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The Impact of Professional Learning Communities on Social Studies Teachers' Professional Development and Student Academic Achievement

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ABSTRACT

The main goal in this study was to explore the impact of a professional learning community (PLC) on social studies (SS) teachers' professional development (PD) and student academic achievement. With this in mind, the study was carried out using a design-based research approach with an overarching ADDIE design model. The participants of the study consisted of six SS teachers from two middle schools and 113 students. Data were collected using scales, observations, and semi-structured interviews and analyzed through qualitative techniques on teacher data as well as *t*-tests on student data. Findings suggest that the PLC designed in a reflective thinking cycle has had a positive impact on teacher PD and enhanced student achievement in SS. The conclusion is that there is a positive relationship between teacher participation in the PLC and student achievement. Therefore, it is recommended that the PLC be made widely available in PD of SS teachers, and PD programs be planned as long-term hands-on training activities, while also taking into account the specific needs of the field.

KEYWORDS

Professional development; professional learning community; teacher competency; social studies; reflective thinking

Introduction

Debates on the effectiveness of educational systems are intensifying today. Because with the rapid change in globalization and communication technologies, the social structure has changed, and the needs have differentiated. The Turkish educational system has also undergone fundamental changes given the impact of the globalization process (Turkish Ministry of National Education, [MNE] 2018). Countries have sought, in this sense, to keep pace with this global change by restructuring schools as living spaces. This change has created the need to raise students to become individuals with the 21st century skills (MNE, 2017). On the other hand, the target level of success could not be achieved to the full extent because of the incompetence of teachers and the disruptions in professional development (PD) practices (Erdoğan et al., 2015). Research on this subject has shown that teachers need PD on some areas (Gokmenoglu et al., 2015). For instance, social studies (SS) teachers in Turkey need training on development of instructional

materials and activities (Avcı, 2013), implementation of modern instructional methods and techniques (Tomal, et al., 2019; Yener, 2014) and contemporary issues (Demirkaya, 2013; Yener, 2014).

Because the PD experience and teacher self-efficacy are significantly related (Yang, 2020), the experience and content knowledge acquired through participation in PD activities enhance student learning (Bednarz et al., 2013). For this reason, PD activities involving field-specific competencies and instructional strategies should be carried out (Reitz, 2018). The impact of PD practices should be identified through multidimensional and longitudinal research studies, bearing in mind teacher skills and competencies, and field reforms (Van Driel et al., 2001). On the other hand, educational practices for providing PD in Turkey are unsatisfactory in terms of process design, implementation, and impact analysis (MNE, 2010). Additionally, because teachers do not believe that PD programs are useful for themselves, participation in these programs has

not been satisfactory (Özmuşul, 2011), and Turkey's PD need index has remained below the TALIS average (Teaching and Learning International Survey, [TALIS] 2009). This is mostly linked to the fact that teachers tend to prefer training programs tailored to their needs and support their teaching (Cuiccio & Husby-Slater, 2018). In this context, the content of PD programs should be determined based on needs analysis (Taymaz, 1997). It is also important for training programs to be appropriate for the fields and conditions of teachers (Kahraman Özkurt, 2019). Additionally, the TALIS (2018) report shows that the participation of teachers in PD programs has a positive impact on their teaching practices. The contribution of the programs appears to be even more significant in those that are based on prior knowledge, appropriate for PD needs, and focus on content knowledge (TALIS, 2018). In this regard, several points stand out as areas of need: the development of field-specific measurement instruments through needs analysis, determination of their effectiveness (Engin, 2019) and implementation of process-based and practical PD programs.

Professional Learning Communities (PLCs) focusing on educational improvement through teacher interaction (Bryk et al., 1999; DuFour, 2004; McLaughlin & Talbert, 2006) can meet current needs for PD. There is compelling evidence to suggest that PLCs have significant potential to enhance instructional quality (Backman, 2013; Creemers & Reezigt, 1996; Early, 2012; Grossman et al., 2001). There is also a significant theoretical background to demonstrate the way the dynamics in PLCs influence teaching preferences (Borko, 2004; DuFour, 2004; Little, 2006). Experimental evidence that discusses teaching practices about PLCs has not yet reached a reasonable level, however (Desimone, 2009). Additionally, more experimental proof is necessary to uncover a direct positive connection between PLCs and greater student achievement (Backman, 2013). Therefore, to paint a more comprehensive picture of the impact of PLCs on teachers and students, more comprehensive research is needed (Doğan & Adams, 2018). Based on this information, it was considered valuable to undertake a practical and experimental research study to enhance SS

teachers' PD through a PLC, not only as a contribution to the literature by possibly filling the gap in this respect but also as an alternative proposal to the PD practices.

Research on the conceptual framework of PLCs

The term PLC has initially been used to mainly emphasize the concept of school (Barth, 1990; Bryk et al., 1999; Hord, 1997). Hord (1997) describes PLCs as places where educators' and students' learning is improved through continuous learning of teachers. DuFour (2004) describes them as a powerful new way of working that deeply influences school practices in more general terms. In the same vein, a PLC is defined as a group of educators motivated by the same vision to improve student success, collaboratively through a reflective process and with the same vision to ensure a better school culture (DuFour et al., 2010; Feger & Arruda, 2008; Hord, 1997; McREL, 2003; Protheroe, 2008; Reichstetter, 2006). Over time, different definitions of PLCs with common points have been made (DuFour et al., 2010; Hord, 2008) but the lack of a standard definition presents a challenge (DuFour, 2004; Lomos et al., 2011). This is because it is hard to measure or examine something that has not been clearly defined (Backman, 2013). It is necessary to create a common PLC terminology and definition to study PLCs and present their findings (DuFour, 2004). Only in this way will schools be able to use findings to change their culture, improve teaching, and assist students (Lomos et al., 2011). Despite nonagreements, certain aspects of definitions overlap. PLCs appear to be defined universally as communities of people who share and critically question practices in a continuous, reflective, collaborative, inclusive, learning-oriented, and growth-promoting manner (Mitchell & Sackney, 2000; Toole & Louis, 2002).

