Inclusion

Teachers Reported Knowledge, Skills, and Usefulness of Professional Development on the Self-Determined Learning Model of Instruction

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Abstract

Understanding impacts of professional development (PD) on teachers' perceptions of their knowledge, skills, and usefulness (KSU) of evidence-based practices is important, particularly for self-determination interventions in inclusive, secondary classrooms. Limited research exists examining the impacts of self-determination intervention PD on the teachers' learning outcomes. In this study, we analyzed the impacts of PD on the Self-Determined Learning Model of Instruction (SDLMI) delivered during a three-year research project on trained teachers' self-reported KSU of self-determination. Results suggested there were positive impacts on teachers' KSU of self-determination after PD. Implications for future research and practice are discussed.

Keywords: self-determination, professional development, Self-Determined Learning Model of Instruction, general education, special education

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Self-determination has been researched in the disability field for over 25 years (Shogren et al., 2017) and has been shown to impact a broad range of student-level outcomes (e.g., academic, behavior, transition; Mazzotti et al., 2021). Emerging research has provided evidence of the positive impacts of promoting self-determination for *all* students, with and without disabilities, in inclusive settings (e.g., Raley et al., 2021; Shogren et al., 2021). Along with emerging research, there has been an increased focus on self-determination and associated abilities and skills (e.g., choice making, self-awareness) within state and federal policies (Denney & Daviso, 2012; National Research Council, 2012) and educational learning standards (Common Core State Standards Initiative, 2010; Rowe et al., 2015). These efforts highlight the importance of ensuring all students, regardless of support needs, have opportunities to build self-determined actions before exiting K-12 education. Therefore, to support students in enhancing their self-determination, evidence-based practices (EBPs) need to be implemented effectively and with fidelity. To facilitate high-fidelity implementation, high-quality professional development for teachers and other professionals are essential.

Self-Determination

Shogren et al. (2015) developed a new theoretical framework to conceptualize self-determination, Causal Agency Theory, which defines self-determination as "... a dispositional characteristic manifested as acting as the causal agent in one's life" (p. 258). Self-determination develops over the life course as a person has experiences and opportunities to use abilities and skills associated with self-determination (e.g., problem solving; Shogren et al., 2019). Self-determined actions reflect three key characteristics: volitional action (DECIDE), agentic action

(ACT), and action-control beliefs (BELIEVE). Volitional action (DECIDE) relates to making choices and decisions about one's goals that are aligned with one's preferences and interests, reflecting autonomy and self-initiation. Agentic action (ACT) involves engaging in actions that enable one to work towards their goals using self-regulation, self-direction, and pathways thinking. Action-control beliefs (BELIEVE) are the feelings of empowerment that one can achieve as they work towards their goals, which builds self-realization, control expectancy, agency beliefs, and causality beliefs (Shogren & Raley, 2022). Promoting self-determination in secondary contexts enables teachers to center students as leaders in their lives and provide opportunities to draw on students' funds of knowledge and integrate culturally responsive and sustaining practices (Shogren et al., 2021). Self-determined students lead goal setting, action planning, and self-evaluating activities as they work toward self-selected goals with self-identified supports from teachers, family, friends, and community members.

Self-Determined Learning Model of Instruction

The Self-Determined Learning Model of Instruction (SDLMI; Shogren et al., 2019; Wehmeyer et al., 2000) is a flexible teaching model that aligns with Causal Agency Theory and supports teachers to empower students to set and work toward goals they identify as meaningful. The SDLMI supports teachers to shift their teaching practices to promote students' self-direction while delivering instruction on abilities and skills associated with self-determination. Research consistently demonstrates positive impacts of the SDLMI on valued outcomes for students with and without disabilities, such as increased goal attainment and enhanced academic achievement (e.g., Burke et al., 2020; Hagiwara et al., 2017; Rowe et al., 2021).

There are three core components of the SDLMI: Student Questions, Teacher Objectives, and Educational Supports. The 12 SDLMI Student Questions are divided across three phases,

Phase 1 – Set a Goal, Phase 2 – Take Action, and Phase 3 – Adjust Goal or Plan. Each of the 12 Student Questions are phrased in first-person language to situate the student as the director of their own learning. These questions (four per SDLMI phase) guide students through the process of answering an overall problem posed in each phase (i.e., Phase 1 – What is my goal?, Phase 2 – What is my plan?, Phase 3 – What have I learned?). Teacher Objectives, linked to each Student Question, serve as a roadmap for the teacher and enables them to support students to answer the 12 Student Questions. To ensure students have supports they need to engage in the SDLMI, there are also Educational Supports linked to each Teacher Objective. Educational Supports (e.g., problem-solving instruction) encompass a variety of instructional practices that can be intensified based on students' needs.

During professional development, teachers learn to support students in several lessons before Phase 1 (Set a Goal) called Preliminary Conversations to establish common language of key terms (e.g., goal, action plan) and the purpose of the SDLMI. Then, in Phase 1, teachers support students in identifying the goal they want to work on over the course of an academic semester. In this phase, students identify what they want to learn, what they do not know about their goal area, what must change for them to learn what they do not know, and specify their goal. After answering the four Phase 1 Student Questions, teachers support students to move into Phase 2 (Take Action). The four Phase 2 Student Questions guide students in creating an action plan to achieve the goal they set in Phase 1. In particular, and with support from trained teachers, students identify potential barriers and solutions, create a schedule for implementing their action plans, and begin tracking progress with a self-monitoring system (e.g., daily checklist). Finally, Phase 3 (Adjust Goal or Plan) focuses on empowering students to self-evaluate progress toward their goal and identify next steps (i.e., setting a new goal, continuing to work on the same goal,

or adjusting their goal or action plan). This will guide students into the next cycle of the SDLMI as it is designed to be used repeatedly (Shogren et al., 2019).

As a teaching model, the SDLMI is designed to shift teaching practices to increase opportunities for students to engage in self-determined actions. Further, teachers engage in problem solving to identify how the SDLMI best overlays onto their content area (e.g., mathematics, transition planning). To successfully integrate self-directed learning and goal setting into content area instruction, teachers must understand the SDLMI and its core components (i.e., Student Questions, Teacher Objectives, Educational Supports), described earlier (Shogren et al., 2019), along with how to integrate it with practices and strategies they already use. Further, they must understand how to align SDLMI instruction with students' funds of knowledge and integrate culturally responsive and sustaining practices. When implemented in inclusive settings, there must also be collaboration across general and special educators to ensure *all* students have equitable opportunities to engage in self-determined actions. This can promote collaborative teaching practices as general educators have strengths in academic content areas and special educators have strengths in differentiating instruction and individualizing supports.

