Winning Practices in Professional Learning Communities

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Abstract
In this qualitative study, we sought to identify the best practices emerging from professional learning communities (PLCs) in New Brunswick, Canada with regard to teacher collaboration. Established over a decade ago, PLCs are now a common practice in this province. The results of interviews conducted with teachers and principals (*N* = **13)** show a strong level of collaboration between the teachers who shared materials, strategies, and interventions for greater continuity among practices from one grade level to another. In addition to developing assessment grids, technology to monitor student progress, and effective pedagogical tools in their PLCs, the participants were able to expand their reflection on their existing teaching practices and classroom materials, such as new strategies to help their students and a greater standardization and sustainment of practices and interventions, toward better differentiated instruction. A systematic analysis of student outcomes over several levels also helped regulate the teaching practices.

Keywords: professional learning community, best practices, student achievement, teachers, principals

Introduction
To evaluate the quality of their education system, school jurisdictions around the world use standardized tests for their students. These assessments make it possible to compare student data with those of other jurisdictions and thus orient decision-making processes toward effective changes and reforms. In Canada, the following international assessments are administered: (a) Progress in International Reading Literacy Study, (b) Programme for International Student Assessment (PISA), and (c) Trends in International Mathematics and Science Study.

The PISA aims to determine the acquired knowledge and skills of 15-year-old students worldwide. In Canada, the Pan-Canadian Assessment Program (PCAP), in which the participants are 13-year-old students from all of the country's 10 provinces, "inform[s] Canadians about how well their education systems are meeting the needs of students and society" (Council of Ministers of Education, Canada, 2011, p. 1). From 2000 to 2010, New Brunswick students trailed far behind the other jurisdictions. However, in the PCAP 2010 mathematics assessment, the province obtained a better performance rating and ranked fifth among all provinces (Table 1).

Table 1

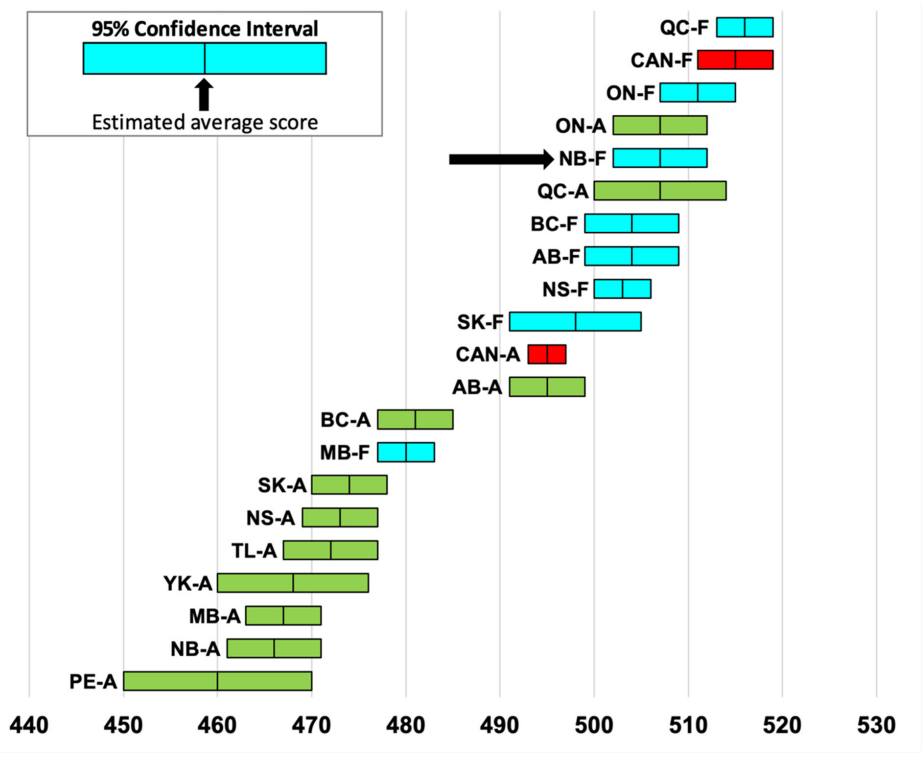
New Brunswick Rank in PISA and PCAP

PISA 2000	PISA 2003	PISA 2006	PISA 2009	PCAP 2007	PCAP 2010
Reading 10/10	Reading 9/10	Reading 9/10	Reading 8/10	Reading 10/11	Reading 9/11
Math 10/10	Math 9/10	Math 8/10	Math 7/10	Math 8/11	Math 5/11
Science 10/10	Science 9/10	Science 10/10	Science 9/10	Science 9/11	Science 8/11

The PCAP 2010, conducted with a sample of approximately 32,000 eighth-grade students (8,000 francophones and 24,000 anglophones) from all 10 Canadian provinces and Yukon (Ministère de l'Éducation et du Développement de la petite enfance [MÉDPE], 2012, p. 1), revealed a marked improvement over the previous years. Another analysis of this significant improvement, which considered the two language groups (francophone and anglophone), found that New Brunswick's francophone students did very well in mathematics by ranking third among the 19 represented instances (MÉDPE, 2012, p. 1) (Figure 1).

