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Co-teaching-based professional development: Self-efficacy, attitudes toward the profession, and pedagogical practices

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Co-teaching-based professional development: Self-efficacy, attitudes toward the profession, and pedagogical practices

Abstract

The design of university training programs affects academic outcomes therefore, exploring the various design components in the academic program is important. The study explored how participating in a co-teaching-based professional development program (PDP) affects novice teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices; and measured the correlation between self-efficacy and attitudes and how it is influenced by the application of pedagogical practices. We used a questionnaire answered by 300 novice teachers and interviews with 15 teachers who participated during their academic studies in the co-teaching-based PDP. The results indicated a higher sense of self-efficacy and attitudes toward the profession among teachers who participated in the co-teaching-based PDP. The relationship between teachers' self-efficacy and attitudes was partially mediated by six pedagogical applications. The findings provide insights on designing PDP that may contribute to ameliorating the entrance of novice teachers into the teaching profession with teaching skills that will sustain over time.

Practitioner Notes

1. Connecting experiential components from the educational field is important in the professional academic training of teachers. The findings of the study show that the integration of a component of co-teaching by university educators strengthens the academic course and contributes to teachers' self-efficacy and positive attitudes toward the teaching profession.
2. The findings of the study confirm the positive and significant relationship that exists between teachers' self-efficacy and their attitudes toward the teaching profession. University educators need to take this into account in teaching and designing learning environments.
3. The relationship between teachers' self-efficacy and attitudes was mediated by several pedagogical practices: applying constructivist pedagogical practices; matching to differences between learners; collaboration between fellow teachers; accountability; planning and teaching management; and academy-community relationships. University educators, therefore, should include these aspects in academic curricula.

Keywords

Co-teaching; professional development; teacher's sense of efficacy; attitudes toward the teaching profession; novice teachers

Introduction

The notion for a collaborative teaching stemmed in the United States, following the Education for All Handicapped Children act in 1975 which stated the integration of special education students into general educational frameworks. For the special needs students to integrate in the general classroom it was important that a special education teacher cooperatively teach, alongside a general education teacher (Drescher, 2017; Murawski & Swanson, 2001). Over the years, the terminology has been shortened to co-teaching by Cook and Friend (1995) who defined it as two or more professionals who teach a diverse group of students in the same class in a combined manner. In the early years of 2000, it had become an emerging practice to include training time for the special education pre-service teachers within schools during their teacher education programs (Pratt, 2014). Such practice induces authentic teaching experience for the pre-service teacher while assigning them to a mentoring veteran teacher in the same class (Griffin, 2003). Indeed, during the last years, it has become a more common practice of teacher education programs, during which the pre-service teachers have a year-long field experience of teaching side-by-side with a mentoring veteran teacher and they collaboratively plan, instruct and assess students (Guise et al., 2017; Kamens, 2007; Murawski & Lochner, 2011). Thus, during co-teaching the veteran teacher receives the role of training and accompaniment, and the novice pre-service student gradually integrates into active teaching.

Jackson et al. (2017) describe different variations of co-teaching models: (a) One Teach, One Observe - one teacher instructs while the other observes students to identify issues and assess their performance; (b) One Teach, One Drift - while one teacher is instructing the classroom, the second teacher provides additional assistance and support to students as needed; (c) Station Teaching - the lesson is divided into segments and each one of the teachers instruct part of the lesson at independent stations or rotate among groups of students; (d) Parallel Teaching - the teachers divide the class into two groups and they instruct each group with the same content simultaneously; (e) Alternate Teaching - one teacher handles a larger group, while the other teaches a small group of students who need special attention and additional supports; (f) Team Teaching – the co-teachers share responsibility and deliver instruction at the same time as a 'tag team'.

Professional development programs (PDP) affect teachers' concepts about the teaching profession and their identity as educators, as well as their pedagogical knowledge and teaching skills (Jacob et al., 2017; Taylor et al., 2017). The type of training also affects the perceptions of pre-service teachers' 'readiness' (Hine, 2015). PDP that involves two colleagues who are engaged in a mutually supportive relationship enriches the teachers' reflections on their practices. This method provides mutual assistance, feedback, and support, for the purpose of enhancing learning (Alsaleh et al., 2017; Ma et al., 2018). Viewing this co-teaching concept at large, supports the significance of PDP in assimilating teaching skills that will sustain over time (Sachs et al., 2011). The main goal of this study was to explore the contributions of a co-teaching-based PDP for novice teachers who participated in it during their academic training as pre-service teachers.

