Running Head: Teacher Attitudes towards New Technology

Teacher Attitudes towards New Technology

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**1. Introduction**

The scene opens on a teacher in-service being held during fifth period at a local high school. The subject is iRespond, the clicker system being introduced during the school year. A newer teacher in her twenties excitedly asks questions of the presenter. Her veteran colleagues roll their eyes and mutter about one more thing they are being forced to attempt on top of all of the other paperwork already piling up.

This scene took place in a training I was in several years ago. I was the excited newer colleague looking forward to exploring new technology. My veteran colleagues were amazing teachers, who I looked up to, and I was more than happy to assist them with learning the new system but they were adamantly opposed to having to deal with one more thing. At the time, I was surprised by their attitudes; however, as I have journeyed through a few more years of my teaching career, I have found this opposition to new technology to be more common than I had supposed.

While technology offers us amazing opportunities as teachers, if we fail to implement it in our classrooms, the money is wasted by districts. Magen-Nagar and Peled (2013) found that “teachers’ relevant beliefs are significant vis-à-vis their attitudes towards incorporating ICT in teaching. These include positive beliefs regarding teaching in a technological environment as contributing and positive, positive beliefs regarding the expectations of educators to teaching in a technological environment as part of the learning routine, and strong beliefs regarding the perception of control for teaching in a technological environment (p.18-19).” This need to understand what leads to positive educator beliefs is what led to the need for this study. Determining teachers' attitudes towards new technology by their age and experience levels will open the door to the potential for differentiated training opportunities.

**2. Research Problem**

While a wealth of information exists on teacher training and the implementation of new technology, it is clear that not enough has been done to research the direct impact between teacher ages and experience levels and their attitudes towards new technology implementation, or the potential for differentiated training based on teacher attitude, age, and experience level. Without more efficient training, this new technology that districts pour millions of dollars into could be wasted.

**3. Literature Review**

**3.1. Definitions and Descriptions of Topic**

As the topic of teacher attitudes towards new technology is addressed, it is important to define some terms and clearly describe the topic. Teacher age will be categorized into various ranges, namely 21-30 years, 31-40 years, 41-50 years, 51-60 years, and 61 years and up. Teacher experience will be defined as number of years in the classroom designated as a teacher according to Georgia Professional Standards Commission definitions. The specific teaching experience ranges utilized in this study are 0-4 years, 5-10 years, 11-15 years, 16-20 years, 21-25 years, and 26 years and up. Technology in the classroom can be expanded to include almost anything; however, for the purposes of this study, new technology will be defined to include new computer programs, new classroom clickers, and different means of utilizing existing electronic devices.

**3.2. Research Findings on Teacher Age and New Technology**

Most research on teacher attitudes towards new technology centers on relationships between teacher age and openness to new technology in the classroom. Kulkarni (2012) examined the relationship between teacher gender, age, computer experience, and computer ownership and attitude towards new technology in Goa. Overall, Kulkarni found that while gender had no significant impact on teacher attitude towards new technology, teacher age, computer experience, and ownership did. Younger teachers tended to be more positive towards new technology as did those teachers with more years of computer experience and those who owned a computer of their own.

Another study by Kuskaya Mumcu and Kocak Usluel (2010) in Turkey examined the usage of information and communications technologies in vocational and technical schools by teacher age, level of education, opportunity of access to computers, and ways of learning computers. They found that most teachers were utilizing information and communications technologies for purely managerial uses rather than instructional uses and that this increased as teacher age increased. Those teachers taught how to utilize information and communications technologies at the university level utilized these technologies more frequently than those teachers whose only training came from in-service trainings at the local school (pg. 104). This would seem to indicate that more in-depth training leads to more efficient utilization of technology for instructional purposes.

Bunch, Robinson, and Edwards (2012) studied the relationship between agriculture teachers’ self-efficacy, outcome expectation, interest, and their use of interactive whiteboards. This study was conducted in Oklahoma and concluded that as teachers’ ages increased, their corresponding levels of self-efficacy and outcome expectation decreased as regards their use of interactive whiteboards in the classroom. This would seem to indicate that older teachers who are not considered “digital natives” seem to have a more difficult time incorporating new technology effectively without corresponding training opportunities and ongoing support.

A study regarding teacher age and attitude towards new technology was done by Kotrlik and Redmann (2009). Kotrlik and Redmann examined several variables in teachers’ technology adoption, including technology anxiety level, perceived barriers to technology adoption, resources available to the teacher, training sources, age, years of experience, and gender (pg. 47). Overall, Kotrlik and Redmann found that age and years of experience did impact teacher attitudes towards new technology implementation, but so did training resources and perceived barriers to adoption.

