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Assessing teachers' mobile device skills and the integration of technology into their lives

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A Master's Thesis proposal submitted to the Department of Psychology in partial fulfillment of specialist degree requirements for the School Psychology Program at the State University of New York at Plattsburgh

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Abstract

The role of technology in education is growing increasingly significant. It has implications for classroom teaching practices, assessment and systems level decision making. The success of technology programs in schools greatly depends on the attitudes and skills of teachers. This study evaluated the validity of two newly developed survey instruments for assessing an individual's skills and attitude towards mobile technology. It also looked at the relationship between those two constructs and group differences. There was a significant correlation between an individual's skills with mobile technology and their willingness to integrate the technology into their daily lives. Regression analysis revealed that an individual's skills with their device was the only significant predictor of their level of integration. Finally, skills were rated higher for individuals who used both smartphones and tablet computers versus individuals who only used smartphones. These results strengthen the validity of the two survey instruments and add to the research base for integrating mobile technology into education.

Keywords: Education technology, TAM, SAMR, validity

Assessing teachers' skills and integration of mobile technology in their lives

The role of technology as a learning tool is a hot topic in the current national conversation about education. A simple online search for "apps in education" yields thousands of results. The benefits of, and concerns about, using new technology are being discussed on the radio (OnPoint , 2014), in blogs (CommonSenseMedia, Edutopia, MindShift) and in magazines (edTechMagazine, eSchoolNews), and companies are popping up to help supply our schools with the software and hardware they need to effectively implement technology as a learning tool (Google Classroom, Knewton, Schoology). All this excitement and optimism raises lots of questions about effectiveness, implementation and logistics. There are claims that these tools will increase student engagement and improve performance. Others in the field see technology as the avenue to finally open doors for students with disabilities to be educated effortlessly alongside their peers. With all these potential benefits, school leaders want to know which devices and programs will actually make a difference, teachers are seeking guidance in best practices, and parents want to be assured their children are receiving high quality education. These are challenging questions that take time and careful research to answer thoroughly. It is undeniable that technology has the *potential* to transform education at all levels, from classroom teaching to state-level accountability. The realization of that potential depends on teachers and other front-line educators embracing technology as one of their tools for fostering relationships, designing environments, and creating learning experiences for their students. Ultimately, teachers' attitudes and skills will be the keystones of technological innovation and change in education.

The foundation of effective education is effective classroom teaching. The relationships, environments, and learning experiences created by faculty and staff drive student learning. The job of the teacher is to “craft circumstances that lead to success” and provide multiple avenues that students can use to reach the desired level of understanding and expression (McTighe and Tomlinson, 2006). The flexibility of digital technology can help teachers craft those circumstances for the diverse students in their classroom. Often, teachers who embrace a constructivist approach to teaching are first to identify the value of digital technology (Donovan, Green & Hartley, 2010). In constructivist teaching, there is an emphasis on student centered activities for consuming information and expressing ideas and knowledge. Digital technology provides teachers and students with many choices in one device. For instance, a teacher can provide her students with links to web-pages, videos or books about specific content, or encourage them to research information independently. Digital tools enhance differentiated teaching strategies as well. They provide options for students of all reading abilities to access information, such as text-to-voice software. With appropriate software, students can create writing (typed, written or dictated) to express their knowledge of a given topic, or they could make a video, create a graphic representation or even a cartoon or graphic novel, if it meets the requirements of the assignment. These options for accessing and expressing information open doors for students with learning disabilities and other learning impairments. Finally, like many other teaching tools, digital technology can be used to promote group work, partner activities, small group projects or whole class games. These types of choices (access to current information on a topic, a diversity of methods for organizing and creating ideas, and the variety of student groupings) capture the natural curiosity of students (Ciampa, 2014). When paired with a nurturing teacher-student relationship, that curiosity drives deep learning.

