



Professional Development Program Evaluation

Prepared for

Portland Public School District

University of Portland & Northwest Evaluation Association

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Executive Summary

Portland Public Schools requested a data and research analysis of its professional development (PD) job titles and roles within the district. The data revealed 101 different job titles at 41 different locations within the district. This report attempts to categorize these numerous positions into four titles based on district job descriptions. The data provided by the district are disaggregated, and recommendations are made. Also, research-based best practices for planning and implementing professional development will be defined. These best practices include job-embedded PD that encourages collaboration among faculty, including team-teaching, mentor relationships, videorecording teaching followed by reflective dialogue, and professional learning communities (PLCs). Research indicates that teachers rate PD higher when they are involved in the planning and implementation of the experiences and when the activities are sustained throughout the year rather than being a one-time experience.

Overall, effective PD involves teacher leadership, collaboration in professional learning communities, and content that connects to classroom learning. PD must consider teachers as learners and their ability to integrate knowledge over time through ongoing PD efforts. The PD will be more successful when it is grounded in research and provides teachers with standards-aligned resources and strategies to implement..

This report will include methods of evaluating the efficacy of professional development. These strategies include gathering participant feedback through surveys, observational data, and utilizing a rubric or checklist to look for key characteristics of successful PD. Mixed-methods studies that include interviews, analysis of documents or artifacts, and student outcome measures can provide a well-rounded assessment of professional development effectiveness. Resources that can be used to guide PD evaluation are in the appendices.

Professional Development Program Evaluation

The Request for Proposal from Portland Public Schools (PPS) for this report on professional development included:

1. Conduct a Literature Review on the best models of professional development (PD).
2. Analyze the existing job titles and responsibilities of employees who provide professional development within the district.
3. Develop an evaluation plan to measure the efficacy of professional development (PD) for the district.

This report will examine research on the most effective forms of professional development and identify innovative new formats for schools to consider.

Redefining Professional Development

Professional development (PD) has experienced a shift in definition and practice in the 21st century as teaching has become a more collaborative practice (Lieberman & Miller, 2014; Stewart, 2014). Technology has also begun to reshape definitions and implementation methods of professional development for educators (Hartsell, Herron, Fang, & Rathod, 2009). West (2002) argued that the ‘bottom line’ goal of professional development for teachers should be to improve student academic performance while empowering teachers through self-improvement.

Literature suggests that PD should be data-driven, evaluated for improvement, research-based, and collaborative (Hirsh, 2007). Additionally, there should be a focus on equity, quality teaching, and family involvement. PD can be categorized as formal or informal, depending on the content. Lieberman and Miller (2014) suggest that teaching as a career has shifted from an individualized, solitary profession to one that is more communal and collaborative. Additionally,

teaching has become much more standardized with a focus on measurable student learning.

Goals of Professional Development

There are numerous goals that professional development aims to achieve, including improving teacher pedagogical content knowledge, building professional learning communities, and increasing student achievement. Additionally, goals include “building the knowledge, skills, and dispositions to teach to high standards” and “sustaining teachers’ commitment to teaching” (Little, 2006, p. 2). Specific goals are more clearly defined below.

Improve teacher pedagogical content knowledge. There is a need for effective professional development (PD) that sustains teacher knowledge and skill development. Professional development should aim to improve pedagogical content knowledge, which is “the practical knowledge that enables teachers to transform the content and epistemology of a subject discipline for purposes of teaching” (Little, 2006, p. 7). It is clear that teachers must have this specific knowledge that integrates both their knowledge about the content and their knowledge about teaching. Although more research is needed in this area, researchers have linked teachers’ pedagogical content knowledge with student achievement (Hill, Rowan, & Ball, 2005).

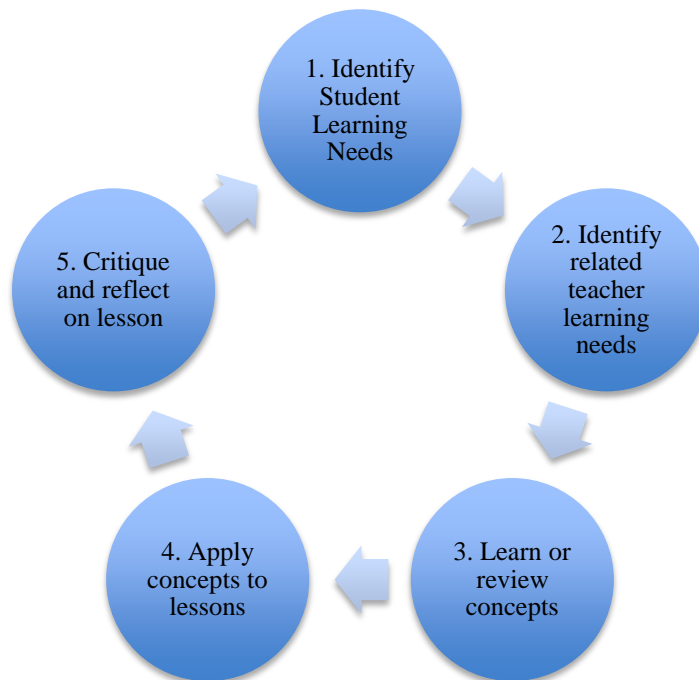
Build professional learning communities. The National Staff Development Council (Hirsh, 2007) defines standards for professional development, including organizing adults into learning communities with goals that align with schools and districts and allocating resources that support collaborative adult learning. Additionally, the National Education Association highlights the importance of “cultivating strong professional community conducive to learning and improvement” in teacher learning (Little, 2006, p. 2). The NEA also suggests that support of teacher learning through PD should maintain a focus on the school’s goals, priorities, and areas for improvement.

