

Examining the impact of lesson study on teachers' professional development: A quasi-experimental study

Muluaem Abie Mengistu 

Ph.D. Candidate, Department of Teacher Education and Curriculum Studies, College of Education, Bahir Dar University

Mulugeta Yayeh Worku (Ph.D.) 

Associate Professor of Curriculum and Instruction, College of Education, Bahir Dar University

Tadesse Melesse (Ph.D.) 

Associate Professor of Curriculum and Instruction, College of Education, Bahir Dar University

Abstract

This study sought to examine the impact of lesson study on teachers' professional development. For this purpose, a quasi-experimental design involving 46 English teachers from 24 primary schools in Bahir Dar city, Ethiopia, was employed. Data were collected through questionnaires and analyzed quantitatively using means, standard deviations, independent samples t-tests, and pair sample t-tests. The findings of the study revealed that the teachers in the experimental group who participated in the lesson study intervention demonstrated better professional practices than those in the control group. This improvement was evident in the teachers' ability to prepare lesson plans, deliver classroom teaching, and reflect on lesson plans. Furthermore, the pre-test and post-test results of the experimental group showed that teachers had demonstrated better performance after the intervention. Generally, the study highlighted that a well-planned and implemented lesson study program can have a positive impact on the professional development of teachers.

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Introduction

Teacher Professional Development (TPD) plays a pivotal role in making various school improvement initiatives successful. Teacher professional learning that is context specific, job embedded, and content-based is particularly important for addressing the diverse needs of students and teachers in differing settings (Darling-Hammond et al., 2017). Teachers' engagement in a well-planned and managed continuous professional learning program has a paramount significance in improving the professional quality of teachers and in boosting the quality of educational services at large (OECD, 2020). Hence, there has been a growing global consideration for teachers' professional development.

CONTACT Muluaem Abie Mengistu  muliemengistu2003@gmail.com

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According to Desimone (2009), the primary purpose of any TPD program is to bring changes in teachers' academic and professional competences, which in turn, would lead to the improvement of students' learning outcomes. Likewise, Rock and Wilson (2005) underscored the role that teacher professional development plays in improving various instructional practices and students' learning achievements. As many other scholars asserted, well managed teacher professional development programs provide teachers with the opportunity to active learning, exploration, reflection, discussion, collective participation, collegial sharing, and constructive feedback (Desimone, 2009; Sherin & Han, 2004).

Effective professional development, as stated by Desimone (2009), involves job-embedded active learning that is focused on content and context collaborative, aligned with curricula and policies, and allows sufficient time for learning. Triwaranyu (2007) emphasized the importance of considering teachers as pillars to student learning, promoting individual, collegial, and organizational improvement, and respecting the intellectual capacity of teachers. Lenski and Caskey (2009) on their part contend that professional development programs should prioritize a learning community that fosters collaboration among teachers rather than relying solely on traditional workshops.

Lesson Study (LS) is one of the emerging models widely used in teacher development programs. Many studies reported the role it plays in making teacher development and learning community schemes effective (Lieberman, 2009). Lesson study, according to Stigler and Hiebert (1999), is a form of professional development in which teachers come together for a period of time to improve their lessons by collaboratively designing (planning), implementing, revising, and reflecting. For these scholars, lesson study provides teachers with the opportunity to learn from their own teaching experiences and to examine their practices in the classroom. Lesson study is also useful to foster the culture of school-based collaboration, peer feedback, and discussion (Lewis et al., 2009). Through lesson study, teachers continuously collaborate and engage in a community of learning which ultimately helps them to improve their professional practices and competences.

According to Fernandez (2010), the lesson study process involves four main elements: (1) study and plan, (2) implementing the lesson, (3) revise and reteach, and (4) reflection and report writing in a collaborative mindset. In the lesson study process, collaboration occurs among teachers with different levels of experience (Rock & Wilson, 2005). Collaboration of teachers is important to update their content knowledge, pedagogical skills, values, and experiences. It also plays important roles in improving teachers' confidence and in providing opportunities for professional dialogue on various instructional issues.

