recorded observation will be to gather information regarding each teacher's, body language, use of technology, activities, and actions during an active lesson. During the interview process, each teacher will be asked to answer a specific series of open-ended

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questions. The open-ended questions can be found in the *Appendix B*. To ensure ethical control, participants' names will be withheld from documentation. Additionally, the participants' approval will be gained before publishing any responses. (Creswell, 2013 p.208)

Producing qualitative reliability and validity in the findings of this research study is an essential component. (Creswell, 2013 p.201) To ensure qualitative reliability, this study will employ strict research protocols for observations, interviews, coding and analysis. The research protocol can be found in *Appendix C*. To ensure validity, this study will use: data triangulation to examine evidence and building justification for themes; member checking to verify accuracy of responses and meaning during interviews, and rich thick description to set the context and experience for the reader. (Creswell, 2013 p.274)

Research Analysis

It is likely that large quantity of rich video, text and image data will be collected throughout the data collection process. Therefore, to effectively analyze and interpret the data to identify findings, a winnow technique will be employed to identify at least five themes, categories or trends. To winnow the data, the researcher will analyze the data and focus on important pieces, while disregarding other parts. (Creswell, 2013 p. 194) During the winnowing process, data will be grouped into themes and categories for analysis, using coding software.

Conclusion

Large sums of money, time and effort are spent annually to fund ET system implementation. (Krueger, 2013 p.2) Schools, administrators, and teachers should be armed with the knowledge to ensure that their time, effort and their funds, as taxpayers, are being used wisely with the implementations of successful ET systems. (Krueger, 2013 p.2-3) This qualitative research study aims to provide educational stakeholders with invaluable knowledge that could be a link to this implementation puzzle by uncovering how the mindset of a teacher impacts ET systems in the classroom.

Appendix A: Budget

Item Line	Duration/Quantity	Estimate Cost
Skype Account	Unlimited	\$0.00
Google Apps Account	Unlimited	\$0.00
Email account for emailing	Unlimited	\$0.00
Coding Software	1 Year	\$100.00-\$200.00
Travel	10 schools x 30 miles (300 miles)	\$50.00
Professor	1 Year	\$0.00
Notebook and Pens	5	\$10
Participants Incentives	10 Gifts card \$20.00	\$200.00
Video Recording	1 Year	\$100.00
Voice Recording	1 Year	\$40
Phone Usage	1 Year	\$100
Food and Beverages	1 Year	\$100
Miscellaneous	1 Year	\$200
Total	1 Year Project Timeline	\$1000

Appendix B: Interview Questions:

1. Ice-breaker: So tell me a little about yourself.
2. How would you describe your experiences using technology in the classroom thus far in your teaching career?
3. How would you describe your mindset towards implementing technology systems in your classroom during your first year of teaching, compared to where currently are in you car? If you are a first-year teacher, compare your pre-service teaching year to where you are now.
4. Can you describe two technology systems that you have successfully used in your classroom and to explain why and how they were successful?
5. What were your thoughts about these successful technologies before and during your use?
6. Can you describe two technology systems that have failed in your classroom and explain why and how they were failures?

Appendix C: Research Protocol

Observations

- Each teacher will be notified prior to being observed.
- Each observation will last approximately 30 minutes
- The research must ensure that he or she is in not way impacting the lesson with the recording device or his or her position in the room.
- Each observation will record the entire lesson.
- In the event of disruption to the lesson for unforeseen reasons, the observation must be rescheduled to capture a complete lesson.

Interviews (Creswell, 2013 p.194)

- Each teacher will be notified prior to being interviewed.
- Each interview section will be digitally recorded and transcribed immediately by the researcher
- The date, place, interviewer and interviewee will be recorded during each interview.
- The interviewer will start with an ice-breaker and
- The interviewer will ask each interviewee the same series of open-ended questions as prescribed by this research study.
- During the interview process the research shall also take notes include, facial expression, body language and thoughts

Coding and Analysis (Creswell, 2013, p. 195-196)

- Video, audio and written data will be coded using a qualitative coding software such as ATLAS.ti, QDAP, NVivo or the like
- Data analysis will progress as follows: Raw data, organizing and preparing the data, reading through all the data, coding the data in 5 consistent themes or descriptions, grouping themes and descriptions, and determining meaning.

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