Furthermore, Stewart (2014) argues that effective professional development begins with successfully functioning Professional Learning Communities (PLCs). There are specific characteristics found in the most effective PLCs. First, a shared vision for a school and collective responsibility for results by a community are vital to success (DuFour, 2014; Vescio, Ross, & Adams, 2007). A second vital component of PLC work is reflective dialogue and inquiry among members of a PLC, which allows for frequent examination and discussion of teacher practice (Brodie, 2014; Darling-Hammond & Richardson, 2009). A third reoccurring theme in the literature is the importance of teachers using classroom data, both formatively and summatively, to inform their collaborative work and professional discussions about classroom practice (Vescio et al., 2007; Williams, 2012).

Once this community of learning and support has been established, the cycle of professional development can be implemented (see Figure 2). This cycle focuses on the interrelated needs of students and teachers, which can be clarified in PLC collaboration. Furthermore, learning and applying new educational concepts can be related to PLC goals. Finally, reflective dialogue that occurs in a PLC setting can help refocus goals.

Figure 2

Professional Development Cycle for Continuous Improvement (Stewart, 2014, p. 29)



Increase student achievement. Another primary goal of teacher PD is to increase student achievement (Joyce & Showers, 2002). A review of nine studies found that “teachers who receive substantial professional development – an average of 49 hours in the nine studies – can boost their students’ achievement by about 21 percentile points” (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007, p. iii). A study conducted by Saxe, Gearhart, and Nasir (2001) analyzed student results after implementing three different types of professional development for teaching fractions to elementary students. Results found that the group of teachers who received PD focused on problem solving and conceptual understanding of mathematics skills had the greatest student posttest scores. The group of teachers whose students did not show as significant of gains received support focused on teacher understanding of fractions, student thinking, and student motivation. The teachers who received the most integrated approach to student understanding showed the most gains.

Another study (Jacobs et al., 2007) with 180 teachers of Grades 1-5 and their associated 3,735 students found that teachers who received professional development not only significantly increased their pedagogical content knowledge of algebraic thinking, but also their students performed significantly better on tests of equivalence. Carpenter, Levi, Berman, and Pligge (2005) found similar results in professional development they provided to 15 elementary school teachers and their accompanied students. Prior to the professional development, less than 10% of the students in grades 1 to 6 could successfully answer the problem $8+4= _+5$. Following teacher professional development, in which teachers were taught lessons and strategies to implement to help students better understand equivalence, 66% of students in grades 1 and 2, 72% of students in grades 3 and 4, and 84% of students in grades 5 and 6 could successfully answer the problem $8+4= _+5$.

However, the literature review also revealed a recent study conducted by The New Teacher Project that reported no correlation between teacher professional development and improvement of instruction (Sawchuck, 2015). The study compared teacher surveys following PD experiences to teacher growth, which was measured with principal ratings, student test scores, and teacher ratings on particular skills. Years of experience was controlled for. Results found no connection between the PD and teacher improvement. This research prompts questions about the efficacy of PD, and the need to be really clear and purposeful about designing effective PD experiences.

Components of Effective Professional Development

Despite these findings, research indicates that the majority of professional development opportunities offered to teachers do little to provide teachers with applicable knowledge. Wei and colleagues (2009) found that fewer than 60% of teachers rated content-focused PD as useful,

stating they desired professional development on the content they teach, tools for classroom management difficulties, and methods for teaching students with special needs. Further, many implementations of professional development often fail to measure successful implementation or provide sufficient resources to maintain the professional development over time (Allen & Penuel, 2015). Teachers also sometimes experience conflicting goals between what is taught in the professional development and their own opinions or experiences (Allen & Penuel, 2015). It is clear that to be effective, PD must be well-planned and defined.

