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Professional Development and Change in Teachers' Beliefs and Practice for Teaching English Language Learners

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ABSTRACT

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To provide quality education to all students, including ELLs, teachers need professional development designed and enacted according to best practice. However, a common problem for professional development is that teachers' practices often do not change. Implemented through the partnership collaboration with university, education, and public school faculty, the professional development designed in this study focused on educating teachers about needed content and engaging them in ways that would increase the likelihood they would enact such practices in their classrooms (Desimone, 2009; Opfer & Pedder, 2011; Penuel et al., 2007). The professional development program comprised six courses that adhered to the Utah State Office of Education's standards for the education of the teachers of ELLs. The study examined the teachers' beliefs and their classroom practices. A total of 197 teachers were surveyed on their beliefs toward teaching ELLs, and a subset of 23 teachers' classroom practices were videotaped. Factor analyses were conducted on the pre- and post-survey. The videos were coded using a protocol based on the SIOP model (Echevarria et al., 2013), and latent variables were created to measure the change of the survey score and practice score. The analysis revealed that teachers' beliefs or knowledge in particular changed from when they began the course of second language acquisition to the time they completed it. In addition, teachers' practice changed from the time they started the professional development program to the time they completed it. However, even though teachers' beliefs and practices changed, there was no correlation found between the belief change and the practice change. This study adds to literature that educating teachers about second language learning and research-based practices (Baker et al., 2014) using professional development that attends to teachers' practices as well as their beliefs (Desimone, 2009; Opfer & Pedder, 2011; Penuel et al., 2007) resulted in positive changes in teacher's beliefs and practices for teaching ELLs. Future research should add a variable of teacher's beliefs about the context of their teaching practice into the study for this can be a confounding variable that affects the correlation between the change of beliefs and the change of practices.

Keywords: professional development, teacher beliefs, practice, teacher change, English language learners, factor analysis

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CHAPTER 1

Introduction

One of the major challenges faced by every state in the U.S. is the education of English language learners (ELLs). Nationally, the number of ELL students in public schools increased from approximately two million students in 1993–94 to three million students in 1999–2000 (Wirt et al., 2004). Between the 2009–10 and 2014–15 school years, the percentage of ELL students increased in more than half of the states, with increases of over 40 percent in five states (U.S. Department of Education, 2020). Researchers, demographers, and the U.S. government have projected that by as early as 2025, the number of students in U.S. classrooms who are learning English as a second language will be 1 in 4 (Goldenberg, 2008). Furthermore, a National Assessment of Educational Progress (NAEP) report comparing achievement scores of ELLs and non-ELLs across grades 4, 8, and 12 showed that the achievement gap between native speakers of English and ELLs is large. For each grade and subject, ELLs were performing far behind the proficiency rates of non-ELLs (The Nation's Report Card, 2018). For example, only 14% of ELLs in grade 4 were at or above proficient in mathematics and 9% were at or above proficient in reading on the 2017 NAEP. In contrast, 43% of non-ELLs in grade 4 were at or above proficient in mathematics and 40% of non-ELLs in grade 4 were at or above proficient in reading (see Table 1). Although ELL performance on NAEP mathematics and reading

Table 1

National Percentage of Students Who are at or Above Proficient for ELLs and Non-ELLs

Grade level	Student group	Mathematics	Reading
4th	ELLs	14	9
	Non-ELLs	43	40
8th	ELLs	6	5
	Non-ELLs	36	38

assessments has improved overall since 2000, more recent years have shown little change for ELLs and non-ELLs alike.

These ELLs and non-ELLs are not intellectually different but there is a big gap in their academic achievement, which suggests the issue is instruction. Non-ELLs need to learn content but ELLs need to learn English as well as content in school. It can take ELLs seven years to become proficient in English (Cummins, 1981; Hakuta et al., 2000), but there is not time to wait for their English to become proficient before providing them with instruction in content. Thus, ELLs need to learn both content and the English language simultaneously. Therefore, ELL teachers need special skills in taking care of the needs of ELLs in teaching. Since teachers may or may not learn these skills during preservice teacher education, they need professional development that can lead to a shift in beliefs and practices in ways that better support the learning of ELLs.

The increasing population of ELLs and their low achievement as compared to non-ELLS calls for a need to prepare a growing number of teachers who are armed with knowledge and skills for teaching ELLs. Currently, while ELLs across all states in the U.S. represent 10% of the total K-12 student population (U.S. Department of Education, 2020), a complex policy context tends to favor educating these students in regular classrooms (Feiman-Nemser, 2018). However, only 24% of K-12 teachers reported participating in ELL professional development, and the majority of in-service teachers did not feel they were adequately prepared to meet the needs of providing quality teaching to ELLs (Hiatt & Fairbairn, 2018). Research shows that for teachers who have participated in professional development of various focuses and have been taught the knowledge and skills needed for teaching K-12 students, few of them will actually learn and enact it in their practice (e.g., Garet et al., 2001; Goldenberg, 2008).

Goldenberg's (2008) article reveals two difficulties we face in improving the educational experiences of ELLs. First, we need to educate more teachers concerning the research-based knowledge and theories behind second language learning and teaching. However, the second difficulty is that for this to be successful we need to provide this education in a way that teachers will actually enact the practices that are most likely to improve the language and literacy skills of ELLs. Potential responses to these difficulties are professional development or teacher education programs that not only educate teachers about best practices in teaching a second language but also lead teachers to embrace the practices that need to be utilized.

Statement of the Problem

Schools across the U.S. need an increasing number of teachers who have the knowledge and skills to teach ELLs and enact the practices that will provide the kind of education that will support the achievement of ELLs they are educating in their regular classrooms. Besides educating new teachers and inducting them into the teaching profession, districts must work with the population of teachers already teaching in their schools. Most of these teachers do not have appropriate knowledge of second language development or the teaching skills that will enable them to develop the educational potential of these learners (Goldenberg, 2008). Overcoming this problem requires professional development (Goldenberg, 2008). However, research has demonstrated that when teachers have received professional development focused on teaching ELLs they are often unlikely to enact these practices in their classroom (Goldenberg, 2008). Fortunately, there is research on the principles of professional development that, when followed, are most likely to change the beliefs and practices of teachers (Desimone, 2011; Desimone & Garet, 2015; Penuel et al., 2007; Thompson et al., 2012). To meet this increasing challenge, researchers need to explore whether providing professional development guided by research-

based findings about effective professional development will result in teachers learning the necessary knowledge and skills and also willingly enacting them.

Statement of the Purpose

This study examines whether engaging inservice teachers of ELLs in professional development designed and implemented according to research-based practices (Desimone, 2011; Desimone & Garet, 2015; Opfer & Pedder, 2011; Penuel et al., 2007) will lead to changes in their teaching beliefs and practices. The study assumes that educating teachers about second language learning and research-based practices (Baker et al., 2014) using professional development that attends to teachers' behaviors (practices) as well as their thinking and beliefs can result in changes in teachers' beliefs and practices for teaching ELLs.

Research Questions

This study will address the following research questions:

1. Is there a statistically significant difference in teachers' beliefs towards second language acquisition (SLA) and teaching ELLs as measured by a repeated survey before and after teachers participated in a professional development program that taught the knowledge and skills needed to teach ELLs and was designed according to research-based best professional development practices?
2. Is there a statistically significant difference in teachers' classroom practices as measured repeatedly by a class observation protocol before and after they participated in a professional development program that taught the knowledge and skills needed to teach ELLs and was designed according to research-based best professional development practices?

3. Is there any correlation between belief change and practice change based on the combined data obtained in the first two questions without controlling for contextual factors?

CHAPTER 2

Review of Literature

Research suggests that in transforming teacher practices in teaching ELLs, teacher educators need to understand teacher beliefs and then provide research-based professional development (Troncale, 2002) that will lead to change. Such professional development (Desimone, 2009; Penuel et al., 2007; Opfer & Pedder, 2011) will lead teachers to shift beliefs about teaching ELLs and enact the practices they have learned. This review explores what is known about teacher beliefs and practices and what is known about changing them, particularly in relationship to teaching ELLs through appropriate professional development. This review contains four sections and focuses on three main constructs that form the basis of this study: teacher beliefs, practice change and professional development. The first three sections report research on teacher beliefs, teachers' practice change, and teachers' professional development respectively. The fourth section reports research methods for exploring teacher change.

Teacher Beliefs

This subsection reviews the nature and concept of teacher beliefs. It argues for defining teacher beliefs in a broad sense, and examines more specifically teacher beliefs concerning ELLs, since this is the focus of this project. Teacher beliefs have been defined in either a narrow or broad sense in teacher belief literature. Sometimes, researchers have not bothered to define it as they apparently assumed that there is universal agreement regarding what teacher belief means.

The Nature of Beliefs

The purpose of this subsection of the review is to make a case for the conceptualization of beliefs adopted in the current study. To do this, extant studies will be reviewed. This

subsection begins by exploring how researchers view the structure of beliefs. An individual person's beliefs are not easy to describe, as they can be inconsistent and cannot be easily categorized or simplified. This is because beliefs exist as a system. While it sounds plausible that people's beliefs toward certain subjects must be consistent or stable, research studies indicate that people's beliefs may be inconsistent across different parts of their belief system (e.g., Eisenhart et al., 1988; Fang, 1996; Gao & Bintz, 2019; Green, 1971; Nespor, 1987). For example, Gao and Bintz (2019) studied Chinese EFL (English as a foreign language) teachers' beliefs about reading and teaching reading. They found that within teachers' individual systems, diverse and multiple orientations coexistent. They reported 38.8% of the teachers held a dual, diverse reading belief system, for instance, constructivist and behaviorist orientations. This concept of complex and inconsistent beliefs in a belief system can be traced to Green (1971), who suggested that people hold beliefs in clusters, and beliefs from one cluster may be incompatible with those from another cluster. People are usually unaware of the incompatibility because they hardly ever set their beliefs side-by-side and examine the consistency among their beliefs. Because of the complexity of a person's belief system, it is never an easy and sure thing to measure beliefs in their proper way, if there even is a proper way.

Other studies corroborate that teachers' belief systems exist and relate specifically to what they do and how they position themselves in the classroom with students and materials. For example, Kendall and McGrath (2014) studied teachers' conceptions, including teachers' ideas about reading and teaching reading. Teachers were found to have fixed views of reading and their beliefs influenced their practice regardless of the education they received. In a similar fashion, Eisenhart et al. (1988) claims that teachers' positioning towards responsibility reflected

mixed and inconsistent feelings about some activities that they perceive as not directly related to their responsibility.

Studies have long indicated that beliefs are not entities based on singular claims. This view of beliefs as a system of different domains or levels helps explain that beliefs are complex and can be inconsistent but should be viewed as a whole structure and can emerge from tacit or implicit status to explicit status through reflection (Ball, 2012). These findings about beliefs have contributed to the ways that beliefs can be conceptualized. In the current study, teachers' beliefs are conceptualized as a construct or several constructs that can be manifested in statements about teachers' understanding of teaching ELLs in general education classrooms.

Beliefs as a Narrow Concept

It is never an easy and sure thing to define and measure beliefs in their proper way. However, researchers have tried their best to describe what belief is and distinguish belief from other related terms. Nevertheless, the term "teacher belief" lacks a commonly accepted definition (Martin et al., 2019) and is not used consistently throughout the extant literature (Kagan, 1992).

Beliefs have been described in various ways, revealing important understanding toward the concept. Although these descriptions were meant to narrow the definition of what belief can mean and are very attractive in their analytic style in parsing out elements in a concept, they do not adequately define beliefs in ways that reveal the difference from similar concepts. For example, beliefs can have affective and evaluative components, but the same can be said about attitudes.

Many scholars differentiate knowledge from belief (Calderhead, 1996; Feiman-Nemser & Floden, 1986; Nespor, 1987; Pajares, 1992; Rimm-Kaufman et al., 2006). For instance, Rimm-

Kaufman et al. (2006) stated that teachers' beliefs are "based on judgment, evaluation, and values and do not require evidence to back them up" (p. 143), whereas knowledge is based on objective facts (Pajares, 1992). In a similar fashion, Feiman-Nemser and Floden (1986) asserted that "it does not follow that everything a teacher believes or is willing to act on merits the label 'knowledge'" (p. 515). Likewise, Nespor (1987) suggested beliefs have evaluative and affective components that are stronger than knowledge, which connotes a cognitive element. However, Nespor argued further that beliefs are more influential and stronger predictors of behavior than knowledge. According to Pajares (1992), the distinction between belief and knowledge common to most definitions is that belief is based on evaluation and judgment, whereas knowledge is based on objective fact.

Similarly, Richardson (1996) agreed beliefs differ from knowledge and defined belief as a psychologically held understanding, premise, or proposition about the world that is felt to be true. Richardson claimed that beliefs, unlike knowledge, "do not require a truth condition" (p. 104). In other words, an individual does not have to prove that a belief they hold is correct, but knowledge is put to this test. The problem with this distinction is that a truth condition is not an absolute surety (Pettit, 2011). Indeed, it is sometimes hard to judge whether some propositions are true or not. Even if some propositions are judged to be true from certain perspectives, they may become false as new evidence emerges.

It is fair to admit that it is interesting and necessary to make such distinction between knowledge and beliefs in some studies, but it still does not provide well-defined terms that can help researchers distinguish beliefs from similar concepts. This is not necessarily the fault of the researchers since beliefs are difficult to define if it is possible to define them at all. As a result of this, many researchers define beliefs in a broad sense.

Beliefs as a Broad Concept

Beliefs have often aroused wonder from researchers who found it hard to define them accurately. Beliefs have long been thought of as closely related to cognitive constructs. Some researchers regarded knowledge and other similar constructs as part of beliefs. For instance, Sahin et al. (2002) suggested the idea that belief may refer to "perceptions, assumptions, implicit and explicit theories, judgments, opinions, and more" (p. 373). In a similar fashion, Martin et al. (2019) asserted that beliefs are the set of all things that people believe and they include knowledge, attitudes, and values. Their assumptions were built upon Rokeach's (1968) definition of beliefs that includes knowledge as a part of beliefs. Considering the complexity of teacher beliefs from a holistic perspective, Martin et al. (2019) tried to characterize teacher beliefs by categorizing them as professed beliefs (focusing on words), intended beliefs (focusing on intentions), and enacted beliefs (focusing on actions). This way of obtaining evidence of belief from different resources (words, intentions, and actions) helped scholars measure beliefs in a more comprehensive way, enabling them to account more validly for teacher beliefs.

Conversely, other researchers defined beliefs as a part of knowledge. For example, Fang (1996) stated that theories and beliefs make up an important part of teachers' knowledge. Likewise, Alexander et al. (1991) claimed that "knowledge encompasses all that a person knows or believes to be true, whether or not it is verified as true in some sort of objective or external way" (p. 317). In a review of conceptions of knowledge in research on teaching, Fenstermacher (1994) stated in a similar fashion, "objectively reasonable belief is an acceptable form of knowledge within the context of educational practice" (p. 24). However, he also wrote that a claim to know something is different from having a belief in something. Fenstermacher asserted

you can use the terms “knowledge” and “beliefs” interchangeably if you are using knowledge as a grouping term that includes all sorts of mental states.

Other researchers, not willing to subsume knowledge under belief or vice versa, equated beliefs with knowledge. Some researchers (e.g., Kagan, 1990) equated knowledge with beliefs because they assumed that teachers’ knowledge was subjective. In this sense, belief was like knowledge. Kagan (1992), for example, argued “most of a teacher’s professional knowledge can be regarded more accurately as belief” because the domain of teaching is characterized by an “almost total absence of truths” (p. 73). Similarly, Pajares (1992) suggested that beliefs

> travel in disguise and often under alias—attitudes, values, judgments, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, explicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertoire of understanding, and social strategy, to name but a few that can be found in the literature. (p. 309)

This equation of knowledge with beliefs seemed to go to the extreme since the difference of these two terms were self-evident that they were not the same. However, practically, this is an expedient way in research to ward off the complicated and endless argumentation of what is true and what is not or what is knowledge and what is not. This may be a good strategy for studying teachers’ beliefs, especially since the current study deals with beliefs on teaching second language to ELLs. Research using this strategy has not yet produced many findings that are supported by strong evidence (Dixon et al., 2012; Saunders & Goldenburg, 2008).

Another problem with belief studies is that many researchers rarely define "belief" or use it explicitly as a conceptual tool in their work (Eisenhart et al., 1988, p. 52). This is not surprising considering the obvious difficulty in distinguishing belief, knowledge, and other

connected constructs. In addition, the fact that researchers have different conceptions of the source and structure of teacher beliefs further contributes to the definitional confusion (Hutner & Markman, 2016). As discussed earlier, for some practical reasons, researchers tend to define beliefs as a very broad concept. In this study beliefs will be treated as a broad concept that can subsume or be interchanged with knowledge.

Beliefs About Teaching ELLs

In the current global economy world, many students outside the U.S. study English as a foreign language, while within the U.S. the number of ELLs has been continuously increasing for decades, particularly in the K-12 school population (U.S. Department of Education, 2020). Because of this growth, the beliefs of ELLs (including students learning English as a foreign language apart from ELLs) and their teachers have naturally attracted attention in the educational research field. As a result, instruments have been developed to help study these beliefs. For example, in the 1980s, Horwitz developed three Beliefs about Language Learning Inventory (BALLI) instruments to explore both learner and teacher beliefs (Nikitina & Furuoka, 2006). One of these instruments was developed to assess teachers' beliefs; however, the statements in the instrument did not cover the knowledge that the current professional development designers intended for the teachers to acquire and the instrument was not often adopted in research. The other two instruments were developed to assess learners' beliefs. As a result, these instruments were not used in this project.

Existing studies of beliefs of teachers who have ELLs in their classrooms are not copious, but they are illuminating. Lucas et al. (2015) identified 37 studies in their review of literature on teachers' beliefs about ELLs. They found that teachers generally reported (a) feeling inadequately prepared to teach ELLs, (b) holding largely negative beliefs about ELLs' academic

ability and potential, and (c) valuing the use of learners' first language in instruction but not acting on this belief in practice. The review also found that the studies identified variables related to teachers' beliefs. These variables included teachers' (a) experience with ELLs or with linguistic diversity; (b) educational experiences, such as teacher preparation and professional development; (c) background factors, such as teachers' language, ethnicity, and gender; and (d) contextual factors, such as school-level work environment, the natural history of the language community, discourse in school culture, and the broader policy context. This review also identified the relationship between teachers' beliefs and their practices, which will be discussed in the next section.

Although the relationship between beliefs and some other similar terms can be complicated and opaque, the current study has used belief in the broadest terms (Pettit, 2011), encompassing many mental constructs such as knowledge, attitudes, and perceptions. As Pettit pointed out in his literature review, "this is the most useful definition to use in relation to beliefs about ELLs because the authors of the articles in this review use many of these constructs interchangeably, and often do not cite what definition they are using" (p. 126). The current study reviewed mostly literature about teachers' beliefs in general, but Pettit's concept of teachers' beliefs about ELLs has been adopted since ultimately the focus of the current study is on the beliefs and professional development of teachers who have ELLs in their classrooms. Thus, teachers' beliefs referred to in the current study subsume or are interchangeable with teachers' knowledge, attitudes and values. In addition, the use of this broad definition of beliefs is preferable when discussing the possibility of teacher change. Studies of teacher change usually involve change in both belief and practice. However, beliefs have not been defined unanimously or narrowly across these studies. Evidence of teacher change based on a narrow definition of

beliefs is difficult to find. Troncale (2002) argues that if teachers are to meet the needs of ELLs, their system of beliefs and their repertoire of practices must both change. This suggests that holistic concepts of both beliefs and practices are needed to explore the influence of PD on ELLs' teachers' beliefs and actions. While the current study argues that beliefs can be changed through professional development and reflection, using narrow definitions of beliefs would make it difficult to account for or identify such change.

In short, teacher beliefs can encompass many related terms that may be distinguished by some researchers but not others. It is practical not to pursue an endless and futile argumentation of what is accurate and what is not with regard to teachers' beliefs. Moreover, there is, in particular, a lack of studies on teachers' beliefs about teaching ELLs. Further, teacher beliefs exist on many levels and should be regarded as a system of belief clusters. It is not easy to measure teachers' beliefs; nor is it enough to collect just one piece of evidence in studying teachers' beliefs. Studies that use surveys and measure teaching behaviors or practices can be integrated to provide a richer view of teachers' beliefs.

Teacher Practice

Much of the research on teaching and teacher education proceeds on the assumption that teacher beliefs and teacher practices are related to each other. Indeed, just as many studies have sought to define and examine teacher beliefs, other studies have explored this relationship. Often these studies have made the implicit assumption that beliefs and practices have a fairly straightforward and known relationship. This review of literature will make this assumption explicit. Practice in the current study is conceptualized as the way teachers teach students in K-12 grades, and belief is defined broadly as encompassing many mental constructs such as knowledge, attitudes, and perceptions (Pettit, 2011). In this section, the relationship between

beliefs and practice will be reviewed. If beliefs are closely connected with and influence practices, then teacher beliefs need to be attended to when the goal is to change teacher practices. Clarification of this relationship will help guide the design of professional development programs.

The term "relationship" may be inappropriate here because it implies the separation of beliefs and practice or thinking and action. However, the fact that these two have been regarded as separate for a long time and are still perplexing to educational researchers cannot be ignored. Researchers who tend to view the dichotomy of beliefs and practice have been studying solutions too narrowly seeking to somehow close the gap between the two. In contrast, researchers who tend to view them as connected have been searching for ways to make them more congruent.