Figure 1

PCAP 2010 Mathematics Results by Language



Note. Outcomes were measured with a 95% confidence interval. It indicates to what extent the interval contains the true population mean. The PCAP score distribution has a Canadian average of 500 and a standard deviation of 100.

These results raise two questions. How can this improvement be explained? What are the factors explaining this net improvement for New Brunswick's francophone students? New Brunswick's De-

partment of Education and Early Childhood Development (DEECD) stated that several initiatives implemented in the francophone sector could explain this notable progression (MÉDPE, 2012). One such initiative was the introduction of professional learning communities (PLCs) in the province's schools. DEECD declared that by working in collaboration, maintaining high standards, and favoring practices that promote assessment to enhance learning, elementary math teachers were able to demonstrate that New Brunswick's francophone students could figure among the best in Canada (MÉDPE, 2012, p. 1).

The Context in New Brunswick

For New Brunswick's DEECD, PLCs represent an excellent work approach to introduce sustainable changes in teaching practices and ensure a more effective monitoring of student outcomes and progress. To address the issue of low academic achievement, the school districts in the province established PLCs in every francophone-sector school and allowed their teachers scheduled meeting time during school hours for a smoother and more successful implementation of this new work method. Consequently, there are no classes for students in the order of one full day per month, two half-days per month, or one hour per week. This planned action is part of the school schedule transmitted to the parents at the beginning of the school year. This collaborative structure between teachers, which has been in operation in New Brunswick for over 10 years, is not another task added to the schedule but rather an efficient way to give teachers the time they need to discuss and collaborate with peers. This structure has worked for more than a decade, which is why the principals continue to allocate this time during school hours.

Research Objectives

The practices developed through the established PLCs are often highly diversified because many educators lack training on how to properly launch and successfully sustain this work approach. In this regard, the authors acknowledge the challenges experienced when introducing and maintaining PLCs in schools (McLaughlin & Talbert, 2006; Timperley, 2008). On this Timperley (2008) wrote, "sustainability depends both on what happens during the professional learning experience and on the organizational conditions that are in place when external support is withdrawn" (p. 24).

It is through continuing education, training, and practice-related reflection with peers that winning practices emerge and are developed, between in-class professional experiences and collaborating with colleagues. So how can these winning practices be formalized and disseminated?

Carpenter (2019) put forth that future studies on collaborative structures and on the impact of PLCs on teaching practices must identify the aspects on which teachers collaborate as well as determine how the interactions in the PLC impact these practices. In this perspective, we examined teachers' collaborative practices in New Brunswick PLCs to identify the most successful practices, in a context where the PLCs have been established for more than 10 years. We sought to answer the following questions:

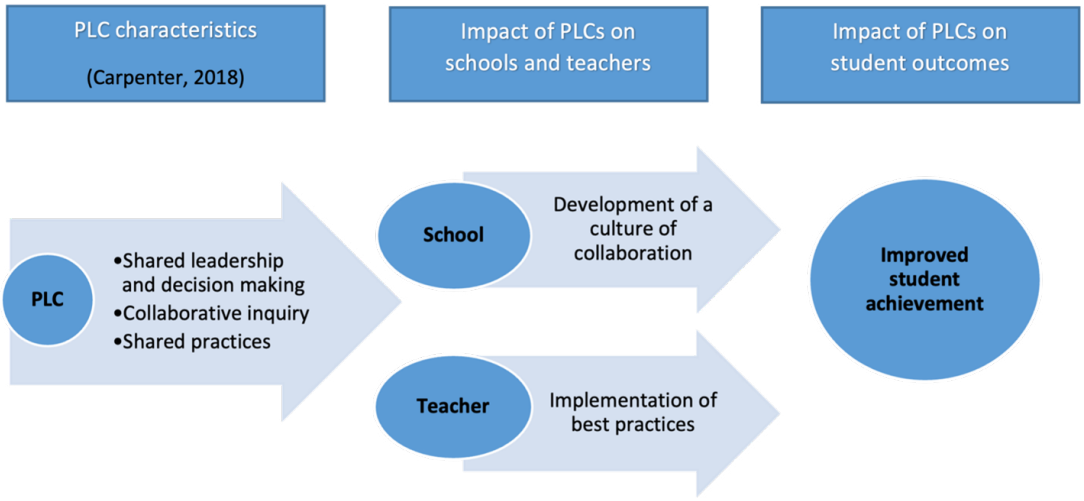
1. How did the teachers collaborate?
2. Did the teachers develop any tools?
3. Following the PLCs, what did the teachers do in class?
4. How did the teachers monitor their students' progress?