Most recently, a study regarding teacher age and attitude towards new technology was done by Elsaadani (2013) and explored the direct relationship between teacher age and attitude towards new technology. Elsaadani examined a population of over four hundred teaching staff with a mean age of thirty-five utilizing a survey method. Elsaadani concluded that there is a correlation between teacher age and attitude towards new technology implementation, and he advocated that this contrast in teacher attitude towards new technology by age group be taken into account when providing training opportunities for teachers.

**3.3. Research Findings on Teacher Efficacy and Attitude and New Technology**

Moore-Hayes (2011) conducted a study in Canada on the interaction between preparedness to integrate technology into their classroom and positive self-efficacy beliefs. Utilizing a Likert scale survey, pre-service and in-service teachers ranked their perceived efficacy about technology integration. Moore-Hayes found that both pre-service and in-service teachers felt inadequately prepared to evaluate and select software and to select and utilize assistive technologies (p. 10). In an open-response portion of the survey, Moore-Hayes received responses regarding the inadequacy of teacher preparation and in hands-on training for in-service teachers.

Rohaan, Taconis, and Jochems (2012) conducted a study in The Netherlands of over three hundred primary school teachers regarding their subject matter knowledge of technology and their pedagogical content knowledge of technology. They found that while subject matter knowledge of technology was fairly high, actual pedagogical content knowledge of technology was fairly low. Rohaan, et al. also found that subject matter knowledge is a necessary base for pedagogical content knowledge and that both types of knowledge directly contribute to teacher efficacy and attitude. “Furthermore, the positive correlations between teachers’ confidence (self-efficacy) and attitude on one hand, with the frequency of technology activities on the other, suggest that the enhancement of teachers’ confidence in technology teaching and/or attitude towards technology will increase the frequency of technology activities (p. 278).”

Yeung, et al. (2012) conducted a study on the mandatory inclusion of digital technology into Singaporean schools utilizing a survey of pre-service teachers regarding compliance with the mandate, sense of competence, value of using technology, and frequency of application of technology within their classrooms (p. 861). Yeung, et al. found that compliance did not correlate with competency. They further found that perceived value of technology integration and frequency of application of technology were positively correlated. Thus, while mandating technology use does not necessarily increase teacher competency, a teacher’s own attitude towards technology will increase technology use within the classroom.

Miranda and Russell (2012) found that there are four predictors for teacher-directed student use of technology within a classroom. The first of these is teachers’ experience with technology. The second is that teachers believe that technology is beneficial to meet instructional goals. The third is that there is a perceived importance of technology for teaching. The final predictor is that experiencing obstacles to technology integration is a deterrent to teacher use of technology in the classroom. Zhang and Xu (2011) conducted a study of college professors and also found that willingness to accept new technologies was directly linked to the belief that the new technology would be beneficial to meet instructional goals.

**3.4. Research Findings on Teacher Training and New Technology**

One major study addressing teacher training and new technology was done by Anderson and Williams (2012) and focused largely on agriculture teachers in Texas and their attitude towards new technology. What Anderson and Williams found overall was that while teacher age did impact attitude towards new technology, what could act as a more significant impact was the opportunity for in-depth and ongoing training on new technology.

Ageel (2012) offers a position paper on teacher training and new technology. Ageel contends that the main obstacle to a better integration of information and communications technologies at the university level is the attitudes of teachers towards the new technology. In his study, Ageel aims to change the attitude of teachers towards technology by advocating involving them in virtual learning environments themselves. Ageel concludes that by offering teachers an opportunity for continuous interaction with new technology, attitudes will change and more technology infusion will take place in modern classrooms.

Isman, Abanmy, Hussein, and Al Saadany (2012) conducted another study on teacher attitudes towards new technology and training in Saudi Arabia as concerns interactive whiteboards in the classroom. They found that teachers are in need of an ongoing professional development program to facilitate their use of interactive whiteboards in the classroom as well as student understanding and utilization of these tools.

Konstantinos, Andreas, and Karakiza (2013) conducted a study in Greece on the introduction of ICT into primary schools by ICT teachers. Although many of the ICT teachers were adequately trained to incorporate new technology into their own courses, there was limited interaction with teachers of other subjects such that the technology integration was largely limited to technology courses.

**3.5. Research Findings on Changing Teacher Training**

Singh (2013) evaluated the changing nature of technology integration in teacher education and asked if this integration was an infusion or a delusion. She found that while technology was deemed state of the art in the schools she observed, true integration of technology in the teacher education programs themselves were limited. Singh states, “The technology skills of the teachers must be sharpened to make them more proficient as this is not only related to their own attitude but also with the attitude of their students towards technology integration in the instructional transactions (p. 153).”

Kumar and Vigil (2011) conducted a survey of pre-service teachers who were digital natives, “people born after 1984 who have grown up with digital technologies (p. 144).” They found that even digital natives are not being equipped with how to utilize new Web 2.0 tools in their academic lives. While they are incredibly familiar with using these tools in a social landscape, they had very little experience working with tools such as social bookmarking or multi-user virtual environments.