In addition to classroom instruction, assessment is also a critical component of effective education in which digital technology opens doors for improvement and innovation. One method of assessment made possible by technology is computer adaptive tests. Computer adaptive software is designed to track each student's progress by item and tailor the subsequent questions to their individualized ability level as they complete the assessment. This method reflects Vygotsky's theory of the zone of proximal development, keeping the student challenged but successful. Meyen, Poggio, Seok and Smith (2006) proposed that computer adaptive tests can be used both formatively and summatively throughout the school year allowing student performance data to be aggregated and made accessible to teachers. This type of assessment provides scores and data that can be analyzed by teachers to produce specific information about what students know and what they struggle with, making the test practical for formative assessment in the classroom. Computer adaptive software has expanded greatly since its introduction. Several commercial products for assessment systems are now available for schools to purchase that include computer adaptive technology (FastBridge, STAR-Rennaisance, iReady).

Another development in assessment that has been influenced by digital technology is Universal Design for Assessment. The universal design concept originated in the field of architecture when architects and builders considered the barriers many people faced when trying to access their buildings, including those in wheelchairs and those with other disabilities. In Universal Design for Assessment, the same concept is applied to test development. This means that a variety of student characteristics are considered throughout the conceptualization, construction and implementation stages of test development (Ketterlin-Geller, 2008). Some barriers students may experience include reading disabilities, which impact their ability to receive and process written content, writing disabilities, which impact their ability to produce an intended response, or attention challenges that impact their ability to complete work within a restricted time limit or in a large group of students. The flexibility and efficiency of digital tools makes universal design for assessment economically realistic. When applied, all students taking a test have the option of having it read aloud, or dictating their response to the device. Questions about test validity that can be raised by students' low reading abilities, or writing skills, are minimized because these things are already considered and accounted for in analysis and interpretation during test development (Ketterlin-Geller, 2008).

At the administrative level of education, technology has an impact on decision-making and problem solving. When school leaders have questions to answer or problems to solve, they turn to data and evidence for concrete information. Digital tools are making the collection and analysis of school data more accurate and more efficient. Classroom management software and student information systems centralize attendance data, grades, demographic information and schedules. As described above, assessments completed with digital tools allow for fast aggregation of student performance data. While the benefits are clear, the systems required for successful implementation of technology tools must be in place. It is the responsibility of school leaders to provide the framework in which these tools can be effective (Basham, Israel, Graden, Poth and Winston, 2010). If barriers exist that prevent faculty from embracing and implementing these tools, then the data they provide will either be unavailable or unreliable.

One consensus among researchers is that teachers are an integral part of any new practice in education (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Most studies investigating effective implementation of technology in education include a discussion about the teacher's role in integration. The discussion about different external and internal barriers teachers experience when faced with new technology tools is common (Ertmer et al, 2012, Blackwell, Lauricella, Wartella, & Robb, 2013). External barriers refer to administrative and logistic challenges, such as limited devices or internet access. Internal barriers come from the teacher's personal beliefs and teaching techniques, and their own skepticism of a technology's usefulness. Early research focused on external barriers because they were blatant and most often cited by teachers who were struggling with technology initiatives. The last 15 years has seen significant growth in technology infrastructure in schools. This growth has shifted the focus from external barriers to internal barriers that prevent tech integration (Ertmer et al., 2012). Experience with technology, attitude towards technology, and teaching philosophy have also been evaluated with mixed results (Mueller, Wood, Willoughby, Ross, & Specht, 2008). Another study looked at the relationship between perceived external barriers and attitudes towards a new program, suggesting that despite personal beliefs, external barriers remain significant (Blackwell et al., 2013). It is hard to change negative attitudes, but eliminating external, barriers like poor logistics or limited training, will help ease a school's transition towards technology integration.