Conceptual Framework

The conceptual framework of this research contained three key concepts: (a) PLC characteristics, (b) impact of PLCs on schools and teachers, and (c) influence of PLCs on student achievement (Figure 2).

Figure 2

Impact of PLC Practices on Schools, Teachers, and Student Outcomes



PLC Characteristics

A PLC is an effective work approach centred on collaboration between teachers with the goal of improving teaching practices (Gee & Whaley, 2016; Vescio et al., 2008) and, ultimately, student achievement (Roy & Hord, 2006). According to Carpenter (2018), a successful PLC demonstrates the following core characteristics that guide the collaboration process: (a) shared leadership, in which the PLC members are supported to become leaders; (b) shared decision making, as the decisions pertaining to student improvement are made as a group; (c) collaborative inquiry related to accountability measures, in which PLC members discuss different aspects of their educational practices; and (d) shared practices, which bring the PLC members to reflect and share their successful professional practices.

As the foundations of a PLC, these characteristics must imperatively be established to obtain the desired outcomes, namely, improving teaching practices and, ultimately, student achievement (Eaker et al., 2002; Roy & Hord, 2006; Vescio et al., 2008). This collaborative inquiry must also be guided by the four anchor questions of a PLC (DuFour et al., 2005, p. 15):

1. What is it we want all students to learn?
2. How will we know when each student has mastered the essential learning?
3. How will we respond when a student experiences initial difficulty in learning?
4. How will we deepen the learning for students who have already mastered essential knowledge and skills?

Impact of PLCs on Schools and Teachers

Several studies have shown that well-implemented and developed PLCs constitute an excellent work model to improve schools (DuFour et al., 2005; Hord, 2004; Toole & Louis, 2002) and that these improvements have positive impacts on both the school and its teachers.

For schools, integrating PLCs changes not only the school's culture but also its climate (Carpenter, 2018; Khourey-Bowers et al., 2005), thus creating a highly fertile environment for sustained collaboration focused on student achievement. In this perspective, PLCs favour and support reflection and sharing among their members, which in turn generates positive changes in how teachers teach (Gee & Whaley, 2016; Hord & Sommers, 2008; Vescio et al., 2008). However, this productive culture of collaboration can only exist when a PLC has achieved a certain level of maturity through considerable efforts and resources toward its sustainment (DuFour et al., 2005). Only then can this collaborative structure bring about effective changes in how teachers teach.

For teachers, participating in a PLC breaks the sense of isolation many of them experience (Mat-

thews et al., 2014; Woodland, 2016) and enables them to pursue professional development (Dionne et al., 2010; Moreau et al., 2013; Stoll et al., 2006). An established PLC has numerous positive impacts on teachers: teachers adapt and improve their pedagogical practices, they become learners, their critical thinking is developed as they seek out and try new strategies to meet their students' needs more effectively, and they evolve into leaders and learn how to collaborate better with peers in other schools (Hord & Sommers, 2008).

Impact of PLCs on Student Achievement

Extensive research (Bolam et al., 2005; Lomos et al., 2011; Phillips, 2003; Stoll et al., 2006; Strahan, 2003; Supovitz & Christman, 2003; Vescio et al., 2008) has shown that integrating PLCs in schools is a work method that substantially improves student achievement.

After having assessed their students, the teachers analyze the results and subsequently make informed decisions regarding their teaching methods (Van Lare, 2016). Through fruitful discussions and sharing in a PLC, the teachers are encouraged to enhance their own pedagogical methods by looking at research-supported practices, such as those identified by Hattie (2009) and Marzano (2007). These winning practices will allow teachers to better respond to the educational needs of their students. In other words, this collaborative work approach enables a rigorous and productive analysis of student data (Prud'homme & Leclerc, 2014), which in turn helps regulate and adapt teaching practices (Bernhardt, 2017) for the ultimate benefit of the students.

