Microteaching Lesson Study: Its Impact on the Development of Self-Efficacy with Teachers-in-Training in a Community-Based Outreach Program

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Abstract

Lesson study is a collaborative inquiry method that bridges pre-service and in-service teacher training. It encourages teachers to plan, execute, and reflect on lessons delivered to students in a supportive and collaborative environment. Microteaching during a lesson provides the layering of strategies into the lesson. Lesson study and microteaching can be combined into a microteaching lesson study (MLS) to create a cyclical process of planning, executing, reviewing, and reflecting on a lesson. MLS has been shown to be effective in teacher training programs. Teacher self-efficacy, a belief that their skills can impact student success, may be enhanced by MLS. This study examines the impact of MLS on teacher self-efficacy in a graduate education course at a private college in the suburbs of New York City. The MLS was embedded as part of an authentic course requirement that provided an enrichment program to elementary school students in a local school district via an online platform. Fifty-four graduate students completed a pre and post survey assessing their self-efficacy in engaging students in the learning process and the implementation of instructional strategies. The results showed that MLS significantly increased their teacher self-efficacy in these areas. MLS helped the graduate students prepare for authentic teaching experiences and may better prepare them for their full-time student teaching requirements.

Keywords

Microteaching Lesson Study (MLS), Teacher Self-Efficacy, Special Education Graduate Course

1. Introduction

For teachers-in-training there is no substitute for excellent curricula and rigorous classroom instruction. As beginning teachers, it is important to develop and build on their pedagogical methods, but it is just as important for them not to do it alone. University teacher training programs have embarked on professional development as support systems for new teachers (Coenders & Verhoef, 2019). The purpose of these professional development programs is first and foremost to supplement a critical component of teacher education which is teacher quality and overall efficacy of teachers in the classrooms in designing and executing their lessons. Successful models of professional development allow collaboration with colleagues, offer opportunities for reflection and discussion of teaching strategies, as well as nurture their beliefs that they can use instructional strategies to impact the teaching and learning experience and maintain student engagement in the process (Bayram & Bıkmaz, 2021).

Rock and Wilson (2005) pointed out that it is important that teachers undergo continuous professional development to improve their instruction and student outcomes. This continuum ensures improved and effective methods of instructional delivery thus centering teachers as life-long learners while broadening their understanding of teaching, assessment, observation, feedback, and reflection (Darling-Hammond & McLaughlin, 2011). Such a communal consultation of educators lays the foundations for an improved best-practices collaboration that not only connects instructors with their students but also creates a forum for shared knowledge. This collaborative engagement of teachers in professional development broadens their understanding of teaching, assessment, observation, feedback, and reflection, which are the hallmarks of effective professional development.

Nevertheless, teacher professional development programs have a disconnect from this tenet of life-long learning and active participation by failing to use professional development as a bridge between pre-service and in-service training. The discontinuity disrupts not only the idea of professional development and student learning as mutually beneficial but also a consistent avenue to re-evaluation and re-assessment of best practices in the classroom.

Saito (2012) stated:

In recent research, it has been argued that effective professional learning would continue over the long term and is best suited for a school community that promotes learning. This requires an examination of the teachers on a daily basis. In order to develop such a community, it becomes increasingly important for teachers to mutually observe and jointly reflect on practices at the classroom level. (p. 777)

An effective method of professional development called lesson study provides a way to bridge the gap between pre-service and in-service training. It also connects the life-long learning objectives of teachers and instructors to the need for

continued re-evaluation, assessment, and examination of the classroom experiences for teachers and students. Teaching and learning are dynamic and professional development seeks to inform new ways of thinking and doing; lesson study offers an interactive and engaging inquisition to teaching that is not only beneficial to the students and teachers but to the overall growth and sharing of knowledge.

