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Technological Proficiency Level of English Faculty Members of a Philippine State University: Application of Cognition Learning Approaches

Carlito C. Biares
carlitobiares@gmail.com
Eulogio "Amang" Rodriguez Institute of Science and Technology
Manila, Phillipines

Abstract: In today's digital society, the role of teachers in the classroom has technologically challenged them over the past so many years. New technological tools including interactive videos, digital light processing projectors, and other significant appurtenances of digital learning have become more prevalent amidst its essential impulse to the millennial learners. In conjunction with this, teachers must delve into innovative teaching strategies and how to effectively integrate them into the classroom and adapt these methods with the new digital learning devices. The study notes that teacher technological performance can affect the meaningful change in the pedagogical setup and that learning with the aid of technology is a more interactive and effective process of learning acquisition. The effective use of modern equipment in teaching relies mainly on the exposure of a certain teacher in seminars, training, and other related professional skills of advanced technologies. Under this circumstance, many teachers are still using the conventional way of teaching and perhaps some of them will never intend to use technology as a supplement or rather as a core component of instruction. This study provided a modest understanding of the technological proficiency of the target respondents and the opportunity to know their proficiency level in the utilization of advanced technologies. Henceforth, the study revealed the technological proficiency level of the respondents through the use of digital devices and the integration of these available instructional tools in their classes.

Keywords*:* Technological Proficiency, Situated Cognition, Distributed Cognition, Socially Shared Cognition, Cognition Learning Theory

INTRODUCTION

In the present study, the term technology refers to the use of systems that rely on computer chips, digital applications, and networks in all of their forms and the term proficiency refers to the frequency utilization of any kind of instructional technology tools in learning by the teacher who independently uses it with or without the assistance of others.

The educational benefits of technology are proven to be essential in terms of innovative teaching and learning process. The fast pace of technology for teaching has become a great challenge for many teachers to know the best potential of computers, other forms of digital technology, and the use of the internet in language teaching.

Despite the acknowledged need for technology integration in higher education to meet the demands of a "technology-driven knowledge society" (Lock, & Redmond, 2010), the issue at the faculty level is still critical. Technical skill development opportunities (training and seminars) are some of the issues that need to be addressed among educators to become proficient in the effective use of technology as an instructional tool. Archambault et al. (2010) describe professional development for teacher educators may be required to stay abreast of innovations and possibilities for technology integration in courses.

This is a solid learning awareness that can fill the gap between the teacher and digital natives (students) which requires some individual teachers to involve themselves in the adaptation and diffusion of technological innovations. Professional development programs, through mentoring, workshops, or university-school collaborations, are a key component of building awareness and expertise (Polly et al., 2010; Yilmazel-Sahin & Oxford, 2010).

There are many technological tools at a teacher's disposal to facilitate classroom instruction. In terms of instructional applications, many teachers are still not familiar with the scope of technology available or are not confident in their abilities to use them effectively.

One major challenge of today's teachers is to design and develop student-learning activities that integrate related technologies in education. The use of PowerPoint presentations, the internet for additional instructional materials, social media for dissemination of information, etc. are some of the jolting advantages that technology offers. Today, technology is no doubt one of the most relevant and ultrapractical instruments to be used in delivering effective knowledge acquisition. On one hand, it is a fact that having adequate material or equipment to be used in a classroom can supplement better learning outputs among students who are now classified as digital natives that relied on the technological teaching strategies or approaches that the teachers intend to use. Faculty members with strong technological literacy are more apt to integrate specialized technologies, such as videoconferencing, digital media, and gaming, into course assignments (Vaughan, Beers, & Burnaford, 2015). Yet, a persistent challenge for faculty is the time and opportunity to learn technology and integrate it into coursework (Spotts, 1999; Vaughan et al., 2015).