Research on the theoretical foundations of PLCs

PLCs are based on a variety of theories from both inside and outside of education (Kastner, 2015). A PLC is theoretically a learning organization (Kalkan, 2015). The concept of organizations as learning structures is based on the work of

Argyris and Donald (1978), who proposed that experiences are critical for organizations to learn and adapt to changing conditions. Additionally PLCs are implemented as a functional process for PD based on the principles of theoretical frameworks considering how people, particularly adults, learn (Bransford, Brown, & Cocking, 2000; Duman, 1999; Knowles, 1980). So, PLCs depend on the adult learning theory and reflects a variety of characteristics that are essential for adult learning (Early, 2012). Learning that occurs in PLCs can be explained in the context of the constructivist approach (Hord, 1997), according to which, learning is a social structure that people construct through their experiences with the world and others, and then reflect on their experiences to create new understandings (Vygotsky, 1978). Constructivists believe that social interaction in learning at various levels benefits all students (Nyikos & Hashimoto, 1997). The components of PLCs are consistent with constructivist theory in this regard (Kastner, 2015). PLCs also include learning principles as a social and cultural process. These principles form the basis of socio-cultural theory and especially the theories developed by Vygotsky (1978) and Bruner (1996) (Kastner, 2015).

Teachers join collaboration groups believing that individual work is an ineffective way of solving the complex problems that today's educators face (Kastner, 2015). In the PLC context, teachers' quest for meaning corresponds to the significance of shared experiences highlighted by Dewey saying that "affairs find meaning through a shared experience or through a common action" (Dewey, 1938, p. 20). So, PLCs based on common actions concentrate primarily on a learning goal for both teachers and students (Kastner, 2015; Vandeweghe & Varney, 2006).

There are different classifications for the development and sustenance of PLCs (DuFour & Eaker, 1998; Hord, 1997; Kruse & Louis, 1993). The conceptual framework of the current study is based on the works of Hord (1997) and her colleagues between 1995 and 2000. They established PLCs as "a new model of school culture and organization that actively promotes change and development" (Hord, 1997, p. 4). Their model consists of the following dimensions: "shared and

supportive leadership," "shared belief, values and vision," "collective learning and application of learning," "shared personal practice," "sharing feedback from personal practice" and "supportive conditions." In the years to follow, a sixth dimension, "sharing feedback from personal practice," was added (Hord, 2009). As this last dimension and "shared personal practice" are similar, in this study, these two dimensions were examined together.

Impact of PLCs on professional development and classroom practices of teachers

An effective PLC is a collaborative, on-going, and reflective process focused on student learning (DuFour et al., 2010; Hord, 1997; McLaughlin & Talbert 2006; McREL, 2003; Protheroe, 2008; Stoll et al., 2006). Research studies are led by identification, components, and conditions to support three major ideas that define PLCs and their features: learning, collaboration, and outcomes (DuFour et al., 2008, 2010). Learning corresponds to teacher learning as well as student learning. A well-implemented PLC is a tool that helps teachers and students advance by combining teaching with professional learning (Greene, 2015; Sparks, 2002; Vescio et al., 2008). Thus, learners learn better (Doğan & Adams, 2018; DuFour et al., 2008; Hord, 1997; McLaughlin & Talbert, 2006; McREL, 2003; Sparks, 2002), and a culture of learning is created in the school (Darling-Hammond & McLaughlin, 1995; DuFour, 2004).

Collaborative work among teachers leads to professional learning opportunities (Brodie & Chimhande, 2020). By contrast, only a small percentage of teacher interactions are at the critical level of collaboration required for learning opportunities (Horn, Garner, Kane, and Brasel, 2017). A growing number of experimental research foundations are being formed, uncovering the challenges in studying PLCs (Vangrieken et al., 2017). To establish stronger links between teacher learning and practices, detailed accounts of what is happening in communities need to be developed (Brodie & Chimhande, 2020).

Recent research emphasizes data gathered through systematic PLC reviews and meta-analyses

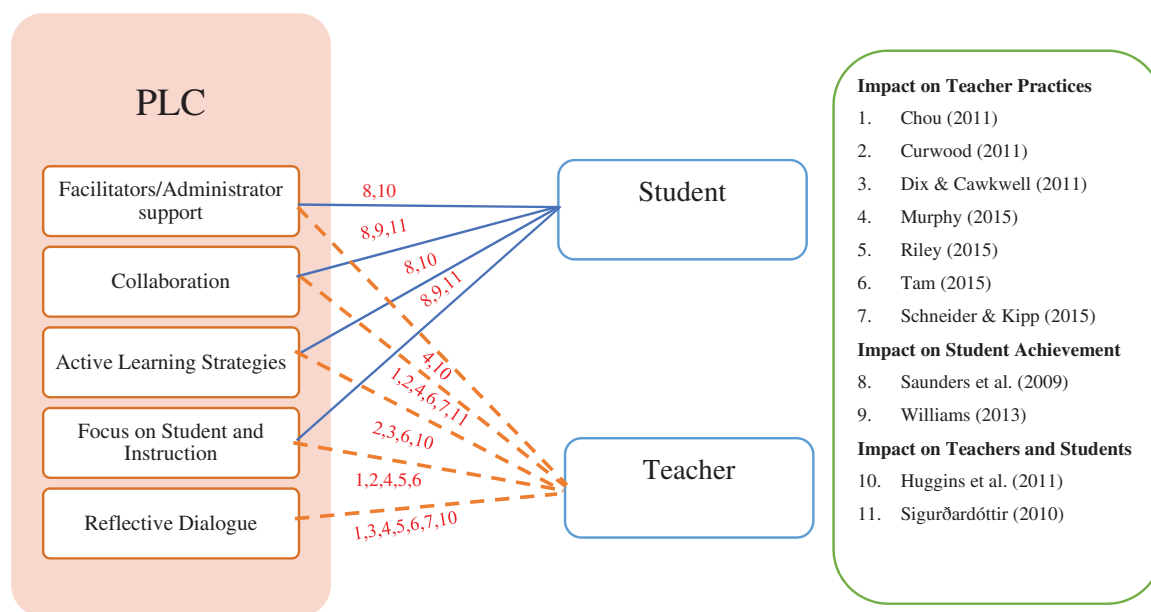


Figure 1. Experimental studies on the effectiveness of PLCs (Doğan & Adams 2018, p. 651).

to demonstrate the effectiveness of PLCs (Doğan et al., 2016; Doğan & Adams 2018; Lomos et al., 2011; Stoll et al., 2006; Vescio et al., 2008). Doğan and Adams (2018), for instance, confirmed that the PLC they studied enhanced classroom practices of teachers and, as a result, improved student achievement. They modeled this effect as in Figure 1.

