International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2016, Vol. 12, Issue 1, pp. 129-143

Developing technology needs assessments for educational programs: An analysis of eight key indicators

Erin N. O'Reilly
University of Illinois at Urbana-Champaign, USA

ABSTRACT

As access to information and communication technology grows, educators have increasing opportunities to experiment with and to adapt both hardware and software to their current practice. Technology's integration, however, can vary widely between teachers within the same program for numerous reasons. Understanding the challenges practitioners face with technology integration is a critical first step to successful adoption and sustained use. This paper looked at eight indicators commonly found in technology needs assessment survey tools. Indicators included: self-assessed skill level, technology use and integration, teacher beliefs, barriers to access, professional development resources, leadership, needs and wants, and demographics. These core indicators were used to create a technology needs assessment survey for pre- and in-service language teachers within a US higher education setting, but the indicators are both relevant and applicable to a wide range of educational programs and teacher backgrounds. Recommendations are made for adapting the indicators and the specific survey items depending on context.

Keywords: *technology needs assessment; educational technology; professional development; technology survey; program administration; ICT*

INTRODUCTION

The push for technology's integration and innovative classroom use is pervasive, but the reality is that today's teachers represent a diverse cohort with varying degrees of facility when it comes to effectively deploying technology tools. Whether deciding to upgrade technology infrastructure or allotting funding for professional development programs, resource allocation effectively begins only after establishing what our teachers need. This article identifies and analyses eight major indicators commonly included in technology surveys designed for teachers: self-assessed skill level, technology use and integration, teacher beliefs, barriers to access, professional development resources, leadership, needs and wants, and demographics. These indicators emerged after comparing surveys designed for use at the national, regional, and institutional levels, and they have proven useful in the needs assessment phase of an internal program review. Regardless of the specific context, educational programs involved in strategic planning can adapt or build on these indicators during the needs assessment process to enhance the effectiveness of technology support and integration.

This paper first presents a brief literature review on technology adoption in the field of education and on the needs assessment process. This is followed by a description of the present study's context, methodology, and findings. Next, the paper includes a discussion of each indicator as well as considerations for adapting survey items. The paper concludes by situating the survey's role in the needs assessment process and a recommendation for ongoing research.

LITERATURE REVIEW

Barriers to Adoption

The early argument on 'digital natives versus digital immigrants' outlined by Prensky (2001a, 2001b) contended that the individual's chronological age played a critical role in his or her innate digital literacy. Those teachers who were educated prior to the ubiquitous access to personal computers and their integration into teacher training programs would need to re-educate themselves. Those teachers who were fortunate to be born and/or go through their formal education in the information age would enjoy a greater facility with information and communication technology (ICT). Since Prensky's writings, the demographic question has received additional attention. Findings from research by Inan and Lowther (2010) suggest that years of teaching and age negatively affect ICT adoption and integration. Conversely, researchers have found that chronological age does not always correlate to degrees of digital literacy (Xiaoqing Guo *et al*. 2008). Indeed, a myriad of factors, both internal and external to the teacher, affect successful ICT adoption.

The complex interplay between the individual teacher's attitudes, beliefs and ICT adoption is well documented (cf. Sang *et al*. 2011; Aldunate & Nussbaum 2013). Existing models and frameworks reflecting teachers' ICT adoption processes underscore the cost-benefit interplay at the individual level. Teachers must be willing to invest limited time resources to acquire new ICT skills often risking unknown returns. The more complex the technology, the more time invested, and the greater the possibility of failed adoption. These theoretical models are tangibly visible in second language classrooms, where ICT adoption has lagged in part due to a resistance to the use of technology in the classroom (many equipped classrooms go unused) coupled with a common belief held by many language teachers that learning requires physical interaction (Hampel & Stickler 2015).

The various external factors affecting adoption are no less multifaceted. Hohlfeld *et al*. (2008) proposed a tri-level pyramid framework depicting the digital divide within schools. The first level outlines the need for equitable access to ICT as well as technical support personnel within the school. The second level addresses teachers' use of ICT. This is measured in how many times and for what purposes teachers employ technology. The third and final level addresses whether the teachers know how to access and exploit ICT effectively and efficiently to accomplish their goals. Each level subsumes all prior levels. Of interest, evidence of a systematic digital divide emerged with socio-economic status (SES) a key indicator of ICT use in educational settings. The researchers found statistically significant differences between high and low SES K-12 settings in relation to student access and use of software, teacher use of software, and the school's level of ICT support. SES would seem to be a logical barrier to adoption, but more nuanced factors also play a role.

