Online professional development as a way to provide high quality learning for teachers

Desarrollo profesional en línea como una forma de proporcionar un aprendizaje de alta calidad para los maestros

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Contents

ABSTRACT:

The research paper focusses on the problem of providing high quality professional development for secondary school teachers. High quality professional development is characterized by focusing on expanding teachers' content and pedagogical knowledge; ongoing duration; collective participation; personalization to teachers' needs and interests. However, detailed analysis of scholarly articles indicates that delivering high quality professional development is expensive and requires variety of resources, which are not always available. This research paper attempts to reveal advantages of online professional development, its effects on teacher quality and student achievements.
Keywords: online professional development, high quality professional development, teacher quality, student achievement.

RESUMEN:

Este trabajo se centra en el problema de como proporcionar desarrollo profesional de alta calidad para los maestros de secundaria. El desarrollo profesional de alta calidad se caracteriza por centrarse en ampliar el contenido docente y el conocimiento pedagógico; duración continua participación colectiva; Personalización a las necesidades e intereses de los docentes. Sin embargo, el análisis detallado de los artículos académicos indica que ofrecer desarrollo profesional de alta calidad es costoso y requiere una variedad de recursos, que no siempre están disponibles. Este trabajo de investigación intenta revelar las ventajas del desarrollo profesional en línea, sus efectos en la calidad de los docentes y los logros de los estudiantes.
Palabras clave: desarrollo profesional en línea, desarrollo profesional de alta calidad, calidad docente, logros estudiantiles.

1. Introduction

Many scholars have cited teacher quality as the most significant factor that influence academic achievements of students (Hanushek, 2007; Haskins & Loeb, 2007). Nevertheless,

the challenges regarding quality of teaching remain to be present and relevant all over the world, including Kazakhstan. Specifically, the Ministry of Education of Kazakhstan reported scarcity of high quality schools teachers (Ministry of Education and Science, 2015). One way to address this issue is through professional development of in-service teachers. In fact, research shows that professional development of in-service teachers is a key to the enhancing quality of teaching (Guskey, 2009). Although there are variety of professional development programs today, providing effective and high quality professional development remains challenging. High quality professional development is expensive and time consuming. It was estimated that delivering high quality professional development costs district $200 per one student. Along with that, it adds up to the already overwhelmed teachers' schedule, which can negatively affect lesson planning and preparation (Killeen, 2002). Moreover, rural areas often do not possess resources required to provide high quality professional development and experts who can conduct this professional development (Kleiman, 2004; O'Dwyer et al., 2007). Therefore, many countries are choosing innovative online professional development over traditional face-to-face professional development. Online professional development provide teachers with access to information and materials that are difficult to attain and expensive to purchase for schools (O'Dwyer, Carey,& Kleiman, 2007).

Although delivering online professional development is considered cheaper and more flexible than traditional face-to-face professional development, there are still concerns regarding its effectiveness and impact on improving teachers' knowledge and practices. Thus, the following questions guide this research paper. What do we know about on-line professional development for teachers and its effectiveness? What are the effects of online professional development on teacher quality and student's achievement?

There are plenty of research done in the area of online professional development and its impact on quality of teaching and students achievement. The uniqueness of this research is to look at this problem from the perspective of Kazakhstani educator through examining existing research in the area of OPD and its effects on teachers' knowledge and practice done predominantly by US scholars and support it with survey and interview results conducted with Kazakhstani English teachers and graduate students. Studying the impact of online professional development on teacher quality in US schools will help Kazakh local policy makers and school administrators to decide whether to implement OPD for teachers in Kazakhstani settings and safe a budget to conduct similar research.

1.1. Teacher quality and professional development

There are plethora of research studies conducted in the field of teacher quality. Some of them claim that teacher quality is the most significant in-school factor that determines the learning of a child (Rice, 2003; Vandevoort, Amrein-Beardslety, & Berliner, 2004). Other studies show that there is a strong correlation between teacher quality and student achievement (Darling Hammond, 2000; Nye, Konstantopoulos, & Hedges). Moreover, literature shows that highly effective and qualified teachers are crucial to leaners' academic progress (Geringer, 2003; Lasley, Siedentop, & Yinger, 2006).