Teachers' attitudes toward history should change by participation in high-quality professional development activities (Ragland, 2007). In that sense, teachers should create a new historical knowledge structure by comprehending the relationships between facts through critical reading of first- and secondhand sources (Regland, 2007). PD should improve knowledge base about content, learning, and self-awareness so that teachers can transfer this knowledge to practice in order to make decisions (Davis & Krajcik, 2005). New research, on the other hand, is required to effectively innovate teacher training, PD, and education through practice (Bednarz et al., 2013).

PLCs are intended to allow students to structure their own learning rather than simply being taught. Schools must create a collaborative culture for teachers to create common policies in order to achieve this goal. Teachers can use the evidence gathered from students to evaluate the success of practices and improve instruction (DuFour et al., 2010). It is, therefore, possible to

argue that SS teaching can be improved dramatically by implementing various forms of collaboration in schools and shifting the emphasis to student learning.

Based on these points, the aim in the present study was to explore the impact of PLCs on the PD of SS teachers and student achievement. To that end, answers to the following questions were sought:

1. How does the designed PLC affect teachers' professional development?
2. What is its impact on how teachers plan and implement a course?
3. How does its impact on teachers' professional development vary depending on time?
4. What do SS teachers think about the PLC and what are their suggestions?
5. How does the PLC affect student achievement?

Method

Research design

To accomplish the goal of the study, a design-based research approach (Design-Based Research Collective [DBRC] 2003) was used. Design-based research is a new approach to learning that addresses learning within the scope of systematic design and development of instructional strategies and tools (Brown, 1992; Collins, 1992).

Design-based research is defined in a broader context as a research method that aims to improve educational practices through systematic, flexible, and cyclical review, analysis, design, development, and implementation depending on collaboration between researchers and practitioners (Wang & Hannafin, 2005). Because a professional development program is proposed in this study, and it includes collaborative (Wang & Hannafin, 2005), systematic and cyclically advancing educational practices (Gravemeijer & Cobb, 2006), it is suitable to use the design-based research approach. Design-based research studies are preferred to create a product (Kelly, 2004) and develop testable new instructional approaches (Anderson & Shattuck, 2012; Brown, 1992; Collins, 1992). Design research also falls in line with the research objective based on the creation and applicability of an alternative PD program (Aşık & Yılmaz, 2017).

Design-based research is cyclical, repetitively going through the stages of analysis, design, development, implementation, and evaluation (ADDIE) (Gravemeijer & Cobb, 2006; McKenney & Reeves, 2013; Morrison et al., 2013; Van den Akker et al., 2006). ADDIE is a well-established design-based model. The study followed these five stages of ADDIE, which are explained in the following headings. The first and fifth stages of the present study were carried out as a holistic multi-case study, which is a model proposed by Yin (2009). In the first stage, a descriptive case study approach was preferred to identify the aspects of teachers that could be advanced. In the fifth stage, an explorative case study approach was used to identify the effects of the program on the teachers' PD.

Analysis stage

During the analysis stage, an attempt was made to reveal the current PD status of SS teachers through a literature review first. Once the problem situation was determined, the “need analysis and performance assessment” step began. In this step, observations, semi-structured interviews, and a scale—the Social Studies Teacher Competencies Scale (Çopur, 2020)—were used to reveal the areas of need.

The next step was a learner analysis. Theories and models for adult learning (Bransford, Brown, & Cocking, 2000; Knowles, 1980; Lawler & King, 2000) were utilized during the instructional design because the target audience consisted of adults. The last step of the analysis stage was the determination of researcher and participant roles. The researcher took part in the instructional design as an instructional designer, a subject matter expert, and an evaluator. The teachers chosen as the target audience for the training program supported the researcher when preparing the achievement test and during classroom observations as subject matter experts.

Design stage

In this stage, first, instructional objectives were determined based on the areas of need. Next, a PD model was designed. The decision was to use a PLC (Hord, 1997) as the context of the PD model, which is detailed in the Introduction section, and a reflective thinking cycle derived from Korthagen's (1985) work as the instructional strategy in the PD model which is shown in Figure 5. The reflective thinking cycle was preferred to provide a systematic and cyclical flow in the teachers' PD (Korthagen, 2005).

The PD model shown in Figure 5 shows the final product enhanced through the ADDIE process and the cyclical implementations detailed in the subsequent sections. As shown in the most outer layer of Figure 5, the process involves five main dimensions (Hord, 1997). The next inner layer represents Korthagen's (1985) cyclical process. The further inner layer symbolizes the resulting professional development of teachers from the first two layers. And the final, most inner layer is there to imply student achievement which is the ultimate goal of the model. What happens in each dimension is also briefly explained in bullet points in Figure 2.

An attempt was made to give the PLC activities, which normally progress as a linear process during the design stage, a cyclical structure by integrating the reflective thinking cycle into two dimensions of the PLC, namely (2) “shared values and vision” and (3) “collective learning and sharing learning.” However, as a result of the formative evaluation during the design stage and the