Each of the divides in Holfeld *et al*.'s framework reflects areas where the administration can intervene to provide support to the school or teacher to overcome barriers, through both access to resources and/or professional development. For example, while widespread access to ICT has resulted in the growing importance of digital tools for professional practice, the reality is that pre-service and in-service teacher professional development programs struggle to keep pace with methodological changes stemming from the rapid growth of ICT (Hampel & Stickler 2015), reflective of a level two or three divide in Holfeld *et al*.'s framework. Additionally, the literature shows that the school leadership itself is critical to the successful adoption of new technology (Buabeng-Andoh 2012; Berggren *et al.* 2015), a level one divide. All of these factors underscore the need to evaluate the current ICT environment within a school or program prior to implementing change.

Needs Assessment

Conducting a needs assessment is one of the first steps in setting programmatic goals or developing strategic plans, and the needs assessment process will be familiar to many readers. A needs assessment is defined as an evaluation of an organization's current environment relative to the preferred environment, with the difference between the two identified as the organisation's needs (Szuba *et al.* 2005). From this definition, the goal of the needs assessment is twofold: to ascertain existing capabilities and to determine the gap that exists, if any, between the current state and the desired end state. The needs assessment accomplishes more than just identifying a gap, however, the process also serves to:

- Provide direction for programs, projects, and activities;
- Allow staff to determine priorities and allocate limited resources to activities that will have the greatest impact;
- Create cohesion through the alignment of goals, strategies, professional development, and desired outcomes;
- Enable benchmarking and monitoring of implementation and impact; and
- Assist with continuous improvement activities by helping staff identify change, which instructional and other practices are working, and the strategies associated with the greatest success (Southwest Comprehensive Center 2008, p.7).

Research validates the use of needs assessments in unifying faculty's ICT needs, hardware and software procurement, and ongoing professional development (Kocher & Moore 2001; Kanaya *et al*. 2005). Developing and executing the needs assessment is often the most important and time consuming step in the process of setting ICT related goals for a specific educational program (Szuba *et al*. 2005). This attributed to the work required to determine who is involved in the process, what the process will look like, and the desired outcomes.

Needs assessments can include data collection from many sources. Existing documentation, such as historical budgets, student achievement, and target population demographics, is typically available in program files. Interviews, focus groups, and environmental scans provide additional information on current practice. Surveys, however, remain the most common form of needs assessment, as they are relatively easy to administer and provide data in an accessible format (Southwest Comprehensive Center 2008). To this end, the current paper focuses on the development of an ICT needs assessment survey.

THE STUDY

Context

The review of technology needs assessment tools emerged in response to the preliminary stages of a multi-year strategic plan for program development focused on resource allocation and faculty development at an intensive language program within a US higher education setting. An informal environmental scan revealed wide disparities in teachers' integration of ICT into their professional practice. For example, teachers expressed preferences on classroom assignments at the beginning of each semester, varying from needing tech-enabled rooms to foregoing access to technology entirely. Classroom observations further revealed that not all teachers used the technology available to them in the equipped classrooms. This variance reflected a range of skills and comfort levels with technology as well as beliefs about teaching and the role of technology integration. In keeping with the needs assessment process outlined above, as well in consideration of known barriers to ICT adoption, the goal in designing and administering a

technology needs assessment was to identify the faculty's current knowledge base, values held towards technology integration, barriers to integration, and perceived program evolution. This would then allow the program to articulate critical professional development and technology support needs.

Administration is discussed throughout the paper, a term which is intended to refer to those individuals who are involved in the decision making process. Depending on the local context, this could refer to the school or department heads, core technology support group, or even a teacher who has taken on the role of technology specialist within his or her institution.

Method

Surveys were selected based on their availability through an Internet search and through research databases. Primary search terms included *teacher technology survey*, *educational technology needs assessment*, and *school technology survey*. Sampling included surveys from a diverse range of educational settings, to include regional and national primary and secondary schools, as well as university level contexts.

Surveys were analysed for common themes, or indicators, through a constant comparison approach, allowing the content from one survey to be compared to another for either similarities or differences (Glaser & Strauss 1967). Descriptive coding was used to extract a categorized inventory of the data using lean codes (labels rephrased in the researcher's own words). For example, survey questions that asked the individual to rate his or her overall level of technology proficiency fell under the umbrella indicator of *Self-Assessed Skill Level*. Survey analysis continued until each additional survey yielded no further novel indicators.