Previous studies such as Elald Yerliyurt (2016), Eroglu and Unlu (2015), and Kanadli (2017) indicate a positive and significant correlation between teachers' self-efficacy and their attitudes toward the profession. While still during their academic teaching-education, pre-service teachers' sense of efficacy increases due to supportive and guided experiences (Coladarci, 1992) and they develop positive attitudes toward the teaching profession (Cortés, 2016). Teachers' self-efficacy is corelated with their pedagogical behaviours. High self-efficacy involves higher levels of planning

and organizing educational goals (Allinder, 1994); more applications of new pedagogical methods and curriculum innovations (Cousins & Walker, 2000; Deemer, 2004); and more investment time with students, particularly students who have difficult dispositions or students lacking motivation to learn (Tschannen-Moran & Hoy, 2001). On the other hand, failure in implementing effective teaching practices leads to low self-efficacy (Wyatt, 2013). Based on these previous researches, the goals of this research were: (a) to explore how participating in a co-teaching-based PDP affects novice teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices; and (b) to measure the correlation between self-efficacy and attitudes toward the profession and to explore how it is influenced by the application of pedagogical practices.

Theoretical Background

Teachers Sense of Efficacy

The concept of teachers' sense of efficacy is rooted in the social cognitive theory by Bandura (1997), who suggested to define it as the teacher's subjective sense of effectively coping with the challenges of the teaching profession and realizing his or her potential as a teacher. The term refers to the teacher's own belief rather than to his or her observable behaviour, therefore to what extent the teacher believes he or she can successfully accomplish a teaching task and influence their students learning (Coladarci, 1992; Tschannen-Moran et al., 1998). Self-efficacy serves as a powerful source of teachers' motivation, their goals, and their persistence when they face difficulties but what comprises the sense of efficacy in teachers is complex and has been researched upon in the last few decades (Ciani et al., 2008; Rimm-Kaufman & Hamre, 2010; Tschannen-Moran et al., 1998). This is due to the different perspectives in several areas related to students' achievements; collaboration and relationships with colleague teachers and students; and organizational factors of the education system such as leadership and decision making, support from the management, sense of belonging and school climate (Friedman & Kass, 2002).

There is a strong correlation between teachers' efficacy and students' achievements (Lacks & Watson, 2018). Teaching efficacy and teacher's self-efficacy are intertwined. Teachers' ability to be effective in their teaching, reach out to their students and positively affect and influence their students' academic achievements as well as their psycho-social abilities, is strongly correlated to teachers' self-efficacy. Teaching efficacy relies on various parameters not necessarily within the teacher's own control, but strong predictors for it are school climate and the teachers views of student motivation (Lacks & Watson, 2018; Protheroe, 2008). Holding teachers' sense of efficacy to students' achievements often times correlates with their perception of responsibility (Frumos, 2015). According to Matteucci et al. (2017), teachers who had greater sense of responsibility for their students' outcomes were more engaged and satisfied with their teaching techniques than teachers who did not have a great sense of responsibility for their students' academic outcomes. Relationships with colleagues and students also play a role in the construct of teachers' sense of efficacy. Collaboration among colleague teachers is positively correlated with teaching efficacy and help in improving it (Lacks & Watson, 2018). Cooperation among teachers, teachers' learning communities and coaching intervention support positive sense of efficacy, especially in novice teachers (Meristo & Eisenschmidt, 2014; von Suchodoletz et al., 2018).

Friedman and Kass (2002), Kanadli (2017), and Tindowen (2019) attribute organizational factors to play an important role on teachers sense of efficacy as well. Teachers' perceptions that are

school-based variables such as school climate and principal's support impact their sense of efficacy (Ciani et al., 2008; Collie et al., 2016; Meristo & Eisenschmidt, 2014; Shapka & Perry, 2012).

Attitudes Toward the Teaching Profession in Novice Teachers

Among teachers, a dominant motive for choosing a teaching profession stems from the desire to be part in shaping the world of tomorrow while delivering universal values and contributing to society (Ezer et al., 2010; Mukminin et al., 2017). Teachers often conceive their students to be like clay that can be shaped and moulded by the hands of the teacher, giving teachers a sense of purpose to inspire and impact their students (Heinz, 2015). Although the teaching profession is perceived to have low wages and is therefore considered inferior to many other professions, additional motives to take part in the profession include a high demand for teachers worldwide and stable job security with retirement conditions (Ewing & Manuel, 2005); and the convenience of integrating the profession with family growth which may explain why women favour the profession (Cinamon & Rich, 2005).