Despite the significant interest toward developing PLCs and the acknowledged effect on student achievement, little is actually known about the most successful practices emanating from the PLC method. Indeed, although best practices are identified in the literature (Hattie, 2009; Marzano, 2007), questions still remain as to how teacher collaboration practices work, what the discussions are centred around, and what tools are being developed.

Methodology

Sample

This qualitative research consisted of a case study to better understand the practices of teachers and principals in a PLC and in their classrooms and to gain insight on their perspective regarding the process (Patton, 2002). For this purpose, we invited principals and teachers from the francophone school district in northwest New Brunswick, Canada to participate in this study. Their participation was voluntary. In each school of this district, the teachers worked in PLCs. For the data collection, we interviewed nine teachers and four principals ($N = 13$). The participants hailed from New Brunswick's three francophone school districts, which consist of 136 principals and 1,826 teachers.

A semi-structured grid guided the interviews, which focused on different aspects of the participants' PLC, namely, collaboration practices, changes made to their teaching practices, their view of the effect the PLC had on how they monitored their students' progress, and the tools they developed.

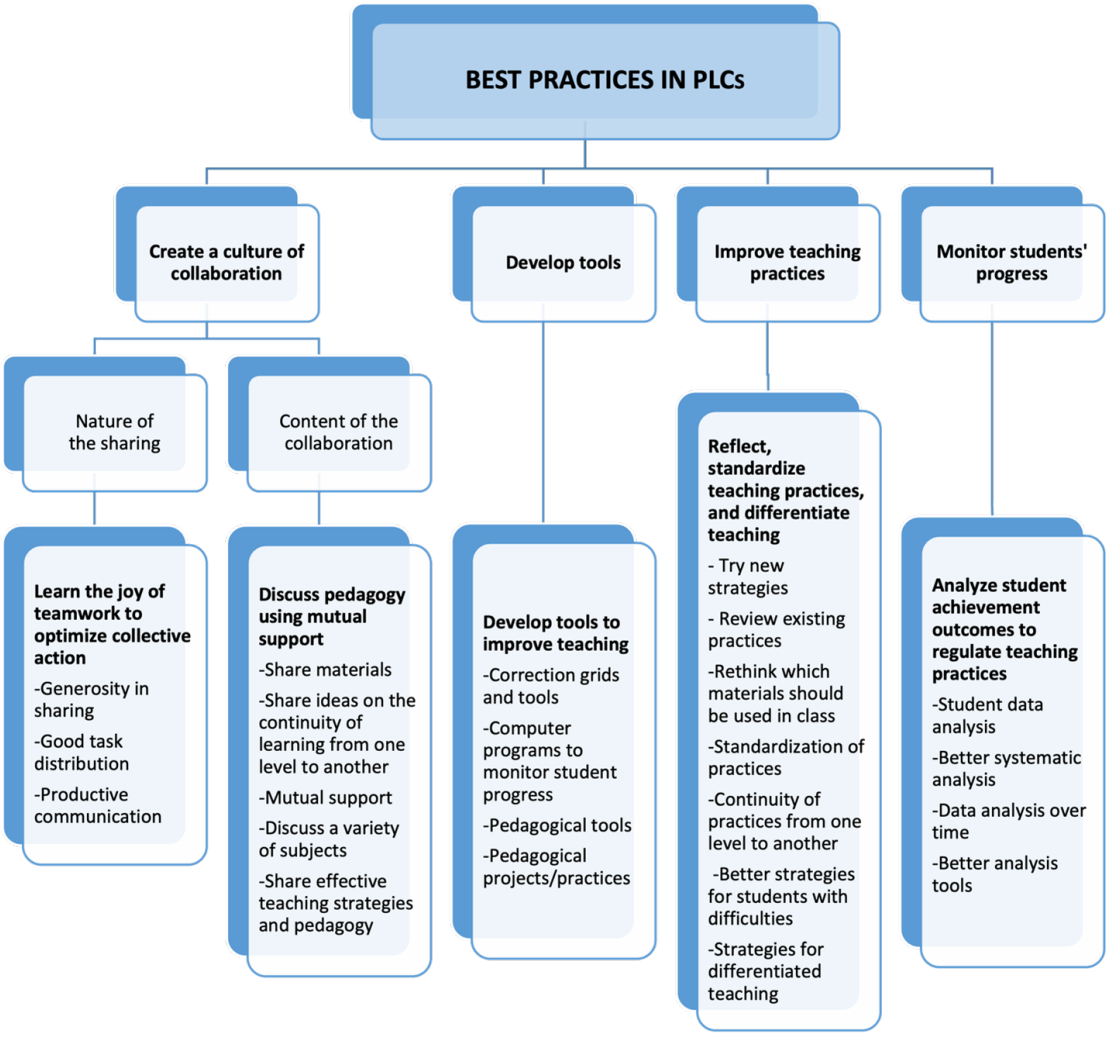
Data Analysis

The fully transcribed interviews underwent a mixed-method thematic analysis (Paillé & Mucchielli, 2021). This coding housed three main close-ended themes and open-ended subthemes. For the present study, we retained the theme on the best practices of PLCs. Preliminary analyses enabled us to identify the emerging subthemes that were closely aligned with the research questions; therefore, the results of this study emanate from the categories derived from the research questions. Intercoder reliability, an operation performed by the researcher and two other coders, was 90% according to the principles of Miles and Huberman (2003).

Results

Figure 3

Synthesis of the Results on Winning Practices in PLCs



Create a Culture of Collaboration

The first theme, namely, *create a culture of collaboration*, contained two subthemes: *nature of the sharing* and *content of the collaboration*.

Nature of the Sharing

When participating in PLCs, teachers are called upon to communicate, discuss, and share with their colleagues. In the New Brunswick francophone sector, PLCs are mandatory; therefore, every teacher is required to participate. In this context, where volunteering is not an option, it is interesting to examine the nature of the sharing, a principle that many participants may find difficult to accept. This did not appear to pose a problem in this study, as there was evidence of a good level of collaboration, according to the participants, as noted in their comments in the following sections.

Most of the teachers in this study observed a significant amount of generosity throughout the sharing process. Teacher 1 shared, "I never witnessed a teacher who did not want to share their materials or ideas." The teachers had no choice but to actively participate in this form of collaboration. According to Principal 2, "I think that in general, with the strength in numbers, you don't have the choice but to get