Professional development is vital to the improvement of quality of teaching including teachers' subject content knowledge and pedagogical practice. It is considered a policy solution to the increasing the quantity of highly qualified teachers and assisting students in achieving desired academic results (Colbert, Brown, Choi, & Thomas, 2008). This assertion is reinforced by the research study of Wenglinsky (2000), which indicates that students whose teachers participated in professional development in critical thinking skills and in teaching specific populations performed much better on math assessments than students whose teachers did not take part in those professional development courses. Another research shows that teachers who take part in an extensive and comprehensive professional development courses can raise academic results of their students by 21 percentile points (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Along with improving quality of teaching, professional development assist teachers in mastering of 21st century skills and retaining in the position of teaching. Study done by

National Commission on Teaching and America's Future revealed that retainment of high quality teachers is strongly correlated to the quality of professional development. Teachers are more likely to stay in the school that spends its time and effort on developing quality of teaching (Salpeter & Bray, 2003). Mastering of 21st century skills are necessary to be up to date with constantly changing technology and preparing learners to the future work (Bush, 2005).

1.2. Features of high quality teacher professional development.

Although researches have not agreed yet regarding exact qualities of high quality PD, literature review showed some common features upon which there is a consensus (Corcoran, 2007; Desimone, 2009; Elmore, 2002; Guskey, 2003; Hawley & Valli, 1999).

The two most significant features of high quality professional development are expanding of teacher's subject specific content and pedagogical knowledge including knowing how students learn and various methods of delivering that content (Garet, Porter, Desimone, Birman, & Yoon, 2001).

Effective professional development should be continuous, long lasting, and not one time event (Johnson, Kahle, & Fargo, 2007; Cochran-Smith & Lytle, 2001). Ongoing professional development assist teachers in mastering new methods and approaches to teaching, and staying up to date with the realities of their students to meet their needs and interests (Lock, 2006; Sparks & Hirsh, 2000)

PD is considered more effective when teachers of the same department, subject or grade level take part in the same PD and have ability to discuss with each other what they have learnt, which requires support of school and district administration (Banilower & Shimkus, 2004; Ingvarson, Meiers, & Beavis, 2005).

Successful PD requires personalization, meaning ability of teachers to make decisions about their learning, goals, and delivery approach (Garet, Porter, Desimone, Birman & Yoon, 2001; Guskey, 2008; Mazzarella, 1980; Penuel, Fishman, Yamaguchi & Gallagher, 2007). Personalization of professional development gives teachers chance to focus on something that really matter and interesting for them, as opposed to having obligatory professional development courses for everyone without exception. In addition, personalization of professional development ensures that every teacher at any age and level of expertise can better their skills. As it was mentioned by King (1994), improvement of teaching and learning requires teachers to be lifelong learners of their craft.

1.3. Challenges of providing high quality professional development.

Although there is a growing agreement of features of high quality PD, there are still some formidable obstacles in a way of providing high quality PD for all teachers.

Professional development programs are expensive and requires significant efforts from school administrators and teachers. It was revealed that professional development costs school districts approximately 200 dollar per one student. Furthermore, already overwhelmed teachers had to spend their time and efforts to catch up with these professional learning, which could negatively effect on lesson preparation and thus quality of instruction (Killeen, 2002). There is not specific time devoted to do and implement effectively all stages of the professional development and meet its standards. The system puts further burden and intensifies teachers' job. Smith et al. (2000) refers intensification to the expectation of teachers to do more in the same amount of time without any additional resources or support. Teachers possess multiple responsibilities, which they should do along with lesson preparation, checking homework and completing endless paperwork. This leads to the decrease of lesson preparation time and consequently of quality classroom teaching. Moreover, many teachers will probably do most of the 15 teacher responsibilities at home to complete everything in time that will cause negative attitude to work. It will be especially

difficult for female teachers, who work at both school and home.