The purpose of this section is to argue that teacher beliefs and practice are connected and interact with each other, and that teacher beliefs should be attended to; however, teachers' practice change is the actual goal for teacher learning. First, the evidence from research about the close connection between beliefs and practice will be presented, including evidence of teacher beliefs driving and existing in practice and the particular evidence of the influence of teacher beliefs on practice concerning teaching ELLs. Then, some counter-evidence to the connection will also be discussed to demonstrate that this does not undermine the arguments presented here. Finally, this section will focus on reviewing literature about practice change and arguing that attending to belief is necessary in pursuing practice change.

The Connection Between Teacher Beliefs and Practice

The separation of beliefs and practice may be a useful concept for educational research in a collective sense, and this will be explored in the section about the incongruence between beliefs and practice. However, this separation does not make much sense in studying an

individual teacher's beliefs and practice. In this section, the literature that corroborates a close connection between the two will be reviewed. Recognition of this connection will lead researchers to address issues of teachers' practice from a wider perspective, not restricted to practice itself but with the inclusion of beliefs as well.

Researchers have been interested in the connection between teachers' beliefs and practice for a long time. A variety of contemporary writers have argued that beliefs affect behavior (Aspin & Chapman, 2007; Caple, 2005; Carr, 2007; Carr & Skinner, 2009; Eaude, 2007; Edling & Frelin, 2016; Haydon, 2007; Husu & Tirri, 2007; Layard & Dunn, 2009; Moss, 2007; Rodriguez & Magill, 2016). Studies have also been conducted that were meant to lead to predictions about teacher beliefs and practice (e.g., Nürnberger et al., 2016) that could be used for decisions such as entrance into the teaching profession (Doyle, 1990) and planning for teachers' professional development (Wolff et al., 2015). According to Richardson (1996), teachers' beliefs and attitudes are relatively stable and are not likely to change; thus, they are good predictors of teachers' future effectiveness in classroom practice.

The connection between teacher beliefs and practices is supported by studies that show consistency between the two (e.g., Berger et al., 2018; Chen et al., 2012). Two emphases exist in this research that explains the connection between beliefs and practice: one is a one-way direction (i.e., beliefs influence and drive practice); the other is an interactive relationship (i.e., as beliefs influence practice, practice refines beliefs). Research that focused on the one-way direction accounts for only one aspect of the interactive relationship asserted by researchers. In contrast, the interactive relationship, as described by Richardson (1996), suggests that "the perceived relationship between beliefs and actions is interactive. Beliefs are thought to drive actions; however, experiences and reflection on action may lead to changes in and/or additions to

beliefs" (p.104). Many studies corroborate the interactive relationship between beliefs and practice (e.g., Enderle et al., 2014; Hutner & Markman, 2016; Sansom, 2019; Zheng, 2013) suggesting that beliefs not only drive classroom actions but also influence the teacher change process (Richardson, 1996), which makes the attention to beliefs a crucial element in professional development.

Many scholars have suggested that beliefs and attitudes drive classroom actions (Hutner & Markman, 2016; Jones & Leagon, 2014; Macnab & Payne, 2003; Nespor, 1987; Pajares, 1992; Peck & Tucker, 1973; Richardson, 1994). Macnab and Payne (2003), for example, explained that "the beliefs and attitudes of teachers—cultural, ideological and personal—are significant determinants of the way they view their role as educators" (p. 55). In a similar fashion, Richardson (1996) asserted that not only do beliefs affect what teachers see as their purpose in teaching, but also teachers' beliefs influence the ways teachers think about their subject matter and the choices they make in their teaching. This view is based on the assumption that the decisions individuals make throughout their lives can be explained by their beliefs (Bandura, 1986; Dewey, 1933; Rokeach, 1968). Thus, the beliefs teachers hold influence their perceptions and judgments, which then affect the effectiveness of their practice in the classroom either through a direct (Jones & Leagon, 2014) or indirect connection (Hutner & Markman, 2016).

Although the claim that teachers' beliefs influence classroom practice seems to imply that beliefs must be articulable in order to drive or influence teachers' action, in actuality researchers have often seen that a belief identified had nothing to do with the action (e.g., it was done out of habit or prejudice). A person might practice beliefs that she/he cannot articulate, although when pressed, the person might explain his or her actions in accordance with a belief. For example, a

teacher might treat ELLs in a prejudicial manner and when asked about it come up with a reason for behaving this way. It seems that upon reflection many of the beliefs humans say they have are only articulated after attention is focused on some evidence in their practice. People often act from an unarticulated motivation and then attempt to justify an action by appealing to some rational belief. However, this seeming contradiction in experiences does not undermine the hypothesis that beliefs people hold can be a reason for their acts in classroom practice. In fact, Martin et al.'s (2019) study, suggesting researchers examine the professed (articulated), intended and enacted beliefs because of the complexity of identifying teachers' beliefs, corroborated that the intended (in-action) beliefs drive teachers practice and enacted beliefs can be identified in teachers' practice.

To explain practice, attending only to articulated beliefs and values is not enough when researchers seek to understand teachers' practice. Indeed, uncovering implicit beliefs and values is necessary to explain teachers' practice. Sunley and Locke (2010) investigated the meaning of "values" and Unite Kingdom secondary teachers' professional values revealed in studies. The literary contexts discussed in their review include values related with philosophy, education, policy, professionalism, and the individual. The authors claimed that whereas there were many studies on values and explicit values in education, there was concurrence that little attempt has been made to engage teachers in dialogue and reflection on the 'implicit' values that underpin their work and lives (Haydon, 2006; Loughran, 2006; Taylor, 2000). The authors asserted the need for dialogue and reflection on values and professionalism so that "implicit'' values that teachers hold become explicit and refined through practice.

The implicit articulation of beliefs observed in teachers' practices is supported by many studies. For example, some studies (e.g., An, 2000; Cohen & Tellez, 1994; Hsiao & Yang, 2010;

Mueller & Zeidler, 1998; Richardson et al., 1991; Temiz & Topcu, 2013; Thibaut et al., 2018) found a correlation between teachers' beliefs (explicitly-stated and/or implicit) beliefs and their classroom practice. Charalambous et al. (2002) claim that "teachers' philosophical beliefs are considered as the cornerstone of their teaching practices and their beliefs concerning teaching and learning" (p. 1). In short, although it is difficult to define beliefs or measure them precisely, researchers recognize that they are important for influencing teachers' pedagogy (Donaghue, 2003; Thibaut et al., 2018).

In summary, researchers generally acknowledge the connection between beliefs and practice. Often, teachers' beliefs are implicit, but are reflected in their practice. As a result, teachers need to actively reflect on their beliefs and practice to make their beliefs explicit. Some researchers stress the one-way effect that beliefs determine teachers' behaviors in classroom practice while other researchers stress the interactional effect between beliefs and practice. These two orientations are not necessarily contradictory; rather, they stress that beliefs and practice are intertwined, which enables researchers to construct a complete loop in understanding the interactive influence of beliefs and practice in bringing about teacher change. This is the perspective assumed in the current study, where an understanding of the interactional effect between teachers' beliefs and practice have guided the professional development program design. The next section will focus on reviewing literature that particularly explores the connection between teacher beliefs and practice concerning teaching ELLs.

The Influence of Teacher Beliefs on Practice Concerning Teaching ELLs

A relatively small number of studies have been focused on teachers' beliefs concerning teaching English as a Second Language (ESL) and ELLs. Even fewer studies have examined the relationship between teachers' beliefs and practices and this population of students. Lucas et al.

(2015) located five studies that examined this relationship, but their review argues that the direct evidence for the relationship is elusive because so many factors can affect teachers' practices and most of the studies included in their review gathered data through surveys. This uncertainty about the relationship motivates the current study and urges researchers to use more ways to gather data in addition to surveys.

In spite of the uncertainty identified in the belief and practice relationship, some studies do corroborate the close connection between beliefs and practice with teachers of ELLs. Johnson (1992), for example, showed that ESL teachers who possess clearly defined theoretical beliefs provide literacy instruction that is consistent with their theoretical orientation and that teachers with different dominant theoretical orientations provide strikingly different literacy instruction for non-native speakers of English. Rueda and Garcia (1996) also found that teachers' beliefs about second language learning and teaching shape their perceptions and judgments, which, in turn, affect their instructional practice in the classroom. Additionally, Farrell and Ives (2015) studied a particular teacher who had complex beliefs about teaching reading and reported that this teacher's classroom practices reflected his beliefs. Similarly, Mantero and McVicker (2006) found that teachers' attitudes toward ELLs affect the classroom interaction between these students and the teacher.

Apart from reviews of general teachers' beliefs towards teaching ELLs, some reviews or studies have focused on teachers in terms of the stage of their teaching career. For example, Pettit's (2011) review asserted that many inservice teachers have misconceptions about the increasing population of ELLs and second language acquisition, and these teachers' beliefs influence their practices with ELLs. This was a case where teachers' erroneous beliefs negatively affected their practice. Another study (den Hartog King & Nash, 2011) investigated how

seasoned bilingual teachers' and novice bilingual teachers' beliefs were reflected in and acted upon in their pedagogy. The results revealed that teacher education programs, prior teaching experiences, life experiences, experiences of cultural or linguistic differences, and student learning not only influenced teacher beliefs but also permeated their pedagogy. This study corroborates that teacher beliefs are impacted by many things and multiple trajectories must be employed in informing beliefs and potentially changing them because beliefs have an important influence on pedagogical decisions and actions.

Although teachers' personal beliefs are connected with their practices, some researchers have also investigated other factors that may also play a role in affecting teachers' practices such that discordance can be seen between individual beliefs and practices. According to A. Walker et al. (2004), "Local community contexts are large determinants in the extent and nature of societal attitudes" and "when teachers internalize dominant societal messages, they bring them directly into their schools and classrooms" (p. 131). Similarly, den Hartog King and Nash (2011) asserted that alignment of theory with belief is common, but belief and practice congruence can be hindered by school or other outside factors. They asserted that when attempting to determine whether bilingual/ESL teachers' beliefs are consistent with their practices, it is important to keep in mind that school factors such as support for the theoretical model of language learning used by teachers, as well as other factors that relate to the teaching of culturally and linguistically diverse students may enter into what happens in classrooms.

In sum, the extant research on teachers' beliefs generally concurs that teachers' beliefs influence classroom practice, and a number of studies suggest that research from this perspective is conducive to a better understanding of teacher behaviors that focuses on what they think and how they think (e.g., Clark, 1988; Edling & Frelin, 2016; Haydon, 2007; Husu & Tirri, 2007;

Layard & Dunn, 2009; Moss, 2007; Nespor, 1987; Rodriguez & Magill, 2016). Therefore, understanding the belief structures of teachers is essential to improving their teaching practices (Ashton, 1990; Rodriguez & Magill, 2016). Teachers' beliefs regarding ELLs have also been studied and there is some evidence that these beliefs align with teachers' classroom practice. However, it can also be argued that an extreme view that belief is the same as practice itself is a utopian view of the relationship, which does not take into account many other factors that often influence classroom practices (Fenstermacher, 1986).

The Incongruence Between Beliefs and Practice

When people argue there is incongruence between belief and practice, they are taking an individual perspective. However, most people are not aware of this. They confuse this with the gap between research and practice, which is viewed from a collective perspective. This section makes the argument that there is incongruence or even a gap between research and practice in the educational field, but an individual teacher's practice generally aligns with his/her beliefs. This section also provides an explanation about what leads to this confusion.

That there is a gap between research and practice has been documented in many fields, including education. Farrell and Guz (2019), for example, completed a case study and found that an experienced English for Academic Purpose (EAP) teacher's beliefs and practices were not in congruence with what the research suggests and what has been taught in teacher education programs. Broekkamp and van Hout-Wolters (2007) identified some basic problems that explain the supposed gap between research and practice. First, educational research yields only a few conclusive or practical results, which practitioners believe to be true. Second, practitioners rarely make use of appropriate educational research because of limited resources, including time, available to them. Broekkamp and van Hout-Wolters' (2007) results indicate that researchers,

teachers, teacher educators, and policymakers report the existence of the gap between educational research and practice with remarkable consensus.

The gap between research and practice may be expected given that researchers and practitioners usually stay in their own zone of concern. Additionally, there is a lag between researchers' findings and teachers' understanding and application of the findings to their specific teaching contexts. Indeed, the process where teachers digest and then creatively adapt research finding to fit specific contexts can take a rather long time. This is often what is perceived as the gap between research and practice in the educational field and possible explanations and solutions have been sought for narrowing this gap. Ball (2012) noted, for example, that the knowing-doing gap is not a challenge unique to the field of education and introduced the concept of the zone of generativity, where educational researchers and practitioners can close the gap through reflection, introspection, critique, and the development of personal voice. She noted that these activities can lead to growth and development toward increased levels of potential knowing. And, after practitioners have a better understanding of particular research, they are more likely to apply the research in practice. In this sense, the gap between research and practice is viewed from a collective perspective.

When we talk about beliefs, we tend to take an individual perspective. Every teacher is an independent social organism so that they have different beliefs coming from their unique experiences and environments. Although there is a line of research finding that corroborates the alignment of an individual teacher's practice with beliefs, another line of research finding has identified the inconsistency between beliefs and practice (Fang, 1996). Tours (2017) found that kindergarten teachers tended to have developmentally appropriate beliefs but did not often engage in research-based developmentally appropriate practices. Some other studies also

revealed results of inconsistency between beliefs and practice (e.g., Guerra & Wubbena, 2017; Konopak et al., 1994; Purnomo et al., 2017). Researchers suggested various factors that may result in the inconsistency between beliefs and practice (Davis et al., 1993; Fang, 1996). The factors include school and district policy, student socioeconomic background, teachers' psychological and mental status as a result of the policy and social pressure, and the validity of the measures used in the research.

The inconsistency between an individual teacher's belief and practice does not undermine the thesis that teachers' beliefs influence and are embedded in their practice. Any teacher's belief status is complex. They may take a part or more parts of the research findings and theories they learned from their teacher development or education programs or what they read from literature. They may have a conviction of what they learned or are suspicious if their own personal experiences contradict what they were taught. It is teachers' working beliefs (or intended beliefs, Martin et al., 2019) that guide what decisions they are likely to make in their individual practice setting, and their working beliefs are in a state of constantly balancing between slow, often unnoticeable vibrations and equilibrium. Any new information that surprises them and touches their heart may change their beliefs in some way, even if often this might be in an unnoticeable way. When more similar information works on them, a more noticeable change may become observable in their practice. In this sense, a person's beliefs are most of the time consistent with their practice. However, what is observed often is that the consistency between individual beliefs and practice is constrained by the school and social environment that surround the individual teacher's practice context.

In summary, a gap exists between documented research and teachers' practice if we take the educational field as a whole. This does not necessarily mean, however, that there is a gap

between belief and practice in each individual educator. Usually, an individual educator's belief is in congruence with his/her practice or in a learning process one's practice may be a little bit slower than the belief s/he takes in but is not large enough to constitute a gap. It can be argued that the application of the term "gap" on the incongruence between individual belief and practice results from a narrow understanding of "beliefs." "Gap" claimers view beliefs more as theories that result from educational research than as what teachers really believe as true at the particular time they are teaching. If those theories have not been learned and absorbed by teachers, they are not teachers' beliefs (VanderVen, 2010). There can be a gap between theories or findings resulting from research and educators' practice. However, it is a mistake to confuse research and theories with an individual teacher's beliefs. Theories can be regarded as teacher beliefs only when educators really learn and buy into those theories.

So far, this section has focused on a static view of the relationship between teachers' beliefs and practice. Now it is time to look at teacher beliefs and teacher practices in their dynamic status. The next section will focus on exploring the conditions that lead to teacher change. The goal of any teacher learning is for teachers to utilize the knowledge and/or skills they have learned so that their practice can change for the better. Since beliefs and practice are intertwined, change in practice is often assumed to be connected with change in beliefs.

Practice Change

Richardson (1996) held that "perhaps the greatest controversy in the teacher change literature relates to the difficulty in changing beliefs and practices" (p. 110). Decades later, this controversy continues, and this section will focus on reviewing literature about teachers' change in practice. To begin with, discrete change conditions presented in research will be explored. Then, more systematic frameworks or theories that were raised explaining teacher change will be

reviewed. This review will inform the current study on designing professional development programs that can lead to teachers enacting the practices they believe to be good.

Open-mindedness is the first step that initiates a process of change (Wong, 2013). As discussed in the section on teacher beliefs, open-mindedness as a disposition can be subsumed in teachers' beliefs. According to Wong, belief is a precondition to teacher change. Teachers start to be open-minded to change when they realize their beliefs no longer make perfect sense. In these situations, teachers have difficulty explaining their experiences in terms of the beliefs they have held. Pajares (1992) and others (e.g., Brown, 2004; Kagan, 1992; Rueda & Garcia, 1996) also claimed that beliefs may be replaced when they are proved unsatisfactory, positing that experience and reflection lead to teachers' awareness of the inadequacy of their beliefs.

Whether a teacher's own beliefs and values are understood is a critical factor that affects whether teachers are willing to apply what they have learned to practice. Although teachers can reflect on both their own and other teachers' practice and beliefs, teachers' own beliefs and values are more important elements for them to reflect and need to be identified by teacher educators. Peterson (2012) presented a model to interpret this change process for early childhood educators (ECEs), with the following assumptions:

> If ECEs have the "right information" about best practices, they may or may not be able to put this information into practice….ECEs may be more open to change if they sense that their beliefs, values, and experiences are understood. When ECEs are more internally motivated (when change is aligned with their internal values), they may be more consistent and self-sustaining in implementing new practices. The reasons ECEs align their practices with external standards will vary from person to person. Identifying the barriers ("cons") to change is part of the road to change. (p. 98)

As explained by Peterson, teacher educators often regard helping teachers identify their beliefs as an important task if they are to understand what teachers think and make it possible to support them in willingly enacting in their teaching practice what they have learned.

Besides teachers' own beliefs and values, the contextual and environmental factors (e.g., classroom context, support from administration, and the educational belief environment) are important for promoting teacher change. Kennedy and Kennedy (1996) suggest that perceived behavioral control consists of enhancing or limiting factors associated with the context and these factors can be internal and external: "Underlying perceived ease or difficulty of performing the behavior will be beliefs about past experience, anticipated obstacles, the actions of others, and the availability of resources" (p. 357).

It is important to note that the argument that the context plays an important role in whether teachers can change their practice does not undermine the argument that teachers' beliefs drive their behavior or behavior change. Kennedy and Kennedy (1996) not only point out that context can contribute to whether change in practice can happen but also the interaction between beliefs and context as what they call "perceived behavior control." From their point of view, it is not only whether there are supportive resources that make people act; it is also whether people recognize that there are supportive resources. These beliefs about context influence people's behavior. The ultimate role that beliefs play in teachers' behavior makes it logical to change teachers' beliefs to make behavior change happen.

As teacher change has been a focus in many separate studies, researchers have seen the necessity of proposing a model for the mechanism of teacher change. For example, Salleh and Laxman (2015) illustrated a psychosocial theory, the theory of planned behavior (TPB) which links one's beliefs and behavior and presented a modified model of behavior change. They

proposed that three types of beliefs lead to a teacher's attitude and intention to apply knowledge. These include beliefs about the outcome of applying knowledge and its importance, the referents' expectation of applying knowledge and its influence, and enabling factors of applying knowledge and their availability. According to this theory, a program that aims to change teachers' beliefs and practice needs to show and convince them of (a) the outcome of best practices, and (b) the importance of these practices, while also attending to other teacher beliefs (e.g., self-efficacy), and supporting teachers in strengthening the dispositions they acquired from the program and enacting the best practices they have learned. This model of teacher change requires researchers to attend to teachers' beliefs in order to lead teachers to enact what they learn.

Theories regarding the mechanism of teacher change based on other perspectives have also been proposed. The Zone of Generativity Theory (Ball, 2012), for example, sought to solve the question of why teachers do not practice what they have learned about teaching. Drawing from four models that represent how the knowing-doing gap can be addressed (Broekkamp & van Hout-Wolters, 2007), this theory posits that there is always the possibility for growth and development toward increased levels of potential knowing through stages of reflection, introspection, critique, and the development of personal voice. In this process, a teacher begins at his/her current level of knowledge and goes step by step, through the process of reflection, introspection, critique and use of knowledge, and personal voice, to achieve the results of a realization that to know is not enough, a reconsideration of the purpose of research, knowledge integration, translation, and collaboration, and knowledge that becomes powerful with influence. These strategies, developed to facilitate teachers' ability to apply what they learn to their practice, can also inform research design.

In sum, research-based methods or strategies can be conducive to teachers' change in practice. Both models of change provide light on the process and mechanism of teachers' change in practice. As was reviewed earlier, teachers' beliefs and the interaction between their beliefs and the context are going to decide whether they are going to apply what they were taught to their classroom practice. In particular, teachers' beliefs about their efficacy, the social environment factors, and the accessibility of support resources affect whether they will enact what they learn in their practice. This review of teachers' practice change is enlightening in the current study because it highlights the priority of teachers' beliefs and their understanding of their teaching environment. Besides, the review confirms what has been discussed in the teacher belief section, i.e., reflection, field study, discussion, etc., are conducive to teacher change in beliefs and are proposed in the professional development literature (Desimone, 2011), as described in the following section.

Professional Development

A large body of research has examined different forms of professional development. Specifically, these studies have explored what characteristics of professional development are related to bringing about teacher change, and what can be done in the future to make professional development more effective in enabling teacher learning. This section will begin by explaining the concept of professional development. It will then turn to the problem of whether teachers change or what change happens based on their experiences with these experiences. The section will then focus on reviewing literature that explores mechanisms of how professional development can lead to change in teacher beliefs and practice, and finally, on dispositions and practices that have demonstrated to be effective in professional development programs that are targeted toward teachers who teach ELLs.