on board [to participate].” Those who experienced this generosity in the sharing aspect attributed this to a well-balanced distribution of tasks among the members. Teacher 9 remarked, “Our PLC is doing well. Our duties are well divided between us.”

Good communication between the members was also mentioned. Principal 1 shared, “In our case, communication is pretty good. … When someone does something that works, they’ll say: I did this … you could try it and we’ll go over it together.” Several PLC members expressed actually enjoying working as a team. According to Principal 4, “We have teachers who want to work together, and at times even enjoy doing so. We have a good team.”

These findings thus highlight the winning pattern of learning the joy of teamwork to optimize collective action.

Content of the Collaboration

Collaboration in the PLCs often translated to a sharing of pedagogical materials. According to Principal 1, “When we had three schools, there was a lot of sharing in terms of materials.” Teacher 6 shared, “When we do something that works, for example a writing lesson that was really fun, we’ll share it with our second grade teachers. They can adapt it.”

Collaboration often ensured a continuity of the practices from one level to another. For example, the members of the team discussed their respective views on a specific literacy concept that was not interpreted the same way by everyone. Teacher 5 shared:

> In literacy, with regard to situations of inference, we noticed that between Grades 4 and 5, the teachers’ perceptions differed. We explained to them what we were doing, what we wanted them [the students] to have in Grade 5. So, they made adjustments in Grade 4. Now, when they [the students] come into Grade 5, they do better.

Mutual support was another important component evoked. Collaboration was thus activated when a teacher called upon colleagues to help her with a student for whom she sought solutions. According to Principal 4:

> “I need help with that student.” We see that often. So, we discuss the matter. “I want to help him do better, but I’m stumped. What do I do?” … These are teachers who support each other, work together, and help each other on several aspects.

The PLCs also provided a purposeful environment to discuss subjects of mutual interest or day-to-day work-related matters. Teacher 4 explained:

> We share our opinions and our successes but also what doesn’t work. We also share, “I don’t know anymore what to do with him, give me something I can do to help him understand.” It’s basic needs analysis. It’s searching for activities or methods to help those who don’t understand to understand. It’s teachers sharing their winning strategies or the adjustments made to the programs.

The sharing of teaching strategies emanating from research results, such as inclusion practices, practices that favour inclusion, and explicit instruction, were also part and parcel of the teachers’ discussions. This enabled them to better welcome and orient the changes in their pedagogical practices. Principal 3 observed:

> Sometimes, there are teachers who will do research on the best practices out there, such as inclusion practices and those that support inclusion, winning practices that propose certain pedagogical approaches, such as explicit teaching or other forms of instruction. … They’ll get together and they’ll say, “This is what the research says, so let’s analyze our practices and make changes accordingly.”