Other research focuses on the reasons teachers *do* implement technology in their teaching, and how they *overcome* barriers. A survey study of 389 teachers analyzed the relationship between individual differences and technology integration (Mueller et al., 2008). The highest correlations with technology integration included overall comfort with computers, confidence in computers as an instructional tool, a tendency to enjoy challenges, and positive experiences with computers in the classroom. By identifying attributes that increase the likelihood of effective technology integration, this research lays the groundwork for more effective professional development, focusing on personal exposure to new technologies and positive practical examples of how they can be used in the classroom.

TAM

To help conceptualize what drives teachers to use technology, the Technology Acceptance Model (TAM) is a valuable tool. Since its development in 1989 it has been applied and tested extensively across multiple fields of study (Lee, Kozar, & Larsen, 2003). The model includes three concepts, Perceived Usefulness (PU), Perceived Ease of Use (PEoU) and User's Intent to use (UI) the technology. The basic relationship between these three constructs is that both PU and PEoU influence UI. In other words, if a person believes a technology is useful and easy to use, then they will use it. An important line of research testing the validity of this model questions the relationship between a person's *intent* to use, and their *actual* use. The literature suggests that enough evidence exists showing reasonable correlations between intent and actual use that measuring intent is an acceptable substitute for measuring actual use (Lee, Kozar, & Larsen, 2003).

This model has been applied to teachers in educational settings. The difference between general self-efficacy with technology, meaning a teacher's belief that they could learn new technology skills, versus specific skills with a relevant technology, was investigated using TAM (Holden & Rada, 2011). The technology specific skills proved to be a more valuable predictor of positive intent to use the technology than did the general belief in computer skills. Thus, assessments of teacher’s skills in preparation for technology integration should focus on specific skills related to the chosen platform. For example, an iPad integration program might include an assessment of teachers’ skills with the iPad, versus skills with mobile technology in general. Another study used TAM to evaluate the relationships between a teacher’s instructional style, observations about the technology they were using, the PU, and PEoU of the technology. Results indicated that instructional style, self-efficacy, and positive observations of the technology are influential in implementation (Huntington & Worrell, 2013). Witnessing effective lessons that use new technology in creative ways is thought to be an especially powerful method for training teachers in technology integration (Chou, Block, & Jesness, 2012). The presence of TAM in education research literature emphasizes its role as a straightforward method of assessing a teacher’s intent to use a technology with a reasonable degree of certainty.

SAMR

Another useful model for conceptualizing technology integration into education is the Substitution, Augmentation, Modification, Redefinition (SAMR) model (Puentedura, 2014). As seen in Figure 1, this model specifies different levels of technology integration from simple to complex.

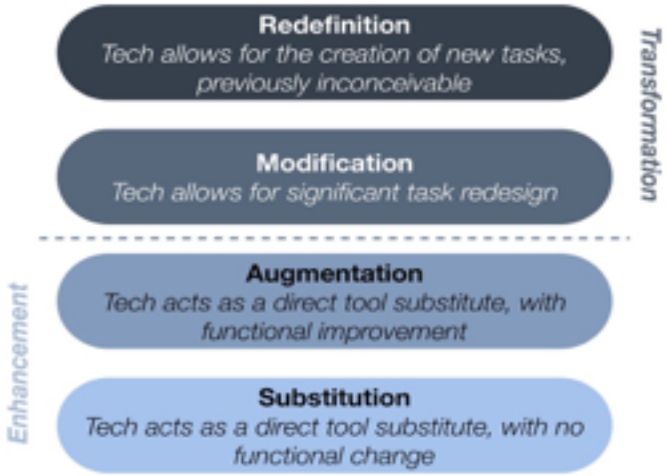

Figure 1. Graphic representation of the SAMR model. Image created by Ruben Puentedura, PhD, www.hippasus.com/rrpweblog/

The SAMR model assumes that technology is already being used in the classroom, so it is a logical next step after a technology has been introduced to a school. The utility of this model comes from its ability to inform teachers and administrators about how technology is influencing their classrooms. By viewing their activities through the lens of SAMR, teachers can gain insight into whether greater gains could be made from even more creative applications (Johnson, 2014). For example, teachers using digital texts that allow for highlighting and defining words, or tapping words to hear them spoken are *augmenting* a familiar activity. Teachers who use an online-based platform to provide relevant news articles or expanded readings for a history class instead of a textbook are *modifying* an activity into something that is new and different. *Redefinition* could be seen in a foreign language class sharing written work with a classroom in another country for feedback, and co-creating projects in both languages (Johnson, 2014).