High quality professional development often requires variety of resources, which are not always available in geographically remote locations including suburban and rural areas (Kleiman, 2004; O'Dwyer et al., 2007). This absence of resources usually prevent teachers from participating in high quality, and meaningful traditional face-to-face professional development (Francis-poscente & Jacobsen, 2013)

1.4. Online professional development

These challenges have led to the rise of online professional development (OPD) as a vehicle for delivering high-quality in-service training to teachers, especially those serving in geographically remote and socioeconomically diverse areas (Dede, 2006; Galley, 2002; Keller, 2005; O'Dwyer et al., 2007a, 2007b).

Teachers can participate in OPD anytime, from anywhere, thus allowing access to PD to all Internet-connected teachers, while not requiring teachers to sacrifice valuable instructional classroom time. OPD is cost-effective for schools and districts because it does not require physical space rental, on-site equipment, or travel, and it can provide access to expertise that many agencies could not otherwise afford (Dede, 2004; Treacy, Kleiman, & Peterson, 2002). Furthermore, offering PD programs online exploits the benefits of online learning more generally, including the additional time afforded for deeper reflection in asynchronous communication and the removal of social and physical boundaries from the communication space (Dede, 2004).

In the next paragraph, we will go deeply into the affordances of online learning and review distinctive features of online professional programs.

1.5. Characteristics of online professional development.

Online professional development can be conducted anytime and anywhere, which gives flexibility and ability to develop professionally along with fulfilling job and personal responsibilities (Davis, 2009). Satisfying the needs and interests of busy teachers online professional development offers ongoing support and access to necessary materials and tools that are expensive and not available to many schools (Dede, Breit, Ketelhut, McCloskey, & Whitehouse, 2005).

OPD promotes collaboration and creation of professional learning communities by connecting educators from different schools and districts. Teachers collaborate and problem solve using online discussions, forums, and chat rooms; while course instructors facilitate interactions, give constructive feedback, and ask guiding questions to promote further discussion (Russell, Carey, Kleiman, & Venable, 2009).

The next advantage of online professional development is ability to deliver it in several forms including distance classrooms, asynchronous interactions, and self-paced courses. In distance learning classrooms, teachers take part in professional development through video conferencing, which resembles traditional face-to-face professional development and requires participants to be present online at the same time. Asynchronous interactions allows teachers to complete tasks and requirements of online professional development in their preferred time and does not require all participants to be present at the same time. Self-paced online professional development lets every teacher to progress and complete tasks and activities in their own pace (Russell et al., 2009).

OPD programs give teachers opportunity to reflect upon their own teaching and learning slowly, deliberately, and thoroughly. Reflections encourages teachers to improve based on their own experience, to understand learning process, and to identify their strengths and weaknesses. There are several ways of doing reflections including reflection papers, online discussions, keeping a diary, self-assessment, pre and post expectations and goals, etc. (Ramsdell, Rose, & Kadera, 2006).

Online professional development immerses teachers in real classroom situations. Watching video recordings and viewing illustrations with challenging situations provide teachers

opportunity to connect their learning to real classroom practice and then to discuss and address these situations. Besides, teachers can adapt, modify and create their own teaching materials in online environment. All of these features make online professional development relevant for every teacher's individual teaching context (Ramsdell, Rose, & Kadera, 2006).

All advantages of online professional development lead to the proliferation of online courses in US nationwide. Along with that, proliferation of online professional development courses caused many researchers to question the effects of online professional development on teacher quality and student learning (Carey, Kleiman, Russell, Venable, & Louie, 2008). In the following section, we will review literature regarding the effects of online professional development on teacher quality and student achievement.

1.6. The effects of online professional development on teacher quality and student achievement.

Overall literature review suggests that online professional development have positive effects on teacher knowledge and practice.