Yet, studies show that there is a difference in the perception of attitudes toward the profession between pre-service teachers and in-service teachers (Cortes, 2016); and between novice teachers and experienced teachers (Meristo & Eisenschmidt, 2014). This may be due to the teachers' seniority and experience in the profession. Richardson (2003) suggests that pre-service teachers' beliefs are based on their own past experiences as individual students rather than from a teacher's perspective. Once those pre-service teachers encounter the challenges of actual teaching, their perspective gradually changes and has to accommodate to a new set of ideas, especially during the first two years of their teaching experiences (Meristo & Eisenschmidt, 2014). This is in line with Slaybaugh et al. (2004) findings of a difference in teachers' attitudes toward the teaching profession between teachers with one-year experience and those with two years of experience, especially in their attitudes toward teaching skills and class management.

For this reason, particular attention should be paid to accompanying new teachers as they enter the teaching profession. In order to prevent dropping out of the profession due to feelings of inadequacy and low sense of teaching efficacy, training programs aimed to accommodate specifically novice teachers as opposed to experienced teachers, are essential (Kamens, 2007). A very strong predictor for enhancing teachers' attitudes toward the teaching profession and leveraging their sense of efficacy is collaboration among colleague teachers (Ciani et al., 2008; Lacks & Watson, 2018; Tschannen-Moran et al., 1998).

Research Questions

RQ #1 How does participating in a co-teaching-based PDP affect novice teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices?

RQ #2 Is there a mediating effect of pedagogical applications on the relationship between novice teachers' self-efficacy and their attitudes toward the profession?

Methodology

The study incorporated quantitative and qualitative tools in a triangulation design to best understand the research problem (Creswell & Clark, 2017). The intent in using this design is to

combine the strengths of the quantitative methods (large sample size, trends, generalization) with those of the qualitative methods (small sample size, details, in depth).

Research Framework

All novice teachers must participate in a professional training during their first year in the educational system. The present study focused on a new co-teaching-based PDP for pre-service teachers that aims to fully introduce the students to the school life as a proper preparation for entering the teaching profession. During their third year, pre-service education students join experienced teachers in schools and kindergartens for co-teaching two or three days a week (about 12-16 hours per week). The teaching subjects are in accordance with the academic training programs - language, mathematics, etc. Lessons integrate viewing of the veteran teacher and co-teaching in several modes such as station, parallel, or team teaching (Jackson et al., 2017). Collaboration between the co-teaching-based PDP participants and the veteran teachers encourages pre-shared preparation of lessons, co-teaching, and shared student evaluation. The veteran teachers provide oral and written feedback to the pre-service teacher students. The main objective of the professional program is to improve the novice teachers' training process by emphasizing their practical training.

Research Tools and Procedure

In order to answer the research questions, we used a close-ended questionnaire and interviews. The questionnaire included two parts. In the first part of the questionnaire the teachers stated whether they participated in the co-teaching-based PDP. The second part of the questionnaire included 44 statements aimed at investigating the teacher's sense of efficacy (the general self-efficacy scale developed by Chen et al., 2001, was adapted to meet the context of teaching); attitudes toward the teaching profession (based on Kazir et al., 2004); and pedagogical applications (based on the national test of the Ministry of Education). A five-point Likert scale was used, where 1 indicated complete disagreement and 5 indicated complete agreement. Table 1 presents the details of the categories and statements, and the reliability values of Alpha Cronbach.