Recent applications of this model include program evaluations, specific intervention evaluations, and teacher readiness research. The SAMR model was used to analyze activities implemented during a one-to-one iPad project (Chou, Block, & Jesness, 2012). Significantly, during this project the SAMR model was presented in professional development trainings in preparation for the program. It gave the teachers a practical tool for evaluating their own lesson plans, and guided discussions during monthly professional development meetings. In Scotland the model was also used to evaluate an iPad program (Fabian & MacLean, 2014). The observations and interview data collected were evaluated in terms of SAMR to help inform the depth of activities taking place. After identifying 12 different activities, the researchers determined 5 of them to be enhancing (Substitution or Augmentation), and 7 to be transformative (Modification and Redefinition). As previously mentioned, the model is useful in developing and assessing individual lesson plans and activities. In a case-study following 2 teachers working with 2 students with autism, the SAMR model was used to select iPad apps that might enhance or transform student learning (Oakley, Howitt, Garwood, & Durack, 2013). These teachers also used the model to examine how they were using the apps with the students and made changes to expand the depth of their technology integration. Finally, SAMR was used to help assess pre-service teachers readiness to effectively implement a BYOD (Bring Your Own Device) program (Burns-Sardone, 2014). The BYOD lesson plans developed by the pre-service teachers were evaluated in terms of SAMR. Of 68 assignments, 25 were determined to be at the substitution level, 35 at the augmentation level, 5 at the modification level, and 3 at the redefinition level, suggesting that even “technology natives” of the current generation are challenged by tech integration tasks.

The concepts and language presented in this model are also reflected independently in education research. In a case-study evaluation of 12 teachers who had been recognized for excellence in technology integration, the applications and methods they used “ran the gamut” from skill reinforcement (substitution) to transforming how they thought about teaching (Ertmer et al, 2012). For instance, one teacher talked about his Results Only Learning Environment, which was completely student centered, with students choosing their own books and how they wanted to present what they know. That type of teaching style is enhanced by new technology tools. This same study emphasized the importance of teaching students to use technology as adults use it, namely for communication, collaboration and problem-solving, all of which are represented in the higher levels of the SAMR model.

The present study combines the details of TAM, SAMR and previous technology integration research, to examine the relationship between an individual's skills with mobile technology, and their level of technology integration in their life, as defined by the SAMR model. The results can be used to validate the relevance of two newly developed surveys, and help inform possible methods for evaluating teacher readiness for technology integration. It is predicted that an individual's skills with mobile technology will positively impact how deeply they integrate their device in their lives.

Methods

Participants

Pre-service teachers at SUNY Plattsburgh and practicing teachers in NY state were asked to complete two surveys, combined into one document. Participation was completely voluntary and anonymous. There were 53 responses.

Survey Instruments

Two surveys were developed by two cohorts in the School Psychology graduate program at SUNY Plattsburgh in Plattsburgh, NY. The first survey assessed an individual's skill level with mobile technology, specifically tablet computers and smartphones. The questions in this survey were structured around 15 common activities completed with mobile technology. Questions included self-assessments about participants use of their device, skills with their device, ability to teach skills, and validity questions. It was constructed and tested in the spring of 2013 by a cohort of 8 graduate students and their psychometrics professor. Internal validity was determined to be satisfactory, and external validity was assessed in a pre-post test study of 50 students at SUNY Plattsburgh with positive results (Kelley, 2014).