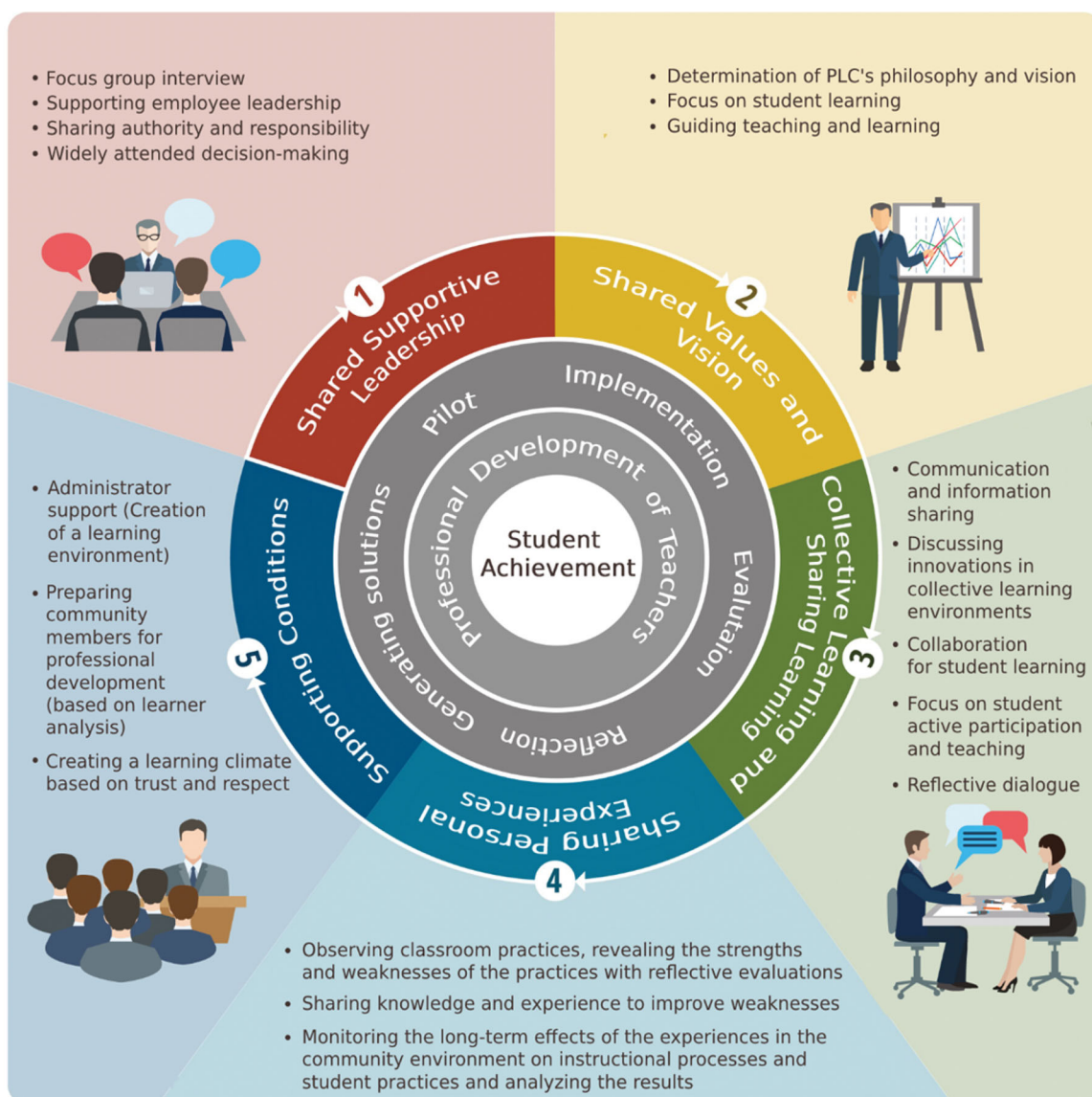


Figure 2. PLC model that emerged by the completion of the design process.

summative evaluation at the evaluation stage carried out by the community members, this cyclical process continued with the steps of implementation (lesson observation), evaluation, reflection and generating solutions, unlike the cycle developed by Kortgenh (1985).

Development stage

This phase is the development of the materials, activities and content to be used and presented during the PD program. The content was organized in a way to support collaboration and active participation. Two sample lesson plans, presentations and activities were designed and shared with the learning community, considering the

specified areas of need, and each stage was explained in detail. The plans, presentations and activities prepared at this phase were sent to subject matter experts, and corrections were made based on the recommendations.

Implementation stage

At the implementation phase, arrangements were made for the designed PD program to take place in the school environment. The conditions of support (physical infrastructure and personal factors) necessary for the implementation of the professional development program were established, and researcher and teacher roles were defined in accordance with the PLC principles.

Following these arrangements, the designed program was implemented.

Evaluation stage

The PLC program was also evaluated in terms of usability, suitability, and applicability (Şimşek, 2016) in line with the ADDIE model. A final dimension in the design of the PD model was the exploration of the reflections of the PD program on student learning. Moreover, a collaborative (Wang & Hannafin, 2005) and systematically and cyclically progressive PD program (Gravemeijer & Cobb, 2006) was proposed, indicating the suitability of the design-based research approach.

Population and sample

“Criterion sampling” technique (Patton, 2014) was preferred to identify the schools and participants to be included in the PD program and the students to be examined experimentally. Schools were determined depending on their compliance with the following criteria: shared, supportive leadership and supportive conditions (Hord, 1997, 2004; Little, 2006). Two schools were determined as samples in which the researcher conducted long-term observations during the phase of needs analysis and mastered the institutional culture. Following this step, the study was carried out on voluntary SS teachers from the schools chosen. Each participant was assigned a nick name (such as P1, P2, and so on for the teachers and O1, O2, and so on for the observers) to protect their identity as a requirement for ethical principles. The classes taught by the teachers who participated in the study formed the experimental group (this group, together with the participant researchers, is referred to as the *community members* or the *professional learning community* throughout this paper), while the classes taught by the teachers who did not participate in the study for various reasons formed the control group. Table 1 shows the descriptive data of the participants.

There were 57 and 56 students in the experimental and control groups, respectively. Table 2 shows the distribution of the students to schools and experimental conditions.

Table 1. Descriptive data of participants.

Code	Attendance at Professional Development Training Programs					
	Gender	Discipline	Teaching experience (years)	Educational level	Field Specific	Total
P1	Male	History	13	Bachelor's Degree	1	11
P2	Female	History	19	Bachelor's Degree	2	13
P3	Male	Social Studies	17	Bachelor's Degree	2	22
P4	Male	History	26	Bachelor's Degree	1	13
P5	Male	History	19	Bachelor's Degree	2	14
P6	Male	Social Studies	17	Bachelor's Degree	3	15

*Pedagogical content knowledge. **General Knowledge/General Ability.

The school where P1, P2, P3, and P4 worked (School A) is one of the area's leading middle schools (grade levels 5–8) with a 25-year history of success. The school is in a neighborhood populated by people with middle and upper socio-economic income levels. In the school, technological facilities and physical infrastructure are adequate for implementing modern instructional methods and techniques. The School B (also a middle school like School A) where P5, P6, P7 and P8 worked has a 32-year history. The school is in a neighborhood where people with lower and middle socioeconomic incomes have mostly settled through migration. In the school, technological facilities and physical infrastructure are adequate for implementing modern instructional methods and techniques.