SDLMI Professional Development in Practice

Effective, teacher-focused professional developments (PD) have shown to have positive impacts on student outcomes (e.g., Blank & de Las Alas, 2009; Darling-Hammond et al., 2017; Dunst et al., 2015). Yet, teachers in the United States often do not receive enough intensive PD and are often not satisfied with short, less intense learning opportunities (Darling-Hammond et al., 2017; Wei et al., 2010). Further, PD often does not focus on practice-based application, but rather the abstract, theoretical concepts (Hirsch et al., 2020; Joyce & Showers, 2002). Effective PD must be intense, collaborative, sustained, and connected to practice (Darling-Hammond et

al., 2009; Wei et al., 2010). These opportunities must also be content-focused (e.g., connected to practice) and engage participants in active learning activities (Darling-Hammond et al., 2017). Given the complexity of the SDLMI and its implementation (e.g., teaching model requiring a shift from teacher- to student-directed learning), effective PD is critical to enable implementation with fidelity to the core components of the SDLMI (i.e., Student Questions, Teacher Objectives, Educational Supports). To ensure general and special education teachers are equipped to implement the SDLMI in inclusive, general education classrooms, standardized SDLMI training protocols have been developed with key elements of effective PD embedded (Bojanek et al., 2021; See Table 1). However, limited research exists on the impacts of SDLMI PD on teacher knowledge, skills, and usefulness of self-determination.

Purpose

There is a need to examine the impacts of the SDLMI PD on teachers' perceptions of their knowledge, skills, and the usefulness of self-determination before and after training as well as with ongoing PD and coaching support. This study builds on previous work (Bojanek et al., 2021) that examined professional outcomes immediately after a two day SDLMI PD during the first year (2018-2019) of a large, longitudinal study, where the SDLMI PD (described subsequently) was developed and initially tested. Specifically, researchers examined all trained professionals' perceptions of training materials, self-reported changes in knowledge, skills, and the usefulness of self-determination, and their view of the essential nature of self-determination abilities and skills in preparing students across multiple academic and transition areas (e.g., self-regulating skills, achieving postsecondary education goals, participation in general education). From their findings, authors suggested further research was needed examining the longitudinal impacts of this PD on teacher knowledge, skills, and usefulness of self-determination,

particularly as teachers began implementing the SDLMI while receiving implementation supports (i.e., online or online+coaching) and participated in ongoing PD during the multi-year study.

The current analyses address recommendations of Bojanek et al. (2021) by examining the impacts of the SDLMI PD on teachers trained in the SDLMI across the three years of the project. In the multi-year, longitudinal study, the first cohort of teachers implemented for up to two and a half years and received multiple PD opportunities. New cohorts were added each year, so there was a sample of new and returning teachers who attended training from each participating school to examine during each year of the project. Although, as described subsequently, the COVID-19 pandemic led to significant disruptions and barriers to retention. However, even with these barriers, the data provides a sample to extend findings from Bojanek et al. (2021). The current analyses addressed the following research questions:

1. To what degree did general and special education teachers who attended SDLMI PD report changes in their knowledge, skills, and usefulness of self-determination before and after training during Year 1, Year 2, and Year 3 of the project?
2. Were there differences in reported changes in knowledge, skills, and use of self-determination before and after training for new and returning teachers who attended the SDLMI PD during Year 2 and Year 3?
3. To what degree did general and special education teachers' who attended the SDLMI PD perceptions of the essential nature of self-determination abilities and skills in preparing students across academic and transition areas change before and after training during Year 1, Year 2, and Year 3 of the project?

4. Were there differences in perceptions of the essential nature of self-determination abilities and skills in preparing students across academic and transition areas before and after training for new and returning teachers who attended the SDLMI PD during Year 2 and Year 3?

Method

Participants and Setting

A total of 69 teachers from 14 schools from three Mid-Atlantic states participated in the SDLMI PD across three years; ultimately not all teachers implemented the SDLMI as six schools (42.9%), who supported teachers to participate in training, ultimately decided not to implement as part of the project. However, given our interest in the impact of the SDLMI PD on teachers' perceptions of knowledge, skills, and usefulness of self-determination, we included data from all teachers, both general and special education, who attended the PD across project years as the intent of these analyses was to determine the impact of the training on teachers' knowledge, skills, and usefulness of self-determination. The sample included 43 general education teachers, 23 special education teachers, and 3 dually certified teachers (see Table 2). We systematically and collaboratively taught all teachers to implement the SDLMI in inclusive, secondary, general education classrooms, with teachers phased into the project across the 2018-2019, 2019-2020, and 2020-2021 academic years (see Table 2 and 3). As such, a subset of teachers from the total sample (n = 27; 39%) participated in multiple PD opportunities (i.e., two years of training, three years of training) while others only engaged in one year of training.

Multi-Year Longitudinal Project Set-Up

The overall project was a three-year randomized control trial (RCT) with the goal of examining impacts of varying intensities of teacher implementation supports (i.e., online vs.

online+coaching) on the outcomes of students with and without disabilities in inclusive, secondary, academic classrooms (i.e., English/Language Arts, math, science). Originally, fifteen schools agreed to participate through the project, however, one school withdrew before training and did not implement. Thus, the sample for the present analysis was the 14 schools who participated in training, with 43 general education teachers, 23 special education teachers, and 3 dually certified teachers (see Table 2). We randomized participating schools to receive one of two levels of implementation supports: (1) online only (n = 8 schools) or (2) online+coaching (n = 7 schools; see Table 3). Online only implementation supports included bi-weekly, online modules emailed to teachers to deepen their understanding and enhance implementation related to specific Student Questions and Educational Supports aligned with the SDLMI Whole Class implementation schedule (Raley et al., 2018). Online modules included interactive activities (e.g., sample case studies with comprehension questions), but teachers did not have direct interactions with project staff or trained SDLMI coaches. The online+coaching supports included bi-weekly, online modules with the addition of in-person, monthly coaching provided by a trained SDLMI coach. Teachers in both implementation support groups received the same PD to implement the SDLMI in secondary, inclusive, core content area classes (e.g., science, English Language Arts) in all years of the project.

