

Improving Instruction for English Learners: A Professional Development Study Using SIOP

(Received on September 25, 2020 – Accepted on December 17, 2020)

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Abstract

This quasi-experimental study examined an eighteen-month professional development project focused on improving instructional practices for emerging bilingual and multilingual English learners (ELs). The study is grounded in sociocultural and interactive learning theories related to teaching ELs. Professional development activities included seven graduate-level courses, practical field experiences in schools, instructional coaching from peers and a qualified instructional coach, video demonstrations and observations, and participation in a one-day conference. The research team conducted pre and post classroom observations for 23 in-service teachers and corroborated findings with participant reflections about instructional practices using the Sheltered Instruction Observation Protocol (SIOP). Results reveal that participants made statistically significant increases in seven of the eight areas of instruction: lesson preparation, building background, strategies, interaction, practice/application, lesson delivery, and review/assessment, and no significant change in the area of comprehensible input. The control group showed no significant increases. The discussion identifies strong areas of improvement, moderate areas of improvement, and discusses the one area that showed no significant improvement. Implications for teacher education and professional learning with teachers of ELs are shared along with considerations for future research.

Key Words: SIOP, classroom observations, english learners, professional development, instructional improvement

Introduction

English learners (ELs), inclusive of emerging bilingual and multilingual learners, are projected to make up 25% of all U.S. public-school students by 2025 (McFarland et al., 2019). This study uses the term EL to represent the many variations of second, third, and multiple language learners in K-12 classrooms where instruction is delivered primarily in English. There is a critical need to increase the quantity and quality of teachers who serve ELs in settings where English is the official language. This study

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took place in a Midwestern state in the U.S. in which the ratio of state-certified English as a Second Language (ESL) teachers to ELs is approximately one to 168. Studies show that pre-service teacher education programs often fall short in preparing teacher candidates to meet the complex needs of ELs (Darling-Hammond, 2008; Kareva & Echevarría, 2013). A primary objective of this study was to improve teachers' preparation to meet the sociocultural and linguistic instructional needs of ELs and multilingual students.

Early career teachers have reported that they feel underprepared to address the instructional and additional linguistic needs of ELs (Kareva & Echevarría, 2013). ELs have a double burden of acquiring an additional language and learning the same content knowledge across various subject areas simultaneously (García & Kleifgen, 2018; Moser et al., 2018). Internationally, there is an increase in professional development (PD) efforts to support culturally and linguistically responsive practices when working with learners who speak two or more languages (Nusche, 2009). Yet, in the U.S., less than one-third of states require any preparation to work with ELs in teacher education programs (Education Commission of the States, 2014).

Background

This project consists of a rigorous and comprehensive PD program wherein participants engaged in coursework, fieldwork, instructional coaching, and attended an ESL conference organized around their interests. All components were designed to improve participants' knowledge and implementation of effective instruction for ELs. The PD model adopted is grounded in research and adult learning theory (Darling-Hammond et al., 2017; Desimone, 2008; Garet et al., 2001; Wei et al., 2009) that confirms the effectiveness of interactive and sustained professional learning communities, video demonstrations, instructional coaching, and field-embedded application experiences.

Effective PD specifically for teachers of ELs should: (1) include language-related knowledge and skills, (2) focus on specific teaching strategies for ELs, (3) promote collaboration between mainstream content-area teachers and ESL specialists, (4) emphasize the importance of cultural diversity, and (5) encourage an inquiry-based, reflective practice (Li & Protacio, 2010). The following overarching research questions are addressed in this article: 1) How do teachers' instructional practices for ELs change over an 18-month PD project, and 2) What do teacher reflections reveal about their perceptions of instruction for ELs during this PD project?

A research team consisting of the following: two Teaching English to Speakers of Other Languages (TESOL) faculty, three literacy education faculty, one director of Science and Mathematics Program Improvement (SAMPI) who served as the external evaluator, and four research assistants from across these areas collaborated on this 18-month project. The team of researchers worked together in this quasi-experimental study to examine pre- and post-classroom observations for a group of teachers us-

ing the Sheltered Instruction Observation Protocol (SIOP) (Echevarria, et al., 2017). Teachers' reflections at the end of the program are used to provide contextual information and to corroborate the findings from the observations.

Theoretical Framework and Literature Review

This study is grounded in sociocultural and interactive learning theories (Vygotsky, 1978; Wertsch, 1991) related to teaching ELs, which are also embedded within the SIOP framework (Echevarria, et al, 2017). The sociocultural perspective of second language and literacy learning emphasizes that language development is shaped by social and cultural interactions (Gass & Selinker, 2008; Lantolf, 2013). First, literacy and communication as a social practice can be traced to the Vygotskian (1978) notion that interactions are mediated by language and symbols and are heavily influenced by social, cultural, and historical contexts. Collaboration and dialogue in classroom settings provide shared learning experiences that help ELs strengthen academic language, increase knowledge, and transfer that knowledge to future applications (Ivey & Broadus, 2007; Kim & McDonough, 2011; Piazza et al., 2015; Stetsenko, 2017).