FINDINGS

This section includes a brief description of the eight major indicators. A more in-depth evaluation of each indicator is included in the discussion section below.

1. Self-Assessed Skill Level

Each of the technology surveys reviewed included a section asking teachers to self-assess their current skill levels; the question type, however, differed greatly. Likert-type items provided a range of labels about overall skills, planning, integration, and content-specific tools (e.g., *unable* to *advanced*) (Florida School Leaders 2013). Alternatively, Wozney *et al*. (2001) provided the teacher a range of skill definitions and asked the practitioner where he or she was in the process of integrating computer technology into teaching activities. Items included, "Awareness: I am aware that technology exists, but have not used it – perhaps I'm even avoiding it," and "Creative Application: I can apply what I know about technology in the classroom." Likewise, the survey included a proficiency scale for users in relation to computer technologies; items from the survey ranged from, "Unfamiliar: I have no experience with computer technologies," to "Expert: I am extremely proficient in using a wide variety of computer technologies." Conversely, Wesley ([no date]) presented the skill level question as a reflective statement, "Do you ever, or often, think, "there must be an easier way to do this?" If so, please list and describe."

In addition to rating technical skill levels, several surveys asked about the teacher's awareness of and adherence to local acceptable use policies (Lowther *et al.* 2008; Florida School Leaders 2013; Campbell & Godin 2014). Acceptable use policies included questions on data storage, the sharing for sensitive information, and copyright adherence.

2. Technology Use and Integration

Technology use and integration questions were divided into two broad categories: frequency of integration and type of integration (Wozney *et al*. 2001; Corn 2007; Edmuson 2013; Florida School Leaders 2013; VeraQuest, Inc. 2013; Campbell & Godin 2014). For the former, one survey asked about the frequency of integrating student-centered technology in teaching (Florida School Leaders 2013). Alternatively, a different survey provided a range of technology teaching methodologies and asked the teacher to identify his or her frequency of integration, examples included *evaluative* (e.g., assessments, portfolios), and *organizational* (e.g., database, spreadsheets, lesson plans) (Wozney *et al*. 2001). Another facet to frequency of use are changes over time, for example, "Are you using technology (more, less, or the same amount) as one year ago" (VeraQuest, Inc. 2013).

The second category of use questions focused on the types of hardware and software applications the teacher currently uses, for example: a class webpage, Smartboards, or online learning platforms (Edmunson 2013; Florida School Leaders 2013; Campbell & Godin 2014). Other integration questions were designed to elicit opinions about best-practices, for example, "Which technology has the ability to enhance education the most?" (VeraQuest, Inc. 2013). Finally, several surveys elicited information on the teachers' use of computers outside of the classroom, to include devices used in their personal lives and the amount of time spent on computers outside of teaching activities (Wozney *et al*. 2001; Florida School Leaders 2013).

3. Teacher Beliefs

As a major indicator, teacher beliefs were included in the majority of the surveys reviewed. Questions examined the perceived linkage between technology and student success (e.g., "I believe that integrating technology into the curriculum is important for student success," [Edmunson 2013]). Not all teacher belief questions were framed around positive outcomes; surveys also included negative beliefs and emotions as well (e.g., "Technology requires too much planning/maintenance," [VeraQuest, Inc. 2013].)

4. Barriers to Access

This indicator focused on technical barriers to ICT adoption. Barriers can come in in many forms, from limited student access to computers, to network connection problems, to unresponsive technology support. Several surveys included questions about resource access and common technology problems (Russell *et al*. 2003; Corn 2007; Lowther *et al*. 2008; Florida School Leaders 2013; Campbell & Godin 2014). One survey was designed to collect data on those barriers teachers encountered during their daily practice by asking them to fill out the survey over a period of time, with the item, "Do you ever, or often, think, “I wish I or my students could contact someone right now to find out...” If so, please list and describe as many of the things or situations as you can to which this statement would apply," (Wesley, [no date]).

5. Professional Development Resources

Professional development questions focused on two different areas: access to training and influence of training. Access to training included generic items, for example, "What professional development resources are available?" (Florida School Leaders 2013). The second aspect of professional development elicited the most influential training opportunities and/or experiences in the teacher's own technology adoption and use (Russell *et al*.; Corn 2007). Sample items included passive experiences, such as, "The fact that the district has put computers in my classroom encourages me to use them with my students," to collaborative experiences, such as,

"I have worked with my colleagues to design lessons that require classroom use of computers," (Russell *et al*. 2003).