Characteristics of Professional Development and Their Connection With Teacher Change

Professional development may mean very different things in different fields but it has a common purpose in education: to promote teacher change towards better practice. Desimone (2011) elucidated a comprehensive definition of professional development. She noted that professional development can refer to a vast range of activities and interactions that can increase teachers' knowledge and skills, improve their teaching practice, and contribute to their personal, social, and emotional growth (p. 68). Although professional development activities can come in a myriad of forms, a common trait of these activities is that they all have a purpose to increase teachers' knowledge and skills, improve their teaching practice, and contribute to their growth. This points out that what is expected from professional development for educators is teacher change in knowledge and practice. Many forms of professional development have been studied in the field of education. These studies have concluded that with the same purpose of realizing teacher change, professional development can be conducted in a variety of forms, each standing alone or combining with other forms.

Characteristics of professional development that have led to teacher change have caught the interest of researchers for decades. Garet et al. (2001), however, provided the first large-scale empirical comparison of different characteristics of professional development on teachers' learning. Results suggested that the structural features of professional development play an important role in determining the core features of professional development and that the core features contribute to teachers' increases in knowledge and skills and changes in classroom practice. The three core features of professional development activities they described are (a) a focus on content knowledge, (b) opportunities for active learning, and (c) coherence with other learning activities. Through these core features three structural features were found to

significantly affect teacher learning: the form of the activity, collective participation of teachers from the same unit, and the duration of the activity. Although the self-reported measures used in this study can be inaccurate in terms of what are the actual effects of the independent factors on teacher knowledge and skills, they can reflect what the teachers think and the connection between the professional development characteristics and their effects on teacher learning.

Other professional development programs were found to be effective to achieve a specific change in teachers' behavior. For example, in their Response to Intervention (RtI) approach, Thompson et al. (2012) examined the effects of tiered interventions on teachers' behavior of implementing behavior-specific praises (BSP). The intervention included Tier 1: school-wide training, Tier 2: video self-monitoring, and Tier 3: coaching. Both teachers' BSP and students' on-task behaviors were observed and recorded, and a multiple probe design across participants was used. The results indicated that video self-monitoring provides an accurate data source that meaningfully informs instruction, especially when accompanied by consultation with a mentor, which concurs with findings from other researchers (Capizzi et al., 2010; Myers et al., 2011; Sherin & van Es, 2005). One limitation of the study was its small scale. However, Guskey and Sparks (2000) claimed professional development, such as this, that involves significant numbers of contact hours over a long period of time is typically associated with effectiveness. This makes it hard to conclude whether the effectiveness of the professional development comes from its variety of forms or just the duration of the professional development. Despite this uncertainty, it makes sense that video self-monitoring can be a good means used in professional development to evaluate and reflect on one's own practices.

Likewise, Penuel et al. (2007) studied the types of professional development activities used in the Global Learning and Observations to Benefit the Environment (GLOBE) Program, an

international earth-science education program, that were associated with (a) increased levels of program implementation, (b) increased teacher knowledge, and changes in science teaching practice, and (c) increased implementation and teacher knowledge and changes as a result of support and follow-up following the PD experience. The data used in the study came from teachers who received professional development and protocol training from GLOBE partners within a 2-year period. The study concluded that teachers' perceptions about the coherence level of their professional development experiences affected their learning and program implementation, and that focusing professional development on implementation and allowing time for teachers to plan for implementation and providing technical support can promote program implementation.

Other studies of professional development models and efficacy have commonly suggested a need for a structured process if it is to produce change (e.g., Peterson et al., 2009; Sprick et al., 2006; Stichter et al., 2006). According to Thompson et al. (2012), Components of structured professional development that lead to teacher learning include:

> (1) school-wide common classroom management practices, (2) observational guides, (3) pre-conferences to determine target teaching skills, (4) post-conferences to collaboratively analyze direct observation data, (5) intervention choices (such as modeling or observation in other classrooms), (6) goal setting and follow-up, and (7) repetition of the process as needed. (p. 523)

These components can be applied to the design of professional development programs to promote teacher change.

Some studies have investigated prerequisite conditions, focusing on teachers' dispositions, for teacher change to occur following teachers' participation in a professional

development program. For instance, Peterson (2012) investigated educators' readiness to change in the context of early childhood professional development in New York. The author defines readiness to change as the combination of internal and external resources that are available to support sustained intentional change in a particular behavior (Peterson & Baker, 2011). One of the three research questions raised was: What were common features of early childhood educators (ECEs) with high and low levels of readiness to change. Findings suggested that typical features of ECEs who were ready to change included the following: they (a) had already identified a behavior they wanted to change, (b) were open to receiving new information, (c) were between the "survival" stage and "burnout," and (d) viewed themselves as professionals. The limitations of the study included the substantial attrition of the mentees and the validity of the scale being used. However, this study corroborated the importance for the teachers to be able to identify a gap between a targeted behavior and the teacher's present behavior. Watching teachers' own practice videos can help teachers reflect on this issue (Thompson et al., 2012).

Other studies focused on the multidimensionality of the professional development program to investigate the program effect. For example, Sibley and Sewell (2011) investigated the effect of multidimensional professional development for language and literacy instruction. Teachers in pre-K classrooms were involved in the study, with half assigned to the treatment group that participated in the Promoting Education for Adults and Children (PEACH) project over the course of 3 years, thus preparing them to implement the Open the World of Learning (OWL), a research-based curriculum. The quantitative study measuring the teachers' language and literacy level and related teaching behaviors revealed that the teachers who participated in the project demonstrated significantly greater use of intentional teaching practices that supported student learning. The findings provide evidence that "(an) intensive, multidimensional, and

sustained professional development that is job-embedded to ensure individualized contextual relevance and provides opportunities for immediate application of new learning" (p. 272) leads to the adoption of intentional teaching practices. These findings are in accordance with the conditions of teachers' practice change through participation in professional development programs proclaimed by Goldenburg (2008).

Still other studies indicated the effectiveness of using various forms of professional development together to achieve teacher change. In a review of the coaching practices used in early childhood education, Gupta and Daniels (2012) summarized the studies' purpose, the coaching model description and general findings and recommendations; and compared key, differentiating characteristics across these studies. The findings supported the use of coaching in tandem with workshops or coursework for professional development and provide evidence that the various forms of professional development positively impacted preschool teachers' language and literacy practices. The author also suggested that their results point out that future research is needed to more carefully explore what coaches are doing, including the strategies they employ and the approaches used to promote change in teachers' practice.

Reflective thinking is often used in professional development as a process that leads to teachers' behavior change. Fifty years after Dewey's seminal explication on "reflective action," which he defined as "active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and the further consequences to which it leads" (1933, p. 9), the teacher education and professional development literature abound with descriptions of reflective thinking as a crucial process for teacher professional growth. For example, Brown and Kennedy (2011) investigated a professional development experience with a group of teachers and educational psychologists in the UK, at a school for children identified as

having social, emotional, and behavioral difficulties. The project focused on how teachers' talk changed. Through reflective and exploratory discussion, enhanced by class videos, teachers explored and developed aspects of their interactional styles. Obvious changes were identified, including that the teachers were using more conversation to build on children's ideas and actively support cooperation between children. The study provided insights for designing professional development that leads teachers to change practice through the use of reflective thinking.

Researchers who study the impacts of professional development also articulate types of changes that may happen to teachers and assert that the distinction between them is important. Evans (2011), for instance, identified "three main constituent components of professionalism: behavioral, attitudinal and intellectual" (p. 856): each of these components relates to what practitioners physically do at work, attitudes they hold, and their knowledge and understanding respectively. Also, the author distinguished between enacted professionalism and demanded or requested professionalism: the former "is constantly reshaping itself through the dynamic agency of its practitioners," while the latter is "what is officially set down as the accepted shared norms and behavior code" and "may remain static for periods of time" (p. 862-863). She concluded that "shaping teacher professionalism is a multi-agentic, constantly evolving, process, but a key determinant of teachers' own agency in this process is the extent to which they 'buy into' a particular professionalism on the basis of their perceiving it as potentially constituting 'a better way': ...." (p. 868). She argued that "the 'real' shape of teacher professionalism will be that teachers forge for themselves, within the confines and limitations of the context set by the government's demanded professionalism" (p. 868). Her article corroborates the view that teachers' attitudes and beliefs are important in shaping their professionalism. In other words, if

teachers do not believe in the efficacy of required professional behaviors, they will not enact the required practice. Evan's study argued for the priority of attitude change compared with other changes. In contrast, other studies did not prioritize attitude change before other types of changes; instead, they took all types of changes as a whole. For example, Clarke and Hollingsworth (2002) claimed that for teacher learning or growth to occur, change must occur in multiple areas of influence.

Other research explored the barriers that prevent teachers from changing their practice. Sturko and Holyoke (2009) assessed the effectiveness of a professional development program, focusing on teachers' use of integration strategies to improve their abilities to integrate their curriculum. The study identified barriers that may prevent teachers from adopting the integration strategies in their practice on a routine basis: teacher beliefs coming from their personal experience, lack of collaboration opportunities among teachers, and lack of cultural support. These findings are consistent with earlier research from Ertmer (2005). Although the focus of these studies differed from studies that emphasized the characteristics of professional development that lead to teacher change, the findings of this study solidified evidence of the characteristics of professional development that lead to teacher change.

In short, many characteristics of professional development have been instrumental in changing teachers' practice. These include teachers' openness to change, their beliefs that professional development is meaningful and has value, collective participation of teachers from the same unit, collaboration of teachers and social-cultural support from the school and the larger environment, video self-monitoring and self-reflection, structured activities and development process, high coherence level of various learning activities and experiences, intensive, sustained, and job-embedded programs that provides opportunities for immediate application of new

learning, and multiple forms of a program comprising coaching, coursework, workshops etc. These characteristics have been identified to lead to teacher change in behavioral, attitudinal and intellectual aspects of their professionalism. The professional development program in the current study paid attention to these characteristics in the program design, and this study examines whether these research-based characteristics will lead teachers to make a comprehensive change in their beliefs and practices.

The Change Mechanisms of Professional Development and Evaluation Issues

In accordance with the research that established the connection between characteristics of professional development and teacher change, professional development designers tended to assume that there was a need to lay down certain rigid rules for best teaching, to acquaint teachers with best practices so that they could use them in the future, and to allow them to practice the teaching skills that professional development was focused on. Some professional development designers are hopeful that developing professional development that combines all these characteristics will lead to teacher change. However, the mechanism of change is far more complex than this. The next part of the review will explore change mechanisms of professional development and raise the issues that obstruct a shared understanding of targeted teacher change. Then, this section will conclude by articulating professional development design strategies adopted in the current research.

A wide variety of studies have contributed to the search for plausible mechanisms that can account for teacher change based on professional development. For instance, Albert Bandura (1977) introduced efficacy expectation as a vital component of behavior change within his learning theory. He defined efficacy expectations, synonymous with self-efficacy, as “the conviction that one can successfully execute the behavior required to produce the outcomes” (p.

193). Further, he maintained that self-efficacy is largely determined through four sources of information, including personal experiences, witnessing other's experiences, societal influence, and physiological reactions in various situations. He also asserted that self-efficacy impacts behavioral choices, effort and persistence, and cognitive and emotive responses (Bandura, 1986).

Teacher beliefs, including self-efficacy, are an important aspect of teacher change and can further lead to other aspects of change valued in professional development programs. Warren (2010) investigated the potential relationships between Rational Emotive Behavior Therapy (REBT), teacher efficacy and student achievement. Through a literature review, the author argues that REBT is a mental health intervention and support tool that can increase teachers' efficacy, which can impact student outcomes. Warren's work supports the importance of raising self-efficacy through teachers' professional development.

Unlike Bandura (1977) and Warren (2010) who explained the teacher change process as a result of teachers' self-efficacy, Guskey (2002) asserted that teacher change does not occur from a starting point of belief change. Instead, he argued that it is only after there is change in teachers' classroom practice as a result of professional development, and there is a change in student learning outcomes resulting from teachers' practice change, that teachers' beliefs and attitudes will change. Although these theories seem to be contradictory, they are not. The current study assumes that change happens when professional development is structured to press teachers to change practices while simultaneously supporting them in changing beliefs. As Richardson (1996) articulated, beliefs and practices complement and interact with each other.

Instead of focusing on the order of change, Griffin (1986) and others (e.g., Gupta & Daniels, 2012; Spodek, 1996) explained the teacher change process as resulting from the orchestration of program traits. Griffin, for instance, argued that a professional development

program "must be embedded in a school context (defining property), and be (1) context-sensitive, (2) purposeful and articulated, (3) participatory and collaborative, (4) knowledge-based, (5) ongoing, (6) developmental, and (7) analytic and reflective" (p. 7).

The importance of these program traits such as cooperation, partnership, and individualized coaching has often been stressed in literature. In reviewing teacher development theories, models, approaches and programs, for example, Sprinthall et al. (1996) explored elements for teacher development. They emphasized the importance of cooperation between the university and the school, and argued,

> effective teacher education programs are based on a conception of teacher growth and development; acknowledge the complexities of classroom, school, and community; are grounded in a substantial and verifiable knowledge base; and are sensitive to the ways teachers think, feel, and make meaning from their experiences. (p. 667)

Based on this school of thought, major professional development programs nationwide have adopted the university-school partnership model to tap into the resources provided both by academic researchers and field experts.

The value of school-wide cooperation is also often stressed as it helps to increase the effectiveness of professional development. Morey (2008) studied how a school coalition designed a model that promotes teacher leadership and professional growth. The school determined that teachers go through a collaborative process of brainstorming and planning backward in the domains that Danielson and McGreal (2000) defined in *Teacher evaluation to enhance professional practice*. Based on their framework, teachers reflect, self-evaluate, and take responsibility for their own professional development. The framework asserts that teacher behaviors and predispositions are important in the design of professional development.

Not only is cooperation and partnership in and between the university, the school and the community important, it is also important to value individual teachers' differences. Gupta and Daniels (2012) asserted,

> In designing a prescribed coaching model, researchers must take into account some variability due to teacher characteristics and ability. Researchers should hire and train coaches to be able to tailor a coaching model to meet teachers' individual characteristics and abilities while maintaining fidelity. (p. 217)

Because each teacher brings personal experiences and personality into the professional development program, teachers need individual attention from teacher educators. While we evaluate teachers' change during and after a professional development program, teachers will also need individual attention.

A more comprehensive framework focusing on teacher change in professional development was proposed by Desimone (2011). She asserted that successful professional development goes through four steps: teachers experience professional development; teachers' knowledge and skills increase or/and beliefs change; teachers apply their learning to their instructional practice; students' learning is boosted. Besides this conceptual framework of how professional development succeeds in bringing change, Desimone identified core features as necessary for professional development to be effective, namely, (a) focusing on subject matter content and how students learn, (b) active learning on the part of participating teachers' (e.g., discussing and reflecting), (c) consistency with other learning forms and environment, (d) spreading over a semester with 20+ hours of contact time, and (e) collective participation from the same community. The advantage of this framework is that it addresses both focuses discussed earlier in this review and repeated below.

Based on the literature of change mechanisms of professional development reviewed previously, there are two major focuses of change mechanisms. One is that change starts from beliefs or practice; the other is that change happens through a combination of program traits. Researchers may be divided about which perspective matters more. Some researchers asserted that core belief change should be the purpose of professional development programs. For example, Warren (2010) pointed out the weakness of some studies that focused on practical solutions including 12 communication skills (Fritz et al., 1995) and peer coaching (Edwards et al., 1998). According to Warren, "this type of professional development neglects to address teachers' core beliefs that influence their emotion and behavior" (pp. 11-12). When researchers evaluate teacher change to search for possible mechanisms, they need to find out how teacher change should be measured, such as what demonstrates teacher change. In the current study, both teacher beliefs and practice will be evaluated to reflect teacher learning. Since teacher beliefs include many elements, like knowledge about teaching, self-efficacy, openness to change, and perceptions of environment resources, measurement of a subcategory of teacher beliefs may or may not be correlated with teachers' practice. However, it is meaningful to explore a relationship like this to start with.

In light of what is found in the literature about teacher change mechanisms during and after professional development, the professional development program designers in the current study incorporated the characteristics and strategies found in successful programs. Beginning in 1999, the university has offered a six-course professional development program (currently titled TELL) that spans two years. This program has been run in the form of a university and school partnership. The partnership collaboration with university, education, and public school faculty focused on developing a professional development program that would both educate teachers

about needed content and engage them in ways that would increase the likelihood they would enact such practices in their classrooms. The university provided the professional development which was taught by veteran teachers endorsed to work with ELLs. The facilitators were chosen from local school districts to teach and coach teachers in their districts. The courses this program offers are structured so that it teaches teachers what they need to know and do to work effectively with ELLs in their regular classrooms. The courses utilized professional development practices that research suggests are most likely to result in teachers enacting these practices. Schools in this study's university public school partnership have been and continue to engage teachers in learning theories, research, and practices that will support the development of academic language among their ELLs.

ELL Teachers' Beliefs and Practices Targeted by Professional Development Programs

In the previous section, literature on plausible teacher change mechanisms during or after professional development, issues worthy of consideration in evaluating professional development, and the comprehensive structure of teacher change that should be examined when considering the effects of professional development was reviewed. This section will review research-based findings about beliefs and practices that are critical and essential in teaching ELLs and helping them to develop language and literacy. These beliefs and practices should be the targets for professional development designed to educate teachers teaching ELLs in general education classrooms. First, Dual Language Learner Teacher Competencies Report (hereafter shortened as DLLTC Report; López et al., 2012) will be discussed because DLLTC manifests key beliefs that ELL teachers are desired to have in order to facilitate the development of ELLs. Then, this section will focus on research findings relevant to teaching ELLs using practice guidelines issued by the Institute of Education Sciences (IES).

DLLTC Report (López et al., 2012) asserts that "it is a well-recognized tenet of education that the skills, abilities and personal dispositions of a teacher are important contributors to a child's educational success" (p. 7). As discussed in section 2.1.3 of the current study, belief is taken as a broad term and includes dispositions. This report indicates that ELL teachers' beliefs and practices can influence learners' educational outcomes.

Dual language learners are commonly found in California state where Spanish-speaking children are learning both English and Spanish in classrooms. However, increasingly schools in the U.S. educate students from multiple language backgrounds. Sometimes as many as 20 or more languages could be spoken in a school. In such cases, schools often utilize ESL rather than dual-language programs. Regardless, most of the ELLs we encounter in the U.S. usually learn English only in classrooms, but they speak and learn informally their parents' mother tongue at home. Although DLLTC Report (López et al., 2012) appears to focus on dual language learners, it can be argued that the report also applies to ELL teachers. In fact, this report notes that it utilizes Dual Language Learner (DLL) and English Language Learner (ELL) interchangeably.

The DLLTC Report lays down a set of core principles for the development of teacher competencies for dual language learners (DLLs) as follows:

- Children have the right to receive a high quality, linguistically and culturally competent education.
- Knowing more than one language benefits an individual's cognitive, social, and emotional development.
- The development of the first language is critical in the development of the second language.

- The socioemotional development of young children is central for language learning.
- Family engagement and involvement contribute to positive child outcomes, positive home interactions, and increased student success.
- Effective teaching for Dual Language Learners is founded on a strength-based approach to learning.
- The learner is perceived as possessing assets that positively contribute to his or her development.
- Reflective practice is a central component of teacher preparation and ongoing development. (abridged from pp.11-13)

These core principles can serve as a good description of core beliefs that ELL teachers are desired to have or develop in professional development programs. Based on research and practice, each principle covers an essential belief that is critical for developing ELLs' language and literacy. Additionally, the report indicates that these principles can assist with the design of professional development efforts for teachers who teach ELLs in regular classrooms.

However, principles alone will not necessarily guide ELL teachers to think in a way that will best prepare them for their work with ELLs. Research-based practices are also needed to guide ELL teachers to strengthen their teaching practices in order to promote the language and literacy development of their ELLs. Dixon et al. (2012) examined research from four perspectives (i.e., foreign language education, child language research, sociocultural studies, and psycholinguistics). They reviewed articles concerning optimal conditions for second language acquisition (SLA), learner and teacher characteristics that are conducive to SLA, and speed of SLA. Their major findings include

1. Optimal conditions for L2 (second language, author's note) learners immersed in a majority-L2 society include strong home literacy practices, opportunities to use the L2 informally, well-implemented specially-designed L2 educational programs, and sufficient time devoted to L2 literacy instruction, whereas L2 learners with little L2 exposure require explicit instruction to master grammar.
2. L2 learners with strong L2 aptitude, motivation, and first language (L1) skills are more successful.
3. Effective L2 teachers demonstrate sufficient L2 proficiency, strong instructional skills, and proficiency in their students' L1.
4. L2 learners require 3-7 years to reach L2 proficiency, with younger learners typically taking longer but more likely to achieve close-to-native results. (p. 5-6)

These are insightful findings concerning what are the optimal beliefs, expectations and practices that will enable ELL teachers to promote students' second language development and literacy. It is notable that some of these key points highlight the necessity for explicit grammar instruction and factors of home environment and student motivation. Teachers need to learn how they can incorporate these principles and practices into their instructional strategies, and professional development programs need to ensure that teachers can learn this.