Rowley and Dunbar-Hall (2012) summarized the introduction of ePortfolios into music education programs at an Australian university. This introduction took place over the years 2009 to 2011, and students in the programs were required to complete simple ePortfolio requirements to more complex assignments, such as filming and editing material as demonstration. By integrating the ePortfolio and curriculum mapping throughout the degree program, students were offered the opportunity to present their work in a different and more technologically advanced medium.

Brooks and Gibson (2012) offer a similar perspective on teacher training and attitudes towards technology. Brooks and Gibson advocate a hands-on and technology integrated method of teacher training in order to assist teachers in understanding how to better utilize technology in their classrooms. Brooks and Gibson point out that in a digital age, teachers should be trained in a digital manner. Without that type of training, technology implementation in the classroom will be limited, and teachers will maintain a negative attitude towards new technology. Shih-Hsiung (2012) offers a similar conclusion that technology should be integrated into core method courses for pre-service teachers and not limited to an isolated course on technology.

Illingworth (2012) offers a different perspective on teacher training. He advocates that training for beginning teachers should move from that offered at the university and instead should focus on hands-on, relevant training received on the job.

**4. Research Questions**

What impacts do teacher age and experience level have upon their attitude towards new technology implementation in the classroom? Additionally, are there particular types of training that are preferred by teachers with different ages and/or experience levels?

**5. Methodology**

**5.1. Participants and Design**

Participants for this study came from a high school in a northern suburb of Atlanta. The Georgia Department of Education (2013) gives this high school’s enrollment as 1,806 in 2009-2010 with 108 teachers, 11 support personnel, and 5 administrators. Less than ten percent of the student population is made up of special education students and less than one percent is listed as ESOL students. Twenty-five percent of the student population are eligible for free or reduced lunches. As such, this high school serves mainly middle class students. This high school typically ranks in the middle of the district in terms of test scores.

The research design for this study is that of a quantitative online survey hosted by Google Forms (see Appendix A for questions) with an optional qualitative question addressing preferred methods of receiving training on new technology. The survey was opened and the link communicated to faculty at this high school in January and February 2014. The survey should have taken no more than five minutes of each teacher’s time, and while encouraged to take it, no teacher was under any mandate to do so. Additionally, teachers were offered the opportunity to take the survey on paper instead with the researcher on any Wednesday afternoon during the time the online survey was open. The survey protocol is included in Appendix A to this report. Participants’ information will remain anonymous as their responses were recorded within Google Forms and results emailed to the researcher. No participants opted to take the survey on paper, and therefore, no anonymity of these types of responses was required.

**5.2. Materials and Measures**

Materials to be utilized in the interview process included the survey protocol included in Appendix A. Once approval was gained from the school district and the Kennesaw State University internal review boards, the survey was sent via a Google forms link to each faculty member at the designated high school. Additionally, the option to take the survey one-on-one with the researcher on Wednesday afternoons during that time frame was made available.

**5.3. Data Collection and Procedures**

The surveys utilized in this research were collected over the month of February 2014, with fifty teachers from the designated high school referenced in the Participants and Design section above having responded at some point during the four week period. The survey stayed open and active for a period of four weeks in February 2014 such that as many responses as possible were collected. Additionally, participants not wishing to take an online survey were given the opportunity to take a paper survey with the researcher so that additional responses could be collected. No teachers at the designated high school took advantage of this option. Given the brief nature of the survey, the target was at least a thirty-five percent response rate, approximately forty-three teachers. This target was reached and surpassed with fifty teachers responding.

Once the four week period closed, responses were compiled according to age and experience level. At that time, a Pearson correlation analysis was conducted to examine the relationship between age/experience and attitudes. Additionally, the eleventh question of the survey offered participants an opportunity to submit their own comments on teacher technology use and training. These comments were compiled for anecdotal use and to supplement the quantitative findings of the study.

When teacher ages were coded into 1 (21-30 years), 2 (31-40 years), 3 (41-50 years), 4 (51-60 years), and 5 (61+ years), the mean was 2.66 indicating an average age in the sample of the late 30s. Standard deviation for this computation was 1.15.

|  |  |
| --- | --- |
| *Age Range* | |
|  |  |
| Mean | 2.66 |
| Standard Error | 0.163157618 |
| Median | 2.5 |
| Mode | 2 |
| Standard Deviation | 1.153698578 |
| Sample Variance | 1.331020408 |
| Kurtosis | -0.766781108 |
| Skewness | 0.297497929 |
| Range | 4 |
| Minimum | 1 |
| Maximum | 5 |
| Sum | 133 |
| Count | 50 |

When teacher years of experience were coded into 1 (0-4 years), 2 (5-10 years), 3 (11-15 years), 4 (16-20 years), 5 (21-25 years), and 6 (26+ years), the mean was 3 indicating an average of 11-15 years of teaching experience in the sample. Standard deviation for this computation was 1.40.