Table 1

Categories and Statements in the Questionnaire

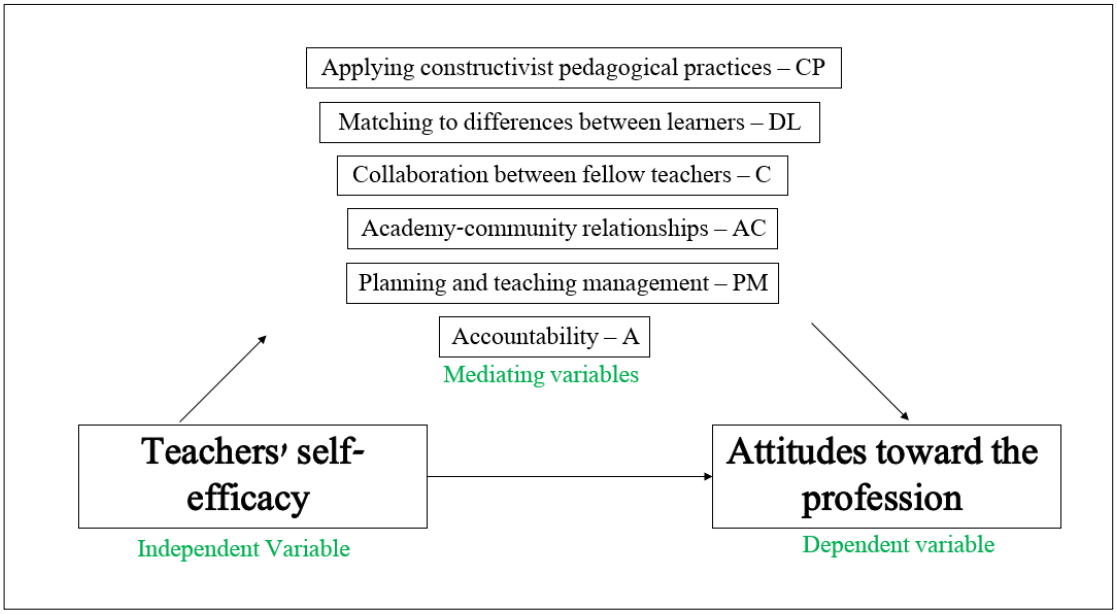
Category (No. of statements)	Subcategory (No. of statements)	Questionnaire statements - Examples	Reliability values of Alpha Cronbach
Teacher's sense of efficacy (8)	-	'I can achieve most of my educational goals'	0.885
Attitudes toward the teaching profession	Socio-economic security (4)	'The teaching profession provides professional-economic security'	0.746
	Educational impact on the next generation (5)	'The teaching profession makes a contribution to the development of the society'	0.830
	Professional self-realization (5)	'The teaching profession gives expression to creativity'	0.765
	Attitudes toward the teaching profession -Total (14)		0.880
Pedagogical applications	Matching to differences between learners (4)	'In my class, different students learn through different learning tasks that suit them'	0.796
	Accountability (3)	'I personally explain to students what exactly they need to do in order to improve'	0.618

Category (No. of statements)	Subcategory (No. of statements)	Questionnaire statements - Examples	Reliability values of Alpha Cronbach
	Planning and teaching management (4)	'I set educational goals for myself in the teaching and learning processes and work to achieve them'	0.658
	Constructivist pedagogical practices (3)	'In most of my lessons, I implement pedagogical practices that encourage student collaboration'	0.696
	Collaboration between fellow teachers (3)	'I collaborate with fellow teachers at the school for developing and editing learning tasks'	0.601
	Pedagogical applications – Total (17)		0.849
Academy-community partnership (5)	–	'Academic resources (library, experts, etc.) are available to me if necessary'	0.812

The interviews were semi-structured and lasted about forty minutes. The purpose of the interviews was to understand the teachers' perceptions of the program and its contributions. The following are examples of questions from the interview: *What are the main contributions of the program in your opinion?; What specific components of the program contributed to this?; Did the program affect your educational conception?; If so, how? Please use examples from your teaching processes.* Participants' responses were analysed based on the qualitative research approach. Data was analysed inductively, and the categories underwent thematic coding (Braun & Clarke, 2006).

To reply the first research question, a comparison was made between the questionnaire findings of teachers who participated in the co-teaching-based PDP and those who did not. The research model for the second research question included teachers' self-efficacy as an independent variable and their attitudes toward the teaching profession as a dependent variable. Six variables were examined as mediating variables in the model. Figure 1 presents the research model.

Figure 1
The Research Model



To test our hypothesized mediation model, we used ordinary least squares path analysis with the PROCESS macro developed by Hayes (2013) in SPSS 23.0. A bootstrap procedure that resamples the data multiple times (5000 times in our study, as per Hayes' 2013 recommendations) and gives an estimate of the entire sampling distribution for the indirect effect was also performed. To test the null hypothesis regarding mediation effects, the bias-corrected percentile method generated 95% confidence intervals. The significance of the indirect effect is the only requirement for mediation (Zhao et al., 2010) when the bias-corrected confidence intervals do not include zero.