The second survey assessed the level of technology integration at which an individual currently uses his or her device. It was structured using activities commonly completed with mobile devices that were described differently to represent the levels of the SAMR model. Individual questions about the activities were designed to reflect each construct of TAM, thus predicting the participant's intent to use the technology at that level of integration.

The activities chosen to represent each level of the SAMR model were generated in a psychometrics graduate class of 10 students and one professor. Three common mobile device activities were selected: note-taking, accessing/creating media, and researching information. Each activity was then described to reflect the intended level of integration. Descriptions for each level were generated in small groups, independently from the rest of the class, and then compiled into a random list. This meant that everyone in the class was only familiar with the descriptions they helped generate, and blind to the intended category of the other descriptions. The validity of the descriptions was tested by a sorting task in which each student and the professor independently sorted the descriptions into the SAMR level that made the most sense to them. Items with fewer than 9 people in agreement were examined and adjusted to more accurately reflect the SAMR level. The final breakdown of each activity and its description by SAMR level is displayed in Table 1.

Table 1

Breakdown of survey items by SAMR level

SAMR Level	Take Notes	Access/Create Media	Research Information
Substitution	Use a mobile device to take and/or store notes	Use a mobile device to view or store media.	Use a mobile device to do research on a subject
Augmentation	Take notes and insert media (such as links and pictures) into notes	Take pictures or videos and edit them on a mobile device.	Find information on a particular subject, make notes and store the notes on a mobile device.
Modification	Take notes and insert media (such as videos, audio clips and/or pictures) and share the notes with others for feedback.	Create, find, store and share media content.	Collect and take notes on information about a subject and share that information electronically with others.
Redefinition	Make notes as a group, each person from their own device.	Access streamed media content (such as movies or music) from others who share similar interests or preferences.	Work together with a group of people in separate locations to do research on the same subject.

To capture an individual's use of mobile technology integration at these levels, TAM was used as the basis for the individual survey items. Each activity, at each level, had a question that asked about Perceived Usefulness, Perceived Ease of Use, and Intent to Use the device for the described purposes. For example, in reference to note-taking at the substitution level, the PU question was "I think it is useful to take and/or store notes on my mobile device," the PEoU question was "I know how to take and/or store notes on my mobile device", and the UI question was “I will or already do take and/or store notes on my mobile device.” There was a PU, PEoU, and UI question for each activity at every SAMR level, for a total of 36 questions. There were also 4 general statements that exemplify each SAMR level. Participants responded to each item with a 5-point scale, 1 being “Strongly disagree” and 5 being “Strongly agree”.

The survey, with demographic questions added, was distributed to 213 adults in order to analyze its psychometric properties using SPSS. First, total values for each SAMR level were calculated in accordance with the structure of the survey. Then a Pearson-Correlation was completed comparing each question to each construct total. With the exception of 2 items, all items showed the strongest relationship with their intended construct ($r = .602-.881$, $p \leq .0001$, $n = 213$). The 2 items that had variation were the general statements for augmentation and redefinition, and the correlations were very close. The general statement for augmentation, “In general, mobile devices are valuable tools for improving daily tasks,” showed a stronger relationship with the Substitution construct ($r = .676$, $p \leq .0001$) than it did with the Augmentation construct ($r = .647$, $p \leq .0001$). The general statement for redefinition, “In general, mobile technology can change the way I complete tasks and projects, through group collaboration, and helping create new, creative solutions to problems,” showed a stronger relationship with the Modification construct ($r = .733$, $p \leq .0001$) than it did with the Redefinition construct ($r = .728$, $p \leq .0001$). Reliability was tested using a split-half, odds and evens, correlation ($r = .976$, $p \leq .0001$). Cronbach’s Alpha was also calculated on all items ($\alpha = .975$, $N=40$).

Due to limited survey development resources, the SAMR survey was developed to assess technology use in general, rather than technology use specific to the classroom. A copy of the combined survey is attached in Appendix 1.