There is plethora of research defining effective PD, with several key components that appear repeatedly. The most effective PD includes “both externally-provided and job-embedded activities that increase teachers’ knowledge and change their instructional practice in ways that support student learning” (Wei et al, 2009, p. 1).

Desimone (2011) identifies five key characteristics that should be embedded into any PD opportunity:

- **Content focus:** Professional development activities should focus on subject matter content and how students learn that content.
- **Active learning:** Teachers should have opportunities to get involved, such as observing and receiving feedback, analyzing student work, or making presentations, as opposed to passively sitting through lectures.
- **Coherence:** What teachers learn in any professional development activity should be consistent with other professional development, with their knowledge and beliefs, and with school, district, and state reforms and policies.
- **Duration:** Professional development activities should be spread over a semester and should include 20 hours or more of contact time.

- **Collective participation:** Groups of teachers from the same grade, subject, or school should participate in professional development activities together to build an interactive learning community. (p. 69)

This literature review will expand on several of the key components, including content focused, collaborative, embedded, and reflective.

Content Focused and Collaborative

Capps and colleagues (2012) argue successful PD includes coherency with standards, development of lessons, modeled inquiry, reflection, transference, and content knowledge. PD should promote the “continual deepening of knowledge and skills” of the professional educator (Boyle, Lamprianou, & Boyle, 2004, p. 2). Studies show that when PD is directly related to content taught in the classroom and involves hands-on learning for the teacher participants, it is more effective (Garet, Porter, Desimone, Birman, & Yoon, 2001).

Garet and colleagues (2001) found that when teachers gained enhanced skills and content knowledge, there was the greatest effect on changes in teaching practice. A national survey of over 1,000 teachers (72% response rate) indicated that PD programs were most effective when they:

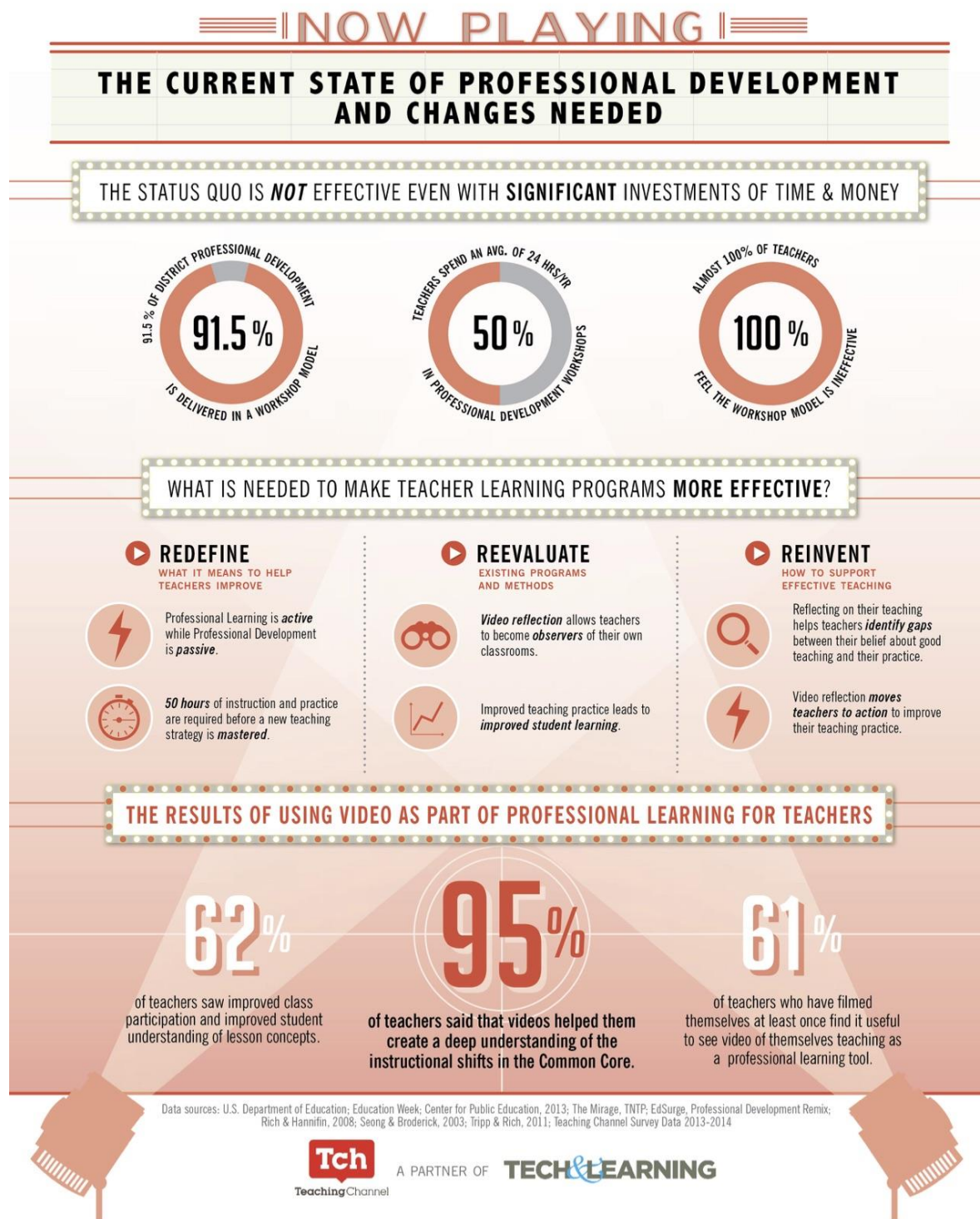
1. Focused on academic subject matter with links to standards of learning, such as helping teachers integrate Common Core State Standards into lesson planning and assessment;
2. Were meaningfully integrated into the life of the school, such as study groups, mentoring, and coaching; and
3. Allowed teachers to take leadership roles, including teachers leading discussions, participating in peer observations, and participation in reflective discussions. (Garet et al., 2001)