Eulogio Amang Rodriguez Institute of Science and Technology is a state institute that needs to strengthen its technical pedagogical resources. Some of the teachers are not yet well equipped with basic technological skills because of the lack of school facilities as the prime reason. Technology is one thing that the school should need to proliferate and invest in among teachers because the single biggest problem facing education today is that Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population (digital natives) that speaks an entirely new language. Despite the massive investments that many school systems are making, the evidence that digital personalized learning can improve student outcomes or narrow achievement gaps at scale remains scattered, at best (Harold, 2016). Not all English Language Teachers of EARIST are technically inclined though some of them are resourceful amidst insufficient facilities of the school. Since they have nothing to utilize, then, there is a tendency that these teachers will be having technical difficulties and complexity of skills that could debilitate their technological proficiency level. It is a fact that the innovative utilization of technology in the field of education has given increasing emphasis to school administrations and teachers who have gradually become the digital migrants of today's technology. The value of technology as a tool for teaching and learning should not be compromised nowadays. Teachers should recognize the benefits of technology that potentially influence the learning process of students who prefer virtual learning scenarios.

Some teachers are using technology to supplement innovative instructional materials that could help them facilitate and strengthen quality instructions in the learning process of their students. Other teachers can also demonstrate technical proficiency in terms of the basic computer application or other prevalent devices that are significantly useful in a learning process. Thus, "there is a conspicuous lack of attention to the complexities and intricacies of how classroom teachers incorporate technology in their teaching" (Peterson & Walberg, 1979).

This research study utilized the emerging theories that support the use of technology and help to create more authentic learning environments (Doak, 2009).

Review of Related Literature

Situated cognition

Situated cognition is a learning theory that supports the idea that learning occurs only when situated within a specific context. It believes that learning takes place in a learning community or community of practice, where the learners take an active role in the learning community. It involves a process of interaction between the learners within the community, the tools available within the specific situation, and the physical world. It is within this active participation, this interaction (whether with tools, artifacts, or other people), where knowledge is located. Therefore, knowing evolves as the learners participate and interact within the new situation. Cognition is linked to the action the

learners in the community take, whether it is physical in nature or a reflective process within the learners themselves (Myers & Wilson, 2000). Wilson and Meyers put it this way, "the development of knowledge and competence, like the development of language, involves continued knowledge-using activity in authentic situations" (Myers & Wilson, 2000). Situated Cognition also takes into account the culture of the community at large and "treats culture as a powerful mediator of learning and practices, both for students and teachers (Myers & Wilson, 2000)." A program based on this theory will not be successful if the larger communities, outside the learning environment, culture is not considered, as it can define what may be possible within the learning environment (Myers & Wilson, 2000). The main points to remember about situated cognition for this paper are that "knowing, learning and cognition are social constructions, expressed inactions of people interacting within communities" (Myers & Wilson, 2000). Therefore, without action, there is no learning.

So, what is the role of technology within this emerging theory of learning? As stated above action needs to take place for cognition to occur. This action must take place within a community of practice or learning communities. This action often involves interaction between tools and or artifacts that are situated in the community (Myers & Wilson, 2000). These tools and artifacts are invaluable parts of the learning system. Without these parts, the interactions that they produce, assist, or motivate, may not occur. Therefore, technology in this learning theory is a piece of the learning environment that helps to bring about cognition. Myers and Wilson (2000) state, "These tools and constructed environments constitute the mediums, forms, or worlds through which cognition takes place. Problem-solving involves reasoning about purposes concerning the resources and tools which a situation affords".

It is quite clear that the learners who are placed in this type of learning environment would be using their "knowledge and skills—by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, making decisions" (Honey, et al, 2003) This learning theory supports the very skills needed by the 21st century.