When learners are given the opportunity to co-create new understandings through social interactions, they develop conceptions of themselves as learners and co-learners with less or more knowledgeable others (Lantolf, 2013). The zone of proximal development (ZPD) is the “distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Evidence-based approaches for ELs that include large and small group instruction and peer partnering will increase social interactions and dialogue that improve learning (Facella et al., 2005; Ivey & Broadus, 2007; Piazza et al., 2015; Saunders et al., 2013).

An example of an evidence-based sociocultural instructional approach used in this PD project is the peer-assisted learning strategy (PALS), which consists of the following interactions between peers: 1) partner reading with immediate feedback and re-reading, 2) paragraph “shrinking” in which the reader identifies the main idea, summarizes, and retells important events, and 3) prediction relay in which the reader predicts what is likely to happen next, reads aloud, summarizes, and confirms predictions with a partner (Saenz et al., 2005). After these activities, partners exchange roles for further practice. This kind of interactive approach is encouraged by the SIOP instructional framework (Short et al., 2012).

SIOP is known as a comprehensive framework for PD that is widely used with K-12 teachers (Echevarria, et al, 2017; Short et al. 2011; Short et al., 2012) and supports interactive and sociocultural theories of language learning. SIOP is designed to support K-12 teachers facilitate grade-appropriate content learning while also improving English language proficiency. Originally a teacher observation tool, it has been

developed into a lesson delivery framework that supports culturally and linguistically responsive instruction. The protocol rubric includes eight components to make subject-matter more accessible and meaningful to ELs: 1) lesson preparation, 2) building background, 3) comprehensible input, 4) strategy use, 5) interactions, 6) practice/application of learning, 7) lesson delivery, and 8) review and assessment (Echevarría et al., 2017).

The features of lesson preparation include defining both content and language objectives for age-appropriate concepts in student-friendly language, and preparing supplementary materials, adaptations, meaningful activities, and vocabulary-focused lessons. Building background includes connecting with students' cultural and lived experiences and past learning. Comprehensible input attends to rate of speech, clarity and modelling of academic tasks, and incorporation of multiple modalities (e.g., gestures, videos, images). The strategies component includes ratings for the use of learner-centered strategies (e.g., prediction, highlighting key vocabulary), scaffolding, and higher-order thinking questions. Practice and application require both practices such as practice using vocabulary to describe a family member, and application of language and content in meaningful ways (e.g., describing a person in the class using the learners' choice of descriptive language). Lesson delivery includes ratings for content and language objectives and how engaged students are in the lesson. Finally, the review and assessment component examines how well teachers review key vocabulary, content and language concepts, assess student learning, and how they provide specific academic feedback on student output.

Researchers found that ELs with teachers who were trained on the SIOP model outperformed those who did not receive training (e.g., Echevarria et al., 2011; Echevarria & Vogt, 2010; Short et al., 2012). Changes were noted across subject-area achievement and on language development. The model incorporates strategies based on second language acquisition and literacy research, such as providing students with the opportunity to interact with peers (Gass & Selinker, 2008:). Interaction and dialogue have been found to be of utmost importance for promoting second language acquisition (e.g., Comber, 2013; Mackey et al., 2012).

In another study, Echevarria et al. (2006) examined improvement in academic writing of expository texts and found that the SIOP instructional model produced slightly better learning outcomes than did comparison groups. The SIOP has been promoted and studied extensively due to its ability to observe and analyse teachers' use of research-based practices on a continuum that ranges from high-implementation to low-implementation (Echevarria, et al, 2017; Guarino et al., 2001). Higher implementers of the SIOP model have been connected to increased student learning outcomes (Echevarria et al., 2011). This study provides empirical evidence of the connection between professional learning and levels of implementation across an 18-month period.

Methodology

In-service teachers participated in a professional certificate program consisting of seven university graduate-level classes that led to an additional English as a Second Language (ESL) endorsement from the state governing body. In these courses, participants focused on sociocultural and interactive instructional approaches to English language learning, supported by the SIOP model, with the goal of improving ELs' academic achievement across all subject areas. As part of the course work, participants also reflected on lessons learned and feedback received from instructors and ESL instructional coaches.