6. Leadership

Leadership emerged in response to items soliciting input on vision, communication, and administrative support practices (Russel et al. 2003; Corn 2007). Russell *et al*. (2003) incorporated several items related to administration and leadership practices. Sample items included, "How much emphasis does your department head place on technology?" and "Teachers lack input into technology decisions."

7. Needs and Wants

This indicator focused on determining what teachers need in order to succeed with technology integration, from specific professional development to specific hardware. Every survey included items related to this indicator. Professional development items included lists of relevant training topics, for example, "Learning about research sources on the Internet," or "Learning to use the internet to engage in on-line interactions and/or mentoring," (Russell *et al*. 2003). In addition to pre-determined lists of professional development topics, open-ended questions were more common under this indicator and allowed respondents to provide a range of input on their needs. Sample items included, "What one technology would you like to have in the classroom?" (VeraQuest, Inc. 2013), and "What technology professional development would you be interested in attending?" (Campbell & Godin 2014).

8. Demographics

The majority of the surveys reviewed for the current study were designed to elicit data at multiple locations and included various demographic questions. The most common demographic question asked for the total number of years of teaching experience, others included number of years in the current school and years in the individual's current position (e.g., classroom teacher or administrative support) (Wozney *et al*. 2001; Lowther *et al*. 2008; Florida School Leaders 2013; Campbell & Godin 2014).

DISCUSSION

The rapid change of ICT signifies that any faculty as a collective group will have varying capabilities and needs. Due to this variance, the needs assessment survey itself becomes a critical data collection tool in the program development process. The following discussion of the indicators includes analysis of question type and data elicitation, along with considerations for adaption. The resultant survey is located in the Appendix.

Self-assessed Skill Level

The question type varied greatly for the self-assessed skill level indicator. While the Likert items are convenient for survey design and data analysis, they do not offer the individual a point of reference; one teacher's *basic*, may be another's *proficient.* The alternative approach of presenting a definition with the skill level provides a clear scale for survey takers. This resulted in an adapted 5-point scale on overall self-assessed skills that the teacher could then use to assess his or her abilities for specific hardware and software applications.

Apart from technical knowledge, questions about copyright adherence and ethical use align with the promotion and modeling of digital citizenship outlined in current teaching and technology

standards ISTE 2008; Healey *et al*. 2009). Teachers rarely have the time or technical expertise to address security issues, such as storing student files, but local and national laws often govern these matters (Szuba *et al*. 2005). Questions on digital citizenship should be incorporated if survey results are intended to inform training on this topic.

Technology Use and Integration

As described previously, technology use and integration questions fell into two categories: frequency of use and type of application. The problem of providing teachers access to technology but then having a failed adoption is well-known (Ensign et al. 2007). As such, technology use and integration questions should be tailored to focus on a program's available ICT resources and/or planned future acquisitions.

Several question types merit consideration under this indicator. Questions that encourage respondents to think concretely about daily practice may be more appropriate for practitioners less familiar with field-specific terminology, such as student-centered technology tools. Questions which look at usage longitudinally (or retrospectively) may be helpful to organizations measuring the success of ongoing initiatives or designing a pre- post-assessment. Other integration questions designed to elicit opinions about best-practices allow the survey taker to identify current practices and provide information on which technologies to invest in and/or what training to offer. Both daily practice and retrospective integration questions were adapted and included in the final survey.

Teacher Beliefs

Teachers hold varying beliefs and attitudes about the value and effectiveness of incorporating technology into their teaching (Hampel & Stickler 2015). Teacher education must consist of on-going training to help teachers develop their pedagogical awareness of how ICT can enhance learning, especially in formal school settings (Germain-Rutherford & Ernest 2015). Not surprisingly, every survey included a category related to teacher beliefs. Including a range of positive and negative questions on teacher beliefs can help trainers scaffold technology training as appropriate. The current survey incorporated an open-ended question to allow teachers to identify the ideal use, if any, of technology in the classroom.

Barriers to Access

Physical barriers to ICT access and use provide another lens to understanding faculty needs. Administrators and technology support personnel are often removed from the classroom. These personnel may lack recent first-hand experience to common barriers teachers and students face when attempting to incorporate technology tools. Barriers can come in many forms, from limited student access to computers, to network connection problems, to unresponsive ICT technical support (Hohlfeld *et al*. 2008). Including items on common barriers can help the administration address those issues. A list of common obstacles was adapted and included in the final survey.