Distributed cognition

In distributed cognition, the student is afforded more power. In other words, it is a student-centered approach to learning where the learners participate in a systematically designed learning environment that supports interaction amongst its participants. Distributed cognition describes the construction of knowledge that takes place in a natural environment which is synergistically connected to the cognitive actions taken by the participants in the learning environment. (Bell & Winn, 2000) This theory promotes learning in a community of learners or a system where interaction takes place. It is through this interaction that cognition occurs. Distributed Cognition requires the sharing of cognitive activity among the parts and participants of this system, which can be other people or artifacts such as devices, technologies, or media. These participants distribute their cognition among other learners and physical or digital artifacts by externally representing their knowledge. Artifacts can help to scaffold new capabilities as well as off-load a certain amount of cognitive work thus reducing the cognitive load of the learners and helping to augment their capabilities. At times, by using these artifacts, a little bit of the information might stick with the user, this is known as the cognitive residue. It is through interaction with other members and artifacts that progresses learning. Therefore, communication among all participants is paramount in importance (Bell & Winn, 2000).

The role of technology within this theory is an invaluable part of the system in which the learners are interacting. This interaction can either help to distribute their knowledge, off-load certain amounts of cognitive work making the cognitive load less, or help to scaffold new capabilities (Bell & Winn, 2000). In this theory technology (artifacts and or tools) can be used to help extend human capabilities. An example of this might be the use of manipulatives in the early development of basic addition skills (Bell & Winn, 2000). The problem might be too complex for the child to solve, but with the use, of the manipulative, they can visually represent their thinking and use the tool to help them solve the problem. Another example of this is taken from a case study that was conducted using robotics to produce solving problem skills. In this case study, students were placed into small collaborative groups and were asked to construct a robot, using Lego Mindstorm for school's kits, which would perform various tasks. The groups were introduced to a tool known as a flowchart. They used these flowcharts to map the programming instructions they would give the robot to complete the given task. This allowed them to off-load some of the cognitive work to the flowchart and then through its use, they were able to solve harder problems (Chambers, et al, 2007). The above example shows that cognition takes place because of the cognitive abilities of the learner plus the augmentation of these capabilities by the use of external technology (Bell & Winn, 2000).

This learning theory supports the very skills needed by the 21st century. Learners who are placed into a learning environment based on this theory would be using their "knowledge and skills—by thinking critically,

applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, making decisions" (Honey, et al, 2003).

Socially Shared Cognition

In socially shared cognition, learners are participants in a community where the cognition is shared between the participants, the artifacts, and tools they are using, and the social institutions in which the learning occurs (Brown & Cole, 2000). The learners of this community are required to be active participants for cognition to occur (Bell & Winn, 2000). In this theory, cognition is also distributed, as sharing implies both that the learners are experiencing something together and that the learning which occurs is being divided and distributed between the participants in the learning community (Bell & Winn, 2000). These ideas of sharing are relevant to this theory because no two learners can ever experience a situation in the same way as another learner. Brown and Cole put it this way:

To say that cognition is socially shared is to say that it is distributed (among artifacts as well as people) and that it is situated in time and space. Because it is distributed, and its assembly requires the active engagement of those involved, it is to some extent constructed (Brown & Cole, 2000).

The role of technology in this theory is similar to that of the other two theories thus far discussed. Technology plays a part in this theory by being something that helps to share cognition in the community of learning. In one example a computer and the games the children play on it, are at the heart of the system. The participants make use of the games as the core activities for learning new skills. While the games are regular off-the-shelf types of games for computers, they are changed by a make-believe activity system. In this system, there are specific tasks set for the children to accomplish, many of which involve communicating with others in the learning community, either orally or in written format (Brown & Cole, 2000).

This learning theory also supports the skills needed in the 21st century. Learners who are placed into a learning environment based on this theory would also be using their "knowledge and skills—by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, making decisions" (Honey, et al, 2003). The use of this learning theory could help to prepare our students for their lives in this new world.

Statement of the Purpose of the Study

This study aimed to describe the technological proficiency of English faculty members of a Philippine State University. Specifically, the study sought answers to the following questions.