The study conducted by Masters, de Kramer, O'Dwyer, Dash, & Russell (2010) examined the outcomes of online professional development on fourth grade English Language Arts teachers' knowledge and instructional practices. It employed randomized control trial as a research method. The OPD provided for fourth grade teachers included three learning workshops, lasted for 7 weeks, and took 4-6 hours per week to complete by every teacher. Every workshop included reading, activities and discussions. The study revealed that there is substantial positive effect of these online workshops on teachers' knowledge and practice. To be specific, in vocabulary, there was a big positive impact on instructional practice and small effect on knowledge; in reading, there was medium impact on teachers' practice and large effect on knowledge; whereas in writing there was significant effect on both practice and knowledge. However, sample size of this study was not enough to generalize. 255 self-selected teachers volunteered to participate in the study, but only one hundred eighteen of them competed all requirements of the OPD workshops. Along with that, demographic characteristics represented in the study are not analogous to all educators countrywide. The next limitation of this study is the fact that teachers self-reported data about their instructional practice, while it would have been better if practice data were based on independent observations of teachers' instructional practices. Moreover, there were only three semesters between pre and post surveys. In addition, post surveys were taken after only few weeks of completion of OPD course, which means that teachers had limited time to apply knowledge and skills they gained from OPD workshops. This could lead to underestimation of the OPD effects on teachers' knowledge and practices. In spite of these limitations, this study shows that ongoing online professional development can positively influence teacher's knowledge and classroom practice (Masters, de Kramer, O'Dwyer, Dash, & Russell, 2010)

2 years later the same group of authors published another study, which investigated the impact of OPD on teacher quality and student achievement in fifth grade mathematics. 79 fifth grade teachers took part in the series of three OPD workshops (fractions, algebraic thinking, and measurement), which lasted for 3 semesters. The study revealed that teachers who completed OPD workshops had considerably higher improvements in subject knowledge and instructional practice than teachers in control group who did not take part in OPD. Having said that, the progress in teachers' knowledge and practice did not lead to significant increases in students' academic achievements in mathematics. This study had similar shortcomings as the previous including small sample size, high attrition rate, self-reported data, and limited time to apply knowledge and skills teachers gained from OPD workshops in their classrooms. Despite these limitations, the findings of this study provide further evidence that online professional development can have a positive impact on teachers' knowledge and instructional practice (Dash, Magidin De Kramer, O'Dwyer, Masters, & Russell, 2012).

The next study examined the effects of online professional development on teacher

knowledge, instructional practices, and student achievements across different grades and subjects. Totally, there were four randomized controlled trials with teachers from multiple states: two of them in mathematics that focused on grades five and eight; and two in language arts focusing on fourth and seventh grades' teachers. Participation in the study was voluntary and those teachers who decided to take part in the study were randomly assigned to the control or treatment group. Teachers in treatment group took part in a set of three online professional development courses, each lasting 7 weeks; while control group teachers were not restricted from participating in ordinary, traditional professional development provided by the local schools and districts. Overall, this study of four randomized controlled trials reveals that there are strong positive effects of online professional development on teachers' knowledge and some small effects on their students' outcomes. It should be noted, however, that students' outcomes were examined a few weeks after teachers completed their last online professional development, thus not showing long lasting effects of OPD on students' achievements. Being the largest study covering four randomized trials that examined the effects of OPD on teacher knowledge, instructional practices and student achievements, the study still possessed some limitations including shortage of time between the treatment and assessment of teachers and students, high attrition rate. However, these limitations do not affect overall findings of this study that series of online professional development can have positive effects on teacher knowledge and instructional practices, which lead to the improvements in student outcomes (Dwyer et al., 2010).