School recruitment and retention was challenging throughout the project given ongoing and dynamic demands in high schools associated with other school reform initiatives. Further, the onset of the COVID-19 pandemic during Spring 2020 led to substantial issues with sample attrition. Table 3 shows the 15 schools that agreed to participate along with their randomly assigned implementation support condition, participation throughout the project, and number of teachers trained per year. During Year 1, we recruited 11 schools to participate. One school

(9.1%) was randomized but unable to identify teachers to participate in the training and ultimately withdrew. Three additional schools (27.3%) supported teachers to participate in training, but ultimately decided not to implement for a variety of reasons (i.e., demands of other school initiatives, changes in co-teaching models). An additional school deferred implementation until Year 2 due to teacher illnesses during training. Ultimately, six schools (54.5%) implemented during Year 1. During Year 2, three implementing schools returned from Year 1, one deferred school returned and implemented, and three implementing schools from Year 1 withdrew due to other demands. In addition to the schools from Year 1, four schools were recruited, but three withdrew after training due to similar reasons as Year 1 and one continued to implement after training. During Spring 2020 (Year 2), the COVID-19 pandemic significantly disrupted SDLMI implementation and associated data collection. Implementation ceased during Spring 2020 as schools navigated initial school shutdowns and planned for non-face-to-face instruction (e.g., virtual instruction). As the pandemic continued, the project team delivered virtual supports to schools that continued implementation. As expected, this led to a lower number of participating teachers in Year 3. Two schools withdrew from the project due to challenges presented by the pandemic, two schools deferred implementation until Spring 2021, and one school continued implementation during Fall 2020 and Spring 2021. No new schools were recruited during Year 3 due to pandemic-related barriers and demands. Despite barriers to recruitment, the project team supported ongoing implementation in three schools during Year 3 while problem-solving barriers, such as instructional delivery methods (i.e., in-person, virtual, hybrid), technology availability, and needs of students and staff. Data from each year of training were retained in these analyses, although limitations of different training and implementation contexts must be acknowledged.

Training Procedures

Year 1 (2018-2019) and Year 2 (2019-2020) Professional Development

Training procedures for Year 1 and 2 of the project were similar. During the first year, teachers, along with other school and district personnel, participated in an intensive, in-person, two-day training developed to align with key indicators of quality PD (see Table 1). This training occurred in the late summer/early fall prior to teachers beginning SDLMI implementation. Throughout the training, SDLMI content experts led participants, including teachers, through content relevant to understanding self-determination, how to implement the SDLMI, and activities to promote engagement and understanding of SDLMI core components. For example, to ensure the PD was linked to the substantive quality indicator, content experts provided information related to Causal Agency Theory, which theoretically underpins self-determination, and provided examples of the SDLMI in practice, which highlighted the link between theory and practice. To address the active quality indicator, trainers and content experts integrated a variety of hands-on activities, such as role-playing to promote implementation of SDLMI lessons. In addition to hands-on activities, the SDLMI PD provided opportunities for collaboration through problem solving and collective learning, which supported the collaborative quality indicator. During training, teachers, with support of training staff, developed implementation schedules for their classrooms that incorporated district-specific initiatives and procedures. Schools and associated teachers randomized into the online+coaching group also planned for coaching visits during the development of their implementation schedule and other training activities.

Year 2 SDLMI PD was expanded to a three-day, in-person training to allow combined and differentiated instruction for new and returning teachers. Year 2 training was held the summer before SDLMI implementation began for the upcoming school year. Again, this training

mirrored Year 1 procedures and activities while also addressing PD quality indicators (Table 1) in similar ways. We added additional activities to engage returning teachers in self-evaluation and reflection as well as expanded planning opportunities, including lessons-learned share-outs and tip-sharing opportunities to support new teachers. We also provided teachers with updated materials, strategies, and resources from SDLMI content experts and were able to engage with returning teachers from Year 1 who shared their experiences and advice (e.g., sustainable).

Year 3 Professional Development (2020-2021)

COVID-19 had ongoing impacts during Year 3, including PD. The SDLMI PD needed to be redesigned to align with COVID-19 protocols, therefore, Year 3 PD was provided virtually via Zoom, across three days to stay consistent with previous years training procedures. Due to school deferments to Spring 2021 implementation, we offered two PDs, one before implementation began in Fall 2020 with one school and another in Winter 2020 before implementation began for the two schools who deferred until Spring 2021. Like Years 1 and 2 PD, Year 3 PD still addressed quality indicators (Table 1) in ways that used online modalities to promote engagement. The most substantial redesign was utilizing Talen Learning Management System (LMS) to support interactive learning (e.g., active). Using Talent LMS, teachers engaged in various independent learning activities, such as reviewing online modules and watching case study and sample implementation videos. To support implementation during COVID-19, we embedded SDLMI materials into two online learning platforms used by participating schools, Google Classroom and Schoology. In addition to training adjustments aligned with COVID-19 protocols, we also made adjustments to coaching and ongoing implementation. Coaching was implemented virtually via Zoom and ongoing implementation adjustments were determined by teachers and school teams based on instructional delivery format for their district (see Figure 1).

Measures

Teacher Demographic Form

The Teacher Demographic Form (TDF) is a self-report measure used to document various demographic variables for professionals participating in the SDLMI PD. Specifically, the TDF collected information, such as gender, race, ethnicity, number of years teaching, teaching assignment, highest degree earned, experience with self-determination, etc. This survey was administered to training participants before the start of each PD.

Teacher Self-Determination Knowledge, Skills, and Use Survey

The Teacher Self-Determination Knowledge, Skills, and Use Survey (SD-KSU; Shogren et al., 2018) is a self-report measure adapted from Lane and colleagues' Knowledge, Confidence, and Use Survey. Cronbach's alpha has been reported to range from .94-.98 for the original tool (e.g., Lane et al., 2015; Oakes et al., 2018). The SD-KSU was completed before and after each training to evaluate participants perceptions of their knowledge (α = .93), skills (α =.91), and usefulness (α = .94) of self-determination. Specifically, respondents rate their perceptions of knowledge, skills, and usefulness of seven constructs related to self-determination as defined by Causal Agency Theory (Shogren et al., 2015; i.e., autonomy, self-initiation, pathways thinking, self-direction, control-expectancy, psychological empowerment, self-realization) on a 5-point Likert-type scale ranging from 0 (*no knowledge/skills/usefulness*) to 4 (*substantial knowledge/skills/usefulness*). In conjunction with knowledge, skills, and usefulness ratings, teachers also rated their perceptions of the essential nature of self-determination skills in preparing students across multiple academic and transition areas (α = .957; e.g., general education participation, developing social skills, achieving community living goals).