2. Lesson Study

Jugyou Kenkyu, or Lesson Study (LS) is a collaborative inquiry method of professional development that has roots in Japan where it is used widely for all subjects (Isoda, 2007). Jugyou, translated directly from Japanese means "lesson," and Kenkyu, means "study or research" (Fernandez & Yoshida, 2004). LS gained traction in the United States after an inferior performance by American students at the Third International Mathematics and Science Study (TIMMS) in 1999. United States teachers observed Japanese teachers implementing LS and videotaped the lessons and discussed it in a seminal book, *The Teaching Gap* (Stigler & Hiebert, 1999).

Lesson study allows a group of teachers to plan and practice lessons that directly affect their students. In a typical LS planning session, teachers will research and write a lesson plan, considering the expected outcomes and the anticipated response from their students. Then they will execute the lesson plan while being observed by colleagues after which they meet to reflect on the lesson presentation. As they re-evaluate and refine the lesson for the next session, the group is studying that lesson plan and giving effective feedback in a collaborative and engaging manner to improve it. Though variations of the model exist, LS has three major components;

1) *Planning*. Addressing each activity and its connection to the intended outcomes.

2) *Observation*. The lesson is taught and observed by colleagues who assess the overall effectiveness of delivery and content.

3) *Reflection*. Teachers and colleagues reflect on what they thought about their lesson and discuss it with observers. After this lesson re-evaluation, they collaborate on ways to improve on the lesson and then run it through the cycle again.

A Lesson Study is a collaborative effort from design, implementation to re-evaluation with each member of the group providing thoughtful feedback on the lesson. Stigler and Hiebert (1999) called this "research lessons" which are actual lessons taught to a group of students, but which have been collaboratively designed and critiqued by colleagues in a group setting. The lesson's implementation is then observed, analyzed, and reflected upon by group members and/or outside observers. LS offers teachers and students an opportunity to learn from one another as they reflect on the effectiveness of the session.

This kind of model allows teachers an opportunity to design, share knowledge

with one another, and brainstorm new concepts and strategies that are beneficial to student learning. While this can be done informally and as a support system, school administrators can allocate resources that allow schools to function as cohesive teacher communities. They can also encourage teamwork by blocking out time for teachers to "work and learn collaboratively," team-planning, learning, sharing new knowledge and adapting to new ways of thinking (Darling-Hammond & McLaughlin, 2011).

3. Microteaching

Lesson study has been an effective tool to impact the teaching and learning process of in-service teachers. Iksan et al. (2014) implemented this cyclical process of lesson study by creating, implementing, and reflecting on lessons with teachers-in-training in a curriculum and pedagogy course. Through microteaching, which focuses on developing specific skills in the context of lesson planning, teachers-in-training skills were addressed. **Microteaching** creates an environment for collaborative work, in which educators have an opportunity to practice and tweak their primary teaching skills which might be difficult to do in a classroom setting as a "learning platform" (Remesh, 2013). Microteaching in a teacher training program provides preservice teachers the opportunity to learn, craft, and apply specific skills for teaching and simulate the assessment of student learning within the cycle of observation, collaboration, teaching, reflecting, critiquing, and re-teaching using the improved lesson study.

In Iksan et al.'s study, instructors simulated targeted skills and provided the teachers-in-training with opportunities to plan lessons and execute the lesson with one another. The learning objectives, teaching tools, and methods to monitor student learning were implemented. Each group's members were given specific roles of teaching or assessing. The use of reflection for the teachers-in-training and assessors to explore the lesson's effectiveness was impactful. This study combined the elements of lesson study and microteaching leading Iksan et al. to conclude that the integration of lesson study in microteaching classes is effective and recommend that this strategy be utilized with pre-service teachers in addition to in-service teachers.