Setting/Context

The state-wide PD program included many components, three of which were expected to contribute directly to changes in classroom instruction, as evaluated by the SIOP: seven graduate-level courses (for a total of 24 credits over an 18-month period), practical field experiences in educational settings in which they received individual feedback from an ESL instructional coach, and participation in a one-day ESL professional conference. As part of fieldwork requirements in educational settings, participants used video recording tools to capture instructional sessions with ELs six times during the program: three times in each of two teaching methods classes. An experienced ESL instructional coach provided detailed feedback using the SIOP on each participant's lessons. Finally, the participants attended an ESL conference that featured national and local experts in the field.

Participants

There were 23 in-service teachers that participated in the program for which pre- and post-observations were conducted on lesson delivery. There were also five participants in a control group who were observed twice on a similar timeline. Of the teachers who participated in the program, three were male and twenty were female. Four of the teachers taught in districts where more than 47% of the students are ELs and these teachers were required by their districts to earn an ESL endorsement as a condition of employment. One of the teachers taught at a bilingual school and two were already in ESL positions at their schools. All teachers in the participant group had at least one EL in their pre- or post-observation class. Many teachers had multiple ELs in both pre- and post-observation classes. The median proportion of ELs in the participant group was 18% for the pre- and 20% for the post-observations.

Class sizes were relatively stable from pre- to post-observations in both the participant and control groups (Table 1). Median class size in the participant group was 23 for the pre-observations and 21 for the post-observations. The average change in class size for the participant group from pre- to post-observation was 2 fewer students. For the control group, the median class was 21 students. Most teachers worked in urban

schools and a few worked in suburban and rural schools. In addition, most of the teachers have more than 10 years of teaching experience.

Table 1.
Class Sizes Pre- and Post-Observation for Participant and Control Groups

Class Size	Number of Students Pre-Observation		Number of Students Post-Observation	
	Participant	Control	Participant	Control
More than 25	7 (30%)	0	5 (22%)	2 (40%)
10 to 25	14 (61%)	3 (60%)	14 (61%)	3 (60%)
Fewer than 10	2 (9%)	1 (20%)	4 (17%)	0
Unknown	--	1 (20%)	--	0
Total	23 (100%)	5 (100%)	23 (100%)	5 (100%)

Participant and control group teachers taught across all grade levels (Table 2). The majority of participant teachers taught at the middle school level at 48%.

Table 2.
Distribution of Teachers by Grade Level

Grade Level	First Observation		Second Observation	
	Participant	Control	Participant	Control
K - 2	5 (22%)	2 (40%)	4 (17%)	1 (20%)
3 - 5	3 (13%)	1 (20%)	3 (13%)	2 (40%)
6 - 8	11 (48%)	--	11 (48%)	--
9 - 12	4 (17%)	2 (40%)	5 (22%)	2 (40%)
Total	23 (100%)	5 (100%)	23 (100%)	5 (100%)

Table 3 shows the distribution of the first and second lesson subjects by group. Most of the participant teachers taught Reading/Writing (12 pre- and 13 post-observations). The control teachers' lessons were limited to mathematics or science subjects, or unknown.

Table 3.
Distribution of Lesson Subjects

Subject	First Observation		Second Observation	
	Participant	Control	Participant	Control
Reading/Writing	12 (52%)	--	13 (57%)	--
Science	2 (9%)	2 (40%)	4 (17%)	2 (40%)
Mathematics	2 (9%)	2 (40%)	3 (13%)	1 (20%)
Other Language	1 (4%)	--	2 (9%)	--
Social Sciences	2 (9%)	--	1 (4%)	--
Unknown	4 (17%)	1 (20%)	0 (0%)	2 (40%)
Total	23 (100%)	5 (100%)	23 (100%)	5 (100%)

Data Collection

Data sources include pre- and post-lesson observations and written reflections submitted by teachers after receiving feedback from instructional coaches and instructors. At the beginning and end of the PD program, researchers observed participants' classroom practices using the SIOP (Echevarria, et al., 2017). Each observation was conducted by two trained members of the research team. Observers attended each lesson and individually scored it using the SIOP® instrument; afterwards, the two researchers discussed each item score and came to an agreement on the item's final, or "joint agreement" score. The research team refers to the joint agreement score as the consensus scores, and were used in the findings reported below.

An important aspect of classroom observation data collection is establishing adequate levels of inter-rater reliability. The research team used an iterative process to increase inter-rater reliability, train new observers, and refresh existing researchers. All the project team members attended training and norming sessions on SIOP as an observation tool, and inter-rater reliability was established before beginning observations. Intra-class correlations (ICCs) were calculated based on research team ratings on three training videos as a measure of interrater reliability. Overall, single measure ICCs were calculated at .801, indicating good reliability (Koo & Liou, 2016).