Data Analysis

Research Question 1 & 2: Perceived Knowledge, Skills, and Usefulness

To determine changes in teacher perceptions of their knowledge, skills, and usefulness of self-determination before and after PD, SD-KSU pre- and post-training scores were utilized for each year of the project. We replicated analyses procedures from Bojanek et al. (2021) for teacher reported SD-KSU data for the first year of the project, and expanded into Years 2 and 3. Descriptive statistics for SD-KSU scales, including means and standard deviations, were calculated across each year of the project, then were broken down by first year attending teachers and returning teachers in Years 2 and 3. Dependent sample *t* tests were used to examine if there were statistically significant changes in teachers' perceptions of their knowledge, skills, and usefulness of self-determination pre- and post-training in Years 1, 2, and 3. We also examined if there were differences based on teacher training experience (i.e., first-time PD attending teachers, returning PD attending teachers) for Year 2 of the project. The original intent was to analyze data longitudinally, but due to barriers to retention and recruitment resulting in a low number of participating teachers particularly during the second half of Year 2 and Year 3 because of COVID-19, the sample size was insufficient for additional analyses. Further, the training experiences for Year 3 teachers were substantially different than Year 1 and 2 teachers. Thus, we looked at descriptive statistics and dependent sample *t* tests.

There were small amounts of missing data, primarily on the post-training survey across years of the project (7.5%). Potential reasons for missing data could be participants left the project or missed a day of training. As this meant teachers were not able to implement since they did not finish training, we chose to use listwise deletion to exclude these data from the analysis. IBM SPSS Statistics version 27 for Macintosh was used for all analyses.

Research Question 3 & 4: Perceptions of the Essential Nature of Self-Determination Skills

To better understand the degree to which teachers' perceptions of the essential nature of self-determination abilities and skills in preparing students across multiple academic and transition areas changed before and after PD as well as across teacher training experience (i.e., first-time trained teachers, returning trained teachers), the subset of questions regarding the essential nature of self-determination from the SD-KSU were utilized for analyses. Specifically, pre- and post-training scores from this subset of questions for each teacher were utilized. Descriptive statistics, including means and standard deviations, were calculated for all trained teachers across each year of the project. Similar to data analysis methods for Research Question 1, dependent sample *t* tests were used to examine if there were statistically significant changes in teachers' perceptions of the essential nature of self-determination skills before and after PD. Again, we examined if there were differences based on teacher training experience (i.e., first-time trained teachers, returning trained teachers) for Year 2. The intent was to also analyze data longitudinally, including Year 3 data. Barriers to retention and recruitment resulted in a low number of participating teachers during Year 3 of the project, thus, only descriptive statistics were reported.

Results

Perceived Knowledge, Skills, and Usefulness

Research Question 1: All Teachers Across Years

Pre-training SD-KSU results from trained teachers across all years of the project (i.e., Year 1, Year 2, Year 3) suggested *some* or *more than average* (e.g., mean scores ranging from 2-3) knowledge, skills, and usefulness related to self-determination instruction and opportunities in the classroom (Table 4). When looking at changes after training using SD-KSU results for all trained teachers during Year 1 of the project, Year 1 teachers reported statistically significant

increases related to knowledge of (t[23] = -5.73, p < .0001) and skills related to self-determination (t[23] = -5.32, p < .0001). When examining ratings from all trained Year 2 teachers, similar results were found. Year 2 trained teachers reported statistically significant increases in knowledge of (t[38] = -5.91, p < .0001) and skills related to self-determination (t[38] = -5.05, p < .0001). When examining the impact of the SDLMI PD on usefulness of self-determination skills and abilities, trained teachers reported a statistically significant increase as well, (t[38] = -3.61, p < .001), which deviated from Year 1 findings.

Research Question 2: New and Returning Teachers

Beginning with Year 2 data, teachers were divided into subsets of first-time trained teachers and returning teachers, similar levels of knowledge, skills, and usefulness related to self-determination instruction and opportunities in the classroom were reported (Table 4). When Year 2 first-time trained teachers' outcomes were examined, statistically significant increases related to knowledge of self-determination (t[16] = -4.29, p < .001), skills related to self-determination (t[16] = -3.98, p < .001), and usefulness of self-determination skills, abilities, and attitudes (t[16] = -3.36, p < .005) were found before and after PD. Similarly, returning trained teachers during Year 2 of the project also reported *some* level of knowledge, skills, and usefulness related to self-determination instruction and opportunities in the classroom (Table 4). They also reported statistically significant increases related to knowledge of (t[21] = -4.20, p < .0001) and skills related to self-determination (t[21] = -3.82, p < .001), however, they did not report statistically significant increases in usefulness of self-determination skills, abilities, and attitudes (t[21] = -1.93, p < .07).

Teachers who were trained during Year 3 of the project were impacted by COVID-19, thus training procedures changed and barriers to retention and recruitment were encountered.

Year 3 teachers, both first-time and returning trained teachers, were trained virtually. Due to the barriers imposed by COVID-19 and the limited sample size in Year 3, the authors decided to only report descriptive statistics for all teachers, first-time trained teachers, and returning teachers (Table 4). Similar to Years 1 and 2 teachers, Year 3 teachers reported *some* levels of knowledge, skills, and usefulness related to self-determination instruction and opportunities in the classroom. The reported scores mirror pre- and post-training scores of previous project years.

Research Questions 3 & 4: Perceptions of the Essential Nature of Self-Determination Skills

Teachers trained across Years 1, 2, and 3 of the project reported relatively high scores for perceptions of the essential nature of self-determination across all academic and transition areas (mean scores ranging from 4-5). Thus, teachers who attended PD, both first-time and returning, perceived self-determination skills, abilities, and attitudes as essential across academic and transition areas (i.e., participating in general education, developing social skills, achieving post-secondary goals). No statistically significant changes in perceptions of the essential nature of self-determination skills across academic and transition areas were reported. See Table 5 for mean scores and standard deviations.