The combination of lesson study with microteaching is an opportunity to integrate the process driven approach to planning, executing, and reflecting on the teaching and learning process in a classroom setting. Lesson study and microteaching are both instructional improvement strategies that share a strong internal connection. Lesson study is a professional development model in which teachers/teachers-in-training work together to design, teach, observe and refine lessons. Microteaching is a technique used in teacher education that involves teachers/teachers-in-training practicing and refining their specific teaching methods. In this way, microteaching serves as a precursor to lesson study. Thus, the internal connection between microteaching and lesson study lies in their complementary nature. Microteaching serves as a foundation for lesson study by

providing teachers/teachers-in-training with the opportunity to practice and refine their teaching skills, while lesson study provides a collaborative situation for teachers to work together to design, teach, observe, and refine lessons. Together microteaching lesson study (MLS) can help to improve teaching and learning outcomes for teachers/teachers-in-training and their students.

Microteaching lesson study (MLS) includes five steps: addressing lesson content (student learning goal); structuring the experience (plan, implement, analyze, revise cycle), feedback (peers and advisors in MLS group), implementation (small group setting), and the production of a written reflection and revised lesson plan. "It includes cycles composed of several phases, collaborative planning, lesson observation by colleagues and other knowledgeable advisors, analytic reflection, and ongoing revision" (Fernandez, 2010: p. 351). In a study conducted with 18 education students in an introductory teaching course, data was collected on the MLS. While the experience simulated a simplified classroom setting, Fernandez (2010) purported that "MLS sufficiently maintained important and authentic aspects of the complexity of typical classroom practice in order to help focus the prospective teachers' attention on content pedagogy and the related student learning while engaging in managing classroom processes" (p. 359). MLS provided the opportunity to engage education students in the multifaceted process of teaching that includes intensive planning, practice, and reflection. Fernandez noted that future research may want to address how future teachers apply the principles of MLS in their classrooms.

One critique of the Fernandez study was the simulation of a classroom, which was lacking in actual students and student experiences. The authentic process of teaching and learning with actual students to determine the lesson's effectiveness was missing. As a result, the impact of MLS design in an authentic setting is in question. Would the MLS be as impactful in an authentic setting? Would education students experience a change in their teaching skills and in other areas, such as self-confidence and self-belief as a result of the dynamic exchanges with students? Would MLS applied in an authentic setting better prepare teachers-in-training with teacher self-efficacy?

4. Self-Efficacy

Bandura (1995: p. 2), known for his contributions in the field of social learning theory, researched self-efficacy, which refers to an individual's belief in their own ability to accomplish a specific goal or task. Self-efficacy is "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations". Bandura's self-efficacy theory posits that individuals with high levels of self-efficacy are more likely to engage in challenging tasks, persist in the face of obstacles, and ultimately achieve success. On the other hand, individuals with low self-efficacy may avoid challenging tasks, give up easily when faced with obstacles, and experience feelings of anxiety and self-doubt.

In education, teacher self-efficacy is a belief in their own abilities which influ-

ences their motivation, behavior, and performance in the classroom. As a result, these beliefs impact their students' classroom experience. "Teacher efficacy is explained as a teacher's judgments as to the knowledge and skills one possesses and applying those beliefs about his or capabilities and capacities to affect students' success" (Cerruto & Moroney, 2020: p. 170). Teacher self-efficacy is impacted by their commitment and attitude towards their students, the teaching/learning process, and their professional goals and aspirations (Cerruto & Moroney, 2020: p. 170).

For graduate education students, authentic experiences, like student teaching, are direct learning opportunities to develop their skills such as teaching strategies, motivational tools, and assessment measures. Bandura has identified strategies for increasing self-efficacy, such as modeling, social persuasion, and mastery experiences that can be applied in authentic experiences such as student teaching or clinical opportunities. These hands-on experiences shape their belief in themselves as effective teachers. Studies demonstrate the value of experiential learning opportunities to develop self-efficacy (Tschannen-Moran & Hoy, 2001; Tasgin & Kucukogl, 2016). These studies utilized a Teacher Self Efficacy Scale to measure these changes through experiential learning and are suggested to demonstrate measured progress during the preparatory phases of teacher education.