Procedures

The combined survey document was distributed by the experimenter to 51 students in the education and psychology departments at SUNY Plattsburgh and two employed teachers. Participants were informed that their participation was voluntary and anonymous.

Data were aggregated in an excel document and transferred into SPSS. Scores for total integration level (IntTot) and total skills (SkillTot) were calculated based on participant responses. IntTot and SkillTot were evaluated for normality. The relationship between IntTot and SkillTot was analyzed using the Pearson product-moment correlation coefficient and a simple multi-step regression analysis. Differences between groups for collected demographics were also analyzed using ANOVA or an independent sample T-Test, as appropriate.

Results

In this study, the total number of participants was 53. Participant age ranged from 18 years to 39 years (M = 21, SD = 6.2). All participants reported owning a mobile device (smartphone or tablet computer). The number of years they owned their device ranged from 0 to 10 years (M = 6.5, SD = 2.5). Gender was highly skewed, with 46 participants identifying as female and 7 identifying as male. All participants had some college education, and 14 reported completion of a master’s degree. Thirteen participants indicated that they had taken a class in educational technology or participated in a technology program, 23 participants indicated they had not taken a class or participated in a program, and 17 participants indicated that they were not sure. When answering the survey questions, one participant was thinking of their tablet computer, 29 participants were thinking of their smartphones, and 23 participants were thinking of both their smartphone and their tablet computer.

Table 2

Correlations for demographic data, skill level results and integration level results

		Age	Gender	Education Level	Years Owned Device	Self Skill Rating	SkillTot	IntTot
Age	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	53						
Gender	Pearson Correlation	.135	1					
	Sig. (2-tailed)	.334						
	N	53	53					
Education Level	Pearson Correlation	.320*	-.057	1				
	Sig. (2-tailed)	.019	.683					
	N	53	53	53				
Years Owned Device	Pearson Correlation	-.305*	.127	-.122	1			
	Sig. (2-tailed)	.026	.366	.383				
	N	53	53	53	53			
Self Skill Rating	Pearson Correlation	-.041	-.077	-.081	.095	1		
	Sig. (2-tailed)	.768	.583	.565	.497			
	N	53	53	53	53	53		
SkillTot	Pearson Correlation	.129	-.043	.086	-.206	.288*	1	
	Sig. (2-tailed)	.357	.757	.539	.138	.037		
	N	53	53	53	53	53	53	
IntTot	Pearson Correlation	.009	.083	.099	-.010	.342*	.693**	1
	Sig. (2-tailed)	.951	.556	.483	.944	.012	.000	
	N	53	53	53	53	53	53	53

Note: *. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive statistics were completed for the total variables (IntTot and SkillTot) as well as correlation analysis and group-mean comparisons. On the technology integration survey, participants' IntTot scores had a mean of 162.3 (SD = 25.3). On the skills survey, participants SkillTot scores had a mean of 132.4 (SD = 30.2). Skewness and kurtosis were also evaluated. SkillTot scores showed skewness and kurtosis within acceptable limits. IntTot scores showed kurtosis within acceptable limits. Skewness for IntTot scores was highly skewed to the left, indicating that many participants indicated a high level of technology integration into their lives. Table 2 shows correlations between sample demographics and the calculated variables IntTot and SkillTot.

The Pearson product-moment correlation coefficient was calculated to compare IntTot and SkillTot scores. For the 53 participants, the IntTot (M = 162.3, SD = 25.3) and the SkillTot (M = 132.4, SD = 30.2) were positively and significantly correlated, r(52) = .69, $p < .01$.

A simple linear regression was calculated to examine which variable measured in the survey (ie. skill, demographic variables) predicted outcomes of the integration score (IntTot). Preliminary analyses were performed to ensure there was no violation of the assumptions of linearity and independence. A significant regression equation was found (F(1,51) = 47.048, $p < .001$), with an adjusted R^2 of .470, in which the SkillTot variable was the only significant predictor of the IntTot variable. Analysis of the standardized coefficients of the model showed that for every increase in one standard deviation of a participant's SkillTot score, their IntTot score increased by .693 standard deviations.