Discussion

We conducted this study to expand Bojanek et al. (2021) findings, exploring the impacts of a multi-year professional development (PD) series on teachers' perceived knowledge, skills, and usefulness of self-determination over time. Specifically, the authors examined the impacts of PD on teachers' perceived knowledge, skills, and usefulness of self-determination for each year of a multi-year project and examined the impacts based on teacher training experience (i.e., new teachers, returning teachers).

Overall, results suggest the SDLMI PD has a significant impact on teachers' perceptions of their knowledge, skills, and usefulness of self-determination. This study reported similar findings from Bojanek et al. (2021) further supporting the importance of training teachers to implement self-determination interventions to enhance student outcomes (e.g., goal attainment, academic achievement), although more research is needed directly linking teacher perceptions of their knowledge and skills with student outcomes. This project provides important information in planning for long-term training to promote sustainability of use of evidence-based practices (EBPs) as Tier 1 supports. For example, we found impacts on certain aspects of knowledge, skills, and usefulness of the SDLMI across cohorts and ongoing impacts with returning teachers who attended training. More specifically, there was a statistically significant impact on teachers' perceived knowledge and skills related to the SDLMI and self-determination before and after training. Further, returning teachers in Year 2 who received additional training reported ongoing impacts of the second training on knowledge and skills. Interesting, while teachers who attended the PD for the first time in Year 1 did not report significant change in their perceived usefulness of self-determination after the SDLMI PD, Year 2 teachers did. One reason that could have impacted perceived usefulness of self-determination during Year 2 is the addition of returning teachers. As stated earlier, Year 1 teachers were all considered first-time trained teachers as they were the initial participants in the project. Thus, the Year 2 cohort included new teachers from returning schools and returning teachers from those schools as well as new schools with new teachers. Returning teachers were invited to share their experience and lead activities during training. Thus, returning teachers' experiences implementing the SDLMI could have impacted the new teachers' perceptions of the usefulness of the SDLMI. In addition, teachers may not have seen how the SDLMI fit into their classroom and school culture prior to the SDLMI PD.

Therefore, returning teachers in the project could have been change agents for how self-determination was viewed within the classroom and school culture. Additional research is needed to explore these findings as well as the most effective way to operationalize PD aligned with quality indicators of professional development (e.g., Darling-Hammond et al., 2017) and tenets of implementation science (Fixsen et al., 2013; Fixsen et al., 2009).

Although, the SDLMI PD had impacts on teachers' knowledge, skills, and usefulness related to self-determination during Years 1 and 2, when it was broken down by training experience (i.e., new teachers, returning teachers) the SDLMI PD did not have an impact on Year 2 returning teachers perceived usefulness, but did on Year 2 new teachers (i.e., first time attending training). This could be due to returning teachers who had already been trained and implemented during Year 1 of the project. Thus, they may have already seen the impact of the SDLMI on students' self-determination and found the intervention useful. Furthermore, teachers developed a community within their school as they implemented the SDLMI together. Current research has shown the community of support that comes from implementing the SDLMI alongside other teachers is critical and supports implementation overall (Raley et al., 2023). In addition to the potentially observed impacts of the SDLMI, teachers reported near the top of the scale pre- and post- training thus there could be potential ceiling effects. Therefore, future research should examine how perceived usefulness of interventions may need to be measured to avoid ceiling effects, as well as the impact of ongoing implementation experiences particularly as there were ongoing impacts of their perceived knowledge and skills after Year 2 training. This could be due to their experience in implementing and identifying their own areas of growth related to SDLMI implementation and supporting their students throughout the process. They

had an additional year to implement and modify the SDLMI to their own teaching style, their students' support needs, and their schools' climate and culture.

Similar to the findings from Bojanek et al. (2021), teachers reported that self-determination is essential across various academic and transition areas across each year of the project before and after training. This may reflect teachers who opted-in to participate in the research project already placed value on self-determination. Outside of a research project, ongoing research is needed to explore if different patterns of results are found. However, it may be teachers understand the importance of these abilities and skills across various academic and transition areas, but are unsure of how to support students to develop these abilities and skills in the context of academic content areas (Bojanek et al., 2021; Carter et al., 2008; Stang et al., 2009). Thus, SDLMI PD can support teachers in gaining knowledge and skills in supporting students to develop self-determination abilities and skills in the context of academic content areas.

Limitations

There are several limitations to this study. One key limitation was the attrition of schools and teachers. There were several reasons for attrition within this longitudinal project, including but not limited to, demands on teachers because of other school initiatives, lack of administrative support, and the COVID-19 pandemic. The lack of school and teacher retention and the ramifications of the pandemic impacted how we examined the SDLMI PD and prevented analyzing longitudinal impacts across all three years of the project. Fourteen out of 15 schools (93.3%) supported teachers to attend training, however, seven schools (50.0%) withdrew from the project after attending training and three schools (21.4%) withdrew from the project after Year 1 of implementation. Further, schools in Spring 2020 did not continue data collection due

to the initial onset of COVID-19 restrictions and navigating barriers to academic content instruction. In addition to data collection disruptions, two schools withdrew (14.2%) from the project during Year 3 due to COVID-19 barriers and two schools (14.2%) deferred implementation to Spring 2021 as they were still navigating instructional formats, such as virtual or hybrid (i.e., part-time online, part-time in-person). Thus, COVID-19 impacted the retention and recruitment of participating schools and teachers resulting in lower participation in Year 3, therefore, we were unable to conduct analyses to examine longitudinal impacts of the SDLMI PD. Relatedly, a second limitation was the shift in PD format. In Years 1 and 2, an in-person, multi-day PD structure was utilized. Due to the COVID-19 pandemic, the PD format was adjusted to accommodate virtual training protocols. Thus, comparing even descriptive data from Years 1 and 2 to Year 3 may not have shown the direct impacts of the SDLMI PD, but rather the impacts of format type (i.e., in-person, virtual).