On this aspect, several participants stated that their PLCs encouraged highly fruitful discussions on pedagogy, as evidenced in the following excerpts:

> For me, if I try a practice that works, I'm going to share it with every teacher in my grade level. If I do something which I feel could be beneficial to the group, I bring it to them [to the PLC]. (Teacher 3)

> There are teachers who use effective strategies, then others try them. This way, … they can develop a trusting relationship, which is important. … They feel more comfortable admitting, "This is not working for me, what am I doing wrong?" (Principal 2)

These findings highlight the winning practice of discussing pedagogy using mutual support.

Develop Tools

Correction grids were among the tools developed in the PLCs. According to Principal 1, "The correction guide for French. We did an activity … so everyone could use the same correction grid." Teacher 1 also shared:

> The first year, we developed a common correction grid for the entire school. So, the students corrected their texts from seventh to 12th grade the same way. The following year, we worked more on punctuation because our provincial exam results showed that that was the biggest problem in our school. So we proceeded to build grids for punctuation.

Many of the participants mentioned having developed a student profile using Microsoft Excel to monitor their students' progress. Principal 2 said, "We created a student profile [using Microsoft Excel] to follow each student from kindergarten through eighth grade. It gives us an overall picture. We use these tools more productively because of our PLCs." Teacher 6 further explained:

> We use our assessment grids a lot and we all use Excel files. Mostly for math and literacy assessments. We all use the same tests, so it gives us a table that tells us exactly where the student is having difficulty.

The teachers also developed pedagogical tools to support their students' learning activities. According to Teacher 2, "We drew up [prepared] a notebook on how we taught [teach] geometry. So, we built a large 'how-to' guide for the entire school." Teacher 6 added, "In our literacy segments, we all use the same materials, so these are tools that we've developed." In some PLCs, the participants went further by developing educational projects in which different professionals were invited to contribute. Teacher 3 shared:

> Our language workshops. What we succeeded in doing was real PLCs: a real community that shared with the speech therapist, … the resource teacher, the language teacher, etc. We even presented our results at a conference. It was really a nice tap on the back, we were extremely proud of what we accomplished.

These findings highlight another best practice, which is developing tools to improve teaching.

Changes in Teaching Practices

For PLCs to be able to reach their ultimate goal, namely, improving student achievement, teachers must adjust their pedagogical practices (referring to the four essential PLC questions identified earlier). The participants often stated that their PLCs brought them to change the way they taught. According to Principal 3, "Obviously, our teaching practices are currently evolving. We are seeing more and more winning practices being used." Teacher 9 also shared, "We've adapted our interventions to better suit our students' educational needs."

The culture of collaboration taking place in the PLC serves as an incubator for productive discussions and sharing between the members. It is then possible for those offering various services in the school to collaborate to plan actions, processes, or interventions that will become part of these integrated services. Principal 2 explained:

> Regarding explicit teaching, for example, we went to visit another school, we came back, we set it up, and now our teachers do it. With respect to integrated services, it's the same thing. I don't think it would have been possible if we hadn't had our PLCs.

The PLCs thus encouraged the teachers to study the student data to try new strategies. Teacher 1 shared:

> In one PLC, a teacher said, "This is what I do," and it rang a bell for me. So I started to do it. Since then, I find it's going well and the students seem to understand better. That's called modelling … and it was a revelation!

The PLCs also provided their members with opportunities to reflect on their existing practices. Teacher 3 mentioned:

> Yes, in the sense that we take the time to think about our practices. Often, we're in action mode, but in the PLC, we can take a step back … and say, "That's true, I had not thought about it like that" or "Maybe I could do that differently."

The interviewed teachers also declared that their PLCs enabled them to reflect on what materials work best in class. Teacher 4 remarked, "We're going to use more materials. We have the time to do research on that to see what we can do." Teacher 5 also shared, "In math [geometry], when we get to teaching polyhedrons, there are materials out there that can help us develop this. I didn't know that. [Now] we use it every year."

Regarding teaching practices, the participants spoke on several occasions of the importance of using standardized practices in same-grade classes. According to Teacher 6, "We have the same language, we use the same strategies, we've developed a common way of doing things." Principal 2 explained, "The science teacher has a better idea [of] what expectations the French teacher has. So, in their science class, they can have the same expectations of their students."