Blended learning. One type of PD that promotes virtual collaboration and helps enhance teacher content knowledge is blended learning. Mironor, Borzea, and Ciolan (2012) advocate for this model of learning, which maintains face-to-face learning while also incorporating online technology. Blended learning is flexible and convenient for learners, and can include: video conferences, interactive multi-media, individual projects, online discussion forums, and face-to-face meetings. Blended learning can be utilized as a supplemental form of PD, especially during times when school is out of session.

One blended learning resource is [Edutopia](#) (2015), which is a free online resource that provides teachers with strategies designed to encourage critical thinking in students. [Edutopia](#) has several core components, including teacher development, project-based learning, social and emotional learning, comprehensive assessment, integrated studies, and technology integration. The [Teaching Channel](#) (also free) also provides a large resource library of videos and articles to support blended learning. The [Teaching Channel](#) has also studied the effects of integrating videos into learning, and found that 95% of teachers indicated that the videos increased their learning (see Figure 2). Another online (not free) resource is [Edivate](#), also called PD 360, which is an “on-demand professional learning resource that creates a highly personalized learning experience for all of your educators, helping them improve their practice and, in turn, raise student achievement” (Edivate, 2015). Edivate provides learning resources, management tools, and implementation support for teachers. Professional development is provided in the form of videos, courses, and training tools. Educators can collaborate online, download lesson plans and study guides, and target differentiated learning strategies.

Figure 2

The Teaching Channel's Current State of Professional Development



Lesson study. Another form of collaborative PD is Lesson Study; a Japanese PD model that is gradually gaining in popularity in the United States (Lewis, 2000). Lesson Study involves five distinctive characteristics: 1) Lessons are collaboratively planned over a long period of time; 2) Lessons are observed by other teachers; 3) Lessons focus on broader educational goals; 4) Lessons are recorded, through video, audio, notes, and/or student work; and 5) Lessons are discussed. Lesson Study may occur in the school, may be open to teachers outside of the school, or may be part of a national conference. The format of a Lesson Study includes detailed collaborative planning, implementation of the lesson, often with full school or full grade-level participation, and a follow-up meeting to discuss the results. At this seminar or meeting, there are comments from the observed teacher, the collaborating teachers, and a group discussion. A commentator, sometimes an outsider, can also be invited and may provide remarks. This form of collaborative professional development can help sustain teacher learning over time.

Lesson Study essentially implements a ‘feedback loop’ of teacher planning and instruction. The ‘feedback loop’ includes: 1) Teachers describe the lesson’s objectives, and strategies, and colleagues perform the task that will be used in the classroom; 2) The group observes the facilitator during instruction and gauges student responses; 3) The group of teachers meets to discuss reactions to the lesson (Mistretta, 2012). Teachers participating in the ‘feedback loop’ reported experiencing sustained learning, building a community of teachers, and sustaining the use of best practices (Mistretta, 2012).