A third limitation was we only examined impacts on inclusive, secondary teachers in academic content areas. Self-determination is an essential characteristic across multiple academic and transition areas (Shogren & Raley, 2022) and ongoing research is needed to examine the impact of PD across content areas (e.g., transition planning, social emotional learning). A fourth limitation was we only examined the impacts of training on teachers who were to serve as implementers. As noted, additional school and district team members (i.e., principals, special education directors, curriculum directors,) participated in trainings or specific aspects of the trainings. Understanding their perspectives, many of which were champions in the school for participating in this project and advancing self-determination instruction, could further inform PD and supports for teachers. A fifth limitation was the fact we did not explore how this training could be aligned with other initiatives' (i.e., Common Core, multi-tiered systems of

support, academic content curriculum) trainings. We asked teachers and other team members throughout training to think about how the SDLMI and self-determination aligned with other initiatives they had within their schools and classrooms, but we did not examine how the PD impacted their perceptions of the knowledge, skills, and usefulness of the SDLMI, self-determination, and other initiatives.

Future Directions for Research and Practice

Self-determination is a predictor of in-school and postschool success (e.g., Shogren & Raley, 2022). Given this evidence, there has been a push for supporting students to develop abilities and skills associated with self-determination through various initiatives, such as college and career readiness and Common Core State Standards. With the focus on supporting students to be prepared for life after K-12 education, there are several areas future research, practice, and policy should explore and expand on.

With increasing demands on teachers and schools, identifying ways to support teachers to develop knowledge and skills to implement EBPs are critical as it is known implementation fidelity impacts student-level outcomes (i.e., academic achievement, goal attainment, behavior; Shogren et al., 2020). Preliminary evidence of the positive impacts of a high-quality, systematic, in-person, multi-day PD, from this study and Bojanek et al. (2021), supports the need for further exploration as to how high quality, systematic PD can be delivered in other formats outside of face-to-face opportunities (i.e., asynchronous, virtual) and other structures (i.e., one day, shorter hours). Teachers and schools have a variety of demands, many of which are increasing, thus leaving little time to support the development of knowledge, skills, and implementation of EBPs. Therefore, future researchers should explore the impacts of various PD formats to ensure

teachers have the knowledge and skills to implement EBPs which positively impact student-level outcomes (i.e., academic achievement, goal attainment, behavior).

We only examined impacts of the SDLMI PD on teachers who attended training regardless of implementation status. As previously stated, schools supported teachers to attend training to learn how to implement the SDLMI within their inclusive, secondary, academic content classrooms, but teachers from seven schools attended training, never implemented, and ultimately withdrew from the project. Further research is needed to understand why teachers attended training and withdrew along with what factors predict attrition over the course of a project. Understanding why teachers did not implement, can support future practice to ensure the needs of teachers are met and appropriate teacher supports are provided, so they are able to implement EBPs to enhance in- and postschool outcomes of students they serve. In addition to teacher attrition, future researchers should examine the impacts of the SDLMI PD on implementing teachers' fidelity and their perceptions of implementation. Understanding the SDLMI PD impacts on teachers who implemented the SDLMI with students could potentially provide evidence of linkages between systematic, high-quality PD, implementation fidelity, and student-level outcomes (i.e., self-determination, academic achievement, goal attainment).

We only examined impacts on inclusive, secondary, academic content teachers, however, impacts on teachers in settings outside of academic content areas (i.e., career and technical education [CTE], music, art) should be explored. Students engage in a variety of activities and classes during their educational career, which can support the development of self-determination abilities and skills to enhance in- and postschool outcomes (e.g., Mazzotti et al., 2021; Rowe et al., 2021; Shogren & Raley, 2022). Future research should explore the impacts of the SDLMI PD on teachers' knowledge, skills, and usefulness outside academic content areas (e.g., physical

education, CTE, transition planning). In addition, impacts of high-quality, systematic PD on other key stakeholders, such as coordinators, transition specialists, administrators, and families, should be explored. These stakeholders are critical team members to support the initial implementation of EBPs, scaling up implementation, and supporting sustainability (Fixsen et al., 2013; Fixsen et al., 2009).

Again, we only examined the impacts of the SDLMI PD on teachers' perceptions of their knowledge, skills, and usefulness of self-determination before and after training, but we did not explore how this training could be aligned with other initiatives' (i.e., Common Core, multi-tiered systems of support) trainings. This is critical as self-determination as well as the associated abilities and skills are already embedded within many of these initiatives (e.g., Rowe et al., 2015; Shogren et al., 2016) although systematic PD and instructional practices have not yet been defined. Additionally, future researchers should examine sustainability, specifically thinking about how we sustain implementation and how we provide for ongoing training and coaching, especially when data highlight the impacts of such interventions and training.

Conclusion

This study has provided additional evidence that the SDLMI PD has positive impacts on teachers' perceived knowledge, skills, and usefulness related to the SDLMI and self-determination. It has also provided additional evidence as to the impacts of the SDLMI PD for newly trained and returning teachers. Overall, these findings suggest high-quality, systematic training is critical in developing teacher knowledge and skills with mixed impacts on perceived usefulness. Further research is needed to understand how this training can be delivered in different formats, impact other stakeholders' perceived knowledge, skills, and usefulness, and be aligned with other initiatives within schools.