Having continuity in the practices from one level to the next was also mentioned. Teacher 4 said that it is about "establishing links between Grades 3, 4, and 5. It's implementing a certain continuity." Teacher 2 shared:

> We looked at [analyzed] each level. For example, we looked at the number. What are we seeing in kindergarten? What are we seeing in Grade 1? Grade 2? So, everyone knows what has been done before and what comes after, to stay on the right path. We did that in math.

To improve student performance, the participants stressed the importance of using strategies to help students with difficulties. According to Principal 1, "Having this pause to reflect makes it possible for us to say, at one point: What do we do with the student who failed this or that question on the math exam? How can we teach him differently?" Teacher 5 added:

> To see that after that [the PLC], we succeeded in really helping certain students. Seeing that this child succeeded and made huge strides. … I could tell that this student was more comfortable now because he had a better perception or attitude toward mathematics or toward reading, because we were able to give him better tools to do so.

The different activities in the PLCs also helped the members discuss and devise strategies to differentiate instruction to respond better to their students' educational needs, based on the four previously

mentioned binding questions regarding PLCs. According to Teacher 2, it was:

> Mostly regarding differentiation. This year, I have two students who are not at the same level of others. So, you see, it's not just a math test that I have to prepare, it's three math tests. It's not one way of teaching numbers; it's three ways of teaching numbers. So I find that it's highly beneficial for that, and what's more, you can go ask the other levels … to see how they do it.

The many advantages of PLCs for improving teaching practices (Andrews & Lewis, 2007; Cordingley et al., 2005; Doğan & Yurtseven, 2018; Louis & Marks, 1998) and teacher professional development (Dionne et al., 2010; Moreau et al., 2013; Stoll et al., 2006) are widely acknowledged. We thus felt it of interest to learn more about the participants' perceptions of how their PLC contributed to their professional growth. On this aspect, the participants declared that they had become better teachers after having joined PLCs. For Teacher 4, it was "an opportunity for professional development, whether through small training activities or research activities. In terms of needs analysis skills, you become better." According to Teacher 5, "For me, it helped me become a better teacher. We become better because we are better equipped, better prepared to work with our students." Teacher 3 also shared:

> For me, what makes me a better teacher is being able to easily adapt, share, listen more, change my practices. … It has opened my eyes to what's going on elsewhere. Of course, I'm becoming better; it's like continuing education.

These findings showcase another winning practice: reflecting on teaching practices, standardizing, and differentiating teaching or instruction.

Rigorous Monitoring of Students' Progress

We recall that the prime objective of PLCs is improving student achievement (Bolam et al., 2005; Lomos et al., 2011; Supovitz, 2002; Visscher & Witziers, 2004). One method for sustained improvement is analyzing the students' achievement outcomes and progress over time for more effective intervention. To better monitor student progress, the students must be evaluated and their results analyzed.

The type of evaluation used in the PLCs is the formative assessment. These assessments, which take place during the student learning process, aim to support their learning (Stiggins & DuFour, 2009; Weurlander et al., 2012). Following their analysis of the assessment results, the teachers can adapt or change their in-class practices to better regulate their students' learning (Clark, 2012; Granberg et al., 2021).

As mentioned in the following excerpt, analyzing the results helped the teachers adjust the educational content presented to the students. Teacher 4 shared:

> I really enjoy analyzing my students' results. … On my first diagnostic in the second semester, I noticed content that should have been acquired in the first semester. Certain content must be learned, but it is not always done. So, I'll add some content.

To ensure improved monitoring of the learning outcomes, PLCs recommend using a systematic procedure. The teachers prepare common assessments, correct these assessments, and then analyze the results. Thereafter, based on this analysis, they will identify and integrate actions to better support students who do not have the desired outcomes.

The participants asserted that they used a systematic process to analyze student results. This was performed informally, with no specific title attributed to the process. Teacher 1 explained, "We do it, but it really isn't really official." According to Teacher 2, "We talk about it, but unofficially. 'What do we want our students to learn? How will we know if they've learned? What do we do when they don't learn? What do we do if they've already learned it?'"

According to one teacher, the analysis was a multi-step process involving the following: administering a common assessment, assessing class performance, self-evaluating the strategies used, and evalu-

ating the students' acquired content and problem areas, all with the goal of identifying the best practices and strategies. Teacher 4 explained:

> We test our students. Then we verify how well our class has performed, how well our methods or strategies worked or didn't work. We identify the students' strengths and weaknesses based on the resulting data which we then upload into Excel. From there, along with other teachers, we'll look for the best strategies or share what works for us.