Research Participants

Novice teachers (teachers within their first five years of teaching) who participated in co-teaching-based PDP and those who did not participate were included in the study. A total of 300 teachers responded to the questionnaire, 61 participated in the co-teaching-based PDP, and 239 did not. 81% of the respondents were women, 18% were men, and 1% did not mention their gender. The average age of the teachers was 33 years, standard deviation 7.33, and the median 30 years. The youngest teacher was 22 and the oldest was 55 years old. The average experience time of teaching was 2.53 years, the standard deviation is 0.926, and the median is two years. The shortest seniority is one year and the longest is five years. Naturally, the number of participants in the unique co-teaching-based PDP is lower than the number of participants in the comparison group, nevertheless, the number of participants is statistically sufficient and allows the use of statistical comparison tests.

In the questionnaire, teachers who participated in the co-teaching-based PDP were asked whether they would be willing to be interviewed. Fifteen teachers responded positively. All the teachers that were interviewed were women. Their average experience time of teaching is 1.73 years, the

standard deviation is 0.961, and the median is one years. The shortest seniority is one year and the longest is four years.

Results

RQ #1: Teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices

Table 2 presents the results of the t-test for comparing the means among the novice teachers who participated in the co-teaching-based PDP and those who did not.

Table 2
Means of Categories – Co-Teaching-Based PDP Participants vs. Non-Co-Teaching-Based PDP

Category	**Subcategory**	**Mean Co-teaching-based PDP N=61** **Min=1, Max=5** **(S.D.)**	**Mean non-Co-teaching-based PDP N=239** **Min=1, Max=5** **(S.D.)**	**t-test and effect size** **Cohen's d**
Teacher's sense of efficacy	-	4.26 (0.52)	3.94 (0.55)	t=4.185, p=0.000, Cohen's d=0.598
Attitudes toward the teaching profession	Socio-economic security	3.38 (0.85)	3.02 (0.82)	t=2.930, p=0.004, Cohen's d=0.431
	Educational impact on the next generation	4.58 (0.45)	4.46 (0.52)	n.s.
	Professional self-realization	4.21 (0.50)	3.95 (0.63)	t=3.326, p=0.004, Cohen's d=0.457
	Attitudes toward the teaching profession -Total	4.11 (0.50)	3.87 (0.55)	t=3.197, p=0.002, Cohen's d=0.454

Category	Subcategory	Mean Co-teaching-based PDP N=61 Min=1, Max=5 (S.D.)	Mean non-Co-teaching-based PDP N=239 Min=1, Max=5 (S.D.)	t-test and effect size Cohen's d
Pedagogical applications	Matching to differences between learners	4.00 (0.50)	3.73 (0.52)	t=3.601, p=0.001, Cohen's d=0.529
	Accountability	4.07 (0.74)	3.96 (0.74)	n.s.
	Planning and teaching management	4.09 (0.62)	3.75 (0.67)	t=3.648, p=0.001, Cohen's d=0.548
	Constructivist pedagogical practices	3.89 (0.68)	3.78 (0.68)	n.s.
	Collaboration between fellow teachers	3.81 (0.69)	3.46 (0.86)	t=3.128, p=0.002, Cohen's d=0.449
	Pedagogical applications – Total	3.13 (1.33)	2.63 (1.33)	t=2.470, p=0.014, Cohen's d=0.376
Academy-community partnership	-	2.87 (1.25)	2.48 (1.30)	t=2.313, p=0.021, Cohen's d=0.306

Quantitative analysis indicates the advantage of the teachers who participated in the co-teaching-based PDP in all the indicators examined in the study. The highest effect size was obtained in the category of sense of teaching efficacy. In other categories, the effect size is medium or low. Teachers who participated in the co-teaching-based PDP feel more confident about their teaching ability. Their perception of the teaching profession reflects more sense of economic security and a sense of professional fulfilment. In comparison to those who did not participate in the co-teaching-based PDP, they feel that they have the pedagogical knowledge that enables them to address the heterogeneity of students in the classroom, to plan and manage teaching and learning processes,

and to collaborate with fellow teachers. Relatively low values were found among all teachers in the academia-community partnership category, but teachers who participated in the co-teaching-based PDP indicate a stronger connection to the academy.

Findings of the Interviews

A qualitative analysis of the teachers' interviews identified key themes supporting the quantitative findings that emerged from the analysis of the questionnaire.