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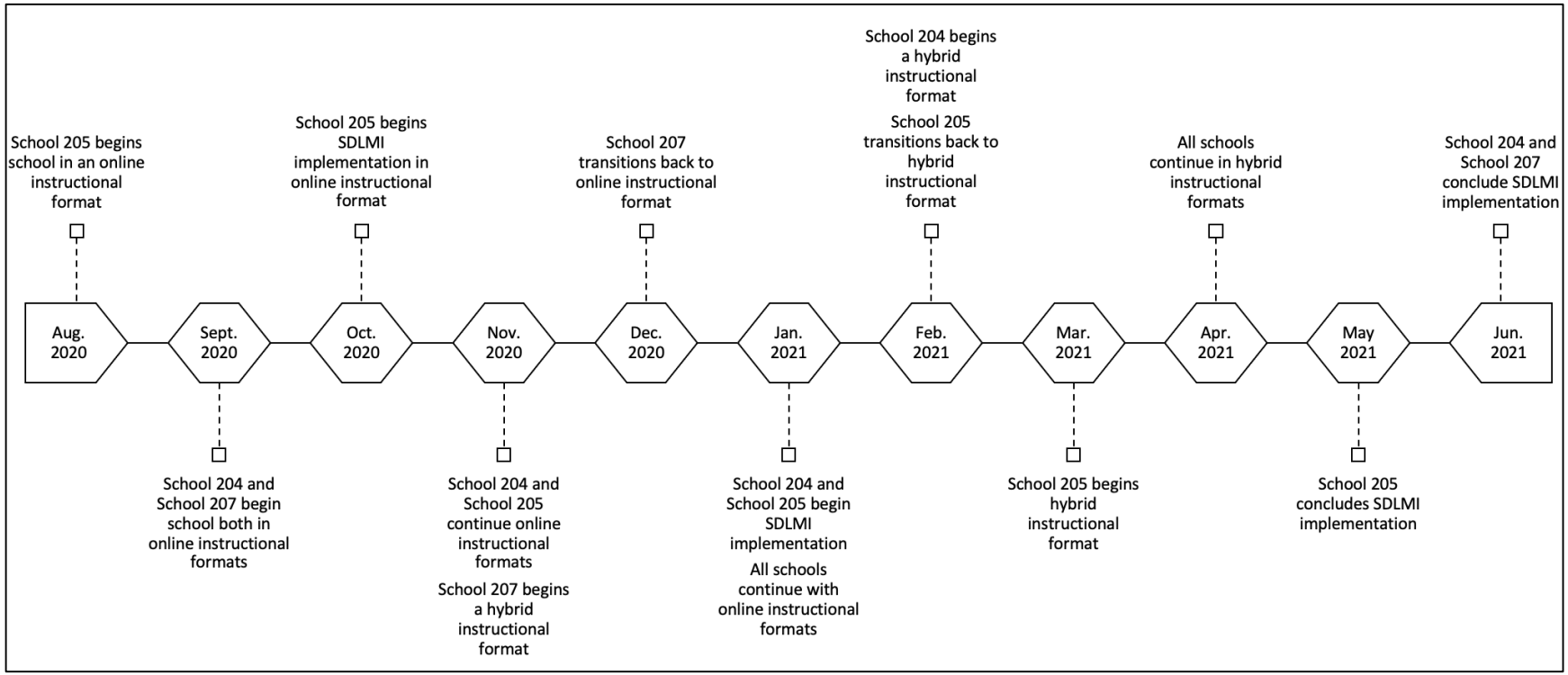
Figure 1

Year 3 SDLMI Implementation Timeline



Note. School characteristic information can be seen in Table 3.

Table 1

Professional Development Quality Indicators and Implementation During Training.

Quality Indicator	Definition	Professional Development Implementation Examples	Year 3 Adjustments due to COVID-19
Substantive	• Developing a common understanding of the theory and intervention	• Content experts provide information on Causal Agency Theory and the SDLMI through presentations and discussions	• Trainings delivered virtually via Zoom
Coherent	• Aligning training and intervention materials with content standards and school/district initiatives	• SDLMI materials are aligned with core content standards; teacher-created implementation schedules are aligned with school schedules and initiatives;	• Materials provided online via learning management system (LMS)
Active	• Engaging attendees through hands-on, interactive activities to support understanding and implementation	• Attendees engage in role-playing of implementation of SDLMI lessons and have opportunities to adapt and adjust materials throughout training	• Learning activities delivered via online activities and LMS such as case study videos and discussions boards
Collaborative	• Providing opportunities for collective problem-solving, including attendee share-outs, group learning activities, and whole-/small-group discussions	• Teacher share experiences related to SDLMI implementation, engage in whole and small group problem solving, and implementation schedule development	• Discussions conducted through Zoom breakouts to support school-specific needs
Evaluative	• Engaging in various self-reflection activities to support understanding and implementation	• Attendees complete surveys related to knowledge and skills, engage in discussion and planning for self-monitoring and reflection during implementation	
Sustainable	• Supporting continuous learning opportunities and developing strategies for continuous implementation	• Trainings are multi-day trainings each year and there is specified time to reflect and plan implementation	

Note. SDLMI = Self-Determined Learning Model of Instruction, Kansas University Center on Developmental Disabilities © 2022

Table 2

Trained Teacher Demographics

Teacher Demographics	Across All Years		Year					
			1		2		3	
	n	%	*n*	%	n	%	*n*	%
Total Sample	69	-	35	-	45	-	16	-
Type of Trainee/Teacher								
First Time	-	-	35	100.0	17	37.8	7	43.8
Returning	-	-	0	0.0	28	62.2	9	56.3
Gender								
Female	52	75.4	27	77.1	35		14	87.5
Male	17	24.6	8	22.9	10	22.2	2	12.5
Race/Ethnicity								
White/European American	59	85.5	31	88.6	40	88.9	12	75.0
Black/African American	9	13.0	3	8.6	5	11.1	4	25.0
Hispanic/Latinx	3	4.3	1	2.9	2	4.4	0	0.0
Two or More Races	2	2.9	1	2.9	1	2.2	0	0.0
Other	1	1.4	1	2.9	1	2.2	0	0.0
Highest Degree Earned								
Bachelor's Degree	27	39.1	13	37.1	21	46.7	7	43.8
Master's Degree	21	30.4	10	28.6	13	28.9	6	37.5
Master's Degree + Credits	21	30.4	12	34.3	11	24.4	3	18.8
Teaching Classification								
General Education	43	62.3	20	57.1	33	73.3	12	75.0
Special Education	23	33.3	12	34.3	12	26.7	3	18.8
Both General & Special Education	3	4.3	3	8.6	0	0.0	1	6.3
Subject Taught[a]								
English	30	43.5	21	60.0	15	33.3	11	68.8
Science	22	31.9	11	31.4	16	35.6	0	0.0
Math	12	17.4	6	17.1	6	13.3	4	25.0
Social Studies	10	14.5	3	8.6	7	15.6	0	0.0
Other	5	7.2	4	11.4	3	6.7	0	0.0
Electives (e.g., music, art)	3	4.3	2	5.7	1	2.2	1	6.3
Grade Taught[b]								
9th	53	76.8	30	85.7	34	75.6	11	68.8
10th	40	58.0	20	57.1	26	57.8	11	68.8
11th	27	39.1	12	34.3	16	35.6	7	43.8
12th	21	30.4	9	25.7	12	26.7	6	37.5
Other	1	1.4	0	0.0	1	2.2	0	0.0

Note. Teacher demographics across individual years are reported based on all teachers trained to implement during that academic year. [a]Teachers could select more than one subject taught. [b]Teachers could select more than one grade taught.