Job-Embedded

Another key characteristic of effective PD is to embed it into a teacher’s daily schedule. Job-embedded PD is allotted time during a teacher’s regular workweek for planning and collaboration to improve teaching practice. Research suggests that this form of PD, such as

mentorship and coaching, increases teacher retention (West, 2002). The following shared characteristics in PD experiences were found in studying high-achieving countries around the world: multiple opportunities for formal and informal PD, time allocated for professional collaboration, and embedded PD opportunities throughout the year (Wei et al., 2009). The United States fell well behind high-achieving countries in allotted time for collaborative and reflective practice (Wei et al., 2009). Job-embedded PD can include peer observations, analyzing student work and data, and developing study groups. Additional embedded PD opportunities include observational visits, collaborative action research, and regularly scheduled collaborations. For example, in Sweden, there has been a shift from administrative-controlled prescribed teacher training to teacher-designed projects that relate to individual classroom concerns. Teachers meet in teams during work hours to collaborate and problem-solve. These forms of embedded PD encourage reflection and collaboration. Additionally, several countries including Switzerland, China, New Zealand, Japan, and France have mandatory new teacher induction programs. Key features of these programs include highly structured roles for those involved, a focus on professional growth, and a community of collaboration (Wei et al., 2009).

Professional Development Schools. Professional Development Schools are one form of embedded PD. Professional Development Schools are partnerships between institutions of higher education and P-12 schools with four main goals: prepare new teachers, provide faculty development, encourage inquiry regarding improvement of practice, and enhance student achievement (McCray, Rosenberg, Brownell, deBettencourt, Leko, & Long, 2011) . PD schools provide a seamless induction process for teachers from pre-service to in-service with embedded support and guidance. University faculty collaborate in planning and classroom management, action research, PD, and mentorship. PD schools have shown measurable increases in student

standardized test scores (National Council, 2006). Teacher preparation programs that partner with P-12 schools provide hands-on teaching experience for new teachers while also providing mentorship and guidance.

Instructional coaching. Another form of embedded PD is instructional coaching, which involves a coach helping a teacher identify a skill that needs to be developed, practicing the specific skill, collecting data through observations, and providing feedback (Duchaine, Jolivete, & Fredrick, 2011). One study by Duchaine and colleagues (2011), for example, found that teachers who received written performance feedback through coaching increased their behavior-specific praise statements for students. An additional study investigated the effects of literacy coaching over a two-year period and found significant differences in teachers who were coached regarding frequency of the use of literacy strategies, yet there were not significant increases in student achievement gains (Feighan & Heeren, 2009). There is a lack of research in measuring the effects of coaching on student achievement.

Reflective

PD that is reflective also promotes efficacy. PD that focuses on developing the teachers' understanding of teaching, learning, and students will be most effective (Darling-Hammond & McLaughlin, 1995). Martin et al., (2014) argue that successful PD has five distinguishing characteristics: it is instructive, reflective, active, collaborative, and substantive. Allen and Penuel (2015) conducted a study of two school sites over a 16-month period in which they used teacher interviews and artifacts to gauge teacher *sensemaking* in relation to PD, which includes how teachers process uncertainty, specifically in the implementation of reforms, such as new standards and curriculum. Allen and Penuel (2015) found that PD needs to “engage teachers in sustained sensemaking activity” to help improve their understanding and application of standard-

aligned practices (p. 136). This type of reflective teaching is a form of effective professional development.

Conclusion

There are many different methods for employing PD to teachers, however it is clear that the method chosen should strive to focus on content, include active learning techniques, match the teacher's and district's beliefs and policies, and occur over a long period of time.

Results

Portland Public Schools (PPS) provides PD to its teachers in many different ways, one of which is through specific, dedicated personnel. To better understand the number of, location of, and job titles of these personnel, PPS provided an Excel database that included job titles and brief descriptors of individuals within the district who provide PD. The data revealed that during the 2014-15 school year, there were 142 positions within PPS that offered professional development in some degree. Of these 142 positions, there were 101 different job title descriptors. These positions were categorized into four titles: Teacher on Special Assignment (TOSA), Instructional Specialist (IS), Coordinator, and Mentor. After categorization, there were 56 TOSAs (39%), 58 Instructional Specialists (41%), 13 Coordinators (9%), and 15 Mentor Teachers (11%). There are 78 schools in PPS, and these 142 different individuals work in 40 different schools plus the district office, for 41 different locations. A list of sample job titles per category are identified in Table 1. Several position titles had potential overlap (i.e., a TOSA position called Coordinator). However, the researchers attempted to accurately categorize titles to the best of their abilities.