Professional Development Resources

Teachers' professional identities, beliefs, and attitudes towards ICT influence their ongoing ICT professional development (Germain-Ruherford & Ernest 2015). Under this indicator, teachers were asked to provide feedback on training access and training influence. Training influence examined those training opportunities and/or experiences which had been the most influential in the individual's own ICT use. Survey administrators should keep in mind that teachers pursue formal and informal ICT learning opportunities. The scope and relative success of formal in-house training is probably known by the survey administrators. However, for some teachers, informal

and flexible learning (e.g., discussion with peers + blogs + classroom observations) provide additional opportunities to continue their professional development. Offering a range of meaningful experiences for the teacher to choose from can give a better picture of the professional development opportunities which teachers have found most effective.

Leadership

Survey items related to organizational leadership practices provide valuable information on ICT use and adoption. The literature shows that leadership's sustained support for in-service training can overcome teacher resistance towards ICT (Buabeng-Andoh 2012; Germain-Ruherford & Ernest 2015), and that organizational leadership which promotes technology integration for learning is a stronger predictor of teachers' technology use than just infrastructure support (Anderson & Dexter 2005). In other words, a well-developed technology plan with a common, shared vision promoted by the administration is of greater importance to ICT's successful adoption than the technology support team alone. Including questions about leadership and past administrative practices provides an opportunity for leadership to reflect on the program's vision moving forward. Indeed, leadership questions reveal the degree of influence administrators have in setting a shared vision and providing adequate resources for technology adoption's success. The final survey included questions on administrative practice, perceived success with previous ICT adoption, and vision clarity.

Needs and Wants

Acquiring new hardware and software are often the first things that come to mind when thinking about ICT adoption. Pre-determined listed items and open-ended items can elicit a range of valuable feedback about what teachers need and want. Listed items that include specific professional development opportunities, hardware, or software should be tailored to the individual program's context. If, for example, the program has purchased institutional licenses for specific software, then that software should logically be included on the list. Likewise, if a program is pursuing an initiative (e.g., mobile technology in the classroom), survey items should target that initiative. Open-ended questions allow for a greater range of input from the survey takers. Caution should be used when providing examples in the open-ended questions as they can bias the respondent's answer to focus on those examples resulting in limited responses. In the final survey, respondents were invited to give input through three open-ended questions related to technology acquisition and administrative support.

Demographics

The majority of the surveys reviewed for this project included items related to the survey taker's demographics; however, the final survey omitted these questions because the context of the needs assessment was limited to a single department. Demographic questions may be appropriate depending on the goals of the needs assessment, especially if broader correlational or longitudinal research are among the anticipated outcomes, or the needs assessment involves multiple sites that have varying ICT capabilities or support practices. Of interest was the fact that demographic questions did not solicit the teacher's chronological age, rather length of employment and time in position. The possibility exists that both of these variables serve as proxy variables for age, despite the debate over age as a reliable predictor of successful ICT adoption (Xiaoqing Guo *et al.* 2008).

CONCLUDING REMARKS

The above article provides a framework from which education administrators can identify and collect feedback on eight key indicators when designing a technology needs assessment survey. These indicators included: self-assessed skill level, technology use and integration, teacher beliefs, barriers to access, professional development resources, leadership, needs and wants, and demographics. Each of the eight indicators may hold varying weight, or importance, for a given educational setting depending on current faculty composition, infrastructure access, budget resources, and program vision. That said, each indicator offers a different type of input to help decision makers which, when combined, present a comprehensive picture of the ICT use and adoption climate within an organization. These eight indicators should be re-evaluated for their currency and relevance as additional research continues to clarify the complex interplay between the multiple variables involved in the ICT adoption process within formal educational settings.

Needs assessment surveys are common. Surveys, however, are a one dimensional tool. In order to expand the process to reflect a comprehensive approach, survey data should ideally be triangulated with other forms of input (Southwest Comprehensive Center 2008). Triangulation for the present model could include a focus group to discuss the results of the survey with stakeholders, or classroom observations to confirm current practice. Any discrepancies between survey data and other forms of input would indicate a need for additional information.

Effectively adopting and integrating technology in a formal educational context begins with identifying program needs. This goes beyond specific hardware and software procurement. Sample technology surveys abound, and when considered in aggregate they offer a framework to create a survey tool capable of eliciting valuable information to help programs move forward. For those in decision making positions, having a firm understanding of a faculty's current skills, attitudes, beliefs and contextual constraints is fundamental to resource allocation, training support, and ultimately ICT's successful incorporation into professional practice.