Saunders and Goldenberg's (2008) research focused on similar perspectives but included seemingly more particular approaches to ELL teaching. They asserted that English language development (ELD) instruction for ELLs was "designed specifically to advance English Learners' knowledge and use of English in increasingly sophisticated ways" (p. 28). They also identified guidelines relevant to ELD instruction and organized them by the level of supporting evidence. Two practices with relatively strong supporting evidence were "1) ELD instruction is

better than no ELD instruction, and 2) Interactive activities can be productive, but they must be carefully planned and carried out" (p. 31). Other practices described were based on hypotheses emerging from recent ELL research and include "ELD instruction should explicitly teach elements of English (e.g., vocabulary, syntax, grammar, conventions)," and "ELD instruction should provide students with corrective feedback on form." Still other guidelines were applicable to ELD but grounded in Non-ELL research, including "ELD instruction should be planned and delivered with specific language objectives in mind" (p. 31). The key points from this review of literature are that (a) ELD instruction is necessary and interactive activities need to be planned carefully, and (b) guidelines that may need stronger evidence are explicit instruction of language elements and specific language objectives should be planned.

Over the years, IES continuously evaluated research concerning teaching ELLs and published two practice guides based on this research (Gersten et al., 2007; Baker et al., 2014). The first practice guide concerns instruction for ELLs in the elementary grades; the second concerns instruction in both elementary and middle school grades. These practice guidelines and pertinent research findings about practices that ELL teachers need to learn and enact in their teaching will be discussed next.

The first practice guide issued by the IES for instructing ELLs (Gersten et al., 2007) listed five recommendations: "1. Screen for reading problems and monitor progress; 2. Provide intensive small-group reading interventions; 3. Provide extensive and varied vocabulary instruction; 4. Develop academic English; 5. Schedule regular peer-assisted learning opportunities" (p. iii). Each recommendation comes with the level and the summary of evidence, ways to carry out the recommendation, and possible roadblocks and solutions. Based on these recommendations, teachers can learn what practices are counted as important for helping ELLs,

and teacher educators or researchers can know what to look for when they want to evaluate teacher learning.

The updated practice guide for teaching ELLs published in 2014 offered four recommendations:

> 1. Teach a set of academic vocabulary words intensively across several days using a variety of instructional activities; 2. Integrate oral and written English language instruction into content-area teaching; 3. Provide regular, structured opportunities to develop written language skills; 4. Provide small-group instructional intervention to students struggling in areas of literacy and English language development. (p. iii)

This updated practice guide, which incorporated research-based evidence from more recent years, is a continuation and expansion of the earlier guide. It provides many detailed exhibits of how to carry out each recommendation, which is extremely useful for teachers and professional development designers. Additionally, these recommendations are more unified than those in the earlier guide by presenting specific suggestions for enhancing instruction so that ELLs have many opportunities to speak, listen to, and write about academic topics in daily classroom instruction. These recommendations focus on intensive vocabulary teaching, writing, and small-group intervention.

The research findings and guidelines passed similar but complementary messages that can be used for designing teachers' learning in professional development catered to teachers who have ELLs in their general education classrooms. The DLLTC Report (López et al., 2012) highlighted ELL teachers' qualification of cultural competence and tendency of reflection on practice, beliefs on the importance of students' emotion and identity development, family engagement, and ELLs' language-based assets. These qualities are what professional

development evaluators need to look at to determine whether teachers learned these principles. The research findings from researchers and practice guidelines from the IES support practices such as small-group intervention, intensive vocabulary instruction, carefully planned interactive activities, explicit grammar instruction, planned language objectives, and academic writing. These practice recommendations can be used by professional development evaluators when they design a tool to assess teachers' practice change.

Although studies reached a consensus on features associated with improved teacher learning in professional development (Desimone, 2011; Girardet, 2018; Penuel et al., 2007) and on best practices concerning teaching ELLs (Dixon et al., 2012; Sanders & Goldenberg, 2008; Baker et al., 2014), there is still doubt on whether there is a fixed formula for the complex process of teacher change with professional development. This study explores whether engaging teachers in professional development that adheres to these guidelines can lead to shifts in teacher beliefs and changes in their practices in teaching ELLs.

The Methodology for Studying Teacher Change

The way teacher change has been studied has changed with time. Generally, the earlier studies were more focused on the analysis of teachers' beliefs and/or practice at a certain point in time. Both quantitative and qualitative methods were used to explore teacher change, but they were often used separately. Quantitative studies tried to predict teachers' beliefs and behaviors while qualitative studies sought to understand teacher beliefs and behaviors in more detail and complexity. Some researchers noted a trend wherein studies, in general, moved from using quantitative methods to the use of qualitative ones. For example, Doyle asserted that the measurement of teacher attitudes and beliefs reflected this paradigmatic shift from positivist research strategies to a more hermeneutic approach (1990). Currently, researchers see value in

using mixed-methods and there is a renewed interest in academia in longitudinal studies of teachers' beliefs. This section will be focused on reviewing the earlier studies that used either quantitative or qualitative methods followed by researchers' recommendations for the future direction of studies on teacher beliefs. Then the focus will switch to mixed-method and longitudinal studies that represent recent trends.

Earlier Trend

In this subsection, research methods that were often used in the second half of the last century will be reviewed. The quantitative studies used at earlier times often attempted to predict relationships between teacher beliefs and behaviors. The purpose of these studies was often to guide teacher selection. The studies, usually large scale, involved the use of multiple-choice surveys or tests (e.g., the Minnesota Teacher Attitude Inventory (MTAI), Khan & Weiss, 1973; Wehling & Charters, 1969).

Qualitative methodology used previously frequently employed interviews and observations as data-gathering techniques (e.g., Franke et al., 1998). These studies utilized approaches that involved interviewing, practical arguments, elicitation of metaphors, or narrative analyses. Many of these studies aimed to understand teachers' thinking through analysis of the transcripts from interviews and/or other artifacts. This trend of using discussions, field notes, and artifacts as data has continued into the present (e.g., den Hartog King & Nash, 2011).

There was a lack of studies that explored inservice teacher's change in earlier times. Instead, most of these studies addressed teachers' beliefs and/or practice at a certain point in time. Only a few studies explored preservice teachers' change in their thinking and/or behavior (e.g., Bullough, 1993; Kolano & King, 2015). The need for longitudinal studies on teacher belief was often noted among researchers (Camacho et al., 1998; Middleton, 1999; Richardson, 1996).

Researchers also noted the separation of belief and practice studies. Since individual teachers may not express their real beliefs for reasons like political correctness or popular social values, scholars suggested that studies should be designed to include both belief and classroom practice data. As Thompson (1992) noted, "investigations of teachers' beliefs should examine teachers' verbal data along with observational data of their instructional practice; it will not suffice to rely solely on verbal data" (p. 135). On the other hand, it is also possible that teachers have absorbed new thinking in teaching, but they may not be able to apply their theoretical learning to their practice immediately. If we only look at teachers' practice in this case, we may miss the development teachers have already made with regard to their knowledge and beliefs. Both practice observation data and teachers' self-report belief data are needed in studies on teacher change (Thompson, 1992).

Most Recent Trend

As reported in the section above, researchers were aware that studies of teacher change should use both teacher belief self-report data and their practice observation data and address possible changes through time. This subsection will be devoted to reviewing studies on teacher change in the past two decades, focusing on the new trend of longitudinal studies. These studies have employed either qualitative or quantitative methods or both. They may also have used practice observation data or belief self-report data but have rarely used both.

Qualitative, longitudinal studies have reported that teachers' practice changed in response to teachers' professional development. Brown and Kennedy (2011), for example, investigated a professional development process with a group of teachers and educational psychologists in the UK at a school for children identified as having social, emotional, and behavioral difficulties. This research project focused on how teachers' talk changed. Through reflective and exploratory

discussion, enhanced by classroom videos, teachers explored and developed aspects of their interactional styles. Obvious changes were identified including that the teachers were using conversation to build more on children's ideas and actively support the cooperation between children. This study measured teachers' practice change but did not measure or attend carefully to teachers' beliefs. As beliefs are not the same thing but intertwined with practice, researchers cannot be sure whether teachers' beliefs about teachers' talk also changed or if the change in practice was just temporary, as a result of training.

Quantitative longitudinal studies have also reported teacher change in beliefs or practices based on multiple time-point data (e.g., Maulana et al., 2015; Ottley et al., 2015; Thomson et al., 2019; Vagi et al., 2019). Among these multiple-time-point longitudinal studies, one interesting study is about teachers' knowledge and beliefs carried out by Ottley et al. (2015). The researchers examined the patterns and predictors of change in knowledge and beliefs for early childhood educators participating in state-implemented professional development. Although this study gave a nuanced description of teacher change in their self-report beliefs, teachers' practice observation data was missing, which might have reflected teachers' implicit or implemented beliefs, and have more value for understanding teacher change in practice.

Teacher change studies have seldom attended to teachers' beliefs and practice toward teaching ELLs. Girardet (2018) reviewed studies of teachers' change in classroom management. These studies of teacher change either focused on beliefs or practice but seldom included both in the same study. Besides, most of the longitudinal studies on teacher beliefs (e.g., Thomson et al., 2019; Thomson et al., 2020) were focused on topics other than teachers' beliefs about ELLs. For the limited studies that focus on ELL teachers' beliefs and practices, they do not address teacher change. For instance, Carley Rizzuto (2017) studied teachers' perceptions of ELL students,

examining how the perceptions of early childhood teachers toward their early childhood ELLs shape their pedagogical practices. The study explores a static relationship between teachers' beliefs and practices at a certain point in time. Since teachers' beliefs and practices are expected to change as a result of professional learning that is supposed to accompany educators all through their careers, more inquiries into active teacher change will be needed.

The current study argues that beliefs and practices are not the same thing, but they are closely connected, interact with each other, and should both be included in a teacher change study to provide a whole picture of teacher change. Beliefs often drive and reflect themselves in teachers' practices, but other environmental factors can promote or delimit the driving effect of teacher beliefs. For this reason, the current study will explore both teachers' self-report beliefs and observations of their practice and whether they are correlated without controlling any environmental factor effects. As teacher change is what the current study is shooting for, the pre and post professional development data will be compared.

This section has focused on reviewing the methodology for studying teacher change. The methods used for studying teacher change across the literature reviewed were varied, which showed the value of looking at both self-report teacher belief data and their practice observation data to gain a richer view of the picture. Both data types are needed to show teacher change, but they were not yet often used together. The longitudinal study of teacher change in beliefs and practices is a budding trend, which can bring richer information about the process of change, but it is rarely used in studies of teacher change concerning teaching ELLs. This review of methodology suggests that studies on teacher change concerning teaching ELLs could utilize both self-report teacher beliefs and their practice observation data in investigating teacher change after they participate in the professional development designed in the current study.

This chapter reviewed what the literature says about teacher beliefs, practice change, professional development, and research methods used for studying teacher change. So far no studies reported professional development concerning Second Language Acquisition (SLA) and teaching ELLs and related teacher change. This study examines whether engaging inservice teachers of ELLs in professional development designed and implemented according to research-based practices (Desimone, 2009; Penuel et al., 2007; Opfer & Pedder, 2011) targeted for teaching general education classroom students, particularly including ELLs, will lead to changes in their teaching beliefs and practices.

CHAPTER 3

Method

This chapter begins by a description of the settings of the study. Then, participants, instruments, procedures, research design, and data analysis strategies of the study are reported.

Settings

The main site for this study was a professional development initiative conducted in a joint partnership between a university in the Mountain West area of the U.S. and five local school districts. The professional development included six courses. The content of the courses focused on different aspects relevant to teaching ELLs: culture, second language acquisition, assessment, methods for developing literacy and integrating content and language instruction. The courses were designed and implemented through collaboration with the college of education, university faculty from other disciplines, and teachers and administrators from the local school districts. Those involved in the construction and implementation paid careful attention to what was known about best practices for teaching ELLs and for professional development. The six courses were delivered in each local school district by teachers from that district who had participated in training for teaching the courses. Inservice teachers from the local school districts in cohorts of 20 enrolled in the professional development program. The teachers enrolled in these courses were used for this study. There are two different data sources.

Source One

The course that is central and foundational for teachers' development of the knowledge necessary for them to understand language development and to be receptive to what needed to be done in their practice is the second course in the series. The topic of this course is second language acquisition. This data source from this course was the results of a survey concerning

teachers' beliefs about and knowledge of practices for promoting the language development of ELLs. The survey was administered by district facilitators in each of the five districts that offer the courses who taught the course of second-language acquisition. It was administered through *Qualtrics* on the first day and after the last day of the course.

Source Two

The second source of data included classroom videos collected from approximately 10% of the participants. The percentage limit was set in the design because of the resources available for the project; the participants were enrolled if they volunteered to do so. Four classroom videos were collected from each teacher: two at the beginning of the program and two after teachers completed all six courses. The classroom videos were taped in the teachers' schools where they taught topics they selected. Two lessons were videotaped within two months of the beginning of the program, and the second two lessons were videotaped within two months of their completion. Two researchers went to the classroom to video-record the teachers' classroom practices.

Participants

The population of the study was 197 teachers who completed the Teaching English Language Learners (TELL) program between 2006-2017. These teachers were part of a district and university partnership program funded by a national professional development grant (NPD 2012 PRT# T365Z120236). Participation in the professional development was open to all educators working with K-12 students in the five partnership school districts around the university where this study was carried out. The demographics of the population are presented in Table 2. These educators participated in this TELL professional development program that was structured around English as a Second Language (ESL) standards for teachers who were teaching ELLs in general education classrooms. Among this population, 27 teachers enlisted in the

videotape project of their classroom practices at the beginning and the end of the program, but four of them did not have the post video recorded for various reasons. As a result, a total of 23 teachers completed both pre- and post-videos (the demographics of this teacher group are presented in Table 3).

Table 2

Sociodemographic Characteristics of Participants

Characteristic	Number of participants	Percent of participants
Age		
18-24	12	6.1
25-34	57	28.9
35-44	49	24.9
45-54	49	24.9
55 & over	20	10.2
Gender		
Male	30	15.2
Female	160	81.2
Education		
High school or associate's degree	9	4.6
Bachelor without teaching certificate	18	9.1
Bachelor with teaching certificate	114	57.9
Master's or Doctoral degree	49	24.9

Note. N = 197. The missing categories are not listed here.

Table 3

Frequency Distribution of Participants by Demographic Variable

Characteristic	Number of participants	Percent of participants
Gender		
Male	2	8.7
Female	21	91.3
Race		
White	21	91.3
Non-White	2	8.7
School Level		
Elementary	17	73.9
High	6	26.1

Note. N = 23.

Instruments

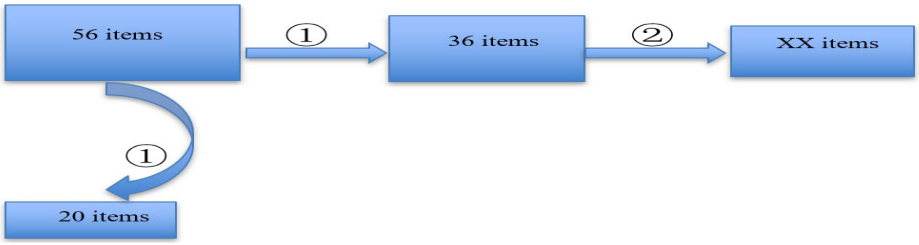
Instrument One

The survey (Teemant & Pinnegar, 2007) which consisted of 56 items (see Appendix A), was administered to the educators who took part in the professional development. Among the 56 items, 20 were excluded from analysis for the current study. Some items were excluded because they asked participants to self-evaluate and were misleading. Other excluded items which were unimportant or irrelevant to the research questions. Additional items were excluded because the wording was ambiguous or because they were controversial rather than straightforward. This resulted in the elimination of 20 items from the analysis. The remaining 36 items concerned knowledge that was relevant for teaching ELLs in general education classrooms. Among these 36 items, some focused directly on what the professional development program was trying to encourage educators to understand (e.g., #3, Speaking fluently can mask deficiencies in academic language abilities). Other statements focused on practices teachers needed to not attend to (e.g., #15, Second language learners' errors are haphazard).

These 36 items were used for exploring educators' beliefs on teaching ESL to ELLs. As the validity information of the survey was not available, exploratory and confirmatory factor analyses were conducted to find out whether these items test the appropriate construct(s). In this factor analysis process, the survey items that could be used as valid measures were identified. This process is illustrated in Figure 1. The main strategy for the factor analysis will be illustrated in the data analysis section.

Figure 1

The Flow Chart of Narrowing Down the Survey Items



Note. 1. Choose the 36 knowledge items from the 56 total items.

2. Do factor analyses to retain (XX) items that form factor(s).

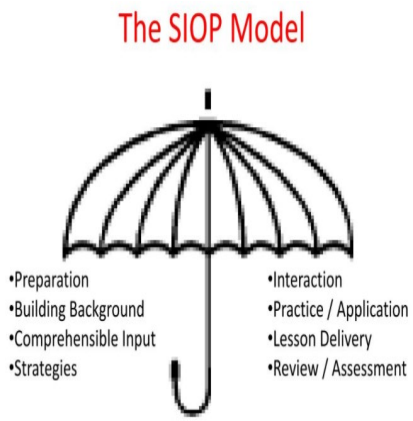
Instrument Two

Analysis of the videos were conducted using a protocol adapted from the Sheltered Instruction Observation Protocol (SIOP) model (Echevarria et al., 2013). This protocol is used as standard practice for observations of teachers who have ELLs in their classrooms (see Appendix B). This observation tool is based on the SIOP Model, which is a research-based and validated instructional model that has proven effective in addressing the academic needs of ELLs throughout the United States. Since the current study is focused on teachers' beliefs and practices concerning teaching ELLs and no other tools of similar purpose are known, the SIOP model became the natural choice.

The SIOP Model consists of eight interrelated components: lesson preparation, building background, comprehensible input, strategies, interaction, practice/application, lesson delivery, review and assessment (Figure 2). Using instructional strategies connected to each of these components, teachers are able to design and deliver lessons that address the academic and linguistic needs of ELLs.

Figure 2

The SIOP Model



Procedures

The inservice teachers (n=197) in our current study participated in a two-year program that involved six courses and educated them to teach ELLs in their regular classrooms. This program is structured so that it teaches teachers what they need to know and do to work effectively with ELLs in their regular classrooms using the instructional practices that research suggests are most likely to result in teachers enacting these practices. This program attended to both the content and the practices involved in teaching teachers how to best support the learning of ELLs (Baker et al., 2014).

Survey Administration

At the first week of the second language acquisition course (about 2.5 months after the onset of the program), all teachers who took part in the program were asked to complete an online Qualtrics survey of their attitudes and beliefs about teaching ELLs. The survey was completed after the first session of the second language acquisition class and again in the last week of the same course.

Analysis of the Video Using the SIOP Model

At the first week of the program (2-year span), teachers were invited to sign up to be observed and videotaped in two of their classes. Twenty percent agreed to participate. However, because of attrition, we ended with 10% of the teachers for whom we had both pre and post video tapes. The attrition resulted from teachers selecting not to complete the program or being unable to be videotaped within two months of the end of the program. In addition, the video tapes of three teachers whose district mandated the use of scripted lessons were omitted from the analysis. Researchers scheduled videotaping time with teachers who signed up. During the third, fourth, and fifth week at the beginning of the program, two researchers took videotaping equipment to the classroom where they were scheduled to videotape. At the end of the program, two researchers took videotaping equipment to the classroom where they were scheduled to videotape those teachers who signed up and fulfilled their commitment to have two classes videotaped at the beginning of the program. Two post videos were taped for each teacher.

Two researchers coded the teaching videos independently. They received training before they started coding. They were not informed, nor could they find out whether the videos were pre or post. If there was a 2-or-more point difference in the two coders' scores on an item, the item was reviewed and discussed by the researchers and rescored until they had a point or less

difference on that item. The interrater agreement reached 91% on the total items. The two coders' scores for each item were averaged to a mean score for each item. The highest point for each item was 4 points, and the total possible score for all 30 items was 120 points.

Research Design

This study explored the impact of a professional development program on teachers' beliefs about second language learning (the 1st question), teachers' practices of teaching ELLs in general education classrooms (the 2nd question), and whether there is a relationship between the two types of changes (the 3rd question). Given the questions, a quantitative method is regarded as appropriate to evaluate the possible shifts of teachers' beliefs and change in practices from the beginning to the end of the professional development program. For teachers' beliefs, we used a Likert-scale survey to quantify the belief shifts that happened between the two time points, while for teachers' practices, we used a class observation protocol to quantify the practice changes between the two time points.

Given the research problem explored, we collected two sets of data: 1) inservice teachers' surveys of beliefs about teaching ELLs, 2) inservice teachers classroom practice videos. Both sets of data are quantitative. For the first set of data, researchers had inservice teachers respond to a set of questions having choices ranging from 1 to 5, meaning strongly disagree to strongly agree. Each of the inservice teachers responded with a set of numerals that indicated the degrees of agreeing or disagreeing on a series of beliefs. The second set of data was originally qualitative, but the qualitative data was transformed to a set of quantitative scores ranging from 0 to 4 based on a scale that was used for evaluating teachers' effectiveness in teaching an ELL-inclusive classroom. The first set of data was collected on the first day (roughly 2.5 months after the onset of the program) and again on the day after the last day (roughly 5.0 months after the

onset of the program) of the teachers' course of second language acquisition that they took in the professional development. The second set of data was collected at the beginning and the end of the professional development program that spans two years for each cohort. Each set of data is analyzed and interpreted separately but they were combined in a third analysis.