The SIOP instrument includes 30 items related to the model's eight areas of instruction, in which practices are scored on a Likert scale ranging from 0 (not evident) to 4 (highly evident). A few of the items can be rated as not applicable under special circumstances; for example, if there are no ELs present or if learners are considered

proficient, the item is considered irrelevant. As a result, findings reported below are based on the percentage of points earned on the SIOP for consistency in reporting.

Previous research with SIOP suggests it is a reliable tool (alpha coefficients ≥ 0.90) (Guarino et al., 2001) for detecting instructional intervention effects (Cohen's $d = 0.833$) (Short et al., 2011). One of the original authors of the SIOP provided guidelines for SIOP scores that define low implementers as scoring less than 50%, moderate implementers as scoring 50-75%, and high implementers as scoring greater than 75% (Short, 2012). This study will refer to these guidelines when discussing the outcomes of our participants using this protocol.

Data Analysis

The SIOP scores were analysed using SAS' MIXED procedure to fit a repeated measures model (time of measurement pre or post). The model included three fixed factors: the time of measurement (pre- or post-observation), the teacher's group membership (program participant or control) and the interaction of time of measurement and group membership. Four covariates were also considered for inclusion with the basic pre/post repeated measure in the model: (1) total class size, (2) number of ELs in the class, (3) grade level, and (4) subject taught. None of the covariates were found to be significant. Scores are reported as percentages of points earned for ease of comparison. Different totals were possible depending on the number of items that received "NA" scores for a particular observation following the procedures of the original SIOP authors.

Qualitative data in the form of written reflections from teachers were used to contextualize the observation data. The written reflections were analysed using a systematic and a priori template of codes (Crabtree & Miller, 1999), derived from the eight areas of instruction found in the SIOP model. Written reflections were read and coded for each instructional practice by four members of the research team to ensure trustworthiness. This study's use of deductive thematic analysis of reflections is an efficient method for supplementing quantitative data with the first-hand perspectives of participants and helps researchers connect authentic narratives to the observational data (King, 2004).

Limitations

There are two primary limitations associated with this study. First, the sample size for the study is small for both the participant and control groups. However, this is mitigated to some extent by the inclusion of paired pre- and post-data for both groups and the demographic comparability of the participant and control group. The study's selection process for teachers were used to ensure control group teachers were selected from similar districts. The comparability of the groups is also supported by findings from the initial repeated measures models that included demographic variables that did not show significant effects. The findings of this study provide insights about how

the PD program influenced instructional practices of participating teachers but should not be used for broad generalizations. Second, there are limitations inherent to the use of observational data. It is challenging to ensure consistency in interpretations across members of a research team. For this study, care was taken to ensure that researchers were using the SIOP in a consistent manner through multiple group training sessions. Measures of interrater reliability indicate that this potential limitation was also reduced through this process.

Findings

Between 2017 and 2018, SIOP scores for participant teachers increased 12 percentage points on the average, from 64% to 76%; the increase is statistically significant at the five percent Type I Error rate. Based on standards set by Short (2012), on average, participants are high implementers by the end of the PD program since they scored over 75%. Statistically significant increases also registered for seven of the eight subscales of SIOP: lesson preparation, building background, strategies, interaction, practice and application, lesson delivery, and review and assessment. The control group did not show any significant increases. There was only one significant difference between the participant group and the control in average pre-observation scores in the Lesson Preparation sub-scale (Table 4).

Table 4.
Pre- and Post-Observation Lesson Observation Results

SIOP Sub-Scale	Group Participant N=23 Control N=5	Pre-Observation		Post-Observation		Change		
		Mean (%)	Std. Error	Mean (%)	Std. Error	Mean Diff.	Std. Error	p-value
<i>Average overall percentage score</i>	Participant	64.18	2.69	76.78	2.95	+12.60*	3.21	0.0006
	Control	55.68	5.77	55.05	6.33	-0.64	6.88	0.9271
<i>1. Lesson Preparation: Items 1-6</i>	Participant	71.63	3.17	85.14	3.25	+13.51*	3.76	0.0013
	Control	54.00	6.79	65.00	6.97	+11.00	8.07	0.1846
<i>2. Building Background: Items 7-9</i>	Participant	52.72	3.92	73.37	4.10	+20.65*	5.28	0.0006
	Control	53.33	8.41	41.67	8.80	-11.67	11.33	0.3128
<i>3. Comprehensible Input: Items 10-12</i>	Participant	78.62	3.59	81.88	3.03	+3.26	4.13	0.4366
	Control	78.33	7.70	75.00	6.51	-3.33	8.85	0.7095
<i>4. Strategies: Items 13-15</i>	Participant	67.75	4.98	79.71	3.85	+11.96*	5.83	0.0504
	Control	65.00	10.68	58.33	8.26	-6.67	12.50	0.5983
<i>5. Interaction: Items 16-19</i>	Participant	65.85	4.44	78.08	4.08	+12.23*	5.60	0.0381
	Control	57.50	9.52	44.58	8.75	-12.92	12.01	0.2919
<i>6. Practice & Application: Items 20-22</i>	Participant	65.94	3.78	79.35	3.52	+13.41*	4.45	0.0057
	Control	55.00	8.11	60.00	7.54	+5.00	9.55	0.6050
<i>7. Lesson Delivery: Items 23-26</i>	Participant	66.76	3.54	82.88	3.87	+16.12*	4.63	0.0018
	Control	60.00	7.60	61.25	8.30	+1.25	9.92	0.9007
<i>8. Review & Assessment: Items 27-30</i>	Participant	44.57	3.93	52.45	4.81	+7.88*	3.63	0.0392
	Control	31.25	8.43	33.75	10.32	+2.50	7.78	0.7506