During teacher training, the cyclical, collaborative, and reflective nature of the microteaching lesson study may impact their sense of self efficacy. As Bandura posited, modeling, social persuasion, and mastery experiences, impact the development of self-efficacy. In MLS, the process of direct instruction of planning and executing an effective lesson, the implementation of strategies, and the act of reflecting on the lesson with the support, guidance, and suggestions of others may bolster a sense of self efficacy. The element of microteaching specific skills such as teaching strategies and implementing assessment tools may provide teachers in training with the opportunities to practice these teaching skills in a supportive environment thereby impacting their belief in their abilities. The extent of the impact of MLS on self-efficacy is unknown, particularly in authentic teaching settings.

At a small private college in the suburbs of NYC, a master's level teaching program attempted to implement MLS to explore the impact of it on teacher-in-training self-efficacy. In a strategy and pedagogical methods course, graduate students engaged in microteaching within a lesson study in an authentic experience. This course is offered, within the graduate program sequence, prior to student teaching and may be the first authentic teaching experience for the graduate students. Through a collaborative project with a local school district an enrichment program designed to address foundational ELA skills within a social emotional learning context has been running for numerous years. Graduate students engage in lesson study, designing and executing lessons with actual students. Additionally, elements of microteaching are infused in the sessions in which the professors model the strategies and provide the graduate students with opportunities to execute these skills with feedback and situations to engage in a

review and reflection process immediately following the sessions.

Due to the COVID-19 pandemic this authentic fieldwork component of a methods course in a graduate special education program was required to pivot and adapt to the demands of online teaching and learning. Graduate students, as a course requirement, engaged in a four-week virtual enrichment program with a local school district to address social emotional learning needs based on English language arts standards. The course instructors selected authentic pieces of children's literature that the modified unit plan utilized, which was based on the book, *Growing a Growth Mindset* by Sheehan and Ryan (2017). Small groups of graduate students collaboratively planned, executed, and reflected on the lessons, while consulting with their field supervisor and course instructor; revising, executing, and reflecting on the lessons in their small groups and with the class at large. The design of this program is an adaptation and modified lesson study. Course instructors modeled various teaching strategies and technology techniques due to an unfamiliar virtual platform. Zoom sessions were established with the graduate students, professors, and elementary students at a local school district on Saturday mornings.

5. Research Question

This research study aimed to determine the impact of the use of a microteaching lesson study approach on graduate students' sense of self-efficacy in the areas of student engagement and use of instructional strategies in an outreach program with the local community

Research questions:

1) Did the MLS process, including intensive support during the preparation, execution, and reflections of the lessons as a team, positively impact graduate students' overall sense of self-efficacy?

2) Does the use of MLS impact graduate students' sense of self-efficacy related to student engagement in a community-based outreach enrichment program?

3) Does the use of MLS impact graduate students' sense of self-efficacy related to the use of instructional strategies in a community-based outreach enrichment program?

6. Methods

This program implemented MLS with authentic application in our enrichment program. A pre-post design was conducted in which the graduate students volunteered to engage in a self-efficacy survey prior to the beginning of the four-week program with the elementary school students and at the conclusion of the program. The survey was comprised of two subscales of the Teachers Sense of Self Efficacy Scale created by the London School of Excellence Fund (2015). The data collection for this experiment was conducted in accordance with all applicable institutional review board (IRB) procedures. All participants provided informed consent, and their rights and privacy were protected throughout the study.

Data Collection

Data was collected from the graduate course over a period of three semesters, Fall of 2021, Spring of 2022, Fall of 2022. Graduate students completed two subscales of the Teachers Sense of Self Efficacy Scale (London School of Excellence Fund, 2015). The two subscales, student engagement and instructional strategies, focused in on the impact of the teacher's belief in their knowledge, skills, and disposition as they related to the coursework and enrichment program. This design allows the researchers to measure changes in the participating graduate students' sense of self-efficacy over the course of any one of the three semesters, thus assessing the effectiveness of their participation in the project. Graduate students, as a course requirement, engaged in a four-week virtual enrichment program with a local school district to address social emotional learning needs based on English language arts standards. Small groups of graduate students collaboratively designed the lessons, while consulting with their field supervisor, revising, executing, and reflecting on the lessons in their small groups and with the class at large. The design of this program is an adaptation and modified lesson study. Professors modeled various teaching strategies and technology techniques due to an unfamiliar virtual platform. Zoom sessions were established with the teachers in training, professors, and elementary students at a local school district on Saturday mornings.