|  |  |
| --- | --- |
| *Years Teaching* | |
|  |  |
| Mean | 3 |
| Standard Error | 0.197948664 |
| Median | 3 |
| Mode | 3 |
| Standard Deviation | 1.399708424 |
| Sample Variance | 1.959183673 |
| Kurtosis | 0.052433095 |
| Skewness | 0.69768995 |
| Range | 5 |
| Minimum | 1 |
| Maximum | 6 |
| Sum | 150 |
| Count | 50 |

**6. Data Analysis**

Following the closing of the survey window in February 2014, data was compiled based upon age and teaching experience ranges. Each question, as seen on Appendix A, contains user-friendly rankings detailing most comfortable to least comfortable in terms of various forms of technology use and what types of training each teacher finds most helpful. These responses were compiled based on these rankings and sorted according to age and experience ranges.

The results are as follows:

Table 1a.

*Correlation for comfort level with variables using age range and years of experience for teachers.*

|  |  |  |
| --- | --- | --- |
| Variable | Age Range | Years of Teaching Experience |
| 1. Computer Programs | 0.416 | 0.125 |
| 2. iRespond | 0.290 | 0.249 |
| 3. Socrative | 0.422 | 0.316 |
| 4. Synergy & Pinnacle | 0.340 | 0.134 |
| 5. New Technology Anticipation | 0.133 | 0.051 |
| 6. Training Preference | 0.044 | 0.072 |

Age range is strongly correlated with computer program comfort level; however, it is insignificantly correlated with years of teaching experience. This indicates that age range is a stronger predictor of comfort level with various forms of computer software such as email, internet, PowerPoint, Excel, and Word. Age range and years of teaching experience are insignificantly correlated with iRespond comfort level. Comfort level with iRespond was not influenced by either age range or teaching experience. Age range is strongly correlated with comfort level with programs such as Socrative; however, it is only moderately correlated with years of experience. The younger teachers were much more likely to indicate comfort with programs such as Socrative. Age range is moderately correlated with comfort level with programs such as Synergy and Pinnacle; however it is insignificantly positively correlated with years of experience. In this case, years of experience did not factor as significantly as age range in comfort level. Both age range and years of teaching experience are insignificantly positively correlated with new technology anticipation and with training preference. This would indicate that new technology anticipation and training preferences cannot be determined based on a teacher’s age or experience level. Results for the previous questions are further broken down by each question in Appendix C.

A basic analysis of age range with factors influencing willingness to learn or incorporate new technology even if you dislike the new technology indicates that all teachers were heavily influenced by how much potential value they saw in the new technology. Younger teachers (those in the age ranges of 21-30 and 31-40 years) were more influenced by technology requirements of the school and district than older teachers were. Older teachers (those in the 41-50, 51-60, and 61+ years age ranges) were more influenced by new technology being written up in journals or websites pertinent to their subject area than younger teachers. All teachers except those in the 61+ years age range were reasonably influenced by department members’ use of new technology.

Table 1b.

*Basic analysis of age range with factors influencing willingness to learn or incorporate new technology.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age Range | A | B | C | D | E |
| 21-30 years | 100% | 25% | 50% | 50% | 13% |
| 31-40 years | 94% | 41% | 53% | 47% | 18% |
| 41-50 years | 83% | 33% | 42% | 33% | 33% |
| 51-60 years | 80% | 30% | 40% | 10% | 20% |
| 61+ years | 67% | 0% | 33% | 33% | 33% |

A basic analysis of years spent teaching with factors influencing willingness to learn or incorporate new technology even if you dislike the new technology indicates that all teachers were heavily influenced by how much potential value they saw in the new technology. Teachers with less experience (those in the years spent teaching ranges of 0-4 and 5-10 years) were more influenced by technology requirements of the school and district than teachers with more experience were. The 100% influence on teachers with 21-25 years teaching is a little misleading as there was only one respondent in this category. Teachers with the most experience (those in the 26+ years spent teaching range) were more influenced by new technology being written up in journals or websites pertinent to their subject area than less experienced teachers. When broken up by years spent teaching, department members’ use of technology had less effect.

Table 1c.

*Basic analysis of years of experience with factors influencing willingness to learn or incorporate new technology.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Years Teaching | A | B | C | D | E |
| 0-4 years | 67% | 33% | 67% | 50% | 0% |
| 5-10 years | 100% | 43% | 50% | 50% | 43% |
| 11-15 years | 100% | 27% | 33% | 33% | 20% |
| 16-20 years | 67% | 33% | 56% | 22% | 0% |
| 21-25 years | 100% | 0% | 100% | 0% | 0% |
| 26+ years | 80% | 20% | 20% | 20% | 60% |

The final question on Appendix A offers a qualitative element to this study and the opportunity for teachers to submit their own comments on teacher technology and training. The research question was *Are there any other comments on technology training that you feel would be helpful to this study?* Eleven teachers of the fifty teacher sample responded to this question, and data analysis of the responses yielded the following codes: *(a) Technology Issues; (b) Training Preferences; (c)* *Aversion to Technology; (d) Frustration with Communication; and (e) Technology Preferences*. The table provides the data analysis code frequency and themes that emerged. Appendix B provides all teacher responses along with coding noted.