1. What is the technological proficiency level of English faculty members in terms of the following:
    a. Communication technology,
    b. Integrating technology into instruction,
    c. Accessing information, and
    d. Professional growth?
2. How often do they use technological instruction?

METHODOLOGY

The methodology of the research includes research design, locale, respondents of the study, sampling technique, instrumentation, frequency of distribution, percentage, ranking, and the statistical tools used.

Research Design

To accomplish the purpose of the study, the researcher used the descriptive method to determine the level of technological proficiency level of English Faculty members of a Philippine State Institute. The researcher began his study by surveying the existing related studies and methodologies and soliciting the opinions of experts in the field of research.

Participants

This study was limited to twenty-two (22) respondents who presently teaching English under the English Department of Eulogio Amang Rodriguez Institute of Science and Technology from the eight (8) colleges that comprise the institute: College of Hospitality Management (CHM), College of Business Administration (CBA),

College of Public Administration and Criminology (CPAC), College of Arts and Sciences (CAS), College of Education (CED), College of Engineering (CEN), College of Architecture and Fine Arts (CAFA), College of Industrial Technology (CIT), with a total of 29 faculty members including part-timers. By using the Slovin's formula, out of twenty-nine (29) faculty, only twenty-two (22) sample size represent the total number of the population because the remaining seven (7) faculty members were not an English Major but they handle literature subjects.

Locale

This research focused on the technological proficiency level of English Faculty members at Eulogio Amang Rodriguez Institute of Science and Technology for the school year 2019-2020.

Instrumentation

To determine the technological proficiency level of English faculty members of a Philippine State Institute, a standard survey questionnaire was devised for the total number of twenty-two respondents. The questionnaire covered the four areas of technological proficiency and these are communication technology, integrating technology into instruction, accessing information, and professional growth.

Procedure of Investigation

Before the conduct of the study, the researcher determined first the sample size or the number of respondents by using Slovin's formula. After this, surveying what research instrument was appropriate to the study and the conduct of the survey questionnaire were followed. Data collected were treated with care and a high degree of professionalism and confidentiality to ensure the validity of the results.

RESULTS AND DISCUSSION

The data gathered from this study were presented in tables and they were described and discussed in a narrative form. The present study used a percentage with verbal interpretation to describe the different variables that illustrate the technological proficiency level of the respondents.

Table 1

Communication Technology

I can:	Percentage	Description
Apply regular use of email for faculty and peer communication.	36%	Few of the Faculty members
Use an email to send information and assignments.	68%	Majority of the faculty members
Read and reply to messages through electronic device/s.	77%	Majority of the faculty members
Understand the strengths and weaknesses various devices and programs.	50%	Half of the Faculty members
Summarize and present test score results to a resource teacher or administrator.	36%	Half of the Faculty members
Average Percentage	53%	Half of the Faculty members

Table 1 illustrates that 77% or the majority of the faculty members read and reply to messages through electronic devices. The majority of the 68% use emails to send information and assignments. However, 50% or half of the respondents understand the strengths and weaknesses of various devices and programs. On the other hand, 36% or half of the faculty members summarize and present test score results to a resource teacher or administrator, and the same percentage score of 36% or half of the faculty members apply the regular use of email for faculty and peer

communication. Thereupon, an average percentage of 53% or half of the faculty members have demonstrated their technological proficiency in terms of communication technology as part of their teaching method. As communication technology among the respondents should undertake to augment their abilities to provide instructional technology in the classroom. The average percentage of 53% or half of the faculty members need to strengthen their communication technology. It appears that almost 50% of the faculty members understand the value of communication technology through electronic devices. Teachers' effectiveness, in this case, is a vital component of the overall success of technology integration in the teaching and learning process. Similarly, the definition of information and communication technology literacy focuses on the ability to gather, organize, analyze, and report information using technology (Leu & Kinzer, 2000). These terms focus on specific aspects of technology literacy and have an educational context; however, the definition used for this article focuses on a broader perspective of educational technology literacy.