In lesson study, teachers improve the lessons not as an end in itself, but as a way to deepen their own content knowledge and knowledge of student thinking, their understanding of teaching and learning as well as their commitment to the improvement of their own practices and their colleagues'. As Lewis and Hurd (2011) stated, lesson study is not about discovering one right way to teach a lesson, but it is about building knowledge for many teaching strategies and habits of observation, inquiry, and analysis of practice.

Due to this, many scholars consider lesson study as a powerful teacher professional development and school improvement program (Darling-Hammond et al., 2017; Desimone, 2009). A study conducted by Darling-Hammond et al. (2017) indicates that while professional development is crucial for preparing teachers to facilitate in-depth student

learning, there is significant variability in the effectiveness of professional development programs in achieving this objective.

Statement of the Problem

Numerous countries worldwide have adopted diverse Continuous Professional Development (CPD) programs. However, several researchers have investigated why certain professional development plans failed to improve teaching practices and student achievement in schools. For instance, Buczynski and Hansen (2010) argued that insufficient time allocated for teaching the newly acquired knowledge and skills, adherence to a mandated curriculum on a pacing guide, and difficulties in instructing English learners without appropriate professional development catering to their learning needs were impediments to the implementation of professional development programs. These researchers further reported that scarcity of resources such as curriculum materials, technology, science equipment, and classroom management issues were among the factors that inhibit the success of CPDs. System-level barriers, school closures, numerous daily distractions in urban schools, and challenges in engaging learners who frequently face complex external factors beyond their control were additional obstacles hindering the implementation of professional development plans (Tooley & Connally, 2016).

In Ethiopia, as a reaction to the pressing demand for quality teachers, the Ministry of Education (MoE) introduced a national school-based teacher CPD intervention program that aimed to improve the quality of teachers and thereby the learning outcomes of students (MoE, 2020). The country has been working towards improving teachers' competence with a particular emphasis on the professional development of teachers (MoE, 2015, 2018, 2020, 2021).

However, the quest for quality teachers remained an unresolved national educational agenda. For instance, the reports of the Ministry of Education indicated that the performance of school teachers was inadequate compared to the standards of the CPD program (MoE, 2018, 2020, 2021). According to some studies (e.g., Dereje, 2015; Tadesse & Sintayehu, 2022), the practice of CPD in Ethiopian schools has been engulfed by many challenges including teacher reluctance to take part in the program believing that CPD is a politically imposed initiative. These studies also reported that teachers in Ethiopian schools pass through a similar kind of content and professional development planning with poor coherence and standardization of activities. Besides, lack of willingness, motivation, collaboration, and poor school administrative support were reported to be challenges that hindered the implementation of CPD in Ethiopia (Yayeh, 2012; Worku, 2015).

Due to the above-mentioned failure story of CPD in Ethiopian schools and the increasing demand for the application of constructivism to date, the researchers believe that an alternative approach of teacher professional development has to be attempted. Therefore, the main objective of this study was to examine the impact of lesson study on teachers' professional development. For this purpose, the study is organized under the following directional hypotheses: (1) The implementation of lesson study positively affects teachers' professional development, and (2) teachers who engaged in the experimental group demonstrate better professional practices following the lesson study intervention.

Methods

Research Approach and Design

The present study employed a quantitative research approach with a quasi-experimental design. Quasi-experiments are designs in which researchers have only partial (or no) control over randomly assigning participants to levels of the manipulated variable of interest (Creswell & Creswell, 2018). Thus, quasi-experiments include purposive assignment of participants to groups. Quasi-experimental research designs test causal hypotheses and identify a comparison group that is as similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics. Therefore, in the quasi-experiment, the experimental groups were assigned purposively while the control group was assigned as a comparison to the treatment group. In both groups a pretest (before intervention) and posttest (after intervention) were administered.

However, only the experimental group received the treatment of lesson study for eight weeks and the control group uses the conventional approach. This was to allow the researchers to identify causal relationships observing under controlled conditions and see the effects of changes in the variable (Creswell & Creswell, 2018). The cause-and-effect relationship in this study is based on the activity theory of causation (Creswell, 2008). To see this relationship, the pretest-posttest comparison was made within the experimental group.

Sampling

According to the statistics of the 2021/2022 academic year of the Bahir Dar city administration education department, there were 41 government primary schools. In these schools, there were 200 English language teachers who were trained in the cluster and linear modalities*. To be specific, 89 of them (41 males and 48 females) were trained in the linear modality while the remaining 111 (38 males and 73 females) were graduates of the cluster modality.