Table 1

PPS Sample Job Titles by Category

Teacher on Special Assignment (TOSA)	Instructional Specialist	Coordinator	Mentor Teacher
TOSA - Achievement Coordinator – Equity (7)	Instructional Specialist – K-8 Reading (3)	Careers / Coordinator	Mentor Teacher – Dual Immersion (2)
TOSA – SPED Behavior Coach (4)	Instructional Specialist – K-8 - Bilingual Spanish	Coordinator – Elementary School Instructional Support / Arts & Enrichment	Mentor Teacher – Elementary School (3)
TOSA – English Language Arts (4)	School Improvement Specialist – Behavior	Teacher-HS Language Arts / Coordinator Freshman Academy	Mentor Teacher – ESL
TOSA – Grade 6-12 Advanced Math (2)	Instructional Specialist – High School Language Arts	Teacher – SPED LC Class Support / Coordinator	Mentor Teacher – High School (2)
TOSA – English Language Development (ELD) (4)	Teacher – Middle School / AVID/Instructional Specialist Staff Development	Coordinator – AVID / Test Support	Mentor Teacher – K-8 (3)
TOSA – ESL Speech Language Pathologist	SMS (Student Management Specialist)- K-8 / Instructional Specialist – K-8	Coordinator – HS / Teacher – Social Studies	Mentor Teacher – Middle School (2)
TOSA-PBIS Instructional Behavior Coach (3)	Teacher K-8 / Grade K-5 ESL / Instructional Specialist	Teacher – K-8 Grade 6-8 Technology Coordinator	Mentor Teacher – SPED (2)

The data were disaggregated by job title and location in Table 2. Of all positions, 48% of them reside in the district office (BESC).

Table 2

Professional Development Positions by Location

School / Location	TOSA	I.S.	Coord.	Mentor
Benson HS	-	1	-	-
BESC (Blanchard Education Service Center)	50	3	-	15
Boise-Eliot PK-8	1	2	-	-
Bridger K-8	-	2	-	-
Capitol Hill K-5	-	-	1	-
César Chávez K-8	-	2	-	-
Chief Joseph K-3	-	1	-	-
Cleveland HS	-	1	1	-
Creston K-8	-	1	-	-
Faubion PK-8	-	2	-	-
Franklin HS	-	1	1	-
George MS	-	1	-	-
Grant HS	-	1	-	-
Harrison Park K-8	-	3	-	-
Irvington K-8	-	2	-	-
James John K-5	-	2	-	-
Jefferson HS - Middle College for Advanced Studies	-	1	2	-
King PK-8	-	2	-	-
Lane MS	-	1	-	-
Lee K-8	-	2	-	-
Lincoln HS	-	-	1	-
Madison HS	-	2	1	-
Marysville K-8	-	2	-	-
Metropolitan Learning Center K-12	-	-	1	-
Ockley Green 4-8	-	2	-	-
Peninsula K-8	-	1	-	-
Rice Site	3	-	-	-
Richmond PK-5	-	1	-	-
Rigler K-5	-	1	-	-
Roosevelt HS Campus	-	6	2	-
Rosa Parks PK-5	-	2	-	-
Sabin PK-8	-	1	1	-
Scott K-8	-	1	-	-
Sitton K-5	-	1	-	-
Skyline K-8	-	-	1	-
SPED Community Transition Program	1	-	-	-
SPED Early Childhood Evaluation Team	1	-	-	-
Vernon K-8	-	1	1	-
Whitman K-5	-	3	-	-
Woodlawn PK-8	-	2	-	-
Woodmere K-5	-	1	-	-

The data were further disaggregated by level, as seen in Table 3.

Table 3

Professional Development Positions by Level

	PK-8	High School	K-12	BESC	SPED & RICE (TAG)
<i>n</i>	47	21	1	68	5
Percentage	33%	15%	<1%	48%	4%

It is recommended that PPS develop a protocol for naming positions, such as a list of job responsibilities and duties. The job title could be based upon these descriptors. The researchers recommend utilizing the four titles already used in the district: TOSA, Instructional Specialist, Coordinator, and Mentor. To better clarify duties and responsibilities, observations of professional development personnel in the district could also be conducted. Future research could also utilize the four job descriptions to create a matrix to ensure application of the PD best practices highlighted in the literature. Consideration should be made for the fact that budget allocations for professional development positions often stem from various locations, which may impact job responsibilities for certain roles.