Table 3

Implementing School Characteristics

Cohort	School	Implementation Support	Project Participation						Number of Teachers		
			Year 1		Year 2		Year 3		Year 1	Year 2	Year 3
			Fall	Spring	Fall	Spring	Fall	Spring			
SY 18-19	206	Online+Coaching	W	-	-	-	-	-	0	0	0
SY 18-19	208	Online	W	-	-	-	-	-	4	0	0
SY 18-19	209	Online	W	-	-	-	-	-	3	0	0
SY 18-19	211	Online+Coaching	W	-	-	-	-	-	1	0	0
SY 18-19	205	Online+Coaching	D	D	I	I	I	I	2	6	5
SY 18-19	201	Online+Coaching	I	I	W	-	-	-	1	1	0
SY 18-19	202	Online	I	I	W	-	-	-	2	0	0
SY 18-19	210	Online	I	I	W	-	-	-	3	1	0
SY 18-19	203	Online	I	I	I	I	W		8	9	0
SY 18-19	204	Online	I	I	I	I	D	I	5	5	5
SY 18-19	207	Online+Coaching	I	I	I	I	D	I	6	6	6
SY 19-20	214	Online+Coaching	-	-	W	-	-	-	0	5	0
SY 19-20	215	Online	-	-	W	-	-	-	0	4	0
SY 19-20	216	Online	-	-	W	-	-	-	0	3	0
SY 19-20	213	Online+Coaching	-	-	I	I	W	-	0	5	0

Note. School numbers are not in order as they are numbered in the order they entered into the project data collection system but organized in the table to reflect withdraw and implementation in Year 1. SY = School Year, I = Implemented Self-Determined Learning Model of Instruction, W = Withdrew from Project, D = Deferred Implementation

Table 4

Self-Determination Knowledge, Skills, and Use Survey Total Score Results by Teacher Training Experience

Project Year	Teacher Training Experience	SD-KSU Timepoint	*N*	Knowledge		Skills		Usefulness	
				M	*SD*	*M*	*SD*	*M*	*SD*
Year 1	All Teachers[a]	Pre	27	16.22	6.34	15.74	6.15	18.89	5.64
		Post	26	23.08**	4.05	22.00**	3.77	21.19	3.81
Year 2	All Teachers[a]	Pre	45	19.89	5.40	19.44	5.80	22.47	4.42
		Post	39	24.72***	3.61	23.90***	3.50	25.28**	4.58
	First-Time	Pre	17	20.88	5.17	21.06	4.67	22.76	5.90
		Post	17	26.00**	2.55	24.76**	2.56	26.82*	2.40
	Returning	Pre	28	19.29	5.54	18.46	6.27	22.29	3.34
		Post	22	23.73***	4.04	23.73**	4.01	24.09	5.49
Year 3	All Teachers	Pre	16	23.00	4.65	20.50	5.03	26.13	2.66
		Post	15	24.53	2.92	23.40	3.48	26.13	2.83
	First-Time[b]	Pre	7	23.29	4.23	20.14	5.81	26.29	2.63
		Post	6	23.83	3.25	22.50	3.89	25.17	3.43
	Returning[b]	Pre	9	22.78	5.19	17.67	4.30	26.00	2.83
		Post	9	25.00	2.78	23.67	2.65	26.78	2.33

Note. Only total scores were compared for statistical significance. * $p <$ .005, ** $p <$ .001 ***$p <$ .0001. [a]All teachers trained in the first year were considered first-time training participants because this was the first training conducted for the project. [b]Descriptive statistics were only reported for Year 3 teachers. No dependent sample *t*-tests were conducted.

Table 5

Teacher Perceptions of the Essential Nature of Self-Determination Across Life Domains by Teacher Training Experience

Project Year	Teacher Training Experience	Time	*N*	General Education				Developing Skills				Achieving Post-Secondary Goals					
				Participation		Learning Curric.		Social Skills		Self-Regulatory		Comm. Living		Employment		Edu.	
				M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Year 1	All[a]	Pre	27	4.44	.64	4.44	.64	4.59	.57	4.70	.54	4.59	.57	4.67	.56	4.63	.57
		Post	26	4.46	.71	4.31	.79	4.38	.75	4.69	.62	4.46	.76	4.50	.71	4.58	.64
Year 2	All[a]	Pre	45	4.33	.85	4.22	.95	4.42	.87	4.56	.76	4.44	.84	4.53	.77	4.49	.82
		Post	39	4.51	.72	4.51	.72	4.49	.76	4.64	.71	4.62	.75	4.62	.75	4.59	.72
	First-Time	Pre	17	4.53	.80	4.53	.80	4.59	.87	4.65	.79	4.53	.87	4.59	.80	4.65	.79
		Post	17	4.76	.56	4.76	.56	4.65	.61	4.76	.56	4.76	.56	4.76	.56	4.76	.56
	Returning	Pre	28	4.21	.88	4.04	1.00	4.32	.86	4.50	.75	4.39	.83	4.50	.79	4.39	.83
		Post	22	4.32	.78	4.32	.78	4.36	.85	4.55	.80	4.50	.86	4.50	.86	4.45	.80
Year 3	All	Pre	16	4.37	.62	4.37	.62	4.31	.60	4.63	.50	4.56	.73	4.50	.73	4.50	.73
		Post	15	4.73	.46	4.73	.46	4.60	.63	4.80	.41	4.60	.51	4.67	.49	4.60	.51
	First-Time[b]	Pre	7	4.14	.39	4.14	.39	4.14	.39	4.43	.54	4.14	.90	4.00	.82	4.14	.90
		Post	6	4.83	.41	4.83	.41	4.50	.84	4.83	.41	4.50	.55	4.50	.55	4.67	.52
	Returning[b]	Pre	9	4.56	.73	4.56	.73	4.44	.73	4.78	.44	4.89	.33	4.89	.33	4.78	.44
		Post	9	4.67	.50	4.67	.50	4.67	.50	4.78	.44	4.67	.50	4.78	.44	4.56	.53

Note. Essential nature of self-determination was measured on a 5-point Likert scale from 1 (not at all essential) to 5 (very essential). All values were rounded to the nearest hundredth. [a]All teachers trained in the first year were considered first-time training participants because this was the first training conducted during project years. [b]Descriptitve statistics were only reported for Year 3 teachers. No dependent sample *t*-tests were conducted.