Teachers' Self-Efficacy

Teachers noted that the program contributed to their sense of confidence and self-efficacy mainly because of the support they received from their mentor, the veteran teacher who formed a model for them. Here are some examples of this theme:

> *My confidence increased greatly following the program, the confidence in my abilities... I had two amazing mentors and they pushed me tremendously. They told me that I had these abilities, encouraged me to invent something new that is part of who I am. They were very open-minded to hearing ideas and were very much in a position to build it right. They gave me full confidence, confidence in what I was able to give, perseverance*. (Interviewee No. 3)

> *The program completely affected my sense of confidence. It gives you confidence ... it just completely empowered me. I could stand in front of a class and was not afraid ... I knew how to deal with them… It's different… it's really being another teacher in class.* (Interviewee No. 13)

> *The program made a significant contribution to my sense of competence. When you are a lead teacher while still during your pre-service training (non-PDP program), you are really alone and have to cope alone and you have to prepare lesson plans on your own. Here in the program you're always with someone else, with another teacher. It contributes to experience*. (Interviewee No. 5)

> *I think that more than anything, what helped me was watching a veteran teacher. Throughout the program I was an additional teacher in the class, who helped the teacher. This observation is very instructive, to see professionally how she teaches, what teaching methods she chooses, how she organizes her teaching… This is very instructive and you end up acquiring tools for your future experience.* (Interviewee No. 12)

> *I participated in the program and my friends who participated in the regular program (non-PDP) constantly consult with me ... it is very noticeable that I have an advantage over them.* (Interviewee No. 2)

> *The lead-teacher in class who was my mentor, would share with me all kinds of dilemmas that happen in the classroom or I would raise dilemmas that I would see in the classroom, and she would pay attention to my thoughts, what I think could be done, she would add her insights.* (Interviewee No. 9)

Pedagogical Knowledge

The novice teachers also emphasized the contribution of the practical experience to the development of their pedagogical knowledge. The experience in the classroom exposed them to the application of theories they had learned in the academia as reflected in these examples:

> *Thanks to the program you gain more knowledge toward teaching. A year later I managed a kindergarten and I knew what I was dealing with, what I needed*. (Interviewee No. 10)

> *I feel that my knowledge is much greater. There are things I knew because of the program, such as what is a plenary session, what is bean done during pedagogic meetings. I was a full partner in the class; it was like two educators in the same class.* (Interviewee No. 4)

> *During the program you are exposed to the curriculum, you are exposed throughout the year to what the children learn so you see how teaching is done, you understand what is important to emphasize, what is less important. It really exposes you to the field; it contributes a lot pedagogically.* (Interviewee No. 14)

> *The program contributed to me pedagogically. At the university we learned how to prepare a curriculum, for example. Here in the classroom we really do it, it's something else*. (Interviewee No. 7)

> *As part of the program, we also attended meetings with parents, so when I was already a teacher in the system all by myself, I had some idea as of what it was supposed to be. I had a background*. (Interviewee No. 9)

Relationship between Theory and Practice

Some of the teachers referred to the importance of the connection between academia and the field, which was expressed by the joint accompaniment of an academic lecturer and a mentor teacher in the field. According to the interviewees, academic theoretical support complements practical support in the field:

> *The connection between academia and the field is very important to me. The program includes a supervisor from the university and a mentor teacher in the class. The lecturer from the academy gives personal attention to students more than a lecturer who lectures in front of thirty students in a regular course*. (Interviewee No. 4)

> *The connection between academia and the field is very important. The course raises problems that arise in the field and together we think about appropriate solutions along with the lecturer*. (Interviewee No. 9)

RQ #2: Testing the Research Model

We ran Pearson bivariate correlations between the research variables (teachers' self-efficacy – TSE; teachers' attitudes toward the profession – TAP; applying constructivist pedagogical practices – CP; matching to differences between learners – DL; collaboration between fellow teachers – C; accountability – A; planning and teaching management – PM; and academy-community relationships – AC). Table 3 presents the findings.

Table 3

Pearson Correlation Coefficients Between the Research Variables

	TSE	TAP	CP	DL	C	A	PM	AC
TSE	1							
TAP	0.543**	1						
CP	0.406**	0.367**	1					
DL	0.575**	0.547**	0.707**	1				
C	0.289**	0.340**	0.323**	0.648**	1			
A	0.323**	0.279**	0.408**	0.642**	0.221**	1		
PM	0.605**	0.583**	0.524**	0.830**	0.479**	0.387**	1	
AC	0.281**	0.337**	0.233**	0.369**	0.258**	0.154*	0.325**	1

** $p = 0.000$, * $p = 0.014$

The results in Table 3 indicate a positive and significant correlations between all variables. Some are weak, some are moderate, and some are relatively strong. Particularly prominent are the positive and high correlations between the application 'planning and teaching management – PM' and 'matching to differences between learners – DL' and between the applications 'matching to differences between learners – DL' and applying constructivist pedagogical practices – CP.