The following study compared the effects of online and face-to face professional development on teacher quality in mathematics (Russell, Carey, Kleiman, & Venable, 2009). Research participants consisted of first to fifth grades teachers in mathematics. The same course was designed to be delivered online and face-to-face and to compare their learning outcomes. Participants of both versions of professional development provided with the similar learning and instructional activities, reading and writing assignments. Furthermore, both courses were designed to have similar amount of participation and interaction among teachers and lasted for 8 weeks. The medium of interaction [face-to-face vs. online] among participants and their instructor was the major difference between two versions of the same course. The learning outcomes of the two courses were identical, namely "to affect teachers' pedagogical beliefs, their instructional practices when teaching mathematics", and their comprehension of teaching specific mathematical concepts (Russell et al., 2009). To compare the impact of these two professional development courses on the mentioned learning outcomes researchers conducted teacher and student surveys, mathematic test, and instructional logs. Research findings reveal that both types of professional development significantly changed teachers' pedagogical beliefs and instructional practices in the same way, and improved teachers' understanding of teaching specific mathematical concepts. Specifically, participants of both professional development increased their confidence of teaching math, consolidated their belief in student centered teaching approach, and significantly modified their instructional practices. One attention-grabbing finding of this research suggests that teachers, who took part in online professional development and become familiar with it, prefer next time to choose online courses rather than face-to-face professional development. There are several limitations of this research. The sample size of the research was very small, as there were only 150 teachers from 3 geographic location. Moreover, research was based on one course offered for elementary school teachers. Second, considerable amount of participants of both courses dropped them. About 36% of the participants who started the course did not finish the course. In spite of these shortcomings, the research suggests that online professional development has similar positive effects as traditional face-to-face professional development on teacher knowledge, instructional practices, and pedagogical beliefs.

2. Methodology

As a practical part of the research, a survey was conducted to identify attitude of survey participants towards the impact of online professional development on quality of teaching. The participants were 25 university teachers of English and 72 graduate students pursuing a

master's degree in teaching English at Karaganda State University.

The teaching experience of the sample were as follows: approximately 40% of respondents have been teaching English for 3-5 years, and 20% had more than 20 years of teaching experience. The other respondents have been teaching English either 1-2 years or 6-10 years.

The questionnaire contained 10 multiple choice questions. The first part of the questionnaire covered questions regarding instructional experience of participants. The second part of the survey included questions about goals and motives of attending professional development courses, while the next part of questionnaire was specifically related to online professional development and its effects on teaching quality and academic achievements of their students.

Following the principle of data triangulation, semi-structured interviews were held among survey participants to get valid responses. These interviews enabled participants to express their opinion on the problem of the research in more thorough and deeper way. The interviews revealed participants' views on advantages of online professional development courses as well as challenges faced by teachers while completing them. Furthermore, the interviews also elicited teachers' responses regarding effectiveness of online courses.

3. Results

Almost all respondents treated positively the use of online professional development courses as a means of improvement of teaching and learning process: More than half of participant teachers consider that online courses, workshops and webinars are helpful for enhancing their instructional practice. 75-80 % of teachers take part in online professional courses owing to the fact that they enjoy learning new ideas and practices from peers and experts in their field. Moreover, respondents (55%) stated that they choose OPD because they enable them to climb the career ladder, help improve their teaching quality and consequently raising students' learning. It should be also noted that most of teachers (75%) prefer online courses that are free of charge, provide participants with the certificate of completion and have feature of working collaboratively with other participants. As regards the effectiveness of online professional development courses, absolute majority (85%) of respondents stated that these courses have positive impact both on their knowledge of the subject content and instructional practice. Moreover, as can be seen from figure 1, most of the survey participants (80%) stated that academic results of their students increased substantially as a result of improvement of teaching and learning process.