Table 1b.

*Additional comments on technology training.*

|  |  |  |
| --- | --- | --- |
| Abbreviations | Codes | Frequency |
| TI | Technology Issues | 6 |
| TP | Training Preferences | 6 |
| ATT | Aversion to Technology | 2 |
| FWC | Frustration with Communication | 1 |
| TP | Technology Preferences | 3 |

Technology issues and training preferences were the majority of issues addressed in the optional qualitative question. One participant stated, “I love implementing technology, but if I have trouble with it, I have to assume my students will as well due to my proficiency level.” Another stated, “Usually the days I implement technology, something goes wrong.” Frustrations were clear with actual software or hardware issues, internet connectivity, and student understanding of resource and ability to utilize them.

On the issue of training preferences, one participant stated, “I think that technology training should be on as-needed basis rather than as a requirement of all teachers.” Teachers who feel comfortable with new technology may be better served by training options such that they do not feel as though they are wasting their time on basics. Another teacher stated, “I need release time to attend technology training.” This was a common theme throughout the optional responses was that teachers felt as though they were not given enough time in the day to train, and several mentioned the need of a mentor to help them if technology did not work as they thought it would.

**7. Limitations**

Major limitations could have potentially been a smaller number of responses to the survey or fear of being targeted for their views towards technology hindering the response rate. However, with a target of 43 responses, 50 were actually received. The sample provided a fairly good range of teacher ages and experiences; however, the 21-25 year experience range only had one participant. This deficit seemed to be made up for by the response rate in the 26+ years experience range and the overall wide range of teacher ages in the sample.

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**Appendix A**

**Survey Protocol**

Project: Teacher Attitudes towards New Technology

Questions:

1. **ONLINE SURVEY CONSENT FORM**

**Title of Research Study: Teacher Attitudes towards New Technology**

**Researcher's Contact Information:**  Leah T. Kurtz, 678-234-2885, [leahkurtz2012@gmail.com](mailto:leahkurtz2012@gmail.com)

**Introduction**

You are being invited to take part in a research study conducted by Leah T. Kurtz of Kennesaw State University. Before you decide to participate in this study, you should read this form and ask questions about anything that you do not understand.

**Description of Project**

The purpose of the study is to determine the relationship between teacher age/experience and attitude towards new technology in the classroom. Additionally, potential training methods will also be reviewed.

**Explanation of Procedures**

Participants will take a brief eleven question survey online through Google forms. Participants will also be given the option to take a paper survey in a one-on-one environment with the researcher.

**Time Required**

The survey should take participants no longer than ten minutes to complete.

**Risks or Discomforts**

No risks or discomforts are anticipated.

**Benefits**

Although there are no known direct benefits anticipated for participants due to this study, the researcher anticipates learning more about teacher attitudes towards new technology and optimal training methods for said new technology.

**Compensation**

N/A

**Confidentiality**

The results of this participation will be anonymous. No identifying information will be collected about participants. The only personal information collected consists of age range and experience teaching range. All data collected will be stored in a password protected file on the home computer of the researcher with no identifying information included. All data will be destroyed on December 1, 2017.

**Inclusion Criteria for Participation**

You must be 18 years of age or older to participate in this study.

**Use of Online Survey**

IP addresses of participants will not be collected by SurveyMonkey.

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 1000 Chastain Road, #0112, Kennesaw, GA 30144-5591, (678) 797-2268.

PLEASE PRINT A COPY OF THIS CONSENT DOCUMENT FOR YOUR RECORDS, OR IF YOU DO NOT HAVE PRINT CAPABILITIES, YOU MAY CONTACT THE RESEARCHER TO OBTAIN A COPY

I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.

I do not agree to participate and will be excluded from the remainder of the questions.

2. How many years have you been teaching including this school year (2013-2014)?

* 0-4 years
* 5-10 years
* 11-15 years
* 16-20 years
* 21-25 years
* 26+ years

3. What age range are you in as of the end of 2013?

* 21-30 years
* 31-40 years
* 41-50 years
* 51-60 years
* 61+ years

4. How would you rate your comfort level with computer programs such as email, word processing (i.e. Microsoft Word), presentation programs (i.e. Microsoft PowerPoint), and internet browsers (i.e. Mozilla Firefox, Google Chrome, or Internet Explorer)?