In the second stage of our analysis, we performed six mediation analyses (for each dependent variable) using the PROCESS macro (Hayes, 2013).

In line with our hypothesis, all six pedagogical applications had a positive indirect effect on teachers' attitudes toward the profession (see Table 4). Applying constructivist pedagogical practices; matching to differences between learners; collaboration between fellow teachers; accountability; planning and teaching management; and academy-community relationships were found as partial mediators in the relationship between teachers' self-efficacy and their attitudes toward the profession.

Table 4

Direct, Indirect and Total Effects of Self-Efficacy and Pedagogical Applications on Teachers' Attitudes Toward the Profession

IV	**DV**	**Effect Unstandardized**				**Total**	
		Direct		**Indirect**	**Bootstrap 95%**	**Coeff.**	**p**
		Coeff. (SE)	**p**	**Coeff. (SE)**	**CI (N=5000)**	**(SE)**	
TSE	CP	0.50 (0.07)	0.000				
	TAP	0.48 (0.05)	0.000	0.07 (0.03)	0.02; 0.13	0.55 (0.05)	0.000
CP	TAP	0.14 (0.04)	0.018				
TSE	DL	0.54 (0.05)	0.000				
	TAP	0.35 (0.06)	0.000	0.20 (0.04)	0.12; 0.28	0.55 (0.05)	0.000

IV	DV	Effect Unstandardized				Total	
		Direct		Indirect	Bootstrap 95%	Coeff.	p
		Coeff. (SE)	p	Coeff. (SE)	CI (N=5000)	(SE)	
DL	TAP	0.36 (0.06)	0.000				
TSE	A	0.43 (0.08)	0.000				
	TAP	0.51 (0.05)	0.000	0.04 (0.02)	-0.003; 0.80	0.55 (0.05)	0.000
A	TAP	0.08 (0.04)	0.033				
TSE	AC	0.55 (0.12)	0.000				
	TAP	0.47 (0.05)	0.000	0.06 (0.08)	0.02; 0.09	0.54 (0.05)	0.000
AC	TAP	0.10 (0.03)	0.002				
TSE	C	0.44 (0.09)	0.000				
	TAP	0.49 (0.05)	0.000	0.06 (0.02)	0.02; 0.09	0.55 (0.05)	0.000
C	TAP	0.13 (0.03)	0.002				
TSE	PM	0.73 (0.06)	0.000				
	TAP	0.30 (0.06)	0.000	0.24 (0.04)	0.16; 0.33	0.54 (0.05)	0.000
PM	TAP	0.33 (0.05)	0.000				

Discussion

The present study aimed to draw a deepening understanding of the implications that co-teaching-based PDP may have on novice teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices as well as on the correlation between teachers' sense of efficacy and teachers' attitudes toward the teaching profession. We examined six pedagogical applications: applying constructivist pedagogical practices; matching to differences between learners; collaboration between fellow teachers; accountability; planning and teaching management; and academy-community relationships. A questionnaire, answered by 300 novice teachers, served as a major research tool while interviews that were held with 15 teachers were used to support the questionnaire findings.

The importance of the present study is related to the high dropout rate of novice teachers. It is evident that by the end of their first year of experience, novice teachers experience conflicts with their academic ideals that collide with the realities they meet within their classroom (Pendergast et

al., 2011). According to Tschannen-Moran & Hoy (2007), This may lead novice teachers to lower their own expectations about their teaching abilities to avoid feeling unsuccessful or failure in teaching. As a chain reaction, their attitudes toward the teaching profession may also get affected, and there is an increasing rate of dropout from the teaching profession within the first five years of teaching (Romano & Gibson, 2006).