For this study, 24 primary schools that had two or more English language teachers were purposely selected as a sample site. From these schools, 46 English language teachers teaching in Grades 5-8 were purposely selected. Since quasi-experiments use nonrandomized assignments of individuals to control and experimental groups (Creswell & Creswell, 2018), 20 English language teachers (12 males and 8 females) were assigned in the control group while 26 English language teachers (12 males and 14 females) were assigned in the experimental group using a non-equivalent purposive sampling technique.

Data Gathering Instrument

For this study, questionnaire was the main data gathering tool. The instrument was developed based on the literature review. It had 18 close-ended items with a 5-point Likert-scale ranging from 1= Very Low, 2= Low, 3= Medium, 4= High, 5= Very High.

To check the face and content validity of the initial version of the questionnaire, two curriculum and instruction professionals edited the contents, appropriateness of the items, the

* Cluster modality is a teacher education training approach that prepares teachers with integrated subjects. It is a three-year diploma certificate program that prepares teachers for teaching in grades 1-4. In this study, the integrated subjects are Amharic and English. Linear modality, on the other hand, is a three-year diploma training program with one major and one minor subject preparing teachers to teach in grade 5-8.

language and length of the constructed items and provided important comments and suggestions useful to improve the instrument. On the other hand, to check the reliability of the questionnaire, it was pilot tested in a non-sampled four primary schools on 12 English language teachers who were teaching in Grades 5-8. Finally, the Cronbach alpha values of the reliability coefficients were computed as 0.880 and it is found to be acceptable (Creswell, 2012).

After the validity and reliability test, some items that seem vague for the respondents were rejected and some were amended. Finally, the items were administered to both the control and experimental groups before and after the treatment. Similarly, comparisons were made on the experimental group participant teachers before and after the intervention to examine the impacts of the lesson study intervention on teachers' professional development.

Procedure of the Experiment

To clarify the purpose of this quasi-experimental study and to obtain the consent of the participants, the researchers conducted a brief discussion with the research participants. Thus, all of them became willing to take part in the research. Then, after selecting teachers and grouping them purposely as control and experimental groups, a pre-test questionnaire with 18 items was administered to both group respondents.

After the pre-test, a training manual with five parts was prepared to the experimental group and training was organized to familiarize the experimental group participants with the major theoretical and practical aspects of lesson study. In the training, teachers practiced the major steps and activities of lesson study. Following this training, the experiment was implemented for eight consecutive weeks. In doing so, the participants of the experimental group went through the four major steps of lesson study– planning, doing/implementation, revise and reteach, and reflection. On the other hand, the control group English language teachers taught their subject using the conventional method. After the intervention, the post-test questionnaire items were administered to both the experimental and control group teachers. Finally, a pretest – posttest comparisons were made on the experimental group English language teachers to examine the impacts of the lesson study intervention and its contributions on teachers' professional development.

Data Analysis

In this study, quantitative data analysis techniques were employed. To understand the impact of lesson study in improving teachers' professional development, the pre-test and post-test scores were analyzed using descriptive and inferential statistical methods. Independent samples t-test was used to measure see the significant differences between the control and experimental group of English language teachers' results. First, the pretest comparisons were made between the control and the experimental groups and then the post-test comparisons followed. Similarly, to check the differences between the pre-test (before intervention) and post-test (after intervention) results of the experimental group, paired sample t- test was employed.

Ethical Considerations

In this study, attempts were made to strictly follow the major principles of research ethics. Attention was given to protect the research participants and avoid research misconduct. Throughout the research, attempts were made to respect the autonomy and personal dignity of the participants.

To obtain the participants' willingness to fill the questionnaire and to clarify the purpose and tasks of the study, an informed consent was obtained. Similar consent was requested to conduct the intervention in the experimental group. To protect the participants from any kind of harm and to maintain their privacy, the principles of confidentiality and anonymity were applied. The researchers also adhered to other principles to avoid any research misconduct.

Results

Background Information of the Research Participants

In order to understand the background information of the research participants, items focusing on their sex, educational level, and teaching experiences were included in the questionnaire. The result obtained in this regard is summarized in Table 1.