Figure 1
Academic results of students

What was the impact of improving your knowledge of the subject content and instructional practices through online professional development on students' academic achievements in your subject?
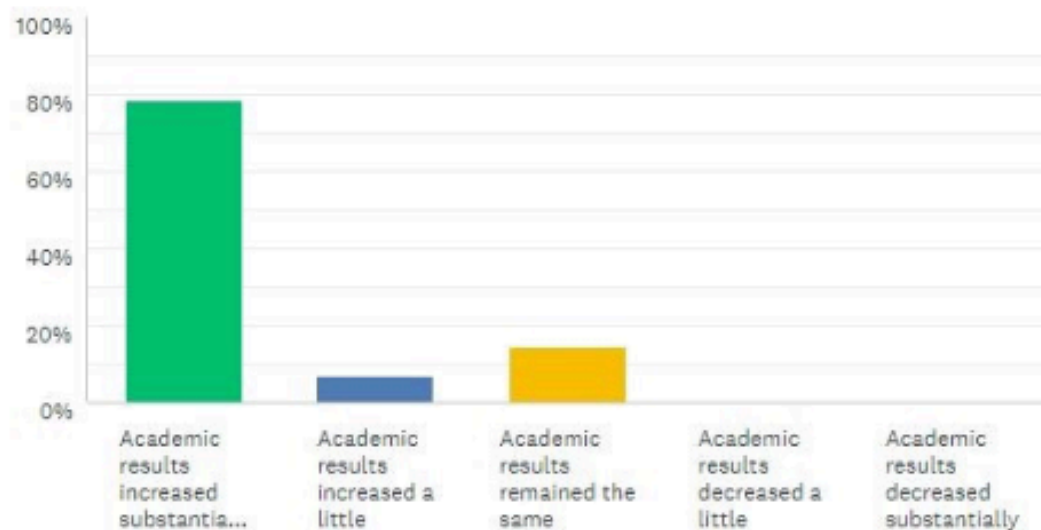
Interview results showed that online professional development has a lot of potential in providing high quality teaching and learning. Interviewees stated such advantages of OPD as opportunity to participate at high quality online courses at low cost; acquiring new knowledge and staying up to date without necessity of moving anywhere. At the same time, respondents mentioned some challenges as lack of time due to work overload and no opportunities to self-control their progress. Concerning the factors influencing effectiveness of online professional development courses, interview participants pointed out trainers' professionalism and their ability to engage students in learning by using wide range of innovative approaches and techniques.

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4. Conclusions

Quality of teaching is considered the most important in-school factor that influences student's learning. One way of improving quality of teaching is through professional development of practicing teachers. Research shows that teacher professional development has positive impact on both teacher quality and student achievement. High quality professional development is characterized by focusing on expanding teachers' content and pedagogical knowledge; ongoing and long lasting duration; collective participation; personalization to teachers' needs and interests. However, delivering high quality professional development is expensive and requires variety of resources, which are not always available in geographically remote locations. These challenges have led to the growth of online professional development courses. Advantages of OPD include low cost, ability to conduct it anytime and anywhere, promotion of collaboration and development of professional learning communities, and opportunity for teachers to reflect upon their own teaching and learning. Moreover, the literature review has shown that online professional development affects positively teacher knowledge and instructional practice as well as learners' achievements across different grades and subjects.

As a practical part of the research, survey and interview were conducted to identify attitude of English teachers and graduate students towards the impact of online professional development on quality of teaching. Their results are significant as they provide insights about English teachers' ideas on the online professional development and confirm our above mentioned theoretical findings about advantages and effects of OPD. The survey findings provide evidence that OPD are beneficial for improving teachers' instructional practice and students' learning. . Interview findings highlight such advantages of OPD as opportunity to participate at high quality online courses at low cost, gain new knowledge and stay up to date with modern trends in education without necessity of moving anywhere.

Bibliographic references

BUSH, G. (2005). Logging on to staff development: Enhancing your teachers' knowledge and use of educational technology through online professional development. T.H.E. Journal, 32(11), 14-18.

COLBERT, J., BROWN, R., CHOI, S., & THOMAS, S. (2008) An investigation of the impacts of teacher-driven professional development on pedagogy and student learning. Teacher Education Quarterly, 35(2), 135–154.

DARLING-HAMMOND, L. (2000). Teacher quality and student achievement: A review of state policy evidence. Education Policy Analysis Archives, 8(1), 1-44.

