
APPLICATION TO PRACTICE DURING PRACTICUM AS A KEY PLAYER IN DETERMINING THE DEVELOPMENT OF SELF-EFFICACY AMONG PRE- SERVICE TEACHERS

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Abstract

This article explores the role played by application to practice of contents learned during pre-service teachers' education courses in developing self-efficacy among pre-service teachers (PTs). A total of 129 PTs participated voluntarily in the study, filling in three questionnaires composed of both quantitative and qualitative measuring tools. Data were collected in three periods: at the beginning of the course, at the end of the practicum and at the end of the course. Qualitative data were also collected at the end of the practicum. Results showed that the self-efficacy of PTs increased during the education course. Furthermore, application of the training course contents during the practicum had a positive influence on enhancing self-efficacy. Findings of this study highlighted the role played by application to practice in enhancing perceived self-efficacy, which could lead to better job performance of future teachers.

Keywords: pre-service teacher education; self-efficacy; teaching practice

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Introduction

Pre-service training courses in Italy

In Italy, the design and implementation of the initial training of secondary school teachers is one of the central themes in both policy agenda and in pedagogical and educational debates (Balduzzi & Vannini, 2008). Although wide consensus on the need for highly qualified professionalism in secondary school teachers has been shared/debated among academics since the Eighties (Corda Costa, 1988; Gatullo, 1990; 1992), today there is still no agreement on what kind of training paths could be more suitable to foster educational innovation. Despite the fact that the Italian teacher population is one of the oldest in Europe (OECD, 2014), almost all in-service teachers have a University Bachelor's or Master's Degree (ISCED 5) or - alternatively - have completed a specific teacher training programme, which generally has an academic approach, considering the pedagogical subjects and disciplinary teaching (OECD, 2014).

The social boost to school renewal, as well as the benchmark identified in European and international agreements, are the most important motives that provoked three changes in the rules and procedures of teacher recruitment and training over the past 15 years. In fact, until 1999, secondary school teachers were recruited through public competitions, which required teachers to hold only a specific qualification in the subject-matter taught. According to the principles and indications of the Lisbon Agreement, from 1999 the pre-service training of secondary school teachers was provided at university level (managed by the Faculties of Education) through a two-year Master degree focused on pedagogy and teaching methodologies (SSIS - *Scuola di Specializzazione all'Insegnamento Secondario*, Specialisation School for Secondary School teachers). At the end of this specialisation course, which followed a first-cycle degree in the subject-matter taught, teachers were qualified to work in secondary schools. The SSIS programme started in 1999 and ended in 2009, after 9 years of activity. In 2010, the Ministry of Education (Ministero dell'Istruzione dell'Università e della Ricerca, 2017) Decree no. 249 established a new one-year training course at Master level (called TFA, *Tirocinio Formativo Attivo* - Active Educational Training). The first TFA programme started in 2014 and, so far, Italian universities have implemented these courses only twice. The TFA model is currently undergoing a process of reformation as a consequence of the implementation of the Law Decree 59/2017 which was recently approved by the

Italian Government under the umbrella Law 107/2015 (*'La buona scuola'*) reforming the entire national school system.

The TFA is structured around two main pillars: education and pedagogical subjects (2/3 of the curriculum activities) and practicum in schools (190 hours). The Universities are required to provide theoretical courses (such as pedagogy, teaching methodologies, assessment and evaluation practices, history of education, special needs education, subject teaching methodologies) while secondary schools are required to host trainees for observation, teaching practice and teaching team-group activities under the supervision of a tutor. As suggested by the literature (Donche, Endedijk, & van Daal, 2015; Schulz & Mandzuk, 2005; Wideen, Mayer-Smith, & Moon, 1998), the TFA curriculum tries to integrate theoretical training courses and school-based practicum periods in order to encourage reflective learning, professional inquiry and collegial collaboration. These two components are bridged by small-group workshops - held at Universities - aiming to facilitate students' reflection on their practicum experiences in schools and analyse the practices implemented. In this way, teachers' professional learning is enhanced through sharing, de-constructing and re-constructing practicum experiences in the context of peer-group reflection facilitated by a pedagogical mentor.

In this sense, the Italian TFA teaching training model is based upon a fundamental pedagogical and political value: the need for cooperation between schools and Universities, at both institutional and cultural levels. In fact, the TFA curriculum emphasises the importance of direct experience, first-hand competence gained in the field, in schools, working with expert professionals and, at the same time, trying to enhance 'practical learning' through reflection nurtured by the theoretical and epistemological dimension (Barbier, 2000; 2011). At the present time, nonetheless, new changes are being introduced to the design of pre-service training pathways for secondary school teachers. However, practicum-based learning will still play an important role in the such training courses.

Application to practice and self-efficacy on pre-service teachers

Practicum is fundamental in ensuring the effectiveness of pre-service training. Darling-Hammond (2006) reports that teacher education programmes should provide enough time to apply what PTs have learned in order to be effective, and more recently, the American Institute for Research (2011) defined

the inclusion of a strong practicum among the key principles for designing effective pre-service teacher education programmes.

