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Objectives/Purposes

A professional learning intervention was designed and implemented in the context of a collaborative partnership between a large urban school district and a university-based state research institute. The purpose of the eight-month intervention was to provide vertically articulated professional learning and job-embedded support to integrate a technology tool i.e., iPad, to support instruction with teachers in 78 Title I classrooms.

This study reports the developmental trends of in-service primary teachers regarding their technological pedagogical content knowledge (TPACK) during the professional learning intervention consisting of more than 30 contact hours. Researchers piloted a survey that followed the development of teachers' technology-related knowledge, and assessed the teachers' TPACK status related to teaching with technology in the primary grades. Researchers also examined the benefits to students, including levels of engagement of iPad implementation, as a result of participating in the professional learning. The current study addresses the following objectives:

1. To assess teachers' perceptions of the complex interaction among their content knowledge, pedagogical knowledge, and technological knowledge

2. To provide evidence of teachers' frequency of iPad use in different learning contexts

3.

Theoretical Framework

Intensive professional development is strongly related to student achievement (Klingner, 2004; Trachtman, 2007). A review of the research on how teacher professional development affects student achievement found that studies that had more than 14 hours of professional development showed a positive and significant effect on student outcomes (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Furthermore, preparing teachers on the educational uses of technology appears to be a key component in the majority of educational reform efforts (Angeli & Valanides, 2009). Early childhood educators need training, professional development opportunities, and examples of successful practice to develop the technology and media knowledge, skills, and experience necessary to meet current expectations (National Association for the Education of Young Children [NAEYC], 2012; Chen & Chang, 2006). Unfortunately, traditional methods of professional development are not designed to support teachers' abilities related to this complex process, and as a result, are seldom addressed in PreK-12 professional learning (Lawless & Pellegrino, 2007). The professional learning intervention in this study used a variety of methods including face-to-face workshops, online sessions, and job-embedded coaching, throughout the eight-month professional learning to support teachers' instruction through the integration of iPads, and in turn examines some of the benefits to students as reported by participating teachers.

Effective teaching is a complex and multifaceted process. High quality teachers use two domains, content knowledge and pedagogical knowledge, to promote meaningful learning (Shulman, 1986). Shulman (1987) found that the td.he (a)4 (t t)-3 (he)4 (t)8 Ateran (197((n)-9 (ing)8 oad5sed i

thinking referred to as pedagogical content knowledge (PCK), represented the integration of

content knowledge and pedagogical knowledge.

job-embedded coaching. Participants attended six workshops and received bi-weekly coaching

visits. All participants received an iPad and a credit to purchase specific iPad applications.

Data Sources/Evidence/Materials

Participants completed an anonymous 39-item survey in November and May of the
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intervention year. Initial surveys were distributed after all participants had received iPads. Items

1-26 of the self-reported survey were adapted with permission from Kabakci-Yurdakul, et al.,

(2012). These items related to three factors from the Kabakci-Yurdakul, et al., (2012) TPACK-

deep scale survey: *Design*, *Exertion*, and *Proficiency*. The *Design* factor refers to teacher

competencies in designing and instructing to enrich the teaching process with the help of their

technological and pedagogical knowledge before teaching the content. The *Exertion* factor refers

to teacher competencies in using technology for the execution of the teaching process and for the

measurement and evaluation of the effectiveness of the process. Lastly, the *Proficiency* factor

refers to teachers' leadership ability to integrate technology into content and pedagogy by

becoming expert users in the classroom. Researchers modified "technology" to "iPad"

a typical 5-day school week. Items 31-36 address teachers' perceptions of students' use of the

Table 1.

TPACK-deep scale Factors Mean Scores (Survey Items 1-26)

Factor		November					May		
		n	*M*	*SD*			*n*	*M*	*SD*
Design	0.903	62	3.96	0.58		0.963	70	4.15	0.84
Exertion	0.934	61	3.91	0.74		0.961	67	4.15	0.85
Proficiency	0.886	66	3.59	0.78		0.927	72	3.72	0.96

Frequency of Use in Learning Contexts

These four survey items were designed to obtain information about the instructional context of iPad use. In May, teachers reported using the iPads across all instructional contexts with noticeable increases in one-on-one and small-group instruction use. Also of note is the increased use in whole-group iPad instruction. As the school year progressed, kindergarten and second grade teachers became able to project iPad content for whole-group instruction and often used projection to introduce students to new apps.