Both our qualitative findings from the interviews and quantitative findings (Table 2) show that co-teaching-based PDP strengthened the sense of efficacy and increased the positivity of teachers' attitudes toward the teaching profession, as opposed to those who did not participate in the professional development program. Novice teachers asserted that the support they have received during the co-teaching contributed to their sense of confidence as well as the development and enrichment of their pedagogical knowledge. Our findings are in line with Sachs et al. (2011), who claim that when novice teachers join experienced teacher and they collaboratively teach in the same classroom, it affects the novice teacher greatly in a positive manner, mainly, with navigating the complex responsibilities presented in the classroom. Co-teaching contributes to successful experiences in the classroom, which may influence novice teachers' self-efficacy and their attitudes toward the profession. When teachers combine their expertise to meet the needs of students and provide a broader response, there are many advantages in collaborative teaching. It helps in developing a classroom community (Brown et al., 2013) while giving personal attention to more students (Austin, 2001). Students benefit as well, because they are exposed to different teaching and communication styles, and teachers with a wide range of skills and knowledge (Pratt, 2014). Reducing teacher/student ratio helps to deepen the teacher's relationship with each student, thus providing a response to the diversity among students and, in addition, improving their scholastic achievements.

Another important aspect of co-teaching-based PDP is that the pre-service teacher gradually acquires the skills required to manage the classroom, through active experiences alongside the teacher who serves as a mentor (Scruggs et al., 2007). At the same time, the veteran teacher is a partner of the pre-service teacher and together the team enjoys a combination of different and complementary perspectives regarding classroom management. In this way, both members of the team, are accountable and share the responsibility of planning and assessing students (Guise et al., 2017; Pratt, 2014). This support process has a positive effect, as our research indicates on teachers' self-efficacy, their attitudes toward the profession, and their application of pedagogical practices in the classroom.

The findings in the current study regarding the practices of classroom pedagogical applications indicate the important role of the application '*planning and teaching management – PM*' in teachers' work. This application is relatively positive and in strong correlation with the other variables studied in this research. This finding strengthens Djigic and Stojiljkovic's (2011) claim that classroom management is a complex process which includes the management of space, time, activities, materials, learning work, social relationships, and student behaviour. Understanding the relationships between this application and other pedagogical applications and the teachers' sense of self-efficacy and their attitudes toward the profession is extremely important, especially when considering the work of Wang et al. (1993) who argued that classroom management has the most direct impact on student achievements.

Deepening the examination into the *sense of efficacy – attitudes toward the teaching profession* connection reveals that each one of the six pedagogical applications that were investigated in this research mediates this relationship. Thus, each one of the six pedagogical applications represents a

partial reason that explains the correlation between the two variables and therefore implies the significance of the teacher professional training process. The relationships among the variables found in our study indicate that a high sense of self-efficacy influences the application of various pedagogical practices that may bring about educational success among students, affecting the teacher's positive attitudes toward the teaching profession. The application *'matching to differences between learners – DL*' has a strong correlation with '*applying constructivist pedagogical practices – PC*'. These two pedagogical applications highlight the importance of students' engagement in class, where teachers aim to motivate students and get them to believe they can succeed and reach their full academic potential (Collie et al., 2012; Tschannen-Moran et al., 1998).

The conclusions of the study indicate that co-teaching-based PDP strengthened the sense of teachers' self-efficacy, attitudes toward the teaching profession, and the development of their pedagogical knowledge. In addition, the research findings allow an understanding of the relationship between the *sense of efficacy – attitudes toward the teaching profession* connection. Applying constructivist pedagogical practices; matching to differences between learners; collaboration between fellow teachers; accountability; planning and teaching management; and academy-community relationships are six pedagogical practices that explain the connection between the two variables and they are therefore of significant value in designing academic training programs for educators.

It is highly recommended to follow-up with future studies on a larger number of novice teachers participating in PDP with the emphasis on co-teaching. It is especially interesting and important to understand what the effect of each component in co-teaching is on teacher , as Murawski and Lochner (2011) articulate, 'co-teaching requires three components: co-planning, co-instructing, and co-assessing; without all three, co-teaching is not occurring' (p. 175). In addition, it is of great value to examine moderator variables of the two variables *teachers' sense of efficacy* and *teachers' attitudes toward the teaching profession* in order to better understand the degree of influence of the interaction between the two. The present study examined a fairly low number of novice teachers who participated in the co-teaching-based PDP and therefor it was insignificant to run a moderating analysis. Nevertheless, the findings of the study suggest the importance of professional development programs for novice teachers which focus on co-teaching, that may ease and help ameliorate the novice teachers' entrance into the teaching profession, increase their self-efficacy, the application of specific practices in classrooms, and enhance their attitudes toward the teaching profession.

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