Table 2

Integrating Technology into Instruction

I can:	Percentage	Description
Facilitate various technological instructional materials like PowerPoint presentations, videos, etc.	72%	Majority of the faculty members
Explore other online materials.	59%	Half of the faculty members
Access to online resources and databases.	36%	Few of the Faculty members
Use websites, social media, and assessment tools.	54%	Half of the Faculty members
Employ knowledge obtained from technology training courses.	63%	Majority of the faculty members
Collaborate with colleagues to understand effective methods of technology integration.	59%	Half of the faculty members
Utilize existing WebQuests or other types of online lessons.	36%	Few of the Faculty members
Average Percentage	54%	Half of the Faculty members

The above results prove that 72% or the majority of the faculty members facilitate various technological instructional materials like PowerPoint presentations, videos, etc. The majority of the faculty members or 63% employ knowledge obtained from technology training courses. Furthermore, 59% or half of the faculty members explore online materials and at the same result, 59% of the faculty members collaborate with colleagues to understand effective methods of technology integration. Likewise, 54% or half of the faculty members use websites, social media, and assessment tools. On the other hand, 36% or few of the faculty members access online resources and databases, while the remaining 36% or few of the faculty members utilize existing WebQuests or other types of online lessons. Wherefore, an average percentage of 54% or half of the faculty members have demonstrated their technological proficiency in terms of integrating technology into instruction.

As to the integration of instructional technology, the respondents demonstrated almost all of them the use of various instructional materials, but the other online resources are not part of their technological instruction. These online resources must be cultivated among faculty members provides several benefits. Most importantly, teachers who have technological skills are more likely to make curricular changes and utilize technology in the classroom. Integrating technology in the curriculum and implementing it in class entails a paradigm change in teaching-learning. The magnitude of change in transitioning to ICT teaching is manifested in the use of new hardware and software resources, adopting of new teaching-learning practices, and altering the perceptions of all those involved in the change

process. This is beneficial since the new form of pedagogy includes technology, which is attractive to both students and teachers, inspiring them to perform more significant and in-depth work (Fullan, 2007).

Table 3

Application and Accessing Information

I can	Percentage	Description
Use the internet for an additional lesson.	81%	Almost of the faculty members
Access the worldwide web effectively.	63%	Majority of the faculty members
Determine portals best for learning.	40%	Half of the Faculty members
use standard application features (e.g. cut, copy, paste, save, spell check).	77%	Majority of the faculty members
Employ storage methods (CD, Zip disks, thumb drives) to archive data.	54%	Half of the Faculty members
Use technology to identify reasons for test score performance disparities among students.	31%	Few of the faculty members
Troubleshoot software or hardware issues	9%	Almost none of the faculty members
Average Percentage	50%	Half of the Faculty members

Table 3 shows that 81% or almost of the faculty members use the internet for an additional lesson. The majority of the faculty members or 77% use standard application features (e.g. cut, copy, paste, save, spell check). Moreover, 63% or the majority of the faculty members access the World Wide Web effectively. Half of the faculty members or 54% employ storage methods (CD, Zip disk, thumb drives) to archive data. Furthermore, 40% or half of the faculty members determine portals best for learning, while the remaining 31% or few of the faculty members use technology to identify reasons for test score performance disparities among students. Finally, 9% or almost none of the faculty members troubleshoot software or hardware issues.

Accordingly, an average percentage of 50% or half of the faculty members have shown technological proficiency in terms of application and assessing information. At this range of technological proficiency, the respondents can only attain these various technological skills through extensive seminars, trainings, and workshops specifically in the troubleshooting software or hardware issues for them to acquire the basic knowledge that helps them more proficient in the use of technology. Teachers have more chances to access relevant knowledge through the internet and share this knowledge without being bounded by the limits of traditional face-to-face interaction.