The first set of data was exported from the *Qualtrics* survey software. The data consisted of inservice teachers (n=197) with teacher identifiers, demographic information, and 56 item responses for a pre survey and a post survey respectively. Only 36 item responses were chosen for the current study. The pre and post survey were combined into one file and converted into SAV and CSV files that included 36 two wave responses for every teacher. The second set of data (n=23) contained teacher identifiers and two sets of pre video cores and two sets of post video scores. Each set of scores had 30 component scores that came from the mean of each researcher's independent scores. To prepare for further analysis, each teacher's component scores for each video were added up. Each teacher had four total scores for further analysis, including two prevideo scores (PreObs1, PreObs2) and two postvideo scores (PostObs1, PostObs2).

Since the professional development on which this study was based was funded by a federal grant, this grant paid for participants' tuition and course materials, the stipend for being videotaped and the researchers who gathered and analyzed the videotapes. This is a potential limitation of the research. Further, the videotaping of lessons has the potential to make participants feel vulnerable for revealing their teaching as less than adequate. Even though compensation was provided to teachers who were videotaped, concern of vulnerability and inadequacy of performance may have contributed to the small sample size of teachers for whom there were pre and post videotapes.

Professional development may mean things very differently in different fields. As discussed in Chapter Two, Desimone (2011) elucidated a comprehensive definition of professional development. She noted that professional development can refer to a vast range of activities and interactions that can increase teachers' knowledge and skills, improve their teaching practice, and contribute to their personal, social, and emotional growth. Professional development in this study refers to a program that helped teachers prepare for teaching ELLs in general education classrooms. The professional development program teachers in this study participated in was designed according to the recommendations and best practices identified by Desimone (2011) and Penuel et al. (2007). In addition, the activities in the program engaged teachers in learning about teaching ELLs using the same techniques and strategies teachers were encouraged to utilize in their own teaching of ELLs. Further, the content of the courses was based on research concerning second language learning (e.g., Epstein, 2001; C. Walker, 1987; Wright, 2010) and research-based best practices for teaching ELLs (Gersten et al., 2007). The program is comprised of six courses that collectively meet the Utah State Board of Education's standards for the education of the teachers of ELLs and the standards recommended by World-Class Instructional Design and Assessment (hereafter referred to as WIDA) (2020). This program was developed through collaboration with Brigham Young University (including relevant faculty from the School of Education, the School of Family Life, and the Linguistics Department) and teachers, specialists, and administrators from schools that participate in the BYU-Public School Partnership.

The six-course professional development program titled Teaching English Language Learners (TELL) spans two years and culminates in an ESL endorsement from the Utah State Board of Education. Specifically, in a series of six courses (10 sessions each), teachers are

educated in the evidence-based knowledge, skills and practices recommended in the What Works Clearinghouse (WWC) practice guides (Baker et al., 2014; Gersten et al., 2007).

In the first course, teachers learn about cultural differences, multicultural educational practices, and federal, state, and local policies and mandates. In the second language acquisition course and literacy course, teachers are taught the theories of language acquisition and the evidence-based practices for developing language and literacy proficiency of the ELLs they teach in their regular classrooms. In the assessment course, they learn to evaluate the learning of the ELLs they teach through standardized test results and the use of formal and informal classroom assessment. In integrating content and language courses, teachers learn how to develop students' academic language proficiency through a curriculum that supports both content and language. In the family course, teachers learn how to collaborate with families and communities to promote the academic progress of ELLs. All of the courses are facilitated by an on-site instructor trained by the developers of the courses. The courses utilize video-anchored segments of instruction which include the content of the course with quotes from experts and school and community examples. The activities in the courses model best practices for teaching ELLs in order to enable teachers to experience learning through engaging in the kinds of practices that best support the learning of ELLs. In addition, participants engage with media cases that provide examples of second language learners and teachers utilizing the best practices endorsed by the program.

The courses reflect the WWC practice guides' recommendations (Baker et al. 2014; Gersten et al., 2007). The classes educate teachers about screening for reading problems, providing intensive small group interventions, using the first language in acquiring a second, and attending to academic vocabulary development using a variety of instructional strategies.

Teachers learn to use WIDA to guide them in promoting ELLs' language development. In this program, teachers learn to use SIOP and the CREDE standards to guide the development and implementation of instruction integrating oral and written English language instruction in content-area teaching in both sheltered and regular classroom instruction. Teachers learn to employ the cultural contexts of students, utilizing their funds of knowledge (González, 2005).

Across all courses, teachers learn how to enact small-group instructional interventions that support students who both shine and struggle in becoming literate in English and engage students in peer-assisted learning opportunities where ELLs demonstrate their learning. This program is structured so that it teaches teachers what they need to know and do to work effectively with ELLs in their regular classrooms using the professional development practices that research suggests are most likely to result in teachers enacting these practices. This research takes on the challenge offered by Goldenberg (2011) to develop professional development experiences that will alter the beliefs, thinking, and practices of regular classroom teachers.

The professional development program in this research attended to both the content and the practices involved in teaching teachers how to best support the learning of ELLs. The partnership collaboration with university, education, and public school faculty focused on developing a professional development program that would both educate teachers about needed content and engage them in ways that would increase the likelihood they would enact such practices in their classrooms.

In the quantitative study of teachers' beliefs, the teachers' belief items measure the teachers' agreement or disagreement with beliefs about teaching second language and ELLs. The

highest score of "5" in each item means they agree very much with a belief that teacher educators desire teachers to have or develop in the professional development program, or they disagree very much with a belief that teacher educators desire teachers to object to or gradually relinquish. The lowest score in each item means they disagree very much with a belief that teacher educators desire teachers to have or develop in the professional development program or they agree very much with a belief that teacher educators desire teachers to object to or gradually relinquish.

After analyzing teachers' responses to the 36 items that were chosen for the current study of inservice teachers' beliefs through exploratory and confirmatory factor analysis, we retained a certain number of items that formed a factor (or factors) that could provide a valid measure of teacher beliefs towards teaching ELLs. In a pilot study conducted earlier, 12 items were identified to measure this type of teacher beliefs. The same strategy and criteria were used to conduct analysis in the current study to obtain a valid measure.

In the quantitative study of teachers' practices in a general education classroom that include ELLs, the teachers' practices measure the level that a teacher has been faithful to the Five C's standards for language instruction (American Council for the Teaching of Foreign Languages, n.d., p. 1): communication, cultures, connections, comparisons, and communities. In order to operationalize this independent variable, researchers in this study used the SIOP model for classroom observations (Echevarria et al., 2013). This independent variable includes 30 items. These items fall into eight categories that characterize the requirements for teaching ELLs: lesson preparation, building background, comprehensible input, strategies, interaction, practice and application, lesson delivery, review and assessment. The highest score for each item is 4 points and the lowest is 0 points.

Data Analysis

There are three parts to the data analysis plan which correspond to the three main research questions: the first part is the analysis of the survey data, the second part is the analysis of the classroom observation data, and the third part is the combined analysis of the survey and classroom data for teachers who also have classroom observation data.

Survey Data Analysis

The 36 designated survey items were collected from 197 in-service teachers at the beginning of the program, and again approximately three months later. The key hypothesis to be tested is that the scores of teachers' beliefs will increase after participating in the professional development program.

In order to answer the hypothesis of differences in the mean levels of the latent variables of teachers' beliefs concerning teaching ESL to ELLs (Beliefs) at the beginning and the end of the course of second language acquisition, several steps needed to be conducted. First, there was a need to determine the number of factors in the dataset by using exploratory factor analysis (EFA). The number of factors to be extracted will be determined by examining eigenvalues, the scree plot, and theoretical meaning that can derive from the items grouped together as factors. During this process, items may be eliminated if they (a) have low standardized factor loadings (< .32), or (b) have high cross-loading across factors (any cross-loading difference < .15), and (c) if there are theoretical issues with interpreting the suggested factors. These cutoffs were taken from Worthington and Whittaker (2006). As measurement invariance is not assured across time (presurvey vs. postsurvey) this EFA will only be applied to the presurvey and those results will later be applied to the postsurvey to see if they still fit the data.

In the second step, a confirmatory factor analysis (CFA) was conducted on all and each of the suggested factors to see if they fit the post survey data and locate any local misfit. All CFA models were assessed using the following fit indices and their respective cut-offs: (a) the root mean square error of approximation (RMSEA), (b) the Tucker-Lewis index (TLI), (c) the comparative fit index (CFI), (d) the standardized root mean square residual (SRMR). A well-fitting model should generally have values above the cutoffs for at least three of the four indices.

RMSEA values should be as small as possible. Values lower than 0.05 indicate a good fit, values between 0.05 and 0.08 indicate an acceptable fit (Browne & Cudeck, 1992). Both TLI and CFI range from 0 to 1, with a perfect fit indicated by 1. A value above 0.95 is considered good, between 0.90 and 0.95 is considered marginal. For SRMR, a value of zero is a perfect fit, and less than 0.08 is generally considered a good fit (Hu & Bentler, 1999).

If the CFA model did not have good fit, the model was modified according to the model modification indices reported by MPlus and consideration of relevant theory. The best-fitting model was tested again both on the presurvey and the postsurvey to ensure that it had an acceptable model fit on both waves of data.

The final step before testing mean differences also involved a check on measurement invariance across the two waves. Measurement invariance tests whether the pattern of results is the same across time and consisted of several steps: (a) testing whether the CFA fits in both waves, (b) testing "configural invariance," or whether the model where the factor loadings and intercepts freely estimated across the waves with the same CFA structure fit the data, (c) "metric invariance" where the factor loadings were constrained to be the same across the waves, and (d) "scalar invariance" where the factor loadings and intercepts were constrained to be the same across the waves. Whether these more constrained models were appropriate for the data will be

checked via a Chi-square difference test and change in CFI (Wang & Wang, 2012). Throughout this entire process, the type of data (categorical or continuous) should be modeled appropriately. As I treat teachers' responses (1-5) as ordered categorical data, weighted least squares with mean and variance correction (WLSMV) will be used as the estimator for the quantitative analysis of ordered categorical data. The measurement invariance test method used in the current study is expounded in Liu et al. (2017). All data preparation and analyses will be performed in SPSS 15 and Mplus 8.4.

Classroom Observation Data Analysis

Observations of teachers' classroom practice videos at the beginning of the program and again approximately two years later were coded and transformed into quantitative measures according to the SIOP rubrics (Appendix B). There are two video-taped observations for each teacher at the initial wave and two more at the final wave. Scores for each observation are the sum of the 30 SIOP rubric ratings for each observation. The SIOP rubrics were developed according to the basic ideas for evaluating language development from the Five C's standards for language instruction (American Council for the Teaching of Foreign Languages, n.d., p. 1): communication, cultures, connections, comparisons, and communities. The SIOP rubrics try to measure whether teachers' practices are in alignment with these 5 C standards.

The classroom observation scores coded by researchers are added up for each teacher in each observation. Thus, there are four total scores for each teacher, with two total scores for the pre observations and two total scores for the post observations. The analysis of the survey data aims to test whether beliefs had changed in the three months since the start of the program for the 200 inservice survey respondents. Similarly, the main hypothesis to be tested with the classroom

observation is whether classroom practice had improved since the start of the program among the 23 inservice teachers for whom classroom observation data were available.

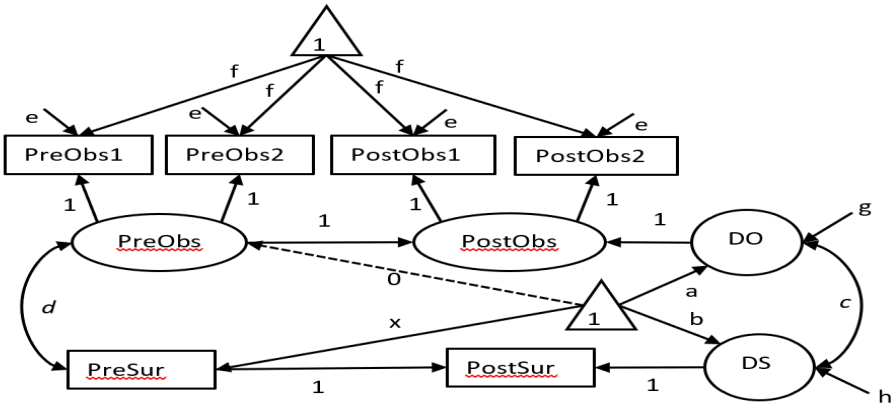
Combined Analysis of the Survey and Classroom Observation Data

Because only 23 of the 197 inservice teachers had classroom observation data, a preliminary independent t-test was conducted to see whether the pretest beliefs of the classroom observation participants differed from those of the remaining respondents who only took the survey. A non-significant group difference would provide some evidence that the groups were relatively similar in their pretest beliefs.

A combined analysis *(n = 23)* of the survey and classroom observation data was conducted to see whether changes in teachers' beliefs were associated with changes in teachers' practices. Because of the small number of classroom observation participants, the analyses of changes in teacher practices and the combined analysis of changes in teacher beliefs and practices will be described together and will utilize a simplified but common model (see Figure 3).

Figure 3

Path Diagram for the Observation Analysis and the Combined Observation and Survey Analysis



In this diagram, rectangles represent observed measures, ovals or circles represent latent variables, connected straight single-headed arrows represent regression coefficients or factor loadings, connected curved double-headed arrows represent covariances or correlations, triangles containing a "1" represent means or intercepts, and short single-headed arrows represent variances or residual variances. The two observed pretest observation measures (PreObs1 and PreObs2) are used as indicators of a pretest observation latent variable (PreObs). Similarly, the two posttest observation measures (PostObs1 and PostObs2) are used as indicators of a posttest observation latent variable (PostObs).

Because the two manifest observation measures at each occasion are considered randomly parallel, all factor loadings are fixed to 1.0, and the indicator residual variances (e) are equated across measures and occasions. The indicator intercepts (f) are also equated across measures and occasions, and the regression of PostObs on PreObs is fixed to 1.0, defining DO as the latent pre-post observation difference whose mean (a) and variance (g) are estimated as model parameters. The calculated mean of the twelve survey items at the pretest (PreSur) and the posttest (PostSur) are treated similarly to PreObs and PostObs. The regression of PostSur on PreSur is again fixed at 1.0, defining DS as the pre-post survey difference, whose mean (b) and variance (h) are estimated as model parameters. Manifest variables are used rather than latent variables for the survey data to reduce model complexity given the small sample size for this analysis.

The model parameters of most central interest in this study are a, b, and c. Parameter a gives the (unstandardized) estimate of the latent pre-post difference for the observation of teacher performance. Parameter b gives the unstandardized estimate of the pre-post difference in the survey measure of teacher belief for the 23 teachers who also had teacher observation data.

A much more powerful test of this hypothesis comes from the initial analysis of the survey data from all 197 teachers. Parameter *c* is italicized in Figure 3 to indicate that one is usually interested in the standardized estimate or correlation form of this parameter which directly tests the hypothesis about the association between changes in belief and performance.

CHAPTER 4

Results

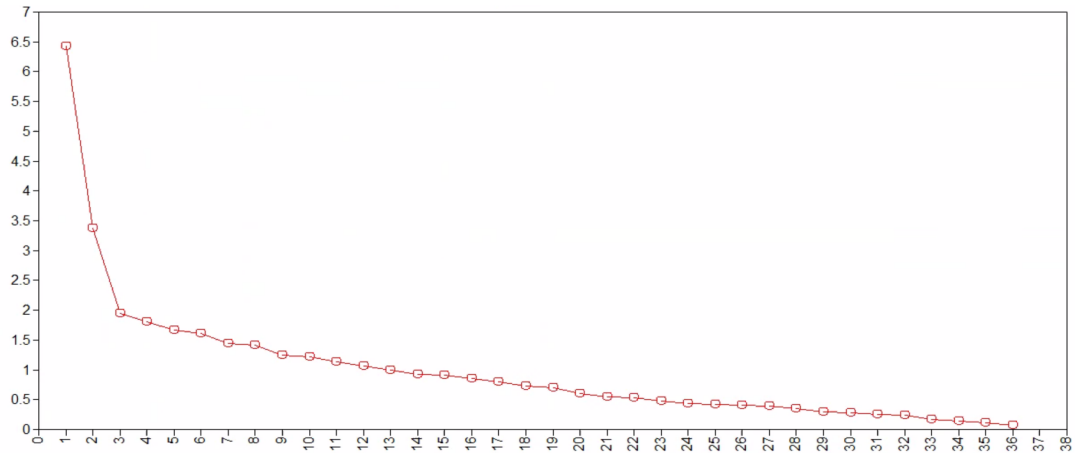
To answer whether teachers' beliefs and practice have changed in the program, the factor analysis and measurement invariance test results for the survey data and combined analysis of the survey and classroom observation data will be presented.

Exploratory Factor Analysis

When an EFA was conducted on the pretest, the scree plot (see Figure 4) suggested three factors. The Geomin rotated loadings suggested: (a) Items 1, 27, 33, 49, and 51 load on Factor 1; (b) Items 14, 15, 19, 20, 21, 34, 38, 41, 43, 45, 47, 48, and 51 load on Factor 2; (c) Items 1, 16, 21, 24, 25, 28, 29, 30, 31, 37, 40, 43, 46, 49, 54, 55, and 56 load on Factor 3 according to a 0.32 cut-off point. Items 21, 43, 49, 51 should be removed because of their narrow cross-loading differences (> 0.15). The EFA model suggested retaining a three-factor model: Factor 1 had Items 1, 27, 33, and 49 as indicators; Factor 2 had Items 14, 15, 19, 20, 34, 38, 41, 45, 47, and 48 as indicators; while Factor 3 had Items 1, 16, 24, 25, 28, 29, 30, 31, 37, 40, 46, 54, 55, and 56 as indicators.

Figure 4

Scree Plot



Examining the item contents under each factor, three factors were found to focus on three aspects of knowledge that were tested: Factor 1 is concrete teaching tactics concerning second language input and output, Factor 2 is the second language development rules, and Factor 3 is the elements that influence SLA. Item 1 loaded on both factor 1 and factor 3. Given that Item 1 has higher loading on Factor 1, and Item 1 (Using shorter sentences when talking to second language learners is an effective linguistic adjustment) has a larger loading and fits conceptually better in Factor 1 than Factor 3. Therefore, Item 1 is removed from Factor 3. The EFA model retained is illustrated in Table 4. Table 5 shows that the three factors are not highly correlated.

Table 4

Results From a Factor Analysis of the Knowledge Items

Knowledge item	Factor loading		
	1	2	3
Factor 1: Language Teaching Tactics			
A1. Using shorter sentences when talking to second language learners is an effective linguistic adjustment.	**0.53**	-0.02	-0.36
A27. ESL students benefit from texts that are simplified for vocabulary and sentence complexity.	**0.56**	0.08	-0.12
A33. Second language learners often use memorized chunks of language before they understand the individual words and forms of those words.	**0.33**	0.01	0.31
A49. Fluency and accuracy are both important in second language learning.	**0.39**	0.15	0.36
Factor 2: Second Language Development			
A14. Many grammatical features of English are learned in a specific, relatively fixed order, and it is fruitless to teach certain aspects of grammar before others are learned.	0.02	**0.47**	-0.12
A15. Second language learners' errors are haphazard.	-0.02	**0.44**	-0.06
A19. Patterns of classroom interaction are universal.	0.02	**0.54**	0.12
A20. Being able to say "I don't know" is a good sign that learners know how to use "does" and "do " as well.	-0.07	**0.42**	-0.11
A34. Academic language is learned primarily through instruction and reading.	0.14	**0.36**	0.31
A38. Abrupt topic shifts and the frequent use of questions are typical adjustments native speakers make when talking to non-native speakers of English.	-0.10	**0.37**	0.31

Knowledge item	Factor loading		
	1	2	3
A41. Younger learners and older learners do not follow similar paths of language development.	0.18	**0.35**	0.15
A45. It is important to avoid individual and competitive activities for students from different cultural backgrounds.	0.06	**0.35**	0.22
A47. A teacher should very carefully select materials to match only the language structures that a second language learner already knows.	-0.17	**0.60**	-0.05
A48. Second language learning is a linear process where students learn one word or structure and then the next.	-0.32	**0.66**	0.01
Factor 3: Elements influencing Language Acquisition			
A16. Affective factors, such as attitude and motivation, directly influence time spent learning and the amount of contact with the new language.	0.17	-0.05	**0.35**
A24. The way I talk and the way I write depends on whom I am talking to and what I am trying to communicate.	0.18	-0.29	**0.34**
A25. Learning is most effective when expert and novice students and adults work together toward common goals.	-0.11	-0.06	**0.56**
A28. Second languages are learned in both formal and informal ways.	0.15	-0.18	**0.60**
A29. Activities that help learners notice language forms support them in analyzing the language they encounter and use.	0.20	-0.01	**0.57**
A30. The English language is always changing and evolving.	0.01	-0.20	**0.39**
A31. The use and choice of a particular variety of English is never politically neutral.	-0.10	0.12	**0.36**
A37. Second language students require instruction that is cognitively challenging.	-0.13	-0.04	**0.56**
A40. If students have literacy skills in their native language, they are able to use those skills when developing literacy in English.	-0.02	-0.15	**0.36**
A46. Insisting on the use of standard English impacts the identity of a speaker of a non-standard variety of English.	-0.09	0.09	**0.55**
A54. Connecting abstract concepts to everyday life is important for teaching second language learners.	-0.16	0.01	**0.72**
A55. When learning a new language, it is common to learn a form, word, or structure and then backslide to making errors when another new aspect of language is learned.	-0.05	0.05	**0.62**
A56. Language development should be a goal of educational activity throughout the school day.	0.09	-0.09	**0.76**

Table 5

Geomin Factor Correlations

Factor	1	2	3
1	1.000		
2	-0.067	1.000	
3	0.399*	0.281*	1.000

Note. * $p < .05$.