REFERENCES

Aldunate, R. & Nussbaum, M. 2013. "Teacher adoption of technology", *Computers in Human Behavior*, vol. 29, no. 3, pp. 519-524.

Anderson, R. E., & Dexter, S. 2005. "School technology leadership: An empirical investigation of prevalence and effect", *Educational Administration Quarterly*, vol. 1, pp. 49-82.

Berggren, B., Fili, A. & Nordberg, O. 2015. "Digital examination in higher education – Experiences from three different perspectives", *International Journal of Education and Development using Information and Communication Technology*, vol. 11, no. 3, pp. 100-108.

Buabeng-Andoh, C. 2012. "Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature", *International Journal of Education and Development Using Information and Communication Technology*, vol. 8, no. 1, pp. 136-155.

Campbell, S. & Godin, L. 2014. "Teacher technology survey and needs assessment" [online]. Available at: http://chs.gisd.k12.nm.us/site_view_survey.aspx?id=7b19202c-9956-41bd-903d-45648d477d5d [Accessed: 13 December 2015].

Corn, J. 2007. "Investigating the validity and reliability of the school technology needs assessment (STNA)", Paper presented at the *American Evaluation Association*, Baltimore, MD.

Edumson, S. 2013. "Evaluation of classroom technology integration professional development", *EDTECH ePortfolio"* [online]. Available at: https://shellyedmunson.files.wordpress.com/2013/09/edmunson-professional-development-evaluation-project.pdf [Accessed: 27 April 2015].

Ensign, J., McAloon, P. Walker, G. & Wright, M. 2007. "2007 U.S. language summits: Ohio language roadmap for the 21st century", *The Language Flagship* [online]. Available at: https://www.thelanguageflagship.org/media/docs/roadmaps/Ohio_language_roadmap.pdf [Accessed: April 27, 2015].

Florida School Leaders. 2013. "Teacher technology survey*"* [online]. Available at: https://www.surveymonkey.com/s/VBSJLZG [Accessed: 27 April 2015].

Germain-Rutherford, A. & Ernst, P. 2015. "European language teachers and ICT: Experiences, expectations, and training needs". In Hampel, R., & Stickler, U. eds. *Developing online language teaching: Research-based pedagogies and reflective practices.* Hampshire, England: Palgrave Macmillan, pp. 12-27.

Glaser, B. G., & Strauss, A. L. 1967. *The discovery of grounded theory*. Chicago, IL: Aldine.

Hampel, R., & Stickler, U. 2015. *Developing online language teaching: Research-based pedagogies and reflective practices.* Hampshire, England: Palgrave Macmillan

Hohlfeld, T. N., Ritzhaupt, A. D., Barron, A. E., & Kemker, K. 2008. "Examining the digital divide in K-12 public schools: Four-year trends for supporting ICT literacy in Florida", *Computers and Education*, vol. 51, no. 4, pp. 1648-1663.

Inan, F. A., & Lowther, D. L. 2010. "Factors affecting technology integration in K-12 classrooms: A path model. Educational Technology Research and Development", *Computers and Education*, vol. 58, no. 2, pp. 137-154.

Healey, D., Hegelheimer, V., Hubbard, P., Ioannou-Georgiou, S., Kessler, G. & Ware, P. 2009. *TESOL technology standards framework*. Alexandria, VA: TESOL. ISTE. 2008.

International Society for Technology in Education (ISTE). 2008. *International society for technology in education standards: Teachers* [online]. Available at: http://www.iste.org/standards/iste-standards/standards-for-teachers [Accessed 30 June 2015].

Lowther, D. L., Strahl, D. J., Inan, F.A. & Ross, S.M. 2008. "Does technology integration “work” when key barriers are removed?" In: *American Educational Research Association National Conference*, New York, NY.

Kanaya, T., Light, D., & Culp, K. 2005. "Factors influencing outcomes from a technology-focused professional development program", *Journal of Research on Technology in Education*, vol. 37, no. 3, pp. 313-329.

Kocher, A. T., & Moore, B. 2001. "Assessing teacher technology skills", Paper presented at the *Annual Meeting of the American Educational Research Association,* Seattle, WA.

Prensky M. 2001a. "Digital natives, digital immigrants", *NCB University Press*, vol. 9, no. 5, pp. 1–6.

Prensky M. 2001b, "Digital natives, digital immigrants, Part II: Do they really think differently?", *On the Horizon*, vol. 9, no. 6, pp. 1–6.