Data collection instruments

The Social Studies Teacher Competencies Scale (Çopur, 2020) was used in the needs analysis phase, while observation and interview techniques were utilized at every phase. Moreover, an achievement test was used during the evaluation phase. The meetings with the members were video recorded with permission.

The achievement test was used to measure the impact of the PLC on student achievement. The achievement test was developed by the authors in cooperation with the participant teachers, within the framework of instructional objectives, by bearing Bloom's (1956) taxonomy in mind. It

Table 2. Numbers of the Students taking the Achievement Test.

	Experimental	Control	Total
School A	34	30	64
School B	23	26	49
Total	57	56	

was given its final form after being reviewed by four subject matter experts. The test included 17 questions consisting of knowledge (2), comprehension (11), analysis (3) and evaluation (1). A pretest-posttest control group quasi-experimental design (Büyüköztürk et al., 2015) was preferred during the implementation of the achievement test to better credit the program's effectiveness in contrast to weaker research designs such as the simple pretest-posttest design without a control group. The posttest was conducted eight weeks after the pretest.

The researcher participated as a participant observer in the lessons that were observed during the 14 weeks of the implementation. The observations were made using an observation form structured by two people, the researcher and one of the participating teachers.

Data analysis

General information regarding the data analysis methods is summarized in general terms in Table 3.

Findings and discussion

The findings obtained at the needs analysis phase are *briefly* presented here. The areas of need that arose during the analysis phase are given in Table 4 and explained in the paragraphs to follow.

Findings on the PLC' influence on teacher PD

This section presents findings from video recordings of the PLC activities and classroom observations. The findings obtained at this phase were analyzed in three stages: (1) the draft lesson presentation in the learning community, (2) the

Table 3. Information regarding the data analysis methods.

Phase of use	Data collection method/instrument	Analysis method
Implementation	Observation	Thematic analysis
	Interview	Content Analysis
Evaluation	Observation	Thematic analysis
	Interview	Content analysis
	Achievement test	Dependent/Independent Samples t-Test
		One-Way Analysis of Variance for Independent Samples
		Wilcoxon Signed-Rank Test

Table 4. Areas where teachers need professional development.

Areas of Need	Scale	Observation	Interview
Content Knowledge and Pedagogical Knowledge	-	✓	✓
Knowledge of Regulations	-	-	-
Planning and Developing the Instructional Process	✓	✓	✓
Managing the Instructional Process	-	✓	✓
Methods/Techniques and Equipment Use	-	✓	✓
Handling Students	✓	✓	✓
Communication and Collaboration	-	-	-
National and Moral Values	-	-	-

classroom implementation, and (3) the evaluation of the implementation within the community environment.

Findings on the first implementation stage

There were several areas of need before and during the first implementation. For one thing, key concepts, objectives, skills, or values were not included in the plans. For another, the content had details that were not in accordance with the curriculum. The questions were largely for measuring the level of knowledge. And the planned activities were not in accordance with their objectives.

The reflective assessment P1 made in the community environment can be given as an example to these areas of need. In her assessment, P1 stated

In the last session, I tried to remove the details of the content by taking into account your recommendations. It was a more comfortable lesson than my previous lessons, and I felt less pressure. One of my students said, 'I saw you laugh for the first time' at the end of the lecture. Nevertheless, the lesson ended up being a knowledge-oriented lesson. This is because we have students who take exams that ask for information. What's more, sometimes the lack of class hours pushes us into traditional teaching. In this regard, the lesson is often taught in a teacher-centered way. I teach this way. I'm not sure whether I can make the lesson different.

Based on these statements, although the recommendations were limited, they still had a positive effect on the lesson. However, P1 continued the lesson in a teacher-centered and information-heavy manner, showing resistance, on various grounds. To solve this situation, a number of solutions were proposed by the community members. In line with these solutions, P1 stated what

he would do: "I will try to create the next lesson with a constructive understanding within the framework of the curriculum. I will try to prepare the presentation to be simple, without details, by modifying it in a way that allows for active participation of students."

According to P2's in-class lesson observation, it was discovered that the recommendations made about the draft presentation and the changes made in this direction were only partially reflected in the lessons. P2's reflective assessment supports this situation:

I can tell you that I had a little difficulty implementing what I planned in line with the recommendations in the class. The low student level has a significant impact on this. I also had a time constraint because the presentation was quite lengthy. However, the presentation contributed, although slightly, to the active participation of even my students who had little interest in the lesson. Moreover, it was useful for student participation to try to have them find the basic concepts and then provide explanations.

P3's self-critique of the first implementation was as follows: "Honestly, I haven't been able to implement the lesson the way I planned. I was short of time since my presentation was very long and not prepared in accordance with the curriculum. With the anxiety of finishing, it on time, the lesson progressed very quickly." considering P3's statement, the recommendations have positive effects on the lesson, even though they were reflected at a limited level. The findings from the observations confirm this situation. O1 added that "I believe that it would be more beneficial for the student if we prepare and present the lesson content based on objectives and skills." Accordingly, O2 stated that "the activity was mostly information-heavy, and because of the time limitation, the activity used to strengthen the learning of the objective was not

used.” P6 was different from other participants when performing her first implementation. Her use of technology, delicacy of lesson planning and use of tools remained limited. P6’s reflective assessment supports this situation:

Honestly, I haven’t been able to implement the lesson the way I planned. Due to the problems caused by the planning and task sharing of the drama, the activity did not really serve the purpose. Although I warned the students, I saw that my warnings were ignored in certain manners and that the students did not adequately prepare for the drama. I’m afraid we haven’t had a chance to see and fix these kinds of glitches, because we haven’t had a chance to have a rehearsal.

The observation findings also paralleled what P6 had experienced. According to O1, “If a more detailed planning and preparation could be done for the drama, the problems we experienced could be minimized.” O2, on the other hand, said, “Using maps is something favorable, but it is necessary to pay more attention to them because the students’ knowledge of maps is usually insufficient.” From this perspective, P6 taught his lesson in a student-centered manner with constructive understanding in general but had problems arising from planning.