Participants

Program participants included 58 graduate students enrolled in a graduate special education methods and strategies course during one of the following semesters: Fall 2021, Spring 2022, or Fall 2022. The graduate students collaborated in developmental groups ranging from prekindergarten to grade 5. Approximately 70 elementary school students participated in each of the four weekly hour-long enrichment sessions. Each group was mentored by faculty acting in a field supervisory role. While 58 of the graduate students completed two subscales of a pre and post survey online using the London School Excellence Fund's (2015) Teacher Sense of Self Efficacy Survey, 4 cases contained a high number of missing data. As a result, they were excluded from the sample. The remaining 54 cases were used for statistical analysis.

7. Results

During the statistical analysis, four cases with missing values in multiple variables of the Teachers Sense of Self Efficacy Scale were excluded from the sample and from any further statistical tests. Table 1 provides a general overview of the distribution of the data. The mean score for the overall self-efficacy scale at the pretest stage is 6.99 with a standard deviation of 1.12, while the same score at the posttest stage is 8.06 with a standard deviation of 0.75. The efficacy in student engagement subscale has a mean score of 7.03 at the pretest stage, and a mean score of 8.03 at the posttest stage, with a standard deviation of 1.11 and 0.78, respectively. Finally, the mean score for the efficacy in instructional strategies

Table 1. Descriptive statistics.

	Range	Min	Max	Mean	σ	Skewness		Kurtosis	
						Statistic	σ_s	Statistic	σ_k
Overall self-efficacy									
Pretest	5.38	3.25	8.63	6.9988	1.12785	−0.965	0.325	1.360	0.639
Posttest	3.25	5.75	9.00	8.0694	0.75144	−1.077	0.325	0.795	0.639
Student Engagement									
Pretest	5.13	3.75	8.88	7.0394	1.11983	−0.714	0.325	0.488	0.639
Posttest	3.50	5.50	9.00	8.0347	0.78699	−1.098	0.325	1.084	0.639
Q1. How much can you do to get through the most difficult students?									
Pretest	6	3	9	6.69	1.477	−0.305	0.325	0.074	0.639
Posttest	4	5	9	7.78	1.093	−0.618	0.325	−0.181	0.639
Q2. How much can you do to help your students think critically?									
Pretest	4	5	9	6.83	1.161	0.038	0.325	−0.774	0.639
Posttest	4	5	9	8.09	1.014	−0.980	0.325	0.405	0.639
Q3. How much can you do to motivate students who show low interest in schoolwork?									
Pretest	5	4	9	7.22	1.423	−0.409	0.325	−0.645	0.639
Posttest	3	6	9	8.11	0.883	−0.565	0.325	−0.685	0.639
Q4. How much can you do to get students to believe they can do well in schoolwork?									
Pretest	6	3	9	7.54	1.410	−0.958	0.325	0.736	0.639
Posttest	4	5	9	8.37	0.831	−1.619	0.325	3.697	0.639
Q6. How much can you do to help your students value learning?									
Pretest	5	4	9	7.15	1.265	−0.463	0.325	−0.247	0.639
Posttest	4	5	9	8.20	0.979	−1.181	0.325	1.022	0.639
Q9. How much can you do to foster student creativity?									
Pretest	7	2	9	7.26	1.532	−0.914	0.325	1.195	0.639
Posttest	3	6	9	8.33	0.869	−1.076	0.325	0.186	0.639
Q10. How much can you do to improve the understanding of a student who is failing?									
Pretest	7	2	9	6.72	1.433	−0.527	0.325	1.144	0.639
Posttest	4	5	9	7.76	1.080	−0.801	0.325	0.445	0.639
Q14. How much can you assist families in helping their children do well in school?									
Pretest	5	4	9	6.91	1.457	−0.213	0.325	−0.709	0.639
Posttest	4	5	9	7.63	1.218	−0.672	0.325	−0.405	0.639
Instructional strategies									
Pretest	6.00	2.75	8.75	6.9583	1.19477	−1.090	0.325	1.810	0.639
Posttest	3.00	6.00	9.00	8.1042	0.75772	−0.875	0.325	0.171	0.639

Continued

Q5. How well can you respond to difficult questions from your students?