*Statistically significant *mean difference* for the given comparison, alpha = 0.05.

The categories within the SIOP are not all mutually exclusive when analysing teaching practices; however, they serve as a valid and reliable means to discern whether teachers are attending to effective instruction for ELs. In addition to the pre- and post-observation data, we analysed participants' written reflections to contextualize how teachers' practices changed during their participation and how they were thinking about these changes. The findings from participant reflections are summarized below and are organized along with the SIOP observation outcomes that showed the greatest change from pre- to post-program.

The strongest evidence demonstrating instructional improvement was identified in four areas that show statistically significant changes in practice greater than 13 percentage points based on pre- and post- classroom observations. These four areas are addressed first and include: a) practice and application, b) lesson preparation, c) lesson delivery, and d) building background. Next, there are three areas of instruction that showed moderate and statistically significant improvements: e) strategies, f) interaction, and g) review and assessment. Finally, one instructional area, comprehensible input, is presented which did not show a statistically significant change in practice between pre- and post-observations.

Strongest Areas of Instructional Improvement

Participants' written reflections stemming from clinical experiences, viewing others' demonstration videos, and receiving feedback from peers and instructional coaches are provided along with the observational evidence to contextualize each of these areas of professional learning and instruction.

Practice & Application

Practice and application refer to the instruction that supports the learning and use of both language and content at the same time. This section of the SIOP framework addresses ways in which students are supported when practicing new language in a content area. For example, teachers may use manipulatives or hands-on activities that allow students to practice and apply new knowledge in pairs or small groups. As well, effective instruction in this area should provide support for ELs to apply new understandings through communication forms such as reading, writing, listening and speaking. Participants in this study initially had a mean score of 65.94% and increased their use of practice and application during instruction to 79.35 percentage points by the end of the program. This is a statistically significant mean change of 13.41%.

Participants shared the following reflections about integrating practice and application techniques during instruction, particularly for ELs. Traditional lessons may inherently include practice with new vocabulary and or content; however, our participants are thinking about how to scaffold student learning so that they are applying their new understandings in authentic ways. The following reflections demonstrate partici-

pants' thoughts about their own growth and teaching, as a result of program activities such as watching others' teaching demonstrations and receiving feedback from peers and instructional coaches.

First of all, I am more aware of the strategies and techniques I can use to provide content area support to ELL students. I have also expanded my repertoire of listening and speaking activities beyond the ones regularly suggested and used from my ELL curriculum teacher's guide (Participant 1).

The activities were virtually invisibly scaffolded, where students moved from physical practice with the manipulatives to guided practice, then to a practice sheet examining and adding coin face values (with the manipulatives still available for reference as needed), and then transitioned them to adding only numerical dollars and cents. She took care throughout the practice to remind students about the real-life application of this skill (Participant 17, based on observing a peer's lesson).

I also appreciated that a peer noticed allowing students to practice what they were going to say with peers before having to present it to another group (Participant 11).

The quotes above share three participants' reflections on practicing and applying language during lessons they delivered or lessons they observed. Effective practice and application in classroom settings are forms of interactive and sociocultural approaches that create authentic and meaningful use of language in context (Piazza et al., 2015; Stetsenko, 2016). These meaningful activities require careful planning.

Lesson Preparation

Lessons supported by the SIOP guidelines require attention to detail and thoughtful planning around both content and language objectives. At the beginning of the PD program, participants' mean score was 71.63 percentage points in the lesson preparation area, and subsequently increased to a mean score of 85.14 percentage points at the end of program observations. This is a statistically significant change in practice around lesson preparation of 13.51 percentage points. Not only do lesson plans need to be grounded in appropriate content and language objectives, lessons need to take into consideration how they will adapt the content for language learners, make effective use of supplemental materials, and provide meaningful activities to increase the motivation and engagement of all learners.

Participants shared the following reflections about their lesson preparation experiences during the program.