DASH, S., MAGIDIN DE KRAMER, R., O'DWYER, L., MASTERS, J., & RUSSELL, M. (2012). Impact of online professional development on teacher quality and student achievement in fifth grade mathematics. Journal of Research on Technology in Education, 45(1), 1–26. http://doi.org/10.1080/15391523.2012.10782595

DEDE, C. (2004). Enabling distributed learning communities via emerging technologies--Part One. T.H.E. Journal, 32(2). Retrieved from http://ezproxy.lib.ucalgary.ca:2048/ /login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ709366&site=ehost-liv

DEDE, C., KETELHUT, D. J., WHITEHOUSE, P., BREIT, L., & MCCLOSKEY, E. M. (2009). A research agenda for online teacher professional development. Journal of Teacher Education, 60(1), 8– 19

FRANCIS-POSCENTE, K., & JACOBSEN, M. (2013). Synchronous Online Collaborative Professional Development for Elementary Mathematics Teachers. The International Review of Research in Open and Distance Learning, 14(3), 319–343.

GLAZER, E. M., HANNAFIN, M. J., POLLY, D., & RICH, P. (2009). Factors and interactions influencing technology integration during situated professional development in an elementary school. Computers in the Schools, 26(1), 21. doi:10.1080/07380560802688257

GUSKEY, T. R. (2009). Closing the knowledge gap on effective professional development. Educational Horizons, 87(4), 224-233. Retrieved from http://files.eric.ed.gov/fulltext/EJ849021.pdf

KILLEEN, K. M., MONK, D. H., & PLECKI, M. L. (2002). School district spending on professional development: Insights available from national data (1992-1998). Journal of Education Finance, 28(1), 25–50.

MARRERO, M. E., WOODRUFF, K. A., SCHUSTER, G. S., & RICCIO, J. F. (2010). Live, online short-courses: A case study of innovative teacher professional development. International Review of Research in Open and Distance Learning, 11(1), 81– 95

MASTERS, J., de KRAMER, R. M., O'DWYER, L. M., DASH, S., & RUSSELL, M. (2010). The Effects of Online Professional Development on Fourth Grade English Language Arts Teachers' Knowledge and Instructional Practices.Journal of Educational Computing Research, 43(3), 355-375.

NATIONAL COMMISSION ON TEACHING AND AMERICA'S FUTURE. (2003). No dream denied: A pledge to America's children. Washington, DC: Author.

O'DWYER, L. M., CAREY, R., & KLEIMAN, G. (2007). A study of the effectiveness of the Louisiana Algebra I Online course. Journal of Research on Technology in Education, 39(3), 289-306

RAMSDELL, R., ROSE, R., & KADERA, M. (2006). PBS TeacherLine and Concord Consortium's

Seeing Math Secondary. Online professional development for teachers: Emerging models and methods, 69-88.

RICE, J. K. (2003). Teacher quality: Understanding the effectiveness of teacher attributes. Washington, DC: Economic Policy Institute.

SALPETER, J., & BRAY, B. (2003, August). Professional development: 21st century models.

Technology & Learning, 24(1), 34.

VANDEVOORT, L. G., AMREIN-BEARDSLETY, A., & BERLINER, D. C. (2004). Students of National Board Certified Teachers Outperform Perms on National Test. Education Policy Analysis Archives, 12, 46

U.S. DEPARTMENT OF EDUCATION. (2008). A nation accountable: Twenty-five years after a nation at risk. Washington, DC: Author. Available at http://www.ed.gov/rschstat/research/pubs/ accountable

WENGLINSKY, H. (2000). How teaching matters: Bringing the classroom back into discussions of teacher quality. Princeton, NJ: The Milken Family Foundation and Educational Testing Service.

YOON, K. S., DUNCAN, T., LEE, S. W. Y., SCARLOSS, B., & SHAPLEY, K. (2007). Reviewing the evidence on how teacher professional development affects student achievement (Issues & Answers Report, REL 2007, no. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. Retrieved from http://ies.ed.gov/ncee/edlabs

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