Group differences were evaluated using a one-way ANOVA for both SkillTot results and IntTot results. There were no significant group differences found for age, gender, education level, or the number of years the participant owned a device. An independent sample T-Test was used for the type of device on which participants based their answers. Only one individual indicated that they answered questions based on their use of a tablet computer only. Since only one participant endorsed this item (n = 1, M = 197), their score was not included in the mean comparison. SkillTot scores were significantly higher for individuals who answered the survey based on their use of a tablet and a smartphone (n = 23, M = 140.5, SD = 26.9) than for individuals who replied based only on their smartphone use (n = 29, M = 123.7, SD = 29.2), t(50) = -2.14, p = .04. However, the T-Test analysis for IntTot results between tablet and smartphone users (n = 23, M = 165.5, SD = 23.3) and just smartphone users (n = 29, M = 159.0, SD = 27.0) revealed no significant group differences, t(50) = -0.919, ns.

Discussion

This study sought to validate the relevance of two newly developed survey instruments, as well as examine relationships between an individual's skills with mobile technology and the level of technology integration in their life. The significant correlation between participants' technological skills and their level of technology integration, as well as the regression analysis, confirmed the initial prediction that an individual's mobile technology skills positively influence the depth at which they integrate mobile technology into their lives. This result strengthened the validity of both survey instruments as measures of an individual's skills and attitude towards mobile technology.

Another interesting result was the skill difference between individuals who answered the survey questions based on their smart-phone use, versus individuals who referred to both their smart-phone and their tablet computer. The greater skills of users of both devices is not surprising, and it has implications for the types of devices that might be most efficient for use in education. It is possible that tablet computers provide greater versatility and allow the user to practice more skills than smart-phones. Since much of the value of mobile technology in education is linked to the flexibility it provides, this result has interesting implications for tablet computer programs versus BYOD programs, which often result in smart-phone use. Further research comparing groups of smart-phone versus tablet computer users more directly may be worthwhile. In addition to identifying the most effective devices for classroom use, further research should consider the potential conflict between research-based programs and school policy. For instance, school policies on mobile device access in class can range from zero-tolerance to regular use as learning tools (Watters, 2011). Strict policies are often in place for safety reasons, such as preventing cyberbullying. Implementing a good technology program requires a balance between depth of integration, program effectiveness, safety, and logistics (Burns-Sardone, 2014).

As discussed in previous research, the specific technology skills of teachers is a valuable predictor of their attitude towards technology and their application of it in the classroom (Holden & Rada, 2011). The surveys in this study provide school leaders with a method of evaluating the skills of their faculty and staff. Such data can help direct professional development opportunities. For instance, if many faculty members show low skill levels with mobile technology, then workshops emphasizing basic functions and fluency may be an appropriate first step. If staff skills are acceptable, but their integration level is low, then opportunities to observe highly integrated classrooms might be a successful way to deepen the level at which their resources are used (Chou et al., 2012).

Limitations

Due to limited resources, this study surveyed a homogenous sample of college students, with only two practicing teachers participating. Future research will benefit from a greater sample of practicing educators. Also, the skewed nature of the IntTot data reduced the reliability of the correlation coefficient. A larger sample in the future will help ensure a more normal distribution and more reliable results.

Conclusion

Teachers' skills and attitudes towards technology integration in their classrooms are the foundation of technological innovation and change in education. Reliable methods for evaluating their skills and attitudes are an important component of promoting and implementing education technology programs. Such methods help administrators and school leaders to create the framework of systems logistics, staff development, and positive environment necessary for new ideas and techniques to grow and thrive (Basham et al., 2010). The results of this study add to the growing research base that is supporting the successful implementation of education technology programs in schools and slowly transforming our approach to teaching and learning.

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