When I taught in the general education classroom, I wasn't focusing on language objectives in relation to the content, but rather the content objectives only. Now I understand the importance of having an awareness of these

when planning a lesson...Overall, I feel the opportunity to try new strategies and implement new activities have made me a better teacher as I am more aware now of creating activities with language goals in mind for the ELLs (Participant 5).

My experience planning, revising, revising again, revising another time, and teaching (and still revising) was a positive experience... I like the idea that the possibilities are endless for this type of lesson, there is a task to complete, and the work is more authentic (Participant 19).

Participants demonstrated deeper thinking around their planning of content and language objectives related to lesson plans as demonstrated by reflections and observations. The planning was integral to teachers' instructional conversations, as well as, post-lesson reflections and dialogue that demonstrates the use of active adult learning theory, collaboration, feedback and reflection that is required as part of effective PD (Darling-Hammond et al., 2017; Fisher et al., 2012). The next section examines how lesson plans were implemented.

Lesson Delivery

The lesson delivery components of the SIOP logically align with the previous section of lesson preparation. Here, however, the protocol attends to how well the content and language objectives are supported during lesson delivery. In addition, two important considerations include how engaged students are during the lesson and whether the pacing of the lesson is delivered in an appropriate manner. This section of the protocol captures the social and interactive nature of the learning environment.

Participants in this study began the project demonstrating 66.76% in the lesson delivery area and increased their scores to 82.88% by the end of the program. This is a statistically significant improvement in instructional practices of 16.12%, which shows a slightly greater change than the lesson preparation change of 13.51%. Given that the PD program is designed to emphasize the translation of research and theory to practice, it is possible that the application of our participants' knowledge is demonstrated more clearly in action rather than through written lessons plans. The following reflections speak to participants' focus on interacting with and supporting students during their lessons or in reference to classroom observations that they conducted themselves.

The opportunity to complete a clinical experience was hugely beneficial to my practice as a teacher; it has given me the opportunity to truly see how I present lessons to my students and the reaction the students present (Participant 6).

This was one of the more practical courses and I really enjoyed it. I felt as if I learned about many new strategies and lesson ideas that I can imple-

ment into a classroom when I am provided the opportunity to teach rather than run my intervention groups. It was also really enlightening for me to see that I do not always scaffold my lessons or provide adequate time for students to talk with each other (Participant 8).

Participants demonstrated strong positive improvements during the implementation of their lessons that included high levels of engagement. The PD program was mindful to provide varied opportunities for increasing teachers' metacognitive awareness of their instructional practices through instructional coaching, written and oral reflections, and viewing demonstration lessons. As teachers indicated above (P6 & P8), these opportunities to reflect provided insights into how their students engaged and connected to the lessons they facilitated.

Building Background

This section of the framework focuses on connecting instruction to students' social, cultural and linguistic background experiences, their previous learning experiences, funds of knowledge (González et al., 2006), as well as building on their use of academic language in connection to their backgrounds. Participants in this study began the project demonstrating 52.72% in the building background area and increased their scores to 73.37% by the end of the program. The control group change resulted in a mean change of 11.67%. Participants in the study demonstrated a statistically significant change in building background knowledge by 20.65%, which is a large improvement during an 18-month period. However, it is notable that the final percentage is still considered within the moderate implementers range of 50-75% (Short, 2012), rather than in the high implementers range as in most other areas.

Teacher interaction and dialogue that connects students' lived experiences with content and language objectives might include things that elicit student connections to text, partner activities that encourage sharing experiences, and examples from the home or community into classroom instruction. Another area of focus here is to make explicit connections to previous learning so that ELs are continually building their knowledge base. Lastly, the emphasis of academic vocabulary and its connectedness to background knowledge will strengthen teachers' effectiveness. These quotes from participant reflections demonstrate professional growth in this area.

The one area I noticed that was an area of improvement was in showing cultural competence, showing how I value the ELL students' cultural and linguistic backgrounds and using their funds of knowledge (Participant 1). I observed an instructor who brought the students voices into the room immediately through the use of her warm-up question that connected students' personal experiences and then continued to develop background knowledge through the use of visuals (Participant 17 reflection on peer observation).

*One big connection I made through this is how easily I can incorporate and be mindful of students' culture and language within a lesson. I realized that making a few comments, asking simple questions, or approaching the lesson with a different mindset can easily change how inclusive or exclusive I am about my student's cultures and languages (**Participant 22**).*

*One missed opportunity that would have made this lesson more impactful for my ELLs would have been to incorporate their native language in the lesson and find compound words from their L1 that would make the examples more meaningful (**Participant 23**).*

The four areas above demonstrate the teachers' greatest success related to improving the quality of instruction for ELs while attending to language, culture and lived experiences. Next, there are three instructional areas in which teachers demonstrated moderate levels of instructional improvement.