Pretest	7	2	9	6.28	1.433	−0.592	0.325	0.155	0.639
Posttest	4	5	9	7.63	1.218	−0.802	0.325	0.116	0.639

Q7. How much can you gauge student comprehension of what you have taught?

Pretest	6	3	9	6.98	1.296	−0.451	0.325	0.429	0.639
Posttest	3	6	9	8.20	0.786	−0.624	0.325	−0.337	0.639

Q8. To what extent can you craft good questions for your students?

Pretest	8	1	9	6.78	1.562	−1.034	0.325	2.226	0.639
Posttest	3	6	9	8.15	0.878	−0.647	0.325	−0.547	0.639

Q11. How much can you do to adjust your lessons to the proper level for individual students?

Pretest	5	4	9	7.11	1.298	−0.428	0.325	−0.436	0.639
Posttest	3	6	9	8.09	1.014	−0.754	0.325	−0.642	0.639

Q12. How much can you use a variety of assessment strategies?

Pretest	7	2	9	7.28	1.433	−1.031	0.325	2.026	0.639
Posttest	3	6	9	8.30	0.944	−1.196	0.325	0.427	0.639

Q13. To what extent can you provide an alternative explanation or example when students are confused?

Pretest	7	2	9	6.89	1.525	−0.899	0.325	1.156	0.639
Posttest	4	5	9	8.15	0.940	−1.014	0.325	0.919	0.639

Q15. How well can you implement alternative strategies in your classroom?

Pretest	4	5	9	7.22	1.239	−0.256	0.325	−0.828	0.639
Posttest	4	5	9	8.07	1.147	−1.085	0.325	0.297	0.639

Q16. How well can you provide appropriate challenges for very capable students?

Pretest	7	2	9	7.13	1.441	−1.335	0.325	2.648	0.639
Posttest	3	6	9	8.24	0.823	−0.692	0.325	−0.535	0.639

N = 54.

subscale at the pretest stage is 6.95, with a standard deviation of 1.19, while the same score at the posttest stage is 8.10, with a standard deviation of 0.75.

The results of the paired-samples t-test (see Table 2) indicate that there was a statistically significant increase in the participating graduate students' overall sense of self-efficacy from the pretest to the posttest stage, with a t-value of 8.73 and a p-value of 0.000 (at 95% confidence). The treatment also increased participants' sense of self efficacy in student engagement (t = 8.61, p = 0.000) and of efficacy in instructional strategies (t = 8.09, p = 0.000). These results suggest that MLS was effective in increasing participating graduate students' sense of self-efficacy in totality, as well as, in terms of the two subscales selected for this study.

Table 2. Paired samples test.