In operationalizing the data analysis, the participants prioritized the required learning content in the study program rather than their own personal preferences. Thereafter, they used tools to better identify the students' difficulties. Principal 2 explained:

> As for the strategy team, when we get together, the teachers are much better prepared. Before, they would come in with an issue with one child but we were not quite sure [of the type of difficulty involved]. The tests the teachers could use, for example PRIME tests to know how well they're doing in mathematics, they were not done. Now, when the teachers come in, they are ready.

Because the data teachers analyze come from multiple sources, prioritizing the information is important, which is why relevant required learning data must be examined first (Ainsworth, 2013; Marzano et al., 2013; Wiggins & McTighe, 2005). In essence, this system of prioritizing refers to the famous quote, "If everything is important, then nothing is important." (Many & Horrell, 2014, p. 2). It is in this perspective that the teachers will have to "prioritize the standards based upon a common and agreed upon set of criteria developed collaboratively while working as a team" (Many & Horrell, 2014, p. 2). Interestingly, during the course of this study, the participants did not mention this aspect of the teachers' work (i.e., prioritizing relevant student data).

Finally, through sharing and discussing in the PLCs, the teachers learned to regulate their teaching practices based on the assessment results of their students. In other words, the teachers changed, adjusted, and adapted their pedagogical practices. According to Principal 3:

> Say that we've been teaching this or that concept for four or five weeks. Then we ask ourselves "Are we making progress? What kind of improvements are we talking about? What data do we have to confirm this improvement? Are the students doing better or not?" We then give them a formative or summative test. From there, we adjust ourselves [change our practices based on these test results]. Ultimately, this improves our practices.

These findings consolidate an additional successful practice, which is analyzing student achievement outcomes to regulate teaching practices.

Discussion

The goal of this qualitative study was to identify winning practices in teacher PLCs in a province where PLCs have been the norm for several years. The findings reveal a strong level of collaboration due to a well-balanced distribution of tasks and good communication between the teachers, who not only shared didactic materials but also provided mutual support. Sharing also had a positive influence on the continuity of the learning activities from one level to another and on teaching strategies and pedagogy. Because the teachers were allowed time during school hours to attend the PLC and collaborate, sharing and discussion between members were not only greatly facilitated but also highly appreciated.

The PLC meetings went far beyond mere discussions between members. The teachers grew professionally by developing several proactive tools, such as correction grids, computer programs, and techniques to monitor student progress, and several pedagogical methods and processes. Educational projects involving several staff members were also led to fruition.

All of the principals and teachers who participated in this study declared that the PLCs had significant positive impacts on their teaching practices. These impacts have been recognized in several studies

(Gee & Whaley, 2016; Vescio et al., 2008). The collegial aspect of the PLC activities made it easier for the teachers to reflect on their current practices, welcome change with less resistance, try new strategies and practices in their classrooms, and examine which materials worked best for them. Evidenced were opportunities for reflection, discussions regarding the practice (e.g., standardization and continuity), and effective differentiated actions to better serve at-risk students. As a result of this collaboration and collective reflection, some of the participants thought that they had become better teachers. Therefore, these findings support that PLCs constitute an excellent professional development approach for teachers (Hord, 2004; Louis et al., 1996; Stoll et al., 2006; Wiliam & Thompson, 2008).

Following and analyzing student data are known to be key actions to improve student achievement (DuFour et al., 2013). For this purpose, the respondents used systematic analysis to effectively monitor their students' progress. The results show that this systematic analysis was performed informally in a series of important steps: test administration, analysis of the test results, identification of strategies to better support the students, and implementation and application of the identified strategies. The core element of this process remains a rigorous analysis of student outcomes, which enables teachers to obtain not only a detailed picture of how well their students are doing but also indications of how to better regulate their teaching practices accordingly.

To conclude, the results of this study on winning practices in PLCs present concrete, tangible evidence that education stakeholders can use to implement or develop this work approach in their schools. Limitations in the present study include the small sample analyzed and the weak representation from the secondary education sector. Because a case study was involved, hence the small sample, further research should help elucidate whether these winning practices resemble those in other contexts and whether they have evolved over time.

The results of this study present several promising avenues for further research, which should explore, among others, the principal's role, contribution, and winning practices in PLCs; how this role evolves throughout the year; and how other stakeholders, such as the school district and ministries of education, figure in the introduction, supervision, and sustainment of PLCs. Furthermore, quantitative studies to investigate the link between student learning outcomes and the effective practices identified in this study will fuel further research.

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