Moderate Instructional Improvement

The next three areas of instruction also showed statistically significant improvements, but at slightly lower levels, and changed 7 - 12.5 percentage points between pre- and post-classroom observations: a) strategies, b) interaction, and c) review and assessment. At the same time, the control groups showed no statistically significant improvements in these areas.

Strategies

This area of the SIOP framework examines how teachers implement the use of instructional strategies to support student learning and application of knowledge, how they use language and teacher moves to scaffold instruction, and how they implement a variety of questions or tasks that promote higher-order thinking skills. Participants began the project demonstrating 67.75% in the area of strategies and mean scores increased to 79.71% after the project, which shows a statistically significant change of 11.96 percentage points. The control group showed a decline of 6.67% points in the use of strategies.

Examples of strategies and scaffolding language used to support student comprehension of English vocabulary and language development include think-alouds, visual organizers, gestures, and even physical movements to map or demonstrate new ideas (Ivey & Broaddus, 2007, Medina, 2010). As well, research has demonstrated that teachers' ability to ask high level and real-world questions help to motivate ELs in reading and writing about critical topics and social issues (Piazza et al., 2015; Comber, 2013). These quotes from participants demonstrate their professional growth in the area of strategy use.

The final strategy that I implemented and was highly effective was the jigsaw activity...Overall, I have learned and acquired many novel and effective strategies that provide scaffolds and tools for ELLs to enable them to understand material more clearly, and make sense of the learning in meaningful and authentic encounters (Participant 7).

One such strategy is using sentence starters. Implementing this strategy was particularly memorable to me because my students had to give a short oral presentation about their experience building a toy car with their group (Participant 9).

Researching and implementing new strategies proved to be very beneficial to my instruction and student outcomes. The first strategy that I implemented was the use of sentence frames. Sentence frames provide necessary scaffolding in writing as students need the temporary support to formulate grammatically correct sentences that demonstrate their understanding of the content (Participant 10).

Strategies are the tools that students learn and apply in order to build their knowledge and skill with reading, writing, listening and speaking. Many of the effective strategies, scaffolding moves, and use of higher-level questioning lend themselves nicely to the use of interaction in the classroom.

Interaction

This area of the SIOP framework includes four items focused on how frequently students are provided with opportunities to interact with teachers and peers, whether or not grouping configurations support the content and language objectives, if and how wait time is used to support student learning, and if students are provided with opportunities to clarify key concepts in their first language whether it is with an aide, peer, or first language text.

Participants' average pre-program score was 65.85% in the area of interaction and their scores increased to an average of 78.08% points post-program, which shows a statistically significant difference of 12.23%. The control group showed a decline of 12.92 percentage points in the area of interaction. The following reflections demonstrate participant growth in relation to this aspect of the SIOP framework.

During the observations I was able to see how teachers can correctly and effectively implement the SIOP model, pull out strategies, and interactive whole group instruction (Participant 6).

For example, providing instant engagement in class building, team-building, and movement into the lesson through heterogenous pair and team structures (seen in the videos) like RallyCoach, Timed-Pair-Share, Round-Robin, Find Someone Who, and Where Am I - facilitating social interaction rather than restricting it (Participant 17).

Participants demonstrated more attention to the interactive components in their lessons and tuned into how students were responding to these techniques and higher levels of questioning. As teachers think more deeply about students' interactions during their lessons, they were better able to assess student learning.

Review and Assessment

This area of the SIOP framework examines how instruction provides a comprehensive review of content concepts and vocabulary, whether regular feedback is provided to students on their output, and how teachers check for comprehension during and after the lesson for both the content and language objectives.

Participants began the project with a 44.57% mean score in the area of review and assessment and completed the project demonstrating 52.45%, which shows a statistically significant increase of 7.88%. This is the area of instruction that showed the least amount of growth across all statistically significant findings. The data shows participants were low implementers at the beginning of the program, and progressed to the lower end (52.45) of the moderate implementers range (50 - 75%) at the end of the program, according to the SIOP authors' expectations (Short, 2012). While this still represents significant improvement in the use of review and assessment, other researchers note complexities of professional learning about the use of assessments for learning and assessments of learning (Deneen et al., 2019). This is an area that warrants further investigation. The control group showed an insignificant change of 2.50 percentage points in the area of review and assessment. The following reflections reveal how participants thought about their assessment practices.

I was able to provide multiple types of assessment – from which students were able to choose – matching assessments to students' learning profiles and language proficiency to ensure that every student had the opportunity to demonstrate what they knew (Participant 10).

Through authentic assessments I can resist pressure to “teach to the test” and value the sociocultural perspectives and contributions of students to my classroom more inclusively (Participant 18).