Mean	σ	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tail)
			Lower	Upper			
Overall Self-Efficacy							
1.0706	0.90033	0.12252	0.82486	1.31634	8.738	53	0.000
Student Engagement							
0.99537	0.84917	0.11556	0.76359	1.22715	8.614	53	0.000
Q1. How much can you do to get through the most difficult students?							
1.093	1.377	0.187	0.717	1.469	5.829	53	0.000
Q2. How much can you do to help your students think critically?							
1.259	1.067	0.145	0.968	1.551	8.670	53	0.000
Q3. How much can you do to motivate students who show low interest in schoolwork?							
0.889	1.144	0.156	0.577	1.201	5.711	53	0.000
Q4. How much can you do to get students to believe they can do well in schoolwork?							
0.833	1.209	0.165	0.503	1.163	5.064	53	0.000
Q6. How much can you do to help your students value learning?							
1.056	1.172	0.160	0.736	1.376	6.617	53	0.000
Q9. How much can you do to foster student creativity?							
1.074	1.399	0.190	0.692	1.456	5.643	53	0.000
Q10. How much can you do to improve the understanding of a student who is failing?							
1.037	1.317	0.179	0.678	1.397	5.786	53	0.000
Q14. How much can you assist families in helping their children do well in school?							
0.722	1.687	0.230	0.262	1.183	3.146	53	0.003
Instructional Strategies							
1.14583	1.04067	0.14162	0.86179	1.42988	8.091	53	0.000
Q5. How well can you respond to difficult questions from your students?							
1.352	1.376	0.187	0.976	1.727	7.221	53	0.000
Q7. How much can you gauge student comprehension of what you have taught?							
1.222	1.223	0.166	0.888	1.556	7.341	53	0.000
Q8. To what extent can you craft good questions for your students?							
1.370	1.545	0.210	0.949	1.792	6.516	53	0.000
Q11. How much can you do to adjust your lessons to the proper level for individual students?							
0.981	1.339	0.182	0.616	1.347	5.388	53	0.000

Continued

Q12. How much can you use a variety of assessment strategies?							
1.019	1.380	0.188	0.642	1.395	5.422	53	0.000
Q13. To what extent can you provide an alternative explanation or example when students are confused?							
1.259	1.376	0.187	0.884	1.635	6.724	53	0.000
Q15. How well can you implement alternative strategies in your classroom?							
0.852	1.420	0.193	0.464	1.239	4.409	53	0.000
Q16. How well can you implement alternative strategies in your classroom?							
0.944	1.607	0.219	0.506	1.383	4.319	53	0.000

N = 54.

The effect size of the paired-samples t-test was measured using Cohen's d (see Table 3). Cohen's d for the overall scale was 1.18, which indicates that, at the posttest stage, the participating graduate students' average sense of self-efficacy is 1.18 standard deviations higher than it was at the pretest stage. Similarly, Cohen's d was 1.17 for the Efficacy in Student Engagement subscale, and 1.10 for the Efficacy in Instructional Strategies subscale.

8. Discussion

The purpose of this study was to determine the impact of the use of microteaching lesson study approach on graduate students' sense of self-efficacy in an outreach program with the local community. The use of MLS provided the graduate students with a supportive community of peers and mentors to plan, execute, and reflect on lessons implemented with local elementary school students. Through the use of the MLS, graduate students engaged in a cyclical practice which positively impacted their self-efficacy to be successful when facilitating lessons with students. The results of the paired samples t-test strongly suggest that the graduate students' overall sense of self-efficacy from the pretest to the post test stage significantly increased. Moreover, the significant increase in sense of self-efficacy in student engagement and instructional strategies suggest that the MLS experience was effective in increasing graduate students' belief that they could be effective teachers and positively impact the learning experience of the elementary school students through the use of effective methods of engagement and instructional strategies.

Closer interpretation of the data highlights the wider impact of increased teacher self-efficacy. Item number 4 in the student engagement section of the Teacher Sense of Self Efficacy Scale asks "how much can you do to get students to believe they can do well in schoolwork?' This item explores the teacher's self-efficacy that they can impact student self-efficacy. The statistically significant result reflects the graduate students' increased belief that they can impact their elementary students' beliefs in their abilities. Bandura posited that modeling,

Table 3. Cohen's d Hedges' correction.