Findings on the second implementation stage

The areas of need that stood out before and during the second implementation are as follows: The content contained details that were not appropriate for the curriculum. Presentations in the lessons were prepared in a teacher-centered way. Maps and visual materials could not be used effectively. And the questions were prepared mostly to measure the level of knowledge. P1, P2, and P3 gave consideration, to a certain extent, to the critiques and recommendations shared during the initial PLC implementation. P2’s assessment constitutes a good example:

In accordance with the recommendations, I have further improved the presentation. The lesson I prepared attracted the students’ attention, and their active participation in the course was improved a bit more. Prior to the presentation, I also explained what the objectives of the subject would be, as you recommended during the meeting. However, because the students’ level of knowledge was very low and I was unable to get down to the level, it became hard

for me to implement what I had planned. Other than that, I can say, I haven’t had any negative situations.

These statements indicate that the recommendations had positive effects on the practice even though they were not fully reflected in the lesson. They also referred to the areas where P2 could improve himself through a reflective assessment. On this subject, P1 pointed out that although the recommendations could not be reflected in the lesson at the desired level, they had positive effects on the practice:

I couldn’t understand how the lesson went. I was a little nervous during the lecture, to be honest. The lesson once again became information heavy. It is very difficult to try to teach lessons using a constructivist understanding because we have been teaching using the method of direct instruction for many years.

According to P3’s in-class lesson observations, the recommendations made about the draft presentation and the changes made in this direction were only partially reflected in the lesson. P3’s reflective assessment supports this situation:

Honestly, I haven’t been able to implement the lesson the way I planned. The fact that I used a previously prepared presentation was effective in this regard. I was pressed for time because my presentation was lengthy and had not been prepared in accordance with the curriculum. With the anxiety of finishing it on time, the lesson progressed very quickly. It would also be more long-lasting and meaningful if I could give the developments in Europe chronologically.

It appears the recommendations were limited but they had a positive effect on the lesson. The findings from the observations suggest this situation. O1 accordingly said, “I believe that it would be more beneficial for the student if we prepare and present the course content based on objectives and skills.” In the same vein, O2 stated that “the activity was mostly information-heavy, and because of the time limitation, the activity used to strengthen the learning of the objective was not used.”

To solve this situation, several solutions were proposed by the community members. In line with these solutions, P3 stated what he would do for a solution as follows: “I will try to create my next lesson process with a constructivist understanding within the framework of the SS

curriculum, considering your suggestions. Moreover, instead of showing the video from start to finish, I will make sure that I will pause at certain intervals and make the necessary explanations, design activities based on the objectives and use time effectively.”

P4, P5, and P6, differentiating from the other participants during the second implementation, took into account, to a considerable extent, the criticisms and recommendations shared during the initial PLC implementation. P4’s reflective assessment supports this situation: “First of all, I think the effective use of maps and visual materials improves student engagement and persistence. The lesson was generally taught as I had planned, and it was an effective process for the lesson.” P6, who had thoughts paralleling P4’s on this issue, shared his impressions as follows: “the lesson was generally productive... Moreover, to have the students try to find concepts instead of directly providing the answers to them was more appropriate for the constructivist understanding. In my evaluation, I saw that the students achieved the objectives I targeted.” These statements by P4 and P6 can be interpreted as indicating that the recommendations to the lessons are highly reflective.

Findings on the third implementation stage

Before and during the third implementation, most of the participants gave consideration to the recommendations and critiques about the previous implementations. For instance, P5’s classroom observation indicates that the draft presentation is fully reflected in the lesson. P5’s reflective assessment supports this: “The lesson was generally taught as I had planned. I can say, in this regard, that the objectives have been achieved. Moreover, the active participation of the students enhanced the efficiency of the lesson.” These are also supported by the observation notes. In their last critique, the observers commented as follows: O1: “The lesson was planned on the basis of objectives in accordance with the philosophy of the curriculum, and the lesson was taught in accordance with the plan.” O2: “I observed that you considered the previous recommendations in this lesson.” They both drew attention to the fact that the recommendations

given by the community are fully reflected in the lessons. Supporting these findings, P3 said, “It was a relief that, to a large extent, I refined the course from having detailed information. Also, the story that I used drew the attention of the students. I can say that this lesson process was a process in which the students were highly engaged in general, and the process worked efficiently.” The observation notes support these statements. In the last critique, the observer O1 said, “It was better for the student that we prepared and presented the lesson content based on the objectives and skills,” and O2 said, “The fact that we included the instructional objectives in planning and that the lesson was student-centered improved student participation.” They thus noted that the recommendations put forward in the community were largely reflected in the lessons.

During the second implementation, P1 was slightly different from other participants, and her major areas of need before the third implementation can be summarized as follows: The content contained little, if any, detail that was not appropriate for the curriculum; and there was a lack of efficient use of technology and a lack of process-related measurement and evaluation. A review of the findings of P1’s classroom presentation shows that the recommendations made on the draft presentation and the subsequent modifications in that regard are largely reflected in the lessons. P1’s reflective assessment supports this: “The lesson was more comfortable than my previous lessons, and I tried to teach the lesson by complying with as much constructivist understanding as possible. In addition, I think I used technology more effectively in this lesson.” These statements are also supported by the observation notes. “It was good that you tried to have the students find the key concepts. You also used maps and figures effectively. This was positively reflected on the persistence of the lesson and student participation,” said O1. Accordingly, O2 said, “It is good that you included instructional objectives during planning and taught the lesson in a student-centered way using the constructivist approach.” In this way, they drew attention to the fact that the recommendations given by the

community were reflected in the lessons to a large extent.

Overall, the participants, who initially resisted change and taught in a traditional way, developed a student-centered approach by shifting to a constructivist perspective during the second implementation. At the end of the third implementation, they largely adapted an instructional approach in which the student was placed at the center in line with the curriculum's philosophy. This situation can be interpreted as that the PLC contributed positively to the teachers' PD.

Findings on teachers' opinions about the PLC

The interview data could be categorized under four themes: expectations, gains, problems, and recommendations. P6's thoughts on expectations were as follows:

I didn't expect anything because I didn't initially think it would be very different from the department meetings. Anyway, I still decided to take part in the community because I thought it would contribute to my professional development. To my surprise, at the end of the process, I saw that there was a different sharing environment from the department meetings, and I have gained experience in various issues.