Being able to look back at the lessons on video, and read the feedback from others, is a great way to figure out how to modify the lessons for the next time they will be taught. It is important to actually “close” a lesson. I know that I often neglect this part. While it is written in my plans, I run out of time and end up moving on to the next thing without review and assessment (Participant 20).

The effective use of assessment to plan instruction and determine what students' instructional needs are at the heart of effective teaching with ELs. When teachers analyse, discuss and reflect on student interactions, work samples, and application of new

knowledge in formative ways, they are implementing effective models of instruction (Heller et al., 2012).

No Significant Change in Instructional Practice

Comprehensible Input

This area of the SIOP framework attends to how teachers provide oral, written and visual instructions to facilitate student language and content learning. Examples of these approaches include things such as enunciation, simple sentence structure for beginners, and using a variety of approaches to clarify concepts such as visuals, gestures, and hands-on activities.

Participants began the project demonstrating a high level of comprehensible input at 78.62% and completed the project demonstrating 81.88%, which shows an increase of 3.26%, but not enough to be statistically significant. The control group showed a decline of 3.33% in the area of comprehensible input. The following reflections demonstrate participants' strengths in using comprehensible input to support ELs.

Those observed lessons where the teacher seemed very prepared, especially with visuals and clear, concise directions seemed to result in the most engaged students (Participant 2).

I was able to see the effectiveness of sheltered instruction on the ability to create comprehensible input in different settings. These confirmed that focus on both language and content allows students, especially those most vulnerable to inequalities in school policies, to access content (Participant 18).

In fact, I think this approach that I used to make the content more comprehensible through videos and hands-on activities was effective for my whole class, not just my ELs (Participant 22).

Given the high usage of comprehensible input demonstrated at the beginning of the project, there was not as much potential to show growth at the end of the project. It is also conceivable that the use of comprehensible input is a more intuitive approach that teachers are already prepared to provide when communicating with language learners. This notion ties into the interactive and sociocultural learning theories that ground this study.

Discussion

The results of this study demonstrate that professional learning for teachers of ELs requires thoughtful and sustained PD efforts embedded within teaching practices and in collaboration with peers. Participants indicated that they appreciated the opportunities to grow professionally and collaborate with colleagues in ways that significantly impacted the effectiveness of their teaching. The quasi-experimental study of pre- and

post-observation data using the SIOP indicated that our PD program was successful at improving instructional approaches in statistically significant ways across seven of the eight areas of instruction, all areas except for comprehensible input in which teachers began as moderate implementers and increased slightly to high implementers. However, that slight increase was not statistically significant.

The teachers in this study ended the PD program as high implementers across all areas of instruction except for review and assessment, although participants showed statistically significant improvements in review and assessment, and moved into the moderate implementer range. Therefore, the findings related to research question one revealed that instructional practices improved across all areas of the SIOP framework for instruction during this 18-month PD project. Based on the current findings, the research team identified that the area of review and assessment needed improvement. The research team will strengthen instructional supports in the PD program to help educators understand the need to provide comprehensive reviews of content concepts and vocabulary, to offer ongoing and consistent feedback during and after lessons, and to check for comprehension and language use during and after the lessons. This instructional area of need confirms calls from other researchers to build educators' knowledge around the use of assessments for learning (Deneen et al., 2019; Li & Protaio, 2010).

Conclusion

The findings related to research question two revealed that teacher perceptions of their instructional practices align and support the observational data collected. Many of the participant quotes that support the observational data demonstrate improved knowledge and skill across the areas of instruction that were examined. One participant's statement about professional learning sums it up best,

Peer evaluations of my teaching strategies and videos were key, as peer comments focused my instruction for the following day. Without this feedback, the flexibility and adaptability of my teaching would be limited to my own experiences. Several activities [I]...implemented...came from observing and discussing peer work. Through discussions, both online and through continued use of Google Hangouts, I collaborated with peers to differentiate activities for multiple objectives and content...These confirmed that focus on both language and content allows students, especially those most vulnerable to inequalities in school policies, to access content. Finally, and perhaps most significantly, I feel empowered to support and advocate for my ELs (Participant 18).

The research team concludes that while it is a complex and time-consuming undertaking, it is feasible to design and implement high quality, interactive professional

development that is sustainable over time to improve the learning environments and learning outcomes that are more equitable for ELs. While no framework or model is ever perfect, we support the use of the SIOP as a professional learning tool related to improving instruction for ELs when used both critically and flexibly based on learners' sociocultural and linguistic needs. When this kind of collaborative PD is provided, teachers appreciate the opportunities and agency that is afforded to them as evidenced by the quantitative and qualitative professional growth exhibited in this study.

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