Russell, M., Bebell, D. & O'Dwyer, L. 2003. "Use, support, and effect of instructional technology study: An overview of the USEiT study and the participating districts", *USEiT Boston College* [online]. Available at: http://www.bc.edu/research/intasc/researchprojects/USEIT/pdf/USEIT_teachersurv.pdf [Accessed 27 April 2015].

Sang, G., Valcke, M., Van Braak, J., & Zhu, C. 2011. "Predicting ICT integration into classroom teaching in Chinese primary schools: Exploring the complex interplay of teacher-related variables", *Journal of Computer Assisted Learning*, vol. 27, pp. 160-172.

Southwest Comprehensive Center. 2008. *A guide for comprehensive needs assessment* [online]. Available at: https://www.cde.state.co.us/sites/default/files/documents/fedprograms/dl/consapp_na_guide.pdf [Accessed: 22 May 2015].

Szuba, T., Rogers, A. & Malitz, G. 2005. "Forum unified education technology suite", *National Center for Education Statistics* [online]. Available at: https://nces.ed.gov/pubs2005/tech_suite/part_2.asp [Accessed 12 November 2015].

VeraQuest, Inc. 2013. "Teacher technology usage", *PBS Learning Media* [online]. Available at: http://www.edweek.org/media/teachertechusagesurveyresults.pdf [Accessed 27 April 2015].

Wesley, T. [no date]. "Perceived educational technology needs survey", *National Center for Technology Planning* [online]. Available at: http://www.nctp.com/articles/assess.pdf [Accessed 15 November 2015].

Wozney, L., Venkatesh, V. & Abrami, P. 2001. "Technology Implementation Questionnaire (TIQ) Report on results", *Centre for the Study of Learning and Performance Concordia University* [online]. Available at: http://doe.concordia.ca/cslp/Downloads/PDF/TIQFINAL REPORT_sept12.pdf [Accessed 27 April 2015].

Xiaoqing Guo, R., Dobson, T., & Petring, S. 2008. "Digital natives, digital immigrants: An analysis of age and ICT competency in teacher education", *Journal of Educational Computing Research*, vol. 38, pp. 235-245.

APPENDIX

Technology Needs Assessment Survey		
1. Please read the following descriptions of the proficiency levels a user has in relation to computer technologies. Choose the level that best describes you.		
	1. Unfamiliar	I have no experience with computer technologies.
	2. Beginner	I am able to perform basic functions in a limited number of computer applications. I still require help on a regular basis.
	3. Average	I demonstrate a general competency in a number of computer applications.
	4. Advanced	I have acquired the ability to competently use a broad spectrum of computer technologies
	5. Expert	I am extremely proficient in using a wide variety of computer technologies
2. Using the 1-5 scale above, rate your skill level for each of the following:		
	Word processing software (e.g., Microsoft Office)	
	Email software (e.g., Microsoft Outlook)	
	Presentation software (e.g., Microsoft PowerPoint)	
	TV Monitor/computer	
	Projector/laptop	
	Multimedia (audio/video) use	
	Multimedia (audio/video) creation	
	Other	
3. Please read the descriptions of each of the five stages related to the process of integrating computer technology into teaching activities (to include homework). Choose the stage that best describes where you are in the process.		
	Awareness	I am aware that technology exists, but do not use it frequently – perhaps I'm even avoiding it. I am anxious about the prospect of using computer technology.
	Learning	I am currently trying to learn the basics. I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful. I am sometimes frustrated using computers and I lack confidence when using them.
	Familiarity	I am gaining a sense of self -confidence in using the computer for specific tasks. I am starting to feel comfortable using the computer technology
	Adaptation	I think about the computer as an instructional tool to help me and I am no longer concerned about it as technology. I can use many different applications.
	Creative Application	I can apply what I know about technology in the classroom. I am able to use it as an instructional aid and have integrated my knowledge into the curriculum
4. Please indicate how frequently computer technologies are integrated into your teaching practice (both inside and outside of the classroom) for each of the uses listed below using the following scale:		