Confirmatory Factor Analysis

The EFA model derived from the pretest was applied to the posttest. The model does not have a good fit (RMSEA = 0.09, CFI = 0.885, TLI = 0.874, SRMR = 0.082), and the factor loadings for each indicator of Factor 2 are not statistically significant, and three indicators (34, 38, 45) of Factor 2 have negative loadings. A careful examination of the 10 indicators of Factor 2 suggests that these items are either misleading, ambiguous, or are not important enough to affect teachers' teaching of ELLs. Factor 2 was singled out as a separate factor and was used to conduct a CFA on the posttest, which turns out to have a very bad fit (RMSEA = 0.101, CFI = 0.714, TLI = 0.633, SRMR = 0.068). Therefore, the items loading on Factor 2 were removed entirely from further analysis, which left a model made up of the items on Factor 1 and Factor 3 from the EFA.

The two-factor CFA model was applied to the posttest, which did not produce a very good model fit result (RMSEA = 0.076, CFI = 0.939, TLI = 0.930, SRMR = 0.069) although the result is much better than the three-factor model that was run earlier. The two-factor CFA model had a number of large model modification indices of which over half are concerned with Item 27. Item 27 (ESL students benefit from texts that are simplified for vocabulary and sentence complexity.) is correct, but the phrases "vocabulary and sentence complexity" was not suitable

for a survey statement because people may agree only on part of the phrases like "vocabulary complexity." Since this statement did not function well, Item 27 was removed from Factor 1. The two-factor CFA model was applied to the posttest again without Item 27.

The two-factor CFA model without Item 27 had turned out to have better fit indices (RMSEA=0.066, CFI= 0.960, TLI=0.954, SRMR=0.061). However, examining the three items left for Factor 1 from a theoretical perspective led to the decision that these three indicators should be joined with the indicators from the other factor as it is hard to justify with theories these three items (1, 33, 49) as a separate factor. Apart from this, these two factors were found to have a high correlation (0.966). Therefore, the remaining three indicators (items 1, 33, 49) from Factor 1 were combined with indicators of Factor 3 of the original EFA.

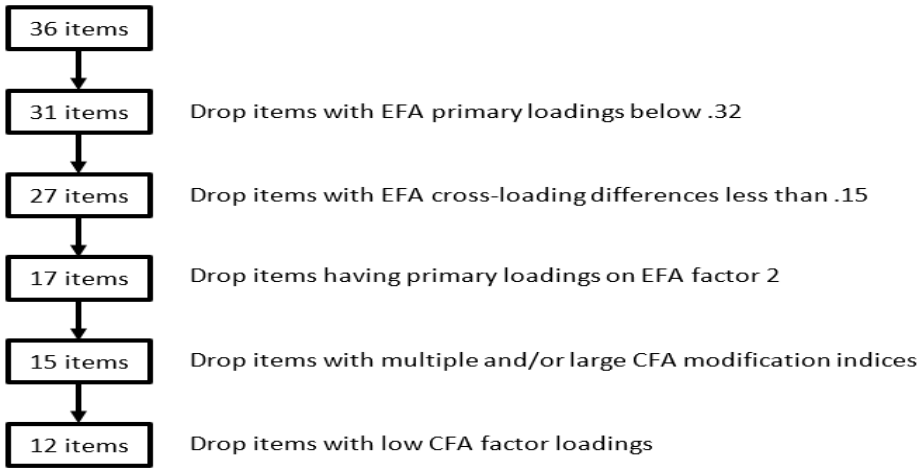
The single-factor CFA model (items 1, 16, 24, 25, 28, 29, 30, 31, 33, 37, 40, 46, 49, 54, 55, and 56) was applied to the posttest, which produced a similar although slightly better model fit result (RMSEA = 0.065, CFI = 0.961, TLI = 0.955, SRMR = 0.061) than the two-factor model. When this single-factor CFA model was applied to the pretest, the model fit result was not as good (RMSEA = 0.060, CFI = 0.943, TLI = 0.934, SRMR = 0.060). The model modification indices suggest item 55 is problematic. Model results show that three items (1, 31, and 49) have low factor loadings (< 0.4) and R^2 (< 0.2) compared with other items. After deeming that Item 55 (When learning a new language, it is common to learn a form, word, or structure and then backslide to making errors when another new aspect of language is learned.) reflects what teachers should know but it is general knowledge that can be applied to the acquisition of any academic subject instead of specific to acquisition of a second language, Item 55 was removed from the model. Item 1 (Using shorter sentences when talking to second language learners is an effective linguistic adjustment), Item 31 (The use and choice of a

particular variety of English is never politically neutral), and Item 49 (Fluency and accuracy are both important in second language learning) are both correct beliefs, but Item 1 is not a very important practice, Item 31 has rare practical implications in practice, and Item 49 is not a very good survey statement for the noun phrase "fluency and accuracy." Therefore, these four items were removed from the model. This whole process of item selection is demonstrated in Figure 5.

The revised model (12 indicators: Items 16, 24, 25, 28, 29, 30, 33, 37, 40, 46, 54, and 56) was applied to both pre- and post-tests. They have good model fit for pretest (RMSEA = 0.050, CFI = 0.958, TLI = 0.951, SRMR = 0.057) and posttest (RMSEA = 0.066, CFI = 0.962, TLI = 0.956, SRMR = 0.060).

Figure 5

Item Deletion Process



Measurement Invariance Test

The teachers' responses did not cover the full range of choices provided for some items. In order to prepare the measurement invariance test in Mplus 8.3, some of the response categories needed to be collapsed so that for each item the response categories chosen by teachers would be the same across time. The information about collapsed categories is provided in Table 6. It happened that only Items 31 and 40 had different response patterns from pretest to

posttest. The pretest response Category 1 and 2 were collapsed to become 2. After this adjustment, responses of all items have four or three matched categories from the pretest to posttest.

The configural invariance with the baseline model, metric invariance with the equal loadings model, and scalar invariance with the equal loadings and thresholds model were confirmed one by one. The model fit indices for the three models were very good (see Table 7). The CFI change is less than 0.005. The Chi-Square difference test between the baseline model and the equal loadings model is 0.3172 and the difference between the equal loadings model and the equal loadings and thresholds model is 0.0026, which are both statistically nonsignificant at the cutoff value of 0.001. The standardized pretest and posttest mean difference is 0.319 ($p < 0.000$) for the full sample of inservice teachers.

Table 6

Response Categories

Item	Recoded Responses	Covered Categories	
		Pretest	Posttest
1	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5
16	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
24	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
25	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
28	3, 4, 5	3, 4, 5	3, 4, 5
29	3, 4, 5	3, 4, 5	3, 4, 5
30	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
31	2, 3, 4, 5	1, 2, 3, 4, 5	2, 3, 4, 5
33	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
37	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
40	2, 3, 4, 5	1, 2, 3, 4, 5	2, 3, 4, 5
46	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
49	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
54	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5
56	2, 3, 4, 5	2, 3, 4, 5	2, 3, 4, 5

Table 7

Measurement Invariance Across Time

Level of Invariance	RMSEA	CFI	TLI	SRMR
Configural	0.047	0.968	0.963	0.063
Metric	0.046	0.968	0.965	0.064
Scalar	0.047	0.964	0.963	0.066

Combined Analysis of the Survey and Classroom Observation

The 12 items that were established as the single-factor measure for the survey scores were used to test the difference between the non-video-taped group (0) and the video-taped group (1) in the presurvey. The calculated sum of the 12 items was not statistically different for these two groups (see Table 8).

Table 8

Results From the t-test

Group	N	Mean	Standard deviation
Non video-taped group	164	47.92	4.02
Video-taped group	20	49.15	4.22

Note. $p = 0.835$

The model results for the subset of 23 teachers having videotaped practice scores showed that the videotaped teachers' classroom practice score increased by 8.793 points from the pretest to the posttest ($p < 0.001$), and their survey score increased by 2.534 points ($p < 0.001$). However, the change in classroom practice scores was not related to the change in teachers' survey scores (r(DIFF_OBS, DIFF_SUR) = 0.053, p = 0.886). The changes in teacher survey

and practice scores for the videotaped subset and the changes in teacher survey for the full sample of inservice teachers were demonstrated in Table 9.

Summary

This study utilized exploratory factor analysis and confirmatory factor analysis to find and confirm the latent variable of 197 inservice teachers' knowledge about teaching ELLs. A single factor model with 12 indicators was established and measurement invariance between the pre- and post-survey of these teachers' knowledge was tested. Measurement invariance was established at the scalar level. The standardized mean difference (Cohen's d) between the

Table 9

Changes in Teacher Survey and Practice Scores

Teacher Score Type		Est	SE	z-value	p-value
Teachers with videotaped practice observations (N=23)	Change in observed teacher practice scores	8.793	2.490	3.531	<.001
	Change in teacher survey scores	2.534	.757	3.349	<.001
	Correlation between the practice and survey changes	.053	.369	.143	.886
All teachers taking the survey (N=197)	Survey latent standardized mean difference	.319	.061	5.263	<.001

pre- and post-survey was 0.319 ($p < 0.001$). An independent sample t-test showed that the group of inservice teachers were not significantly different from the subgroup of 23 teachers who provided classroom practice videos in terms of their knowledge about teaching ELLs at the time they started taking the course of second language acquisition. The combined analysis of the survey and classroom practice scores for a subgroup of 23 videotaped inservice teachers showed

that the subgroup's classroom practice score increased 8.793 ($p < 0.001$), and their knowledge score increased 2.534 ($p<0.001$). The change in classroom practice scores is not related to the change in teachers' knowledge scores.

CHAPTER 5

Discussion

This chapter discusses the results presented in Chapter 4 in further detail. The chapter starts with the findings for each research question from the data analysis in the previous chapter. Thereafter, the results are discussed, followed by the identification of the limitations of this research and the implications of the findings. Finally, a conclusion is drawn.

Findings

In this study, the primary research questions focused on whether or not there is a difference between the pretest and the posttest of inservice teachers' beliefs and practices before and after teachers have participated in a professional development program that taught the knowledge and skills needed to teach ELLs and was designed according to research-based best professional development practices. The results of the analysis suggest that participating inservice teachers had significant growth in their knowledge and practices.

Research Question One

Is there a statistically significant difference in teachers' beliefs towards second language acquisition (SLA) and teaching ELLs as measured by a repeated survey before and after teachers have participated in a professional development program that taught the knowledge and skills needed to teach ELLs and was designed according to research-based best professional development practices?

A single factor model consisting of 12 indicators was retained after factor analysis and was used to measure these teachers' knowledge about SLA and teaching ELLs. For this current sample, the teachers' knowledge of SLA and teaching ELLs changed significantly. The

standardized mean difference between the pretest and posttest is 0.319 ($p<0.001$) i.e., these inservice teachers scored 0.319 standard deviations higher at the posttest than at the pretest.

Research Question Two

Is there a statistically significant difference in teachers' classroom practices as measured repeatedly by a class observation protocol before and after they have participated in a professional development program that taught the knowledge and skills needed to teach ELLs and was designed according to research-based best professional development practices?

Yes, a combined analysis of the survey and classroom observation showed that the videotaped group's classroom observation score increased 8.793 ($p < 0.001$), which is statistically significant. In other words, the model result indicates that these inservice teachers' classroom practice total scores increased 8.793 points from the pre observation to the post observation.

Research Question Three

Is there any correlation between the belief change and the practice change based on the combined data obtained in the first two questions without controlling contextual factors?

No, a combined analysis of the survey and classroom observation showed that the videotaped group's belief change and the practice change was not correlated (($r(DIFF\_OBS, DIFF\_SUR) = 0.053$, $p = 0.886$). Although this subgroup's knowledge score increased by 2.534 points ($p < 0.001$) and its classroom observation score increased by 8.793 points ($p < 0.000$), the increases of knowledge and practice did not covary.

The Concept of Beliefs

Beliefs can be taken as a broad concept. Martin et al. (2019) asserted that beliefs are the set of all things that people believe and they include knowledge, attitudes, and values. The

current study is about beliefs and practices, and the beliefs are taken as a broad concept that includes knowledge, attitudes, and values. The study focuses on teachers' knowledge concerning teaching ELLs instead of teachers' attitudes and values. Since researchers have not reached a consensus on the definitions of beliefs and the other related concepts, a broad concept of beliefs is adopted in the current study. In fact, knowledge and beliefs are used interchangeably in the current study, although knowledge is taken only as part of the belief domain.

Beliefs can be characterized by professed beliefs, intended beliefs, and enacted beliefs (Martin et al., 2019). The current study explored teachers' professed beliefs using a survey and teachers' practice using classroom observation. Although classroom observation is used interchangeably with teachers' practice in the study, it is also a means to examine teachers' implicit or enacted beliefs. Teachers enacted beliefs are embodied in their classroom practice.

The Connection Between Teacher Beliefs and Practices

Beliefs affect behavior (Edling & Frelin, 2016) and beliefs are important for influencing pedagogy (Thibaut et al., 2018). As teachers' beliefs are often implicit in their practice, teachers' practices should be examined as a tool to observe teachers' implicit beliefs. In this sense, teachers' beliefs and practice are closely connected. When teacher beliefs and practices were termed as the focus of the current study, it is equally true that teachers' professed (explicit) beliefs and enacted (implicit) beliefs were the focus of the study. The current study shows that both professed and enacted beliefs of these inservice teachers have made significant gains after they participated in professional development.

The lack of correlation between the change of beliefs and the change of practices derived from the current sample also manifests that the change of professed and enacted beliefs may not be correlated. This finding justifies distinguishing professed beliefs from enacted beliefs. The

different change rates of professed beliefs and enacted beliefs also corroborate the necessity of using both surveys and classroom practice observation to measure teachers' beliefs and belief change. Otherwise, the examination of teacher beliefs will not be complete.

The lack of correlation between belief change and practice change using the current sample does not provide clear evidence that belief and practice are separated. Instead, this suggests the incongruence between professed beliefs and enacted beliefs. As den Hartog King and Nash (2011) asserted, belief and practice congruence can be hindered by school or other outside factors. Teachers have professed beliefs, and a gap can exist between their professed beliefs and enacted beliefs when they perceived that environmental factors did not support their enactment of professed beliefs. These environmental factors can come from various types of resources, available or unavailable, and school and district policies and culture at large that are supportive or unsupportive. The gap between professed and enacted beliefs is also termed as the knowing-doing gap (Ball, 2012).

Although a gap often exists between a teacher's professed and enacted beliefs, their enacted beliefs and their practices are often not distinguished in educational research. Teacher's practices are observed not only as practices themselves but increasingly as teachers' implicit beliefs. In this sense, teachers' enacted beliefs are expected to be congruent with their practices. Their enacted beliefs are the cornerstone of their practice. In other words, teachers' enacted beliefs drive their practices. This perspective of the congruence of enacted beliefs and practice helps clarify the long-term controversy of the relationship between teachers' beliefs and practice.

Limitations

This study is limited in its scope due to limitations in terms of the sample size, available scales that measure teachers' beliefs about teaching ELLs, and the possible limitation concerning external generalizability imposed by convenience sampling.

The survey used in this study focused on measuring teachers' knowledge of teaching ELLs. There were no other surveys available that had the same purposes. The survey did not have items that measure teachers' beliefs about contextual or environmental factors. As inservice teachers are acquiring new knowledge from professional development programs, they are likely to enact knowledge that is supported by contextual or environmental factors. If the outside factors are not supportive of some knowledge that was taught to them, they will not enact the knowledge and skills in practice. When research is about teachers' practice change, teachers' knowledge is a primary factor that influences their practice, but the contextual or environmental factors also play a crucial role in whether teachers will enact the knowledge and skill they acquired from professional development programs. Because of the lack of items that measure these outside factors, it is hard to get a complete picture of the factors that drive teachers' practice.

The sample population was taken from all participants of professional development programs that were implemented in the area of five school districts around a Mountain West university. The sample size of 197 inservice teachers may not be large enough to produce strong statistical power. The subgroup of teachers who volunteered to take videos of their classroom practices constituted a very small sample size of 23 teachers. This small subsample size reduced much of the statistical power. However, it is very hard for researchers to recruit teachers to

participate in having their classroom practice videotaped. Due to the convenience sampling technique, it is not appropriate to generalize the findings to a larger population.

Implications for Future Research

While significant results were found in this study, additional research questions must be explored to expand the literature. A similar study measuring both teachers' learning and their perception of the contextual or environmental factors should be conducted with a larger sample of survey participation and a larger subsample of classroom observation participation to cross-validate the results of the current study.

Future research should add a variable of teachers' beliefs about the context of their teaching practice into the study. The survey used in the current study did not have items that measured teachers' beliefs about their contextual or environmental factors. These factors could wash out the effect of teachers' knowledge learning on their enactment of their knowledge and skills and led to less change in classroom practice for teachers who believed that they did not have adequate available resources, or their school or district did not reward teachers for enacting certain knowledge and skills. These beliefs about context, or "perceived behavior control (Kennedy & Kennedy, 1996), can be a confounding variable that affects the correlation between the change of beliefs and the change of practices.

The scale that measures teachers' knowledge about teaching ELLs needs to be validated on a larger scale or revised to have more explanatory power in theory. The survey used in the current study was the only available scale that measured teachers' beliefs about SLA and teaching ELLs. The single factor model comprising 12 indicators was retained in factor analysis to measure teachers' knowledge about teaching ELLs with the current sample. If this scale can be used on more samples in future studies, the validity and the reliability of the scale can be tested.

Content specialists on teaching ELLs can use this scale as a basis to develop a scale that can be better explained with SLA theories.

Conclusion

To provide quality education to all students, including ELLs, teachers need professional development designed and enacted according to best practice (Baker et al., 2014; Desimone, 2009; Penuel et al., 2007; Opfer & Pedder, 2011). However, a common problem for professional development is that teachers' practices often do not change. Implemented through the partnership collaboration with university, education, and public-school faculty, the professional development designed in this study focused on educating teachers about needed content and engaging them in ways that would increase the likelihood they would enact such practices in their classrooms. The professional development program comprised six courses that adhered to the Utah State Office of Education's standards for the education of the teachers of ELLs. The study of the survey on the teachers' beliefs and their classroom practices showed that teachers' beliefs or knowledge in particular changed from the time they took the course of second language acquisition to the time they completed the course. In addition, teachers' practice changed from the time they started the professional development program to the time they completed the program. This study adds to the literature that educating teachers about second language learning and research-based practices using professional development that attends to teachers practices as well as their beliefs resulted in positive changes in teacher's beliefs and practices for teaching ELLs.

REFERENCES

Alexander, P., Schallert, D., & Hare, V. (1991). Coming to terms: How researchers in learning and literacy talk about knowledge. *Review of Educational Research, 61*(3), 315-343. Retrieved from http://www.jstor.org/stable/1170635

American Council for the Teaching of Foreign Languages (n.d.). World-readiness standards for learning languages. https://www.actfl.org/sites/default/files/publications/standards/World-ReadinessStandardsforLearningLanguages.pdf

An, S. (2000). *Mathematics teachers' beliefs and their impact on the practice of teaching in China* (Report No. ED 442 669). ERIC. https://files.eric.ed.gov/fulltext/ED442669.pdf

Ashton, P. T. (1990). Editorial. *Journal of Teacher Education, 44*(1), 2.

Aspin, D. N., & Chapman, J. D. (Eds.). (2007). *Values education and lifelong learning: Principles, policies, programs* (Vol. 10). Springer Science & Business Media.

Baker, S., Lesaux, N., Jayanthi, M., Dimino, J., Proctor, C. P., Morris, J., Gersten, R., Haymond, K., Kieffer, M., Linan-Thompson, S., & Newman-Gonchar, R. (2014). *Teaching academic content and literacy to English learners in elementary and middle school. IES practice guide* (NCEE 2014-4012). https://files.eric.ed.gov/fulltext/ED544783.pdf

Ball, A. F. (2012). To know is not enough: Knowledge, power, and the zone of generativity. *Educational Researcher, 41*(8), 283–293. https://doi.org/10.3102/0013189X12465334

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215.

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359-373.

Berger, J. L., Girardet, C., Vaudroz, C., & Crahay, M. (2018). Teaching experience, teachers' beliefs, and self-reported classroom management practices: A coherent network. *SAGE Open, 8*(1). https://doi.org/10.1177/2158244017754119

Broekkamp, H., & van Hout-Wolters, B. (2007). The gap between educational research and practice: A literature review, symposium, and questionnaire. *Educational Research and Evaluation, 13*(3), 203-220. https://doi.org/10.1080/13803610701626127

Brown, E. L. (2004). What precipitates change in cultural diversity awareness during a multicultural course: The message or the method? *Journal of Teacher Education, 55*(4), 325-340.

Brown, K., & Kennedy, H. (2011). Learning through conversation: Exploring and extending teacher and children's involvement in classroom talk. *School Psychology International, 32*(4), 377–396. https://doi.org/10.1177/0143034311406813

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research, 21*(2), 230-258.

Bullough, R. V., Jr. (1993). Case records as personal teaching texts for study in preservice teacher education. *Teaching and Teacher Education, 9*(4), 385-396.

Calderhead, J. (1996). *Teachers: Beliefs and knowledge.* In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 709–725). Prentice Hall International.

Camacho, M., Socas, M. M., & Hernandez, J. (1998). An analysis of future mathematics teachers' conceptions and attitudes towards mathematics. *International Journal of Mathematical Education in Science and Technology, 29*(3), 317–324.