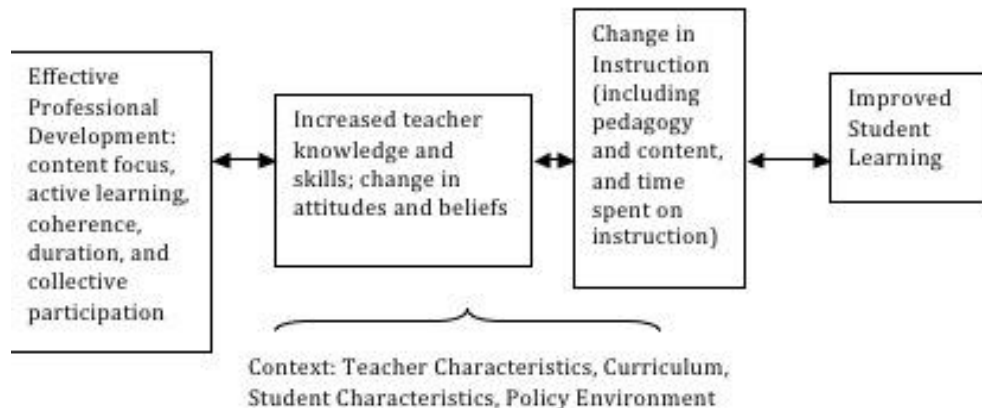
Program Evaluation

Research highlights various methods for evaluating professional development opportunities. After receiving professional development, participant satisfaction is most commonly evaluated but participant use of the new skills and associated student outcomes are least likely to be evaluated (Muijs & Lindsay, 2008). There are various methods for how to measure effective professional development, including evaluating pedagogical concepts, instructional methods, and implementation (Wei et al., 2009). Desimone (2009) argues for a shift

away from measuring the impacts of PD through teacher satisfaction surveys to a more standardized conceptual framework to help improve teacher learning and student achievement, specifically focusing on the content focus, active learning, coherence (extent to which teacher learning is consistent with teacher knowledge), and collective participation of teachers in their own learning. Desimone's (2009) proposed conceptual framework can be seen in Figure 3.

Figure 3

Proposed Core Conceptual Framework for Studying the Effects of Professional Development on Teachers and Students (Desimone, 2009)



The following options are possibilities for evaluating PD efficacy:

1. Gather participant feedback immediately following PD experiences. Professional development can be rated through participant feedback using an evaluation form such as the one in Appendix 1.
2. Evaluate the content and the presentation itself of all PD. Guskey's (2002) rubric for evaluation can help to identify key characteristics related to both content and presentation (see Appendix 2).
3. Measure teacher self-efficacy following implementation of PD content (see Appendix 3). Kao, Tsai, and Shih (2014) developed a survey to measure

teacher self-efficacy following a technology professional development session. Questions included teacher perceived use of the PD content, teacher affection for PD, teacher anxiety of use, and behavior. The survey questions are attached in Appendix 3. These could be conducted immediately following the PD and after an extended period of time in which teachers might implement or use the PD received.

4. Collect and analyze quantitative and qualitative teacher and student data. For example, Muijs and Lindsay (2008) conducted a mixed-methods study to gather feedback on professional development experiences and utilized the following: questionnaires, interviews, learning logs and journals, classroom observations, artifact collection, student interviews, and student outcome measures. Soebari and Aldridge (2015) also used a multi-phase model for measuring PD efficacy, including pre- and post- perception surveys of 2,417 professional development participants, gathering the teacher/presenters' views on the relevance of the PD, and conducting post-interviews and observations with PD participants. These methods can help create a detailed picture of the success of professional development, but do require significant resources.
5. Gather data from instructional coaching experiences, including teacher feedback, student achievement data, and observational data gathered from the coach. A coaching relationship that includes measurable teacher goals can help to provide useful feedback on efficacy.