Table1

Demographic Characteristics of Research Participants

Category		Number	Percent
Sex	Male	22	47.82
	Female	24	52.17
	Total	46	100
Qualification	Diploma	16	34.78
	Bachelor Degree	30	65.22
	Total	46	100
Teaching Experience	≤10 Years	11	23.91
	11-20 Years	15	32.61
	≥ 21 years	20	43.48
	Total	46	100

Table 1 presents the sex, educational level, and teaching experience of the research participants. Accordingly, 22 (47.82 %) and 24 (52.17%) of them were males and females respectively. Regarding their qualification, 16 (34.78%) were Diploma holders while the remaining 30 (65.22%) were Bachelor Degree holders. This indicates that most respondents had the required educational qualification to the grade levels they were assigned for.

As far as their teaching experience is concerned, 11 (23.91%) of them had less than or equal to 10 years of experience while 15 (32.61%) and 20 (43.48%) of them had a teaching

experience of 11-20 and above 20 years respectively. This shows that most of the participants (76%) had a teaching experience of more than 10 years.

The Impact of Lesson Study on the Professional Development of Teachers

In order to understand the impact of lesson study on the professional development of teachers, both independent samples t-test and paired sample t-test were computed. The independent samples t-test was used to analyze the pre-test and post-test results of the control and experimental groups. The paired sample t-test, on the other hand, was used to analyze the pre-test (before intervention) and post-test (after intervention) results of the experimental group. The results obtained using this approach are presented in the following tables.

Table 2

Independent Samples t-test on the Pretest Results of the Control and Experimental Groups

Variable	Respondent	N	Result	M	SD	df	t-value	P
LS for the professional development of teachers	Control	20	Pre-test	41.48	5.88	18	-.907	.325
	Experimental	26	Pre-test	41.08	5.56	24		

Table 2 shows the pre-test results of the control and experimental groups. The pretest result before the intervention revealed that there was no statistically significant difference in the mean score results of English language teachers both in the control (M=41.48, SD=5.88) and experimental groups (M=41.08, SD=5.56) at (t= -.809, df =44, P= >0.5).

Table 3

Independent Samples t-test on the Post-test Results of the Control and Experimental Groups

Variable	Respondent	N	Result	M	SD	df	t-value	P
Intervention of LS to improve the PD of teachers	Control	20	Posttest	37.320	6.85	18	-6.521	.000
	Experimental	26	Posttest	75.160	8.42	24		

Table 3 shows the independent samples t-test of the post-test results of the control and experimental groups. As can be seen from the same table, there is a significant statistical difference between the control group (M=37.320, SD= 6.85) and the experimental group (M=75.160, SD=8.42) at t= -6.521, df =46, p = <0.5. The result reveals that the post-test mean score result of the experimental group is greater than the post-test mean score result of the control group. This implies that the teachers participated in the experimental group had achieved better professional development than their counterparts in the control group.

Table 4*Paired Sample t-test on the Pretest and Posttest Results of the Experimental Group*

Variable	Group	Result	N	M	SD	df	t-value	p
LS intervention for impacting the PD of teachers	Experimental group	Pre test	26	41.08	5.56	24	-16.318	.000
		Post test	20	71.48	6.41	19		

Table 4 shows the paired sample t-test results on the pretest and posttest scores of the experimental group. The results indicate a significant statistical mean difference between the pre-test (before intervention) and post-test (after intervention) results with in the experimental group. This is because, the post-test mean value (71.48, SD=6.41) is much greater than the pre-test mean value (41.08, SD= 5.56) at $t = -16.318$, $df = 44$, $p = 0.000$. The result implies that the lesson study intervention implemented in this study had a significant impact on the professional development of English language teachers.

Discussion

This study examined the impacts of lesson study on the professional development of primary school English teachers. Accordingly, the results of the study revealed that a well-planned and implemented lesson study intervention has a positive impact on teachers' professional development.

Specifically, the results of the present study indicated that teachers' involvement in lesson study had helped them to create an active classroom atmosphere. The results also showed that lesson study has a promising contribution for the professional development of primary school English teachers. The findings of the present study are consistent with previous studies (e.g., Fernandez & Chokshi, 2002; Fujii, 2018; Lewis et al., 2009; Olson et al, 2011).