Results from table 4 exemplify that 59% or half of the faculty members participate in a virtual discussion. Few of the faculty members or 27% identify areas for improvement concerning technological ability. On the other hand, 22% or a few of the faculty members join a professional website organization and the same result of 22% or few of the faculty members use the National Educational Technology Standards, district technology benchmarks, and other applicable resources to develop technology-infused lessons. Consequently, 9% or almost none of the faculty members contribute blogs, articles, and educational videos and at the same result, 9% or almost the faculty members develop a personal website for learning. Therefore, an average percentage of 24% or a few of the faculty members have demonstrated professional growth as part of their technological proficiency. As to professional growth, only a few among the respondents have the chance to participate in worldwide web activities that can also further enhance their technological awareness of emerging technology. Professional growth in educational technology can improve the performance of the teacher across several academic disciplines, including mathematics, science, social sciences,

etc. The U.S. Department of Education's (U.S. DOE) 2010 National Education Technology Plan not only highlights the importance of properly preparing teachers to effectively use technology in the classroom but also recommends a "continuing" and "connected" approach to professional development.13 Technology training should be 'continuing' insofar as it does not consist solely of "short, fragmented, and episodic workshops that offer little opportunity to integrate learning into practice.

Table 4

Professional Growth

I can:	Percentage	Description
Join a professional website organization.	22%	Few of the faculty members
Participate in a virtual discussion.	59%	Half of the faculty members
contribute to blogs, articles, and educational videos.	9%	Almost none of the faculty members
Use the National Educational Technology Standards, district technology benchmarks, and other applicable resources to develop technology-infused lessons.	22%	Few of the faculty members
Identify areas for improvement in technological ability.	27%	Few of the faculty members
Develop a personal website for learning.	9%	Almost none of the faculty members
Average Percentage	24%	Few of the faculty members

Table 5 illustrates that 32% or seven faculty members who have "ALWAYS" used technological instruction for rank 1. The 2nd rank, which represents six (6) faculty members or equivalent to 27% who have "OFTEN", used technological instruction. Furthermore, five (5) or 23% of the faculty members who have "SOMETIMES" used technological instruction for rank 3, while the remaining 18% or four (4) faculty members who have "NEVER" used technological instruction and got the rank 4. Hence, the results substantiate the use of technological instruction among the respondents and it is a clear manifestation that not even 50% of the faculty members frequently use technological instruction based on the frequency of distribution. It only shows, however, that the respondents are not fully mindful or sensible of the effects of technology in the learning process of the students who are now part of the digital society. This idea supports the study of Russell that Instructional media facilitate teaching and learning activities and, consequently, the attainment of the lesson objectives. However, this depends on the adequacy and appropriateness of the materials so selected. This, in effect, means that learning resources are not selected haphazardly (Russell, 2007).

Table 5

How often do you use technological instruction?

Level of usage of technological instruction	Frequency	Percentage	Rank
Always	7	32%	1
Often	6	27%	2
Sometimes	5	23%	3

Never	4	18%	4
Total	22	100%	

CONCLUSIONS

Amidst insufficient technological tools, training, seminars, and advanced study, state institutes should prioritize providing and infusing advanced technical learning skills among teachers. There is a great promise that these technologies will surely improve teaching and learning, especially in today's digital society. Moreover, the government and private sectors have initiated programs with computer emphasis and teacher training to facilitate the technicality of the programs. However, significant gaps are still at large to consider in the implementation of such programs particularly with programs that do not have any technical requirements. Hence, there should be a clear policy that helps teachers become proficient in the field of technology as to how they acquire these technical skills for free with the assistance of the school administration. Consequently, there is a need for a teacher with advanced technical training, especially in computer literacy. Extensive training in both pedagogy and technology is needed through ongoing professional development opportunities. These gaps must be significantly found as a solution for there is always an impact on the teaching and learning process.