Appendix 2: Guskey, 2002

Five Levels of Professional Development Evaluation

Evaluation Level	What questions are addressed?	How will information be gathered?	What is measured or assessed?	How will information be used?
1. Participants' reaction	<ul style="list-style-type: none"> ▪ Was the facilitator knowledgeable and helpful? ▪ Did you have the opportunity during the session to effectively practice or apply the concepts provided? ▪ Did the session activities facilitate the sharing of work experiences among participants? ▪ Did the session materials contribute to your learning during the session? ▪ Were the facilities and equipment conducive to learning? ▪ Were the stated session objectives met? ▪ In terms of preparing you to do your job better, how would you rate the overall quality of the session? 	<ul style="list-style-type: none"> ▪ Questionnaires administered at end of a session ▪ Focus groups ▪ Interviews ▪ Personal learning logs 	<ul style="list-style-type: none"> ▪ Initial satisfaction with the experience 	<ul style="list-style-type: none"> ▪ To improve program design and delivery
2. Participants' learning	<ul style="list-style-type: none"> ▪ Did the participants acquire the intended knowledge & skills? ▪ Did participants' attitudes, beliefs or dispositions change? 	<ul style="list-style-type: none"> ▪ Paper-and-pencil instruments, including self assessments and tests ▪ Simulations & demonstrations ▪ Participant reflections ▪ Participant portfolios ▪ Case study analyses 	<ul style="list-style-type: none"> ▪ New knowledge and skills of participants 	<ul style="list-style-type: none"> ▪ To improve program content, format and organization
3. Organization support & change	<ul style="list-style-type: none"> ▪ Was implementation advocated, facilitated, and supported? ▪ Was the support public and overt? ▪ Were problems addressed quickly & efficiently? ▪ Were sufficient resources allocated? ▪ Were successes recognized and shared? ▪ What was the impact on the organization? ▪ Did it affect the organization's climate and procedures? 	<ul style="list-style-type: none"> ▪ District and school records ▪ Minutes from follow-up meetings ▪ Questionnaires ▪ Structured interviews with participants and district/ school administrators ▪ Participant portfolios 	<ul style="list-style-type: none"> ▪ The organization's advocacy, support, accommodation, facilitation, and recognition 	<ul style="list-style-type: none"> ▪ To document and improve organizational support ▪ To inform future change efforts
4. Participants' use of new knowledge & skills	<ul style="list-style-type: none"> ▪ Did participants effectively apply the new knowledge and skills? ▪ Did teachers' instructional practice change? ▪ Are the teachers consistently applying the knowledge & skills? 	<ul style="list-style-type: none"> ▪ Questionnaires ▪ Structured interviews with participants and their supervisors ▪ Participant portfolios ▪ Participant reflections ▪ Direct observations ▪ Video or audio tapes 	<ul style="list-style-type: none"> ▪ Degree and quality of implementation 	<ul style="list-style-type: none"> ▪ To document & improve the implementation of program content
5. Student learning outcomes	<ul style="list-style-type: none"> ▪ What was the impact on students? ▪ Did it affect student performance or achievement? ▪ Did it influence students' physical or emotional well-being? ▪ Are students more confident as learners? ▪ Is student attendance improving? ▪ Are dropouts decreasing? 	<ul style="list-style-type: none"> ▪ Student records ▪ School records ▪ Questionnaires ▪ Structured interviews with students, parents, teachers, and/or administrators ▪ Participant portfolios 	<ul style="list-style-type: none"> ▪ Student learning: <ul style="list-style-type: none"> ○ Cognitive (performance & achievement) ○ Affective (attitudes & dispositions) ○ Psychomotor (skills & behaviors) ▪ Student participation & attendance 	<ul style="list-style-type: none"> ▪ To focus & improve all aspects of program design, implementation, and follow-up ▪ To demonstrate the overall impact of professional development

Appendix 3

The questionnaire items on the Web-based Professional Development Self-Efficacy questionnaire (WPDSE) survey (Kao, Tsai, & Shih, 2014)

General self-efficacy

- I feel confident about using a Web browser like “Internet Explorer” or “Firefox.”
- I feel confident about reading the content from the Web.
- I feel confident about clicking the hyperlink to connect to another Website.
- I feel confident about keying in the Website address to connect to a particular Website.
- I feel confident about printing out the content of a Website.
- I feel confident about copying images or text on the Web into the WORD software.
- I feel confident about searching for information on the Web using keywords.
- I feel confident about uploading or downloading files from the Web.

Interaction self-efficacy

- I feel confident about selecting appropriate web-based professional development courses.
- I feel confident about registering for web-based professional development courses.
- I feel confident about reading the contents in web-based professional development courses.
- I feel confident about interacting with teachers in web-based professional development courses.
- I feel confident about asking or answering questions in web-based professional development courses.
- I feel confident about completing assigned course work in web-based professional development courses.
- I feel confident about searching for relevant information for web-based professional development courses on the Web.

Applying self-efficacy

- After attending web-based professional development, I feel confident about enhancing my teaching performance.
- After attending web-based professional development, I feel confident about enriching my course contents.
- After attending web-based professional development, I feel confident about applying multiple teaching strategies in my classes.
- After attending web-based professional development, I feel confident about extending my teaching resources.
- After attending web-based professional development, I feel confident about integrating technologies in my teaching.
- After attending web-based professional development, I feel confident about enhancing students’ learning motivations.
- After attending web-based professional development, I feel confident about looking for appropriate web resources to guide my students’ learning.

The questionnaire items on the attitudes toward web-based professional development perceived usefulness:

1. Web-based professional development helps my instruction become more interesting.
2. Web-based professional development helps to increase my creativity for instruction.
3. Web-based professional development effectively enhances my learning.
4. Web-based professional development improves my professional knowledge.

Perceived ease of use

1. It is easy for me to use web-based professional development on the Internet.
2. It is convenient to receive training on the job by using web-based professional development.
3. The content of web-based professional development is clear, and easy to access for learning.
4. The learning of web-based professional development is flexible.

Affection

1. I think it is interesting to use web-based professional development.
2. Web-based professional development provides an interesting and attractive environment.
3. Using web-based professional development can improve my teaching ability.

Anxiety

1. Using web-based professional development makes me feel anxious.
2. Using web-based professional development makes me feel uncomfortable.
3. Using web-based professional development is boring.

Behavior

1. I hope to spend more time using web-based professional development.
2. I want to increase my use of web-based professional development in the future.
3. I would be glad to use web-based professional development in the future.
4. I will recommend the use of web-based professional development to others.

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