	Standardizer	Point Estimate	95% Confidence Interval	
			Lower	Upper
Overall Self-Efficacy				
Cohen's d	0.90033	1.189	0.836	1.535
Hedges' correction	0.90676	1.181	0.830	1.524
Student Engagement				
Cohen's d	0.84917	1.172	0.821	1.516
Hedges' correction	0.85524	1.164	0.816	1.505
Q1. How much can you do to get through the most difficult students?				
Cohen's d	1.377	0.793	0.484	1.097
Hedges' correction	1.387	0.788	0.481	1.089
Q2. How much can you do to help your students think critically?				
Cohen's d	1.067	1.180	0.828	1.525
Hedges' correction	1.075	1.172	0.822	1.514
Q3. How much can you do to motivate students who show low interest in schoolwork?				
Cohen's d	1.144	0.777	0.470	1.079
Hedges' correction	1.152	0.772	0.466	1.072
Q4. How much can you do to get students to believe they can do well in schoolwork?				
Cohen's d	1.209	0.689	0.389	0.984
Hedges' correction	1.218	0.684	0.387	0.977
Q6. How much can you do to help your students value learning?				
Cohen's d	1.172	0.900	0.581	1.214
Hedges' correction	1.181	0.894	0.576	1.206
Q9. How much can you do to foster student creativity?				
Cohen's d	1.399	0.768	0.461	1.069
Hedges' correction	1.409	0.762	0.458	1.061
Q10. How much can you do to improve the understanding of a student who is failing?				
Cohen's d	1.317	0.787	0.479	1.090
Hedges' correction	1.326	0.782	0.475	1.083
Q14. How much can you assist families in helping their children do well in school?				
Cohen's d	1.687	0.428	0.147	0.705
Hedges' correction	1.699	0.425	0.146	0.700
Instructional Strategies				
Cohen's d	1.04067	1.101	0.759	1.437
Hedges' correction	1.04810	1.093	0.753	1.426

Continued

Q5. How well can you respond to difficult questions from your students?

Cohen's d	1.376	0.983	0.654	1.305
Hedges' correction	1.386	0.976	0.649	1.296

Q7. How much can you gauge student comprehension of what you have taught?

Cohen's d	1.223	0.999	0.668	1.323
Hedges' correction	1.232	0.992	0.664	1.314

Q8. To what extent can you craft good questions for your students?

Cohen's d	1.545	0.887	0.568	1.199
Hedges' correction	1.557	0.880	0.564	1.191

Q11. How much can you do to adjust your lessons to the proper level for individual students?

Cohen's d	1.339	0.733	0.430	1.031
Hedges' correction	1.348	0.728	0.427	1.024

Q12. How much can you use a variety of assessment strategies?

Cohen's d	1.380	0.738	0.434	1.036
Hedges' correction	1.390	0.733	0.431	1.029

Q13. To what extent can you provide an alternative explanation or example when students are confused?

Cohen's d	1.376	0.915	0.594	1.230
Hedges' correction	1.386	0.909	0.589	1.222

Q15. How well can you implement alternative strategies in your classroom?

Cohen's d	1.420	0.600	0.308	0.888
Hedges' correction	1.430	0.596	0.305	0.881

Q16. How well can you implement alternative strategies in your classroom?

Cohen's d	1.607	0.588	0.296	0.875
Hedges' correction	1.618	0.584	0.294	0.868

a. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

social persuasion and mastery experiences can develop self-efficacy. The graduate students were the benefactors of the experience but also may have passed the benefits onto their elementary school students. Through increased teacher self-efficacy, by believing in themselves, they are helping students' belief in themselves. The cyclical and collaborative MLS process brings to light the interconnectedness of the school community to raise the level of every teaching and learning experience.

9. Implication

The MLS was a collaborative and dynamic experience with graduate students, mentors, professors, and elementary school students. Through the utilization of the MLS structure, positive impact on the graduate student's teacher self-efficacy was evident. The collaboration among graduate students, mentors, and professors created the opportunity for the graduate students to develop skills to increase self-efficacy while planning, executing and reflecting on a lesson. Based on the graduate students' belief that they could impact their elementary students' belief in their abilities, future research could focus on the elementary school students' development of self-efficacy during the program. As a result of this initial authentic teaching experience, it would be interesting to see if the impact of the MLS experience changes the quality of the graduate students' performance during their student teaching placements. Future research could follow the graduate students into student teaching to measure graduate student success.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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