* Very comfortable (this is second nature to me)
* Comfortable (I can manage without many questions or concerns)
* Somewhat comfortable (I can do most of this, but I sometimes get stuck)
* Not comfortable (I feel frustrated using these programs and get stuck frequently)

5. How would you rate your comfort level with educational technology such as iRespond?

* Very comfortable (this is second nature to me)
* Comfortable (I can manage without many questions or concerns)
* Somewhat comfortable (I can do most of this, but I sometimes get stuck)
* Not comfortable (I feel frustrated using these programs and get stuck frequently)

6. How would you rate your comfort level with educational technology such as Socrative?

* Very comfortable (this is second nature to me)
* Comfortable (I can manage without many questions or concerns)
* Somewhat comfortable (I can do most of this, but I sometimes get stuck)
* Not comfortable (I feel frustrated using these programs and get stuck frequently)

7. How would you rate your comfort level with educational technology such as Synergy or Pinnacle?

* Very comfortable (this is second nature to me)
* Comfortable (I can manage without many questions or concerns)
* Somewhat comfortable (I can do most of this, but I sometimes get stuck)
* Not comfortable (I feel frustrated using these programs and get stuck frequently)

8. When you are informed that a new piece of technology will be implemented, how would you rate your general anticipation level?

* I am excited! I excel with these programs, and I cannot wait to learn a new one!
* I am fine. These programs are fairly easy to me.
* I am a little apprehensive. Sometimes these programs are overwhelming or do not work properly.
* Oh no! Not again!

9. What factors influence your willingness to learn or incorporate new technology even if you dislike the new technology? Please check all that apply.

* If I can see potential value to the new technology.
* If someone else in my department has incorporated the new technology in their own instruction.
* If the new technology is required by the school.
* If the new technology is required by the district.
* If the new technology has been written up in journals or websites pertinent to my subject area.

10. When I must learn a new form of technology, I prefer this type of training:

* Send me an email with an imbedded screencast or PowerPoint, and I will figure it out on my own.
* A brief face-to-face training with follow-up PowerPoints available.
* I need face-to-face training and some practice time.
* Someone modeling a lesson that incorporates the technology, and then provides training after the modeling.
* A mentor who could help me through this new technology would be helpful.

11. Are there any other comments on technology training that you feel would be helpful to this study?

Thank you for your participation in this study. Your responses and comments will be kept confidential.

**Appendix B**

I love implementing new technology, but if I have trouble with it, I have to assume my students will as well due to my proficiency level. I hate being forced to implement technology that doesn't work well or isn't time effective.

I think that representatives from the school and/or the district should test various forms of technology before implementation. If an initial testing phase were set up, the training period would be much easier. Furthermore, with any form of technology, I prefer to look at online tutorials such as PowerPoints or emails with embedded screenshots, but having a face-to-face mentor available is extremely helpful when trouble occurs.

Usually the days I implement technology, something goes wrong. There is nothing worse than planning for an assignment adn then it failing and having nothing to do. I'd rather not implement technology in the classroom.

I think that technology training should be on an as-needed basis rather than as a requirement of all teachers.

Most technology is mandated without any consideration of the needs or interests of the users (the teachers using it). If we were given some sense of buy-in for new technology before were forced to adopt it, often at inappropriate times when we are swamped with other requirements and not during preplanning or on staff days at the beginning of a school year or semester when we have time to adapt to using the technology without lessons. Often it is given with the requirement that we "use it or else" in a short timeframe with planned monitoring of our progress. Technology to me always works better as a way of saving time, making things more relatable or information more accessible to those affected by it. Teaching is an art. When it is forced, the creative process that allows for best use of technology is stifled. Users with different levels of technologic comfort are all forced to some baseline of usage and often times those with minimal comfort scramble to meet the baseline. More advanced users use the bare minimum because there are so many other things on their plates that they don't have time to adapt the tools to what they do. As an anecdote of my personal frustration, when we adopted Pinnacle I found that user support was limited to the school system. I created a list of requests for functionality when it was announced that we were getting a new grading/attendance program. My list contained many time saving programs that would aid with compliance, ease teacher's workload for mundane administrative tasks and the ability to program these would be easily available to anyone with control over our school systems databases, and I was met with the reply "thanks, but we already made a purchasing decision". No input asked for. None considered. If you can't tell, I am a bit jaded when it comes to "educational technology".

Technology is a great assistant but nothing beats the face to face time with your students

I need release time to attend technology trainings.

We need time to implement

In most cases I have no problem with figuring out or using new technology. I just feel that sometimes there are requirements that get in the way of classroom learning. I can make any technology as USEFUL as possible, but sometimes I think there are better less-technological ways to do these things. Also, you still have to teach when things brake or the system is down.

It depends on the reliability of the program.

Make the demos interesting, innovative and focused a least somewhat on our area of study!

**APPENDIX C**

How would you rate your comfort level with computer programs such as email, word processing (i.e. Microsoft Word), presentation programs (i.e. Microsoft PowerPoint), and internet browsers (i.e. Mozilla Firefox, Google Chrome, or Internet Explorer)?