Table 2.

Frequency of Use in Learning Contexts (Survey Items 27-30)

Question	Time	% Not at All	% 1-2 Times	% 3-5 Times	% 6-8 Times	% 9 or More Times	% Don't Know	% Missing

Table 3.

Levels of Engagement and Benefits for Students Related to iPad Implementation (Survey Items

31-36)

Question	Time	% Not at All	% 2	% 3	% 4	% Very	% Don't Know	% Missing
When using the iPad without your assistance, how engaged are your students?	November	0.0	3.0	9.0	13.4	59.7	13.4	1.5
	May	0.0	0.0	4.1	15.1	78.1	1.4	1.4
When you are using the iPad as part of instruction, how engaged are your students?	November	0.0	1.5	1.5	13.4	68.7	14.9	0.0
	May	0.0	0.0	5.5	15.1	76.7	1.4	1.4
When using the iPad, how beneficial is it for your students to hear content read to them by the iPad?	November	1.5	4.5	9.0	11.9	56.7	16.4	0.0
	May	1.4	4.1	11.0	13.7	67.1	1.4	1.4
When using the iPad, how beneficial is it for your students to listen to word/sound pronunciation?	November	3.0	1.5	6.0	9.0	70.2	10.4	0.0
	May	0.0	4.1	11.0	12.3	68.5	2.7	1.4
When using the iPad, how beneficial is it for your students that content is visually stimulating, provides dimensionality, and includes animation?	November	0.0	1.5	3.0	9.0	74.6	11.9	0.0
	May	0.0	0.0	4.1	5.5	89.0	0.0	1.4
When using the iPad, how beneficial is it for your students to manipulate material and information on the iPad screen?	November	0.0	1.5	7.5	17.9	61.2	11.9	0.0
	May	0.0	0.0	9.6	15.1	72.6	1.4	1.4

Note. November Survey, *n* = 67: May Survey, *n* = 72.

District Professional Development Evaluation

The largest percentages of *Strongly Agree* (SA) responses were for the job-embedded

coaching portion of the professional learning intervention. However, the percentages for the

face-to-face workshops were not that different from the job-embedded coaching responses. Ten

percent of the responding teachers made comments about the coaching and the amount of

knowledge acquired, the amazing support, and the overall help offered during classroom visits.

One teacher with more than 20 years of classroom experience indicated the school year was her best ever because of the coaching provided during classroom visits.

Teachers also made comments about the face-to-face workshops. Most complimented the informative nature of the workshops and the willingness of researchers to offer extra assistance. One prekindergarten teacher indicated having the opportunity to collaborate with other teachers was invaluable given that she was the only prekindergarten teacher at her school.

Table 4.

District Professional Development Evaluation

Strand	Benchmark	%SA	%A	%N	%D	%SD	%NA
Job-embedded Coaching							
Planning	1. The professional learning aligned with my goals and/or my individual needs for professional development (based on student learning needs and my IPDP or LPDP).	82	17	0	0	1	0
Learning	1. The professional learning focused on developing content knowledge and research-based instructional strategies and interventions.	87	12	0	0	1	0
	2. The professional learning included theory, modeling, practice, feedback, and learning strategies consistent with adult learning and change.	84	15	0	0	1	0
	3. The length of time for the professional development was adequate for the completion of the objectives.	74	20	3	0	1	3
	4. Technologies that support and enhance professional learning were integrated in the professional learning.	91	8	0	0	1	0
Implementing	1. The knowledge, skills, and ideas learned will enable me to improve my practice.	86	13	0	0	1	0
	2. The demonstrated web-based resources will be used to support the newly acquired knowledge, skills, and practices learned.	80	16	3	0	1	0 wD 0

Scholarly Significance

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