Capizzi, A. M., Wehby, J. H., & Sandmel, K. N. (2010). Enhancing mentoring of teacher candidates through consultative feedback and self-evaluation of instructional delivery. *Teacher Education and Special Education, 33*(3), 191–212.

Caple, K. (2005). Explicit values in the classroom: Is it possible? In M. Leicester, C. Modgil, & S. Modgil (Eds.), *Classroom issues: Practice, pedagogy, and curriculum* (Vol. 3, pp. 37-52). Falmer Press.

Carley Rizzuto, K. (2017). Teachers' perceptions of ELL students: Do their attitudes shape their instruction?. *The Teacher Educator, 52*(3), 182-202.

Carr, D. (2007). Character in teaching. *British Journal of Educational Studies, 55*(4), 369-389.

Carr, D., & Skinner, D. (2009). The cultural roots of professional wisdom: Towards a broader view of teacher expertise. *Educational Philosophy and Theory, 41*(2), 141-154.

Charalambous, C., Philippou, G., & Kyriakides, L. (2002). *Towards understanding teachers' philosophical beliefs about mathematics* (Report No. ED476093). ERIC. https://files.eric.ed.gov/fulltext/ED476093.pdf

Chen, J., Brown, G. T., Hattie, J. A., & Millward, P. (2012). Teachers' conceptions of excellent teaching and its relationships to self-reported teaching practices. *Teaching and Teacher Education, 28*(7), 936-947.

Clark, C. M. (1988). Asking the right questions about teacher preparation: Contributions of research on teacher thinking. *Educational Researcher, 17*(2), 5-12.

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947-967.

Cohen, M. D., & Tellez, K. (1994). *Variables affecting the teacher implementation of cooperative learning methods in ESL and bilingual classrooms* (Report No. ED373562). ERIC. https://files.eric.ed.gov/fulltext/ED373562.pdf

Cummins, J. (1981). Age on arrival and immigrant second language learning in Canada: A reassessment. *Applied Linguistics, 2*(2), 132-149.

Danielson, C., & McGreal, T. L. (2000). *Teacher evaluation to enhance professional practice.* Association for Supervision and Curriculum Development.

Davis, M. M., Konopak, B. C., & Keadence, J. E. (1993). An investigation of two chapter I teachers' beliefs about reading and instructional practices. *Literacy Research and Instruction, 33*(2), 105-118.

den Hartog King, C., & Nash, C. P. (2011). Bilingual teacher beliefs and practice: Do they line up? *Education and Learning Research Journal,* (5), 66-83.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181-199.

Desimone, L. M. (2011). A primer on effective professional development. *Phi Delta Kappan, 92*(6), 68-71.

Desimone, L. M., & Garet, M. S. (2015). Best practices in teachers' professional development in the United States. *Psychology, Society, and Education, 7*(3), 252-263.

Dewey, J. (1933) *How we think.* D. C. Heath.

Dixon, L. Q., Zhao, J., Shin, J.-Y., Wu, S., Su, J.-H., Burgess-Brigham, R., Gezer, M. U., & Snow, C. (2012). What we know about second language acquisition: A synthesis from four perspectives. *Review of Educational Research*, *82*(1), 5-60.

Donaghue, H. (2003). An instrument to elicit teachers' beliefs and assumptions. *ELT Journal, 57*(4), 344-351.

Doyle, W. (1990). Classroom knowledge as a foundation for teaching. *Teachers College Record, 91*(3), 347-360.

Eaude, T. (2007). *New perspectives on spiritual development*. https://edperspectives.org.uk/new-perspectives-on-spiritual-development-2/

Echevarria, J., Vogt, M., & Short, D. (2013). *Making content comprehensible for English learners: The SIOP model* (4th ed.). Pearson, Allyn, & Bacon.

Edling, S., & Frelin, A. (2016). Sensing as an ethical dimension of teacher professionality. *Journal of Moral Education, 45*(1), 46-58.

Edwards, J. L., Green, K. E., Lyons, C. A., Rogers, M. S., & Swords, M. E. (1998). *The effects of cognitive coaching and nonverbal classroom management on teacher efficacy and perceptions of school culture* (Report No. ED439113). ERIC. https://files.eric.ed.gov/fulltext/ED439113.pdf

Eisenhart, M. A., Shrum, J. L., Harding, J. R., & Cuthbert, A. M. (1988). Teacher beliefs: Definitions, findings, and directions. *Educational Policy, 2*(1), 51-70.

Enderle, P., Dentzau, M., Roseler, K., Southerland, S., Granger, E., Hughes, R., Golden, B., Saka, Y. (2014). Examining the influence of RETs on science teacher beliefs and practice. *Science Education, 98*(6), 1077–1108.

Epstein, J. L. (2001). *School, family, and community partnerships: Preparing educators and improving schools.* Westview Press.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development, 53*(4), 25–39.

Evans, L. (2011). The 'shape' of teacher professionalism in England: professional standards, performance management, professional development and the changes proposed in the 2010 White Paper. *British Educational Research Journal, 37*(5), 851–870. https://doi.org/10.1080/01411926.2011.607231

Fang, Z. (1996). A review of research on teacher beliefs and practices. *Educational Research, 38*(1), 47-65.

Farrell, T. S., & Guz, M. (2019). 'If I wanted to survive I had to use it': The power of teacher beliefs on classroom practices. *The Electronic Journal for English as a Second Language, 22*(4), 1-17. https://files.eric.ed.gov/fulltext/EJ1204614.pdf

Farrell, T. S., & Ives, J. (2015). Exploring teacher beliefs and classroom practices through reflective practice: A case study. *Language Teaching Research, 19*(5), 594-610.

Feiman-Nemser, S. (2018). What does research tell us about educating mainstream teachers to work with ELLs? *The Educational Forum*, *82*(2), 227-234.

Feiman-Nemser, S., & Floden, R. E. (1986). The cultures of teaching. In M. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 505-526). Macmillan.

Fenstermacher, G. (1986), Philosophy of research on teaching: Three aspects. In M. Wittrock (Ed.), Handbook of research on teaching (3rd ed., pp. 37-49). Macmillan.

Fenstermacher, G. D. (1994). Chapter 1: The knower and the known: The nature of knowledge in research on teaching. *Review of Research in Education, 20*(1), 3-56.

Franke, M. L., Carpenter, T., Fennema, E., Ansell, E., & Behrend, J. (1998). Understanding teachers' self-sustaining, generative change in the context of professional development. *Teaching and Teacher Education, 14*(1), 67-80.

Fritz, J. J., Miller-Heyl, J., Kreutzer, J. C., & MacPhee, D. (1995). Fostering personal teaching efficacy through staff development and classroom activities. *The Journal of Educational Research, 88*(4), 200-208.

Gao, Y., & Bintz, W. P. (2019). An exploratory study on Chinese EFL teachers' beliefs about reading and teaching reading. *Journal of Asia TEFL, 16*(2), 576-590.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915-945.

Gersten, R., Baker, S. K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007). *Effective literacy and English language instruction for English learners in the elementary grades.* National Center for Education Evaluation and Regional Assistance. Institute of Education Sciences, US Department of Education.

Girardet, C. (2018). Why do some teachers change and others don't? A review of studies about factors influencing in-service and pre-service teachers' change in classroom management. *Review of Education, 6*(1), 3-36.

Goldenberg, C. (2008). Teaching English language learners: What the research does-and does not-say. *American Educator, 32*(2), 8-44.

Goldenberg, C. (2011). Reading instruction for English language learners. In M. L. Kamil, P. D. Pearson, E. B. Moje, & P. Afflerbach (Eds.), *Handbook of reading research* (Vol. 4, pp. 684-710). Routledge.

González, N. (2005). Beyond culture: The hybridity of funds of knowledge. In N. González, L. C. Moll, & C. Amanti (Eds.), *Funds of knowledge: Theorizing practices in households, communities, and classrooms* (pp. 29-46). Routledge.

Green, T. F. (1971). The activities of teaching. McGraw Hill.

Griffin, G. (Ed.). (1986). Reality and reform in clinical teacher education. Macmillan.

Guerra, P. L., & Wubbena, Z. C. (2017). Teacher beliefs and classroom practices cognitive dissonance in high stakes test-influenced environments. *Issues in Teacher Education, 26*(1), 35-51.

Gupta, S. S., & Daniels, J. (2012). Coaching and professional development in early childhood classrooms: Current practices and recommendations for the future. *NHSA Dialog, 15*(2), 206–220. https://doi.org/10.1080/15240754.2012.665509

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching, 8*(3), 381-391.

Guskey, T. R., & Sparks, D. (2000). *Evaluating professional development.* Corwin Press.

Hakuta, K., Butler, Y.G., & Witt, D. (2000). *How long does it take English learners to attain proficiency? University of California Linguistic Minority Research Institute Policy* (Report No. 2000-1). University of California-Santa Barbara. https://web.stanford.edu/~hakuta/Publications/(2000)%20-%20HOW%20LONG%20DOES%20IT%20TAKE%20ENGLISH%20LEARNERS%20TO%20ATTAIN%20PR.pdf

Haydon, G. (2006). *Education, philosophy, and the ethical environment*. Routledge.

Haydon, G. (2007). *Values for educational leadership*. Sage.

Hiatt, J. E., & Fairbairn, S. B. (2018). Improving the focus of English learner professional development for in-service teachers. *NASSP Bulletin, 102*(3), 228-263.

Hsiao, H. C., & Yang, S. L. (2010). The study of teaching beliefs reflected on teaching behavior: Focusing on elementary school teachers. *International Journal of Learning, 17*(9), 299-309.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Husu, J., & K. Tirri. 2007. Developing whole school pedagogical values: A case of going through the ethos of 'good schooling'. *Teaching and Teacher Education: An International Journal of Research and Studies, 23*(4), 390–401.

Hutner, T. L., & Markman, A. B. (2016). Proposing an operational definition of science teacher beliefs. *Journal of Science Teacher Education, 27*(6), 675-691.

Johnson, K. E. (1992). The relationship between teachers' beliefs and practices during literacy instruction for non-native speakers of English. *Journal of Reading Behavior, 24*(1), 83-108.

Jones, M. G., & Leagon, M. (2014). Science teacher attitudes and beliefs. In N. G. Lederman & S. K. Abell (Eds.), *Handbook of research on science education* (Vol. II, pp. 830–847). Routledge.

Kagan, D. (1990). Ways of evaluating teacher cognition: Inferences concerning the Goldilocks Principle. *Review of Educational Research, 60*(3), 419-469. http://www.jstor.org/stable/1170760

Kagan, D. (1992). Implication of research on teacher belief. *Educational Psychologist, 27*(1), 65-90.

Kendall, A., & McGrath, K. (2014). 'I don't think I've ever had discussions about reading': A case study of FE teachers' conceptualizations of literacy. *Research in Post-Compulsory Education, 19*(1), 54-74. https://doi.org/10.1080/13596748.2014.872931

Kennedy, C., & Kennedy, J. (1996). Teacher attitudes and change implementation. *System, 24*(3), 351-360.

Khan, S. B., & Weiss, J. (1973). The teaching of affective responses. In R. M. W. Travers (Ed.), *Second handbook of research on teaching* (pp. 759-804). Rand McNally.

Kolano, L. Q., & King, E. T. (2015). Preservice teachers' perceived beliefs towards English language learners: Can a single course change attitudes? *Issues in Teacher Education, 24*(2), 3-21.

Konopak, B. C., Readence, J. E., & Wilson, E. K. (1994). Preservice and inservice secondary teachers' orientations toward content area reading. *The Journal of Educational Research, 87*(4), 220-227.

Layard, R., & Dunn., J. (2009). *A good childhood.* London: Penguin Books.

Liu, Y., Millsap, R. E., West, S. G., Tein, J. Y., Tanaka, R., & Grimm, K. J. (2017). Testing measurement invariance in longitudinal data with ordered-categorical measures. *Psychological Methods, 22*(3), 486-506.

López, A., Zepeda, M., & Medina O. (2012). *Dual language learner teacher competencies (DLLTC) report*. Alliance for a Better Community. https://www.buildinitiative.org/Portals/0/Uploads/Documents/DualLanguageLearnerTeacherCompetenciesReport.pdf

Lucas, T., Villegas, A. M., & Martin, A. D. (2015). Teachers' beliefs about English language learners. In H. Fives & M. G. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 453-474). Routledge.

Loughran, J. (2006). *Developing a pedagogy of teacher education: Understanding teaching and learning about teaching.* Taylor & Francis.

Macnab, D. S., & Payne, F. (2003). Beliefs, attitudes and practices in mathematics teaching: Perceptions of Scottish primary school student teachers. *Journal of Education for teaching*, *29*(1), 55-68.

Mantero, M., & McVicker, P. (2006). The impact of experience and coursework: Perceptions of second language learners in the mainstream classroom. *Radical Pedagogy, 8*(1), 1.

Martin, A., Park, S., & Hand, B. (2019). What happens when a teacher's science belief structure is in disequilibrium? Entangled nature of beliefs and practice. *Research in Science Education, 49*(3), 885-920.

Maulana, R., Helms-Lorenz, M., & van de Grift, W. (2015). A longitudinal study of induction on the acceleration of growth in teaching quality of beginning teachers through the eyes of their students. *Teaching and Teacher Education, 51*(1), 225-245.

Middleton, J. A. (1999). Curricular influences on the motivational beliefs and practice of two middle school mathematics teachers: A follow-up study. *Journal for Research in Mathematics Education, 30*(3), 349-358.

Morey, N. (2008). Connecting compensation and evaluation to build professional development. *Horace, 24*(1), 1-3. https://www.lib.byu.edu/cgi-bin/remoteauth.pl?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ849817&site=ehost-live&scope=site

Moss, B. (2007). *Values.* Russell House.

Mueller, J. C., & Zeidler, D. L. (1998). *A case study of teacher beliefs in contemporary science education goals and classroom practices* (Report No. ED417970). ERIC. https://files.eric.ed.gov/fulltext/ED417970.pdf

Myers, D. M., Simonsen, B., & Sugai, G. (2011). Increasing teachers' use of praise with a response-to-intervention approach. *Education and Treatment of Children, 34*(1), 36–59.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies, 19*(4), 317-328.

Nikitina, L., & Furuoka, F. (2006). Re-examining Horwitz's beliefs about language learning inventory (BALLI) in the Malaysian context. *Electronic Journal of Foreign Language Teaching, 3*(2), 209-219.

Nürnberger, M., Nerb, J., Schmitz, F., Keller, J., & Sütterlin, S. (2016). Implicit gender stereotypes and essentialist beliefs predict preservice teachers' tracking recommendations. *The Journal of Experimental Education, 84*(1), 152-174.

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376-407.

Ottley, J. R., Piasta, S. B., Mauck, S. A., O'Connell, A., Weber-Mayrer, M., & Justice, L. M. (2015). The nature and extent of change in early childhood educators' language and literacy knowledge and beliefs. *Teaching and Teacher Education, 52*, 47-55.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332.

Peck, R. F., & Tucker, J. A. (1973). Research on teacher education. In R. M. Travers (Ed). *Second Handbook of Research on Teaching* (pp. 943). AERA.

Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921-958.

Peterson, S. M. (2012). Understanding early educators' readiness to change. *NHSA Dialog, 15*(1), 95-112.

Peterson, S. M., & Baker, A. C. (2011). Readiness to change in communities, organizations, and individuals. In J. A. Sutterby (Ed.), *Early childhood professional development: Research and practice through the Early Childhood Educator Professional Development Grant*. *Advances in early education and day care* (Vol. 15, pp. 33–59). Emerald.

Peterson, D. S., Taylor, B. M., Burnham, B., & Schock, R. (2009). Reflective coaching conversations: A missing piece. *The Reading Teacher, 62*(6), 500-509.

Pettit, S. K. (2011). Teachers' beliefs about English language learners in the mainstream classroom: A review of literature. *International Multilingual Research Journal, 5*(2), 123–147. https://doi.org/10.1080/19313152.2011.594357

Purnomo, Y. W., Suryadi, D., & Darwish, S. (2017). Examining pre-service elementary school teacher beliefs and instructional practices in mathematics class. *International Electronic Journal of Elementary Education, 8*(4), 629-642.

Richardson, V. (Ed.). (1994). *Teacher change and the staff development process: A case in reading instruction.* Teachers College Press, Teachers College, Columbia University.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In V. Richardson (Ed.), *Handbook of Research on Teacher Education* (Vol. 2, pp. 102-119). Macmillan.

Richardson, V., Anders, P., Tidwell, D., & Lloyd, C. (1991). The relationship between teachers' beliefs and practices in reading comprehension instruction. *American Educational Research Journal, 28*(3), 559-586.

Rimm-Kaufman, S. E., Storm, M. D., Sawyer, B. E., Pianta, R. C., & LaParo, K. M. (2006). The Teacher Belief Q-Sort: A measure of teachers' priorities in relation to disciplinary

practices, teaching practices, and beliefs about children. *Journal of School Psychology*, *44*(2), 141-165.

Rodriguez, A., & Magill, K. R. (2016). Diversity, neoliberalism, and teacher education. *International Journal of Progressive Education, 12*(3), 7-23.

Rokeach, M. (1968). *Beliefs, attitudes, and values: A theory of organization and change.* Jossey-Bass.

Rueda, R., & Garcia, E. (1996). Teachers' perspectives on literacy assessment and instruction with language-minority students: A comparative study. *The Elementary School Journal, 96*(3), 311-332.

Sahin, C., Bullock, K., & Stables, A. (2002). Teachers' beliefs and practices in relation to their beliefs about questioning at key stage 2. *Educational Studies, 28*(4), 371-384.

Salleh, S., & Laxman, K. (2015). Examining the effect of external factors and context-dependent beliefs of teachers in the use of ICT in teaching: Using an elaborated theory of planned behavior. *Journal of Educational Technology Systems, 43*(3), 289-319.

Sansom, D. W. (2019). Investigating processes of change in beliefs and practice following professional development: Multiple change models among in-service teachers in China. *Professional Development in Education, 46*(3), 467-481.

Saunders, W., & Goldenberg, C. (2008). *Research to guide English language development instruction*. Retrieved March 9, 2019 from http://www-leland.stanford.edu/~hakuta/Courses/Ed205X%20Website/Resources/Saunders%20and%20Goldenberg.pdf

Sherin, M. G., & van Es, E. (2005). Using video to support teachers' ability to notice classroom interactions. *Journal of Technology and Teacher Education, 13*(3), 475–491.

Sibley, A., & Sewell, K. (2011). Can multidimensional professional development improve language and literacy instruction for young children? *NHSA Dialog, 14*(4), 263-274.

Spodek, B. (1996). The professional development of early childhood teachers. *Early Child Development and Care, 115*(1), 115–124.

Sprick, R., Knight, J., Reinke, W., & McKale, T. (2006). *Coaching classroom management: Strategies and tools for administrators and coaches*. Pacific Northwest Publishing.

Sprinthall, N. A., Reiman, A. J., & Thies-Sprinthall, L. (1996). Teacher professional development. In J. Sikula, T. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (Vol. 2, pp. 666-703). Macmillan Library Reference.

Stichter, J. P., Lewis, T. J., Richter, M., Johnson, N. W., & Bradley, L. (2006). Assessing antecedent variables: The effects of instructional variables on student outcomes through in-service and peer coaching professional development models. *Education and Treatment of Children, 29*(4), 665–692.

Sturko, P., & Holyoke, L. (2009). Evaluating professional development that prepares teachers to integrate academic skills into technical curricula. *Professional Development in Education, 35*(2), 211–225. https://doi.org/10.1080/13674580802507847

Sunley, R., & Locke, R. (2010). Exploring UK secondary teachers' professional values: An overview of the literature since 2000. *Educational Research, 52*(4), 409-425.

Taylor, E. W. (2000). Analyzing research on transformative learning theory. In J. Mezirow (Ed.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 285-328). Jossey-Bass.

Teemant, A., & Pinnegar, S. (2007). *Understanding language acquisition: Instructional guide* (3rd ed.). Brigham Young University.

Temiz, T., & Topcu, M. S. (2013). Preservice teachers' teacher efficacy beliefs and constructivist-based teaching practice. *European Journal of Psychology of Education, 28*(4), 1435-1452.

The Nation's Report Card. (2018, April). National achievement-level results. Retrieved December 9, 2019 from https://www.nationsreportcard.gov/math_2017/#/nation/achievement?grade=4 and https://www.nationsreportcard.gov/reading_2017/#/nation/achievement?grade=4

Thibaut, L., Knipprath, H., Dehaene, W., & Depaepe, F. (2018). The influence of teachers' attitudes and school context on instructional practices in integrated STEM education. *Teaching and Teacher Education, 71*(1), 190-205.

Thompson, A. (1992). Teachers' beliefs and conceptions: A synthesis of the research. In D. A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 127–146). Macmillan.Thomson, M. M., Huggins, E., & Williams, W. (2019). Developmental science efficacy trajectories of novice teachers from a STEM-Focused program: A longitudinal mixed-methods investigation. *Teaching and Teacher Education, 77*, 253-265.

Thompson, M. T., Marchant, M., Anderson, D., Prater, M. A., & Gibb, G. (2012). Effects of tiered training on general educators' use of specific praise. *Education and Treatment of Children, 35*(4), 521-546.