1 = Very comfortable

2 = Comfortable

3 = Somewhat comfortable

4 = Not comfortable

Examining the relationship between age range of teachers and comfort level with various computer programs such as email, word processing, presentation programs, and internet browsers suggests a strong positive correlation ( r = .42) using the Pearson product moment correlation coefficient as the measurement of association. The strength of this relationship suggests that age range is strongly associated with comfort level with various computer programs.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *Computer Programs Comfort Level* |
| Age Range | 1 |  |
| Computer Programs Comfort Level | 0.416291072 | 1 |

Examining the relationship between years spent teaching and comfort level with computer programs such as email, word processing, presentation programs, and internet browsers suggests an insignificant positive correlation ( r = .13) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that years spent teaching is not significantly associated with comfort level with computer programs such as email, word processing, presentation programs, and internet browsers.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *Computer Programs Comfort Level* |
| Years Teaching | 1 |  |
| Computer Programs Comfort Level | 0.125358681 | 1 |

How would you rate your comfort level with educational technology such as iRespond?

1 = Very comfortable

2 = Comfortable

3 = Somewhat comfortable

4 = Not comfortable

Examining the relationship between age range of teachers and comfort level with educational technology such as iRespond suggests an insignificant positive correlation ( r = .29) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that age range is not significantly associated with comfort level with educational technology such as iRespond.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *iRespond Comfort Level* |
| Age Range | 1 |  |
| iRespond Comfort Level | 0.289609712 | 1 |

Examining the relationship between years spent teaching and comfort level with educational technology such as iRespond suggests an insignificant positive correlation ( r = .25) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that years spent teaching is not significantly associated with comfort level with educational technology such as iRespond.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *iRespond Comfort Level* |
| Years Teaching | 1 |  |
| iRespond Comfort Level | 0.24947534 | 1 |

How would you rate your comfort level with educational technology such as Socrative?

1 = Very comfortable

2 = Comfortable

3 = Somewhat comfortable

4 = Not comfortable

Examining the relationship between age range of teachers and comfort level with educational technology such as Socrative suggests a strong positive correlation ( r = .42) using the Pearson product moment correlation coefficient as the measurement of association. The strength of this relationship suggests that age range is strongly associated with comfort level with educational technology such as Socrative. Three of the respondents declined to answer. One of those respondents was in the 61+ years age range, and the other two were in the 31-40 years age range.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *Socrative Comfort Level* |
| Age Range | 1 |  |
| Socrative Comfort Level | 0.421957961 | 1 |

Examining the relationship between years spent teaching and comfort level with educational technology such as Socrative suggests a moderate positive correlation ( r = .32) using the Pearson product moment correlation coefficient as the measurement of association. The strength of this relationship suggests that years spent teaching is moderately associated with comfort level with educational technology such as Socrative. Three of the respondents declined to answer. Two of those respondents were in the 16-20 years teaching range and one was in the 5-10 years teaching range.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *Socrative Comfort Level* |
| Years Teaching | 1 |  |
| Socrative Comfort Level | 0.316316392 | 1 |

How would you rate your comfort level with educational technology such as Synergy or Pinnacle?

1 = Very comfortable

2 = Comfortable

3 = Somewhat comfortable

4 = Not comfortable

Examining the relationship between age range of teachers and comfort level with educational technology such as Synergy or Pinnacle suggests a moderate positive correlation ( r = .34) using the Pearson product moment correlation coefficient as the measurement of association. The strength of this relationship suggests that age range is moderately associated with comfort level with educational technology such as Synergy or Pinnacle.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *Synergy & Pinnacle Comfort Level* |
| Age Range | 1 |  |
| Synergy & Pinnacle Comfort Level | 0.340356458 | 1 |

Examining the relationship between years spent teaching and comfort level with educational technology such as Synergy or Pinnacle suggests a an insignificant positive correlation ( r = .13) using the Pearson product moment correlation coefficient as the measurement of association. The strength of this relationship suggests that years spent teaching is insignificantly associated with comfort level with educational technology such as Synergy or Pinnacle.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *Synergy & Pinnacle Comfort Level* |
| Years Teaching | 1 |  |
| Synergy & Pinnacle Comfort Level | 0.134014067 | 1 |

When you are informed that a new piece of technology will be implemented, how would you rate your general anticipation level?

1 = I am excited! I excel with these programs, and I cannot wait to learn a new one!

2 = I am fine. These programs are fairly easy to me.

3 = I am a little apprehensive. Sometimes these programs are overwhelming or do not work properly.

4 = Oh no! Not again!