(1: Never, 2: Practically Never, 3: Once in a While, 4: Fairly Often, 5: Very Often, 6: Almost Always)	
	Communicative (e.g., e-mail, chat functions, video conferencing, LCD projector)
	Organizational (e.g., data base, spreadsheets, record keeping, lesson plans)
	Analytical/Programming (e.g., statistics, charting, graphing)
	Recreational (e.g., educational games)
	Expansive (e.g., simulations, experiments, exploratory environments (Second Life), brainstorming)
	Creative (e.g., desktop publishing, digital video, digital camera, scanners, graphics)
	Expressive (e.g., word processing, on-line journal, wikis, Moodle Blog)
	Evaluative (e.g., assignments, digital portfolio, testing)
	Informative (e.g., internet browsing, media clips, DVDs)
	Other Instructional (e.g., drill, exercises, supplementary practice, tutorials, remediation)
5. Use the following scale to rate how frequently you integrate technology: (1: Not at all, 2: Once a month, 3: Weekly, 4: Almost Every Class, 5: Every Class)	
	Please indicate how often you integrate computer technologies in your TEACHING activities.
	Please indicate how often you integrate computer technologies in your HOMEWORK activities.
	Please indicate how often you integrate computer technologies in your PROFESSIONAL COLLABORATION activities.
	Please indicate how often you integrate computer technologies in your ADMINISTRATIVE tasks (e.g., attendance, gradebook).
6. Please use the space provided to describe the ideal use, if any, of computer technology in the classroom.	
7. How important have computers been in your TEACHING? Use the following scale: (1: Very important, 2: Somewhat Important, 3: Not Very Important, 4: Not Applicable)	
	This year
	Three years ago
	Five years ago
8. How important have each of the following been in influencing how you use technology in your teaching practice? (1: Great Influence, 2: Some Influence, 3: No Influence)	
	Other teachers have shared examples of how they use computers with their students.
	The fact that I am assigned a classroom with computers or audio/visual hookups for a laptop encourages me to use technology with my students.
	Specific in-house training opportunities.
	I have worked with colleagues to design lessons that require use of specific hardware or software.
	Professional development workshops led by someone outside of our program have demonstrated uses that I have adapted to my teaching.

9. Rate how much each of the following conditions provide an obstacle for you in making more effective use of technology in and outside of the classroom. Use the following scale: (1: Not an obstacle, 2: Minor Obstacle, 3: Major Obstacle)	
	Lack of computers in the classroom
	Students do not all have equal access to computers at home
	The overall technology skills (e.g., AV recording) of students in my class vary so widely that it's too difficult to manage technology integration
	My students lack the necessary English language skills to use computers efficiently
	Professional development prepares me to use technology in the classroom but I do not have enough time to practice
	Insufficient or inadequate software on classroom or laptop computers.
	Insufficient or inadequate support on how to use technology in my teaching
	Computers are unpredictable – they crash or the software does not work correctly
	The kinds of computers and software at school are different from the computers and software I use at home
	There is too much course material to cover to make room for technology use
	Teachers lack input into technology decisions
	I have a hard time connecting with technology support
	Internet is too slow or drops connection
	Lack of leadership related to technology
	Not sure how to make technology relevant to my teaching subject
	No idea how the administration wants me to use computers in my teaching
10. As of today, rate the degree of success the program has had in implementing each of the following: (1: Not Successful, 2: Moderate Success, 3: Very Successful)	
	Professional Development on Technology Use and Applications
	Integrating Technology into the Curriculum
	Technical Support
	Access to Hardware
	Access to Software
11. How aware are you of the program's vision for the use of instructional technology?	
	Not aware: I am not sure of the vision
	Somewhat Aware: I have a sense of where we're headed, but not aware of formal plans
	Aware: I am familiar with the vision
	Very Aware: I am very familiar with the vision.
12. What kinds of professional development would be beneficial to you? (1: Great Influence, 2: Some Influence, 3: No Influence)	
	Managing my computer desktop (opening programs, printing, etc.)
	Learning to utilize network services efficiently (email, saving to the server, finding files, etc.)
	Learning about research sources on the internet
	Integrating technology with student writing
	Integrating technology into my classroom activities
	Learning specific applications/software

	Learning to integrate technology for homework assignments
	Learning how to create videos of students for assessment/evaluation
	Learning to create multimedia (e.g., video editing and formatting) for instructional use

13. The following three questions are open-ended. Please use the space provided to respond.

a) Suppose the program made additional resources available each year for improving technology use. In your opinion, what kinds of resources should the program provide? How would you like to see these resources used in order to improve your instructional use of technology? Administrative use of technology

b) What one technology would you want in the classroom?

c) Please use the space below to provide any other feedback or input which might be useful to the administration regarding the use of technology in your daily job.

14. Background Questions

Please indicate your total number of years of teaching experience.	
Please indicate your current position title.	

Thank you for your participation!