Thomson, M. M., Walkowiak, T. A., Whitehead, A. N., & Huggins, E. (2020). Mathematics teaching efficacy and developmental trajectories: A mixed-methods investigation of novice K-5 teachers. *Teaching and Teacher Education, 87*, 102953. https://doi-org.erl.lib.byu.edu/10.1016/j.tate.2019.102953

Tours, S. B. (2017). *Kindergarten teachers' developmentally appropriate beliefs and practices* [Doctoral dissertation, Florida State University]. Florida State University Digital Repository. http://purl.flvc.org/fsu/fd/FSU_FALL2017_Tours_fsu_0071E_14004

Troncale, N. (2002). Content-based instruction, cooperative learning, and CALP instruction: Addressing the whole education of 7-12 ESL students. *TESOL Working Papers, 2*(3), 1-8. https://academiccommons.columbia.edu/doi/10.7916/D86T0M4D

U.S. Department of Education (2020). *Our nation's English learners*. https://www2.ed.gov/datastory/el-characteristics/index.html

Vagi, R., Pivovarova, M., & Barnard, W. (2019). Dynamics of preservice teacher quality. *Teaching and Teacher Education, 85,* 13-23.

VanderVen, K. (2010). If theory and practice were the same, then what? A new approach to designing professional education. *Child & Youth Services, 31*(3–4), 188–212. https://doi.org/10.1080/0145935X.2009.524488

Walker, A., Shafer, J., & Iiams, M. (2004). "Not in my classroom": Teacher attitudes towards English language learners in the mainstream classroom. *NABE Journal of Research and Practice, 2*(1), 130-160.

Walker, C. (1987). Bilingual and ESL classrooms: Teaching in multicultural contexts. *TESOL Quarterly, 21*(3), 549-555. https://doi.org/10.2307/3586502

Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus.* John Wiley & Sons.

Warren, J. M. (2010). The impact of rational emotive behavior therapy on teacher efficacy and student achievement. *Journal of School Counseling, 8*(11), 1-27.

Wehling, L. J., & Charters, W. W., Jr. (1969). Dimensions of teacher beliefs about the teaching process. *American Educational Research Journal, 6*(1), 7-30.

World-Class Instructional Design and Assessment (WIDA). (2020). *WIDA English language development standards.* https://wida.wisc.edu/teach/standards/eld

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The counseling psychologist*, *34*(6), 806-838.

Wirt, J., Choy, S., Rooney, P., Provasnik, S., Sen, A., & Tobin, R. (2004). *The condition of education 2004* (NCES 2004-077). U.S. Department of Education.

Wolff, C. E., van den Bogert, N., Jarodzka, H., & Boshuizen, H. P. (2015). Keeping an eye on learning: Differences between expert and novice teachers' representations of classroom management events. *Journal of Teacher Education, 66*(1), 68-85.

Wong, R. M. H. (2013). A change in teaching philosophy: The effects of short-term teaching immersion on English teaching beliefs and practice. *Teacher Education and Practice, 26*(1), 43-63.

Wright, W. E. (2010). *Foundations for teaching English language learners: Research, theory, policy, and practice*. Caslon Publishing.

Zheng, H. (2013). The dynamic interactive relationship between Chinese secondary school EFL teachers' beliefs and practice. *The Language Learning Journal, 41*(2), 192-204.

APPENDIX A

Specimen Copy of Survey

36 items	12 items	56 items	Reason	Coding
x		1. Using shorter sentences when talking to second language learners is an effective linguistic adjustment.		
		2. Languages (first and second) are primarily learned through interaction with other people.	"Primarily" is problematic	
x		3. Speaking fluently can mask deficiencies in academic language abilities.		
		4. Children learn a second language a lot faster and easier than adults do.	Can be true or false	
		5. I consider myself a successful second or foreign language learner.	self-evaluation	
		6. Drill and practice is more effective than active communication interaction in language learning.	controversial	
		7. Focusing attention on language structures (grammar, word ending, etc.) is more important than using language with peers or adults.	controversial	
x		8. Students always comprehend more than they can say or do.		
		9. A second language learner's proficiency in a language is systematically related to what a learner is asked to do.	unimportant	
		10. I believe there is a correct or right way to speak and write English.	unimportant/ controversial	
		11. Teaching in a bilingual setting is essentially the same task as teaching in a monolingual setting.	unimportant/ controversial	reversed
		12. Students must have a minimum level of English proficiency to benefit from instruction in an English-only classroom.	controversial	
x		13. When second language learners have to make efforts to ensure that they are understood, language learning is supported.		

36 items	12 items	56 items	Reason	Coding
x		14. Many grammatical features of English are learned in a specific, relatively fixed order, and it is fruitless to teach certain aspects of grammar before others are learned.		
x		15. Second language learners' errors are haphazard.		reversed
x	x	16. Affective factors, such as attitude and motivation, directly influence time spent learning and the amount of contact with the new language.		
		17. I am using language correctly when I say and write things the way most people do.	Unimportant/ controversial	
		18. Thinking and the abilities to form, express, and exchange ideas are best taught through dialogue.	controversial	
x		19. Patterns of classroom interaction are universal.		reversed
x		20. Being able to say "I don't know" is a good sign that learners know how to use "does" and "do " as well.		
x		21. Errors in second language learners' speech and writing are an indicator of their level of development.		
		22. Students must first learn Basic Interpersonal Communication Skills (BICS) before they begin learning cognitive or academic language.	unimportant	
		23. Motivation is the primary factor in learning a second language.	controversial	
x	x	24. The way I talk and the way I write depends on whom I am talking to and what I am trying to communicate.		
x	x	25. Learning is most effective when expert and novice students and adults work together toward common goals.		
x		26. A bilingual curriculum provides cognitive challenges that make it superior to a monolingual approach.		
x		27. ESL students benefit from texts that are simplified for vocabulary and sentence complexity.		

36 items	12 items	56 items	Reason	Coding
x	x	28. Second languages are learned in both formal and informal ways.		
x	x	29. Activities that help learners notice language forms support them in analyzing the language they encounter and use.		
x	x	30. The English language is always changing and evolving.		
x		31. The use and choice of a particular variety of English is never politically neutral.		
		32. Much of a new language is learned unconsciously by exposure to the second language.	unimportant	
x	x	33. Second language learners often use memorized chunks of language before they understand the individual words and forms of those words.		
x		34. Academic language is learned primarily through instruction and reading.		
		35. A strategy that is good for beginning language learners is good for all language learners.	unimportant	reversed
		36. I always look for the best way to say or write things to be effective and efficient.	self-evaluation	
x	x	37. Second language students require instruction that is cognitively challenging.		
x		38. Abrupt topic shifts and the frequent use of questions are typical adjustments native speakers make when talking to non-native speakers of English.		
		39. Learning a second language is primarily an intuitive process in which learners may be unaware of the actual 'rules,' which underlie their language abilities.	controversial	
x	x	40. If students have literacy skills in their native language, they are able to use those skills when developing literacy in English.		
x		41. Younger learners and older learners do not follow similar paths of language development.		

36 items	12 items	56 items	Reason	Coding
		42. It is a teacher's responsibility to discourage the use of non-standard or vernacular varieties of English in the classroom.	controversial	
x		43. A necessary condition for second language learning is for students to explicitly notice language forms, structures, and word meanings.		
x		44. A focus on grammatical accuracy through instruction and even correction can improve the speed of language learning and ultimate level of proficiency.		reversed
x		45. It is important to avoid individual and competitive activities for students from different cultural backgrounds.		
x	x	46. Insisting on the use of standard English impacts the identity of a speaker of a non-standard variety of English.		
x		47. A teacher should very carefully select materials to match only the language structures that a second language learner already knows.		reversed
x		48. Second language learning is a linear process where students learn one word or structure and then the next.		reversed
x		49. Fluency and accuracy are both important in second language learning.		
x		50. Language that is not understood by a second language learner has little effect on that student's language development.		
x		51. Teachers and instruction have little effect on the speed at which students learn a second language.		
		52. A learner's first language is an ongoing source of interference in second language learning.	partial	
		53. It is the role of public schools to teach standard English.	unimportant	
x	x	54. Connecting abstract concepts to everyday life is important for teaching second language learners.		

36 items	12 items	56 items	Reason	Coding
x		55. When learning a new language, it is common to learn a form, word, or structure and then backslide to making errors when another new aspect of language is learned.		
x	x	56. Language development should be a goal of educational activity throughout the school day.		

APPENDIX B

SIOP Rubric

*This rubric was based on the book Making Content Comprehensible for English Learners: The SIOP Model, 4th Edition pg. 288-293. Criteria from SIOP book is italicized. Adapted by Jason Jay, Stefinee Pinnegar, Lisa McLachlan. For questions please contact Stefinee Pinnegar at stefinee@byu.edu.

Words in *italics* are copied from the SIOP rubric. Anything that follows a "//" is our interpretation of the feature. If you feel that this rubric is not a fair representation of a teacher's use of SIOP, please justify your rating in the comments section.

Lesson Preparation							
Feature	0	1	2	3	4	Comments	Rating
1.1 Content Objectives	*No clearly defined content objectives for students // **Not defined, displayed, or reviewed***	// The objective is **on the board, but not addressed** or mentioned	*Content **objectives for students implied** //* Ex: "Today we're going to be learning about biomes"	// The teacher covers **two** of the following: display, define, and/or review	*Content objectives clearly **defined, displayed and reviewed** with students*		
1.2 Language Objective	*No clearly defined content objectives for students // **Not defined, displayed, or reviewed***	// The language and content objective are **combined**. The objective is **on the board, but not addressed** or mentioned	*Language objectives for students **implied** //* The language and content **objectives are combined**	// The language objective is separate from the content objective. The teacher covers **two** of the following: defined, displayed, and/or reviewed	*Language objectives clearly defined, displayed and reviewed with students //* The language objective is **separate** from the content objective		
1.3 Content Concepts Appropriate	*Content concepts **inappropriate** for age and educational background level of students*	// The content is **inconsistently** appropriate for educational and background knowledge	*Content concepts **somewhat appropriate** for age and educational background level of students*	// A **majority of the content** is appropriate for age and educational background, with minimal errors	*Content concepts **appropriate for age and educational background** level of students*		
1.4 Supplementary Materials	***No use** of supplementary materials*	//Supplementary materials used with **little effectiveness**	***Some [effective]** use of supplementary materials*	// **Frequent** use of supplementary materials with **varying rates** of effectiveness	*Supplementary materials used to a **high degree**, making the lesson clear and meaningful (e.g., computer programs, graphs, models, visuals)*		
1.5 Adaptation of Content	***No significant adaptation** of content to all levels of student proficiency*	// The teacher adapts **some** of the content to all levels of proficiency, but the adaptations are not effective	*Some adaptation of content to all levels of student proficiency //* Only **some content** is adapted to all levels of student proficiency	// The teacher adapts **most** of the content to all levels of student proficiency	*Adaptation of content (e.g., text, assignment) to **all** levels of student proficiency. //* The teacher adapts **all content** to accommodate **all levels** of proficiency		

1.6 Meaningful Activities	***No meaningful activities** that integrate lesson concepts with language practice*	// Activities **ineffectively** integrate lesson concepts with few language practice opportunities	*Meaningful activities that integrate lesson concepts, but provide **few** language practice opportunities for reading, writing, listening, and/or speaking*	// Meaningful activities that **adequately** integrate lesson concepts with language practice	*Activities are deeply **meaningful and authentic**. **Effectively** integrate lesson concepts with language practice opportunities for reading, writing, listening, and/or speaking*		
Building Background							
Feature	**0**	**1**	**2**	**3**	**4**	**Comments**	**Rating**
2.1 Concepts Explicitly Linked to Background Experience	***Concepts not explicitly linked** to students' background experiences*	// The teacher mentions students' background knowledge, but **no links explicitly made to the content**	*Concepts **loosely** linked to student's background experiences* // Briefly mentioned. Examples may not be applicable to or understood by all students	// The teacher makes **adequate** links to students' background. There is still information that could be added to build background	*Concepts **explicitly and consistently linked** to students' background experiences* // Multiple instances occur. Examples are applicable all students		
2.2 Concepts Explicitly Linked to Past Learning	***No links** made between past learning and new concepts*	// Links **rarely** made between past learning and new concepts. **Poor quality/ineffective.**	***Few** links made between past learning and new concepts* // **Loosely** linked to past learning and new concepts	// **Several, adequate** links made between past learning and new concepts	***Multiple links explicitly made** between past learning and new concepts* // A **significant** connection is made between old and new content that helps students to have a good foundation for the lesson		
2.3 Key Vocabulary Emphasized	*Key vocabulary **not** introduced **or** emphasized*	// Key vocabulary is stated, but **not effectively** introduced. **Not** emphasized	*Key vocabulary **introduced, but not emphasized***	// Key vocabulary **is adequately** introduced **and** emphasized	*Key vocabulary is **thoroughly and completely** emphasized (e.g., introduced, written, repeated, and highlighted for students to see)*		

Comprehensible Input							
Feature	0	1	2	3	4	Comments	Rating
3.1 Speech Appropriate for Students' Proficiency Level	*Speech **inappropriate** for students' proficiency levels*	// Speech is **sometimes appropriate** for student's proficiency level	*Speech **sometimes inappropriate** for students' proficiency level*	// Speech is **generally** appropriate with **few errors**	*Speech **appropriate** for students' proficiency levels (e.g., slower rate, enunciation, repetition, and simple sentence structure for beginners)* // Constantly aware of their speech		
3.2 Clear Explanation of Tasks	***No explanation** of academic tasks*	// Explanations are **implied**, but not explained	***Unclear** explanation of academic tasks*	// **Adequate** explanations given, but not complete	***Clear** explanation of academic tasks*		
3.3 A Variety of Techniques Used to Make Content Clear	***No techniques** used to make concepts clear*	// Techniques **rarely** used to make content concepts clear	***Some** techniques used to make content concepts clear*	// **Multiple** techniques used to make content concepts clear	*[An **ample**] **variety** of techniques used to make content concepts clear (e.g., modeling, visuals, hands-on activities, demonstrations, gestures, body language)*		
Strategies							
Feature	0	1	2	3	4	Comments	Rating
4.1 Opportunities for Students to Use Learning Strategies	***No opportunities** provided for students to use learning strategies*	// **Scarce** opportunities provided for students to use learning strategies	***Inadequate** opportunities provided for students to use learning strategies*	// **Adequate** opportunities provided for students to use learning strategies	***Ample** opportunities provided for students to use learning strategies*		
4.2 Scaffolding Techniques	*Scaffolding techniques **not used***	// Scaffolding techniques **rarely used**	*Scaffolding techniques **occasionally used***	// Scaffolding techniques **often used**	*Scaffolding techniques **consistently used**, assisting and supporting student understanding*		
4.3 A Variety of Questions or Tasks that Promote Higher Order Thinking Skills	***No** questions or tasks that promote higher-order thinking skills*	// A **scarce** amount of questions or tasks that promote higher-order thinking skills	***Infrequent** questions or tasks that promote higher-order thinking skills*	// An **adequate** amount of question or tasks that promote higher-order thinking skills	*[An **ample**] **variety** of questions or tasks that promote higher-order thinking skills (e.g., literal, analytical, and interpretive questions)*		

Interaction							
Feature	0	1	2	3	4	Comments	Rating
5.1 Frequent Opportunities for Interaction	*Interaction is teacher-dominated with **no** opportunities for students to discuss lesson concepts*	// Interaction is **teacher-dominated** with **insufficient** opportunities for students to discuss lesson concepts	*Interaction is mostly teacher-dominated with **some** opportunities for students to discuss lesson concepts*	// Interaction is **balanced** between teacher and students with **occasional** opportunities for students to discuss lesson concepts	***Frequent** opportunities for interaction and discussion between teacher/student **and** among students, which encourage **elaborated responses** about lesson concepts*		
5.2 Grouping Configurations Support Language and Content Learning	*Grouping configurations do **not** support the language and content objectives*	// Grouping configurations **weakly** support the language and content objectives	*Grouping configurations **unevenly** support the language and content objectives*	// Grouping configurations **adequately** support language and content objectives of the lesson	*Grouping configurations **[fully]** support language and content objectives of the lesson*		
5.3 Sufficient Wait Time for Student Responses	*Sufficient wait time for student responses **not** provided*	// Sufficient wait time for student responses **rarely** provided	*Sufficient wait time for student responses **occasionally** provided*	// Sufficient wait time for student responses **often** provided	*Sufficient wait time for student responses **consistently** provided*		
*5.4 Opportunities to Clarify Key Concepts in L1	***No** opportunities for students to clarify key concepts in L1*	// **Minimal** opportunities for students to clarify key concepts in L1 as needed with aide, peer, or L1 text	***Some** opportunities for students to clarify key concepts in L1*	// **Adequate** opportunities for students to clarify key concepts in L1 as needed with aide, peer, or L1 text	***Ample** opportunities for students to clarify key concepts in L1 as needed with aide, peer, or L1 text*	**N/A** is an option for classes **without ELs** or with advanced ELs	
Practice and Application							
Feature	0	1	2	3	4	Comments	Rating
6.1 Hands-on Materials and/or Manipulatives to Practice New Learning	***No** hands-on materials and/or manipulatives provided for students to practice using new content knowledge*	// Hands on materials were used but they were a **distraction and didn't add to learning**	***Few** hands-on materials and/or manipulatives provided for students to practice using new content knowledge // Hands-on materials and/or manipulatives provide for **minimal** use of new content knowledge*	// Hands-on materials and/or manipulatives provided students with **adequate** opportunities to practice using new content knowledge	*Hands-on materials and/or manipulatives provided for students to practice using new content knowledge // students with **exceptional** opportunities to practice using new content knowledge*		

6.2 Activities to Apply Content and Language Knowledge	***No** activities provided for students to apply content and language knowledge in the classroom*	Activities provided for students to apply **either content or language knowledge** in the classroom // **less effective**	**[Effective]** activities provided for students to apply **either content or language** knowledge in the classroom	Activities provided for students to apply content **and** language knowledge in the classroom // **less effective**	**[Effective]** activities provided for students to apply content **and** language knowledge in the classroom		
6.3 Activities Integrate All Language Skills	*Activities **do not integrate** language skills // (listening, speaking, reading, and writing)*	// **One** language skill is evident (Listening, speaking, reading, and writing)	*Activities integrate some language skills // **Two** language skills are evident*	// **Three** language skills are evident	*Activities integrate all **four** language skills (listening, speaking, reading, writing)*		
Lesson Delivery							
Feature	**0**	**1**	**2**	**3**	**4**	**Comments**	**Rating**
7.1 Content Objectives Supported	*Content objectives **not** supported by lesson delivery // The teacher has to receive a score higher than 0 on Feature 1.1 in order to receive a score higher than 0 on this feature*	// **Unclear** aim of instruction and practice (neither point directly towards objective)	*Content objectives **somewhat** supported by lesson delivery // Either instruction or practice aimed at objective*	// Both instruction and practice **adequately** target the objective (not as effective as a 4)	*Content objectives **clearly** supported by lesson delivery // Explicit instruction and appropriate practice targeting the objective*		
7.2 Language Objectives Supported	*Language objectives **not** supported by lesson delivery // The teacher has to receive a score higher than 0 on Feature 1.1 in order to receive a score higher than 0 on this feature*	// **Unclear** aim of instruction and practice (neither point directly towards objective)	*Language objectives **somewhat** supported by lesson delivery // Either instruction or practice aimed at objective*	// Both instruction and practice **adequately** target the objective (not as effective as a 4)	*Language objectives **clearly** supported by lesson delivery // Explicit instruction and appropriate practice targeting the objective*		
7.3 Students Engaged 90-100% of the Time	*Students engaged **less than 50%** of the time*	// The students are paying attention and on task **part of the time**	*Students engaged approximately **70% of the time** // Students are paying attention and on task **some** of the time*	// Students are paying attention and on task **most of the time**	*Students are engaged approximately **90%-100% of the time***		
7.4 Pacing is Appropriate for Students	*Pacing **inappropriate** for students' ability levels // The teacher goes too fast or too slow throughout the lesson*	// The teacher is **inconsistent** with appropriate pacing	*Pacing **generally** [mostly] appropriate, but at times too fast or too slow*	// The pacing is appropriate with **minimal errors**	*Pacing of the lesson **appropriate** to students' ability level // with no errors. The teacher is aware of students' abilities and paces accordingly*		

Review and Assessment							
Feature	0	1	2	3	4	Comments	Rating
*8.1 Comprehensive Review of Key Vocabulary	*No review of key vocabulary*	// **Weak** review of key vocabulary	*Uneven review of key vocabulary*	// **Adequate** review of key vocabulary	***Comprehensive** review of key vocabulary*		
*8.2 Comprehensive Review of Key Concepts	*No review of key content concepts*	// **Weak** review of key content concepts	*Uneven review of key content concepts*	// **Adequate** review of key content concepts	***Comprehensive** review of key content concepts*		
8.3 Regular Feedback on Students' Output	*No feedback provided to students on their output*	// **Scarce** feedback provided to students on their output	***Inconsistent** feedback provided to students on their output*	// Feedback **often** provided to students on their output	***Regular** feedback provided to students on their output (e.g., language, content, work)*		
8.4 Assessment of Student Comprehension and Learning of All Lesson Objectives	*No assessment of student comprehension and learning of lesson objectives*	// **Some** assessment of student comprehension and learning of was used, but **not effectively**	*Assessment of student comprehension and learning of **some** lesson objectives*	// Assessment of student comprehension and learning of **all** lesson objectives throughout the lesson, but **not effective.**	*Assessment of student comprehension and learning of **all** lesson objectives throughout the lesson*		

*5.4 - If it's unclear if there are ELLs in the class or not, still give it a 0. Most of the teachers have ELLs in their class and Jason will clarify this one in the papers and write ups.

8.1 & 8.2 - Comprehensive Review can be considered if they review at the end of the lesson, or consistently review throughout the lesson.