Most participants pointed out that they had similar opinions on this issue. For instance, P1 said, "My first impression was that a simple study similar to the department meetings would be carried out under the name of PLC, and the work would be finalized so. However, I had the opportunity to see how the study was different from the others and its importance in the process."

"Learning outcomes" is another theme emerging from the interview data. The knowledge, skills, attitudes, and behaviors acquired by the participants during the PLC activities were gathered under this theme. In general, all participants who stated that the PLC gave them the opportunity to gain significant professional development experience listed their gains as that "We have shared important experiences in many topics such as methods and techniques, use of tools, planning, and student-centered education in the community. "Moreover, most participants noted that the community provided them with the opportunity to assess themselves. According to

P3, for instance, "When you consider the experiences, pilot lesson presentations and lesson observations shared by other friends in the community environment altogether, you have the chance to realize the weaknesses and strengths of yours." Another common experience was the contribution of the community to the lessons, as well as communication and collaboration. P4's remarks recap the opinions: "I can say that I have benefited a lot from coming together every week, ultimately in terms of contribution to lessons, the ability to follow current affairs, and the creation of an environment for collaboration and sharing." The participants also noted the importance of the evaluations and classroom observations. P2 who said that "lesson observations and evaluations not only revealed our strengths but also made us aware of our abilities that were open to development" articulated other participants' thoughts on this issue as well.

Participants stated that they received assistance in teaching lessons in accordance with the curriculum and its philosophy too. P1 and P3's opinions on this issue were as follows: "I also benefited from the planning and execution of the lesson in accordance with the program and turned to a constructivist teaching approach in which the students actively participated, going beyond the understanding of transferring information to the students." Additionally, P1, P2, P3, P4, P5, and P6 stated that they had gained diverse experiences because the community environment allowed them to do so. It allowed older teachers to share their experiences and younger teachers to present new and current undertakings.

Another theme based on the interview data is the "problems" theme. This theme contains the participants' thoughts on the problems they experienced during the learning community process. All participants expressed problems with supportive conditions: "The supportive conditions could have been a little better, but they were the best possible in the current circumstances." "I can say that I had a hard time because of going out of style and breaking the mold for the first few weeks. This situation has created an unease, frankly," said P1, P3 and P4, pointing out that going beyond the ordinary is a state of anxiety. P1 and P2 stated that the observations in the

classroom were another source of anxiety, saying, “The fact that my lessons were observed initially triggered anxiety.” Another difficulty was during the use of the draft lesson plan and presentation in the classroom, which was told out loud by the community. P1, P2 and P5 drew attention to this difficulty: “There were times when I had difficulty using the planning and presentation of the lessons that we worked on in the community in a classroom environment. In the end, the classroom environment is a natural environment.”

The last theme from the interviews is “recommendations.” This theme contains the participants’ recommendations about the learning community process. A venue where the PLC members can come together stands out as a common demand of all participants: “having a separate physical space where we can share ideas regularly would be beneficial.” Another noteworthy suggestion was to guarantee planning and continuity. From an inclusive point of view, P4, P5 and P6 agreed that “for the continuity of the sharing of experiences, the longer-term continuation of this process is crucial. In this respect, making this planning in department decisions will contribute to the continuity of practices.”

Findings on the PLC’s influence on student achievement

The data were normally and homogeneously distributed in both schools (Shapiro-Wilk test, $p > 0.85$, Levene’s test of homogeneity of variances, $p > 0.92$, respectively). Therefore, independent samples t -tests were conducted to analyze the differences between the experimental and control groups’ gain scores from the pretest to post-test.

Based on the independent samples t -test, a significant difference was found in terms of the mean gain scores between the groups both in School A and B in favor of the experimental group (Table 5), with effect sizes (d) of 0.51 and 0.85, respectively. D values greater than 0.5 and 0.8, according to Green and Salkind (2005), indicate that the effect caused by the intervention is of medium and large size, respectively. So, the intervention had a moderate positive impact on student achievement in School A and a large positive impact in School B.

Table 5. Comparison of Differences Between the Groups’ Gain Scores from Pretest to Post-test.

School	Group	N	M	SD	df	t	p	d
School A	Experimental	34	12.97	11.397	62	2.035	.046	0.51
	Control	30	6.90	12.463				
School B	Experimental	23	13.22	14.02	47	2.337	.024	0.85
	Control	26	4.27	12.77				

Discussion

Impact of the PLC on teacher PD

The implementation and evaluation findings indicate that the PLC made significant contributions to the participant teachers’ PD in terms of professional knowledge and skills, communication and collaboration, knowledge of regulations, methods, techniques, and equipment use, measurement and evaluation, as well as the planning and management of learning processes. Interview data support this. The insights gained here were rather in the form of using appropriate methods and techniques, effective use of tools, and lesson planning in accordance with the curriculum, more so than making plans for the first time and using new methods, techniques, and equipment. Correspondingly, Greene (2015) argued that the process that began with teachers creating a community resulted in collaborative knowledge acquisition, data collection and analysis, and instructional method improvement. There are also many research findings (Backman, 2013; Creemers & Reezigt, 1996; Early, 2012; Grossman et al., 2001) that provide evidence to support our findings, stating that PLCs have significant potential to improve instructional quality. Additionally, Chauraya and Brodie (2017, 2018) attributed improvements in teacher practices to PLC activities. We argue that our study provides notable results that show how PLCs improve instructional quality. However, despite the success of some PLCs, there is a growing empirical research base that shows the challenges and reservations associated with studying in PLCs (Vangrieken et al., 2017). There are also studies showing that only a small percentage of teacher interactions reach the critical level of collaboration required for learning opportunities to occur (Horn et al., 2017).

Communication, collaboration, and exchange of experience are another area where the PLC contributed to teacher advancement. “When you

examine the experiences, pilot lesson presentations and lesson observations shared by other friends in the community environment, you have the opportunity to see the aspects of yourself that are open to development and your strengths,” the participants said of their learning in this subject in addition to “the PLC has created a sharing environment. That’s how there’s professional interaction,” and “the PLC was also useful in terms of the experienced teachers’ sharing their experiences and presenting new and up-to-date developments for teachers who were new to the profession.” It can also be said that meeting weekly ultimately makes it possible for teachers to enhance their contribution to their lessons and to establish a prolonged communication environment. The key experiences gained can be identified as “self-assessment, sharing, interaction and orientation toward change,” which are also at the heart of PD. People in a collaborative sharing environment in a learning community turn toward change by becoming aware of their strengths and weaknesses. This is important for the fulfillment of PD. These results support the findings that collaborative learning opportunities offered by PLCs enhance teacher learning (Greene, 2015; Tobia & Hord, 2012) and that sharing personal practices adds to teacher development on an ongoing basis (Kastner, 2015; Vandeweghe & Varney, 2006).