Examining the relationship between age range of teachers and anticipation level with new technology suggests an insignificant positive correlation ( r = .13) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that age range is not significantly associated with anticipation level with new technology.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *New Technology Anticipation Level* |
| Age Range | 1 |  |
| New Technology Anticipation Level | 0.133197991 | 1 |

Examining the relationship between years spent teaching and new technology anticipation level suggests almost no positive correlation ( r = .05) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that years spent teaching is not associated with new technology anticipation level.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *New Technology Anticipation Level* |
| Years Teaching | 1 |  |
| New Technology Anticipation Level | 0.051302518 | 1 |

What factors influence your willingness to learn or incorporate new technology even if you dislike the new technology? Please check all that apply.

A. If I can see potential value to the new technology.

B. If someone else in my department has incorporated the new technology in their own instruction.

C. If the new technology is required by the school.

D. If the new technology is required by the district.

E. If the new technology has been written up in journals or websites pertinent to my subject area.

A basic analysis of age range with factors influencing willingness to learn or incorporate new technology even if you dislike the new technology indicates that all teachers were heavily influenced by how much potential value they saw in the new technology. Younger teachers (those in the age ranges of 21-30 and 31-40 years) were more influenced by technology requirements of the school and district than older teachers were. Older teachers (those in the 41-50, 51-60, and 61+ years age ranges) were more influenced by new technology being written up in journals or websites pertinent to their subject area than younger teachers. All teachers except those in the 61+ years age range were reasonably influenced by department members’ use of new technology.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age Range | A | B | C | D | E |
| 21-30 years | 100% | 25% | 50% | 50% | 13% |
| 31-40 years | 94% | 41% | 53% | 47% | 18% |
| 41-50 years | 83% | 33% | 42% | 33% | 33% |
| 51-60 years | 80% | 30% | 40% | 10% | 20% |
| 61+ years | 67% | 0% | 33% | 33% | 33% |

A basic analysis of years spent teaching with factors influencing willingness to learn or incorporate new technology even if you dislike the new technology indicates that all teachers were heavily influenced by how much potential value they saw in the new technology. Teachers with less experience (those in the years spent teaching ranges of 0-4 and 5-10 years) were more influenced by technology requirements of the school and district than teachers with more experience were. The 100% influence on teachers with 21-25 years teaching is a little misleading as there was only one respondent in this category. Teachers with the most experience (those in the 26+ years spent teaching range) were more influenced by new technology being written up in journals or websites pertinent to their subject area than less experienced teachers. When broken up by years spent teaching, department members’ use of technology had less effect.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Years Teaching | A | B | C | D | E |
| 0-4 years | 67% | 33% | 67% | 50% | 0% |
| 5-10 years | 100% | 43% | 50% | 50% | 43% |
| 11-15 years | 100% | 27% | 33% | 33% | 20% |
| 16-20 years | 67% | 33% | 56% | 22% | 0% |
| 21-25 years | 100% | 0% | 100% | 0% | 0% |
| 26+ years | 80% | 20% | 20% | 20% | 60% |

When I must learn a new form of technology, I prefer this type of training:

1 = Send me an email with an imbedded screencast or PowerPoint, and I will figure it out on my own.

2 = A brief face-to-face training with follow-up PowerPoints available.

3 = I need face-to-face training and some practice time.

4 = Someone modeling a lesson that incorporates the technology, and then provides training after the modeling.

5 = A mentor who could help me through this new technology would be helpful.

Examining the relationship between age range of teachers and interaction level preferred in technology training suggests almost no positive correlation ( r = .04) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that age range is not associated with interaction level preferred in technology training. One respondent in the 61+ years age range declined to answer.

|  |  |  |
| --- | --- | --- |
|  | *Age Range* | *Training Preference* |
| Age Range | 1 |  |
| Training Preference | 0.04360373 | 1 |

Examining the relationship between years spent teaching and interaction level preferred in technology training suggests almost no positive correlation ( r = .07) using the Pearson product moment correlation coefficient as the measurement of association. The weakness of this relationship suggests that years spent teaching is not associated with interaction level preferred in technology training. One respondent in the 11-15 years teaching range declined to answer this question.

|  |  |  |
| --- | --- | --- |
|  | *Years Teaching* | *Training Preference* |
| Years Teaching | 1 |  |
| Training Preference | 0.072168784 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 1a. |  |  |  |  |  |  |
| *Correlation for comfort level with variables using age range and years of experience for teachers* | | | | | | |

Table 1a.

*Correlation for comfort level with variables using age range and years of experience for teachers.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 1a. |  |  |  |  |  |  |
| *Correlation for comfort level with variables using age range and years of experience for teachers* | | | | | | |
|  | | | | | | |

|  |  |  |
| --- | --- | --- |
| Variable | Age Range | Years of Teaching Experience |
| 1. Computer Programs | 0.416 | 0.125 |
| 2. iRespond | 0.290 | 0.249 |
| 3. Socrative | 0.422 | 0.316 |
| 4. Synergy & Pinnacle | 0.340 | 0.134 |
| 5. New Technology Anticipation | 0.133 | 0.051 |
| 6. Training Preference | 0.044 | 0.072 |