REFERENCES

Archambault, L., Wetzel, K., Foulger, T. S., & Williams, M. K. (2010). Professional development 2.0: Transforming teacher education pedagogy with 21st-century tools. *Journal of Digital Learning in Teacher Education, 27*(1), 4-11.

Bell, P. & Winn, W. (2000). Distributed cognitions, by nature and by design. In D. Jonassen, & L. S. M., Theoretical Foundations of Learning Environment (pp. 123-145). New Jersey: Lawrence Erlbaum Associates, Inc.

Brown, K. & Cole, M. (2000). Socially Shared Cognition: System Design and the Organization of Collaborative Research. In D. Jonassen, & L. S. M., Theoretical Foundations of Learning Environment (pp. 197-214). New Jersey: Lawrence Erlbaum Associates, Inc.

Cennamo, K., Ertmer, P., & Ross, J. (2009). Technology Integration with meaningful classroom use: A standards-based approach. Belmont, CA: Wadsworth.

Chambers, N., Manning, C. D., Cer, D., Grenager, T., Hall, D., Kiddon, C., MacCartney, B., de Marneffe, M.-C., Ramage, D., & Yeh, E. (2007). Learning alignments and leveraging natural logic. *Proceedings of the ACL-PASCAL Workshop on Textual Entailment and Paraphrasing - RTE '07*. https://doi.org/10.3115/1654536.1654570

Doak, S. (2009). Emerging Theories of Learning and the Role of Technology. Boise State University.

Hargreaves, A. & Fullan, M. (2013). The power of professional capital. With an investment in collaboration, teachers become nation builders. *The Learning Foreword Journal, 34*(3), 36-39.

Harold, B. (2016) Digital Education, Editorial Projects in Education, 6935 Arlington Road, Bethesda MD.

Honey, M., Mandinach, E., & McMillan, K. C. (2003). A retrospective on twenty years of education technology policy. Education Development Center, Center for Children and Technology, U.S. Department of Education, Office of Educational Technology.

Hong, H. Y., Scardamalia, M., & Zhang, J. (2010). Knowledge Society Network: Toward a dynamic, sustained network for building knowledge. *Canadian Journal of Learning and Technology, 36*(1). Retrieved January 22, 2015

Kessler, G. (2009). Technology standards in foreign language education. In K. Cennamo, J. Ross,

Leu, D. J., & Kinzer, C. K. (2000). The convergence of literacy instruction with networked technologies for information and communication. *Reading Research Quarterly, 35*(1), 108-127.

Lock, J. V. & Redmond, P. (2011). International online collaboration: Giving voice to the study of diversity. *One World in Dialogue, 1*(1), 19–26.

Myers, K. M. & Wilson, B. G. (2000). Situated Cognition in Theoretical and Practical Context. In D. Jonassen, & L. S. M., Theoretical Foundations of Learning Environments (pp. 57-88). New Jersey: Lawrence Erlbaum Associates, Inc.

Peterson, P. & Walberg, H.J. (1979). Research in Teaching. Berkeley, CA: McCutchan

Polly, D., Mims, C., Shepherd, C. E., & Inan, F. (2010). Evidence of impact: Transforming teacher education with preparing tomorrow's teachers to teach with technology (PT3) grants. Teaching and Teacher Education: *An International Journal of Research and Studies, 26*(4), 863-870.

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and in-service teacher preparation. *Journal of Teacher Education, 54*(4), 297-310.

Spotts, T. (1999). Discriminating factors in faculty use of instructional technology in higher education. Educational Technology & Society, 2(4), 92–99.

Vaughan, M., Beers, C., & Burnaford, G. (2015). The impact of iPads on teacher educator practice: A collaborative professional development initiative. *Journal of Technology in Teaching and Learning, 11*(1), 21-34.

Yilmazel-Sahin, Y. & Oxford, R. L. (2010). Teacher education students' perceptions of the value of handouts accompanying teacher educators' computer-generaled slide presentations. *Journal of Technology and Teacher Education, 18*(3), 509-535.