The PLC was also useful for the participant teachers’ PD in terms of instructional process planning and teaching as well as contributions to classroom practices. These experiences can be listed as the preparation of activities using constructivist understanding, planning, and teaching lessons in conformity with the curriculum, ensuring active participation and directing questions in an effective manner. The participants’ opinions also concur with these findings. All participants stated that in the lessons, they benefited from what their colleagues shared in the community environment. They pointed out that what was shared in the community environment was reflected in the lessons. Participants also indicated that their awareness was enhanced in terms of asking questions that encourage higher-order student thinking, planning, and delivering curriculum-aligned lessons, and preparing activities

in line with the constructivist approach. Reflective assessments during the implementation phase have an important role to play in achieving these gains. This is because this process gave the participants the opportunity to criticize events and share experience-based solutions. These findings are considered noteworthy in terms of presenting evidence that the PLC method not only strengthens the knowledge base of teachers but also has a substantial effect on classroom work (Doğan & Adams 2018).

Participants who resisted change from time to time at the beginning of the PLC and taught lessons using a traditional approach developed a student-centered understanding by adapting a constructivist view in the second implementation. The participants adapted a student-centered instructional strategy at the end of the third implementation, essentially in line with the philosophy of the curriculum. This suggests that the PLC could contribute to the teachers’ professional growth.

Teachers’ opinions on the PLC

Initially, the participants thought of the PLC in a similar way to departmental committees and believed it would not be functional. These findings are consistent with the evidence that PLCs are a collaborative, continuous and reflective process (Hord 1997, McREL, 2003, McLaughlin and Talbert 2006, Reichstetter, 2006, Stoll et al., 2006, DuFour et al., 2008, Feger & Arruda 2008, Protheroe, 2008). Moreover, the participants’ thoughts revealed the difference between the PLC and the teachers’ departmental committee. In this context, the learning community is a practice of PD that allows teachers to gain various experiences by offering opportunities for sharing and collaboration, which is a bit different than the existing departmental committee practices.

Participants commented that they were initially concerned about going beyond the ordinary and about transferring the subjects discussed in the community to the course environment. Another problematic situation was the anxiety caused by the initial classroom observations. These hurdles were resolved by continuing to share personal practices based on mutual respect and trust as

recommended by Hord (1997) and Robertson (2011). In this respect, the teachers cooperated to be open to share their opinions and practices consistent with the vision of the community suggested by Little (1982) and Robertson (2011). In conclusion, these initial issues were transient difficulties due to the nature of the practice.

The participants made several recommendations to improve the effectiveness of the PLC. A venue where the community members can come together stands out as a common demand of all participants. The participants' other major recommendation was to guarantee planning and continuity. These findings coincide with Kastner's (2015) finding that supportive conditions of both structural and relational importance provide a context in which PLCs can thrive. In addition, these findings contribute to our knowledge of the context specificity of PLCs and suggest that the establishment of PLCs is a developmental process with certain challenges (Zhang & Sun, 2018). The recommendations made by the participants are noteworthy: to gain the experience expected from the PLC, lessons should be planned, and there should be a suitable environment for sharing ideas.

Impact of the PLC on student achievement

The findings provide substantial evidence of the PLC's positive impact on student achievement. Pre- and post-test gain score differences were also analyzed to determine student achievement. Results showed a statistically significant difference in both schools in favor of the experimental group. The effect size was moderate in School A and large in School B (Table 5). Considered together, the findings strongly support each other and show that participation in the PLC has a significant impact on student achievement, consistent with studies on this subject (Doğan & Adams, 2018; DuFour et al., 2008; Hord, 1997; McLaughlin & Talbert, 2006; McREL, 2003; Rentfro, 2007; Sparks, 2002; Stoll et al., 2006; Vescio et al., 2008). However, to establish a direct positive relationship between PLCs and student achievement, experimental evidence is required, and further research is necessary to provide a more thorough picture of the impact (Doğan &

Adams 2018). It should be acknowledged that demonstrating the impact of PLCs on student achievement solely through student test scores will be insufficient. This approach will be incomplete in explaining the precise link between PLCs and teacher practices (DuFour et al., 2010). The potential of PLCs can be better understood by looking at this link through the eyes of the teacher (Reitz, 2018). In this context, it would be useful to discuss teacher reflective dialogs that occur within the PLC.

In this respect, the teachers noted the positive impact of the PLC process on students. The findings especially from the implementation period indicate that the PLC improves student achievement via the contribution to the teachers' PD in terms of the focus on student learning, provision of a collaborative and sharing environment between teachers, implementation of active learning strategies, and generation of solutions with reflective dialogs to emergent problems. Concurring with Doğan and Adams (2018), PLCs enhance classroom practices of teachers and, consequently, improve student achievement.

Recommendations

This section presents recommendations based on the results of the study.

1. The findings point out that the level of satisfaction with existing training programs remains low because current practices in the field of PD do not contribute sufficiently to the participant teachers' PD. In this regard, the expected advantage of professional training practices can be realized by addressing issues that arise during inter-institutional collaboration. Moreover, the findings show that there is a lack of field-specific needs analysis and that planned PD programs specific to the field are far from responding to the needs at least in the current context. Therefore, it is recommended to consider the specific needs of the field when planning PD programs and to conduct the programs in a hands-on manner.
2. This study shows that PLCs have considerable potential to enhance instructional quality. The dissemination of school-based professional

development practices and the inclusion of SS departments in such practices will help to reveal how PLCs enhance instructional quality, as well as to show the effectiveness of PLCs from a comparative and broader perspective.

3. The study revealed that the PLC improved student achievement in SS. A quasi-experimental research design with matched groups was preferred due to the current conditions and because the study was limited to two schools and 14 weeks. The effect of the PLC on student achievement can be more strongly revealed by preferring an experimental design with two control groups in a study where there are more schools and longer time to perform the practice.

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