For instance, Olson et al. (2011) reported that lesson study programs had direct effect on fostering senses of collaboration and self-reflection among teachers. They also indicated that participation in lesson study initiatives had helped teachers to deepen their subject matter knowledge and pedagogical skills. Lesson study was also reported to be useful in encouraging teachers to share their implicit knowledge, skills, experiences, and beliefs to their team members (Fujii, 2018; Lewis et al., 2009). Furthermore, it was reported that participation in lesson study, as professional development program, was particularly important for teachers of the same subjects (Fernandez & Chokshi, 2002).

The results of the present study also showed that the practice of lesson study has an important contribution in improving teachers' language skills and teaching innovations. It was found to be important in providing opportunities for teachers to share their experience, insight, information, and ideas for their academic career. As the results of the study confirmed, teachers were able to create better collaboration of teaching and learning with their peers. The study also showed that lesson study is a valuable strategy to improve teachers' skills of evaluation and reflection on their professional practices.

These findings are in line with many research findings (e.g., Dudley, 2015). This study reported that teachers' engagement in lesson study had brought meaningful professional changes which, in turn, played a decisive role in improving various educational problems at the teacher, school, and system levels. The study also explored that lesson study schemes had meaningfully contributed to the professional growth of teachers particularly in deepening their content knowledge and skills of planning and delivering better lessons. Lewis and Hurd (2011) also indicated that teachers participated in lesson study were able to improve their subject matter and pedagogical knowledge, establish stronger collegial networks, and show better commitment towards their students' learning.

In sum, from the results of the present study, it is possible to understand that the lesson study intervention had improved the participant teachers' professional development. It is also possible to understand that the implementation of lesson study has an indispensable role in improving various professional responsibilities and practices of teachers.

Conclusion and Recommendations

Conclusion

The purpose of this study was to assess the effectiveness of lesson study in enhancing the professional development of English teachers. Through the collection and analysis of quantitative data, the study revealed that a well-organized lesson study program has a substantial positive impact on improving teachers' professional growth.

Specifically, lesson study was found to be useful in enhancing teachers' content knowledge, teaching skills, and ability to evaluate lessons. Additionally, it helped teachers in reflecting on their teaching practices and evaluating their ability of effectively managing student behavior. Lesson study also played a crucial role in enhancing teachers' self-efficacy, classroom management abilities, capacity to bridge theory and practice, and proficiency in designing and implementing instructional plans. Furthermore, the study underscored that lesson study programs are instrumental in fostering a collaborative work environment and establishing professional learning communities in primary schools. The study also affirmed that teachers' engagement in lesson study initiatives directly leads to improvements in classroom instructional practices. As the findings of the study revealed, lesson study helps teachers identify issues and develop solutions to enhance student learning outcomes.

In conclusion, the results of the study revealed that the implementation of lesson study programs significantly enhances the content knowledge and pedagogical competencies of primary school English teachers.

Recommendations

Based on the findings of the present study, it is recommended that lesson study should be utilized as a useful in-service school-based teacher professional development strategy by the Amhara Region Education Bureau and the education department of Bahir Dar City. However, to make lesson study initiatives more effective, it is essential to address certain factors.

First, teachers need to be convinced, encouraged, and supported to develop a positive attitude towards lesson study. The education department needs to exert efforts to encourage and motivate teachers to participate in lesson study programs and consider it as a valuable tool for their professional development.

Second, the education department needs to introduce a conducive policy framework and administrative work environment that supports the implementation of lesson study programs. Professional dialogues and training sessions should also be conducted to clarify the issues and benefits of lesson study.

Third, school principals need to be involved in making lesson study programs effective. They should encourage teachers to participate in the program and make it an integral part of the school timetable. Similarly, teachers' participation in lesson study programs should be considered in their performance evaluations.

Furthermore, strong linkages between schools and teacher education colleges/universities should be established. The linkage needs to focus on capacity building and research related to lesson study for school teachers.

Last but not least, the researchers recommend further detailed and comprehensive research on the multifaceted issues of lesson study in a wider geographical area with a larger sample size. This can help to provide more insights into the contribution of lesson study to teacher professional development.

By implementing these recommendations, stakeholders can enhance the effectiveness of lesson study as a professional development tool for primary school English teachers in Bahir Dar City and beyond.

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