This is due to having the opportunity to practice what has been learned during the pre-service training course (in literature also known as application to practice, or opportunity to practice) can influence the transfer of training, defined as ‘the extent to which learning results from a training experience transfer to the job and leads to meaningful changes in work performance’ (Blume, Ford, Baldwin, & Huang, 2010, p. 1066). As reported by Brown and Sitzmann (2011) the most frequently cited model concerning the transfer process, especially in the field of organisational psychology, is the Baldwin and Ford model (1988). Among the training inputs, this transfer process model considers the opportunity to practice what has been learned during training (i.e. the practicum) as a training design characteristic (Blume et al., 2010), which, together with the trainee characteristics (e.g. self-efficacy) and the work environment (e.g. supervisory support) could determine training outputs (i.e. learning and retention) and then, the condition of transfer (generalisation and maintenance).

Thus, application to practice plays a key role in determining transfer. This assumption is also supported by literature. For example, Burke and Hutchins (2007) found that opportunity to perform had a strong or moderate relationship to transfer. Furthermore, Roullier and Goldstein (1993) categorised opportunity to practice training skills as situational cues, a category of transfer climate.

As in the case of pre-service training courses, training contents could be operationalised as open skills, as the aim of the course is more to instil generalizable rules, concepts and principles (Blume et al., 2010). In fact, open skills require that trainees design a plan for how to apply what they learned and model the training to fit their needs (Baldwin, Ford, & Blume, 2009) as there are more choices concerning the condition to transfer. Thus, also according to the transfer process model, trainees’ characteristics could also influence the transfer process.

Considering pre-service teachers as trainees, self-efficacy represents one of the most important beliefs in influencing teachers’ professional behaviour (Avanzi, Miglioretti, Velasco, Balducci, Vecchio, Fraccaroli, & Skaalvik, 2013). The concept of self-efficacy has been widely studied since its development by Albert Bandura, who defined it as the ‘belief in one’s capabilities to organise and execute the course of action required to produce given attainments’ (Bandura, 1997, p. 3).

Self-efficacy is related to motivation, as it could affect the challenges that people pursue, the effort they make, and their perseverance in facing obstacles (Bandura, 1989). Self-efficacy could act as a self-motivating mechanism, as people perceive their levels of competences to be high, and consequently set themselves goals and are motivated to spend considerable effort and persistence in overcoming obstacles (Bandura, 2001). In line with this, studies show that teachers with high levels of self-efficacy report higher levels of engagement, openness to new ideas and tend to use new teaching methods (Avanzi et al., 2013; Tschannen-Moran & Woolfolk Hoy, 2001; Simbula, Guglielmi, & Schaufeli, 2011). On the contrary, lower levels of self-efficacy are related to teaching difficulties, work-related stress and less satisfaction (Skaalvik & Skaalvik, 2009; Betoret, 2006; Caprara, Barbaranelli, Borgogni, & Steca, 2003). Self-efficacy also refers to teachers' beliefs concerning their own ability to influence students' achievements (Künsting, Neuber, & Lipowsky, 2016; Skaalvik & Skaalvik, 2007; Soodak & Podell, 1996; Wheathley, 2005). Ashton and Webb (1986) showed how teachers' self-efficacy is related to students' achievement in maths and linguistic subjects. Furthermore, they found that teachers reporting higher levels of self-efficacy tend to define higher levels of learning objects also for students with difficulties, considering their difficulties surmountable through effort and the use of alternative teaching methods. On the contrary, teachers with low levels of self-efficacy tended to interpret students' problems as being due to low skills of the students. Similarly, teachers with high levels of self-efficacy, when compared to colleagues with low self-efficacy, were more likely to use new arguments, change teaching strategies and use different teaching styles in classes with the aim of meeting students' needs (Caprara, Barbaranelli, Steca, & Malone, 2006; Stephanou & Tsapakidou, 2007).

Some studies also showed how self-efficacy increased during the pre-service training course. For example, Woodcock (2001) reported that, for secondary school pre-service teachers, the training courses increased their general teacher efficacy levels. Furthermore, considering the transfer process, as a trainee characteristic, self-efficacy has a strong to moderate relationship to transfer (Burke & Hutchins, 2007). Moreover, Blume and colleagues (2010) found that pre-training self-efficacy is more important for the transfer relationship when training open skills.

More recent studies conducted on PTs investigated a key relationship between self-efficacy (as a trainee characteristic) and practicum (as a

characteristic of training design) suggested by the Baldwin and Ford model (1988) on the transfer process. For example, Martins, Costa, and Onofre (2014) found that PTs with higher levels of self-efficacy reported that during the practicum they considered class characteristics, planning and teaching practice as mastery experiences; on the other hand, PTs who reported lower levels of self-efficacy highlighted class characteristics and teaching practice as failure experiences. Furthermore, Sokal, Woloshyn, Funk-Unrau (2013) found that PTs who experienced a practicum in an inclusive context developed higher efficacy in classroom management compared to PTs with no practicum.

However, there have been few studies that have explored changes in the TSE of pre-service teachers, the majority of these studies have been conducted in the USA, Canada and Australia and regarded courses leading to a University degree (e.g. Pfitzner-Eden, 2016). These studies have shown that pre-service teacher's self-efficacy may increase during the teaching practicum (e.g. Fives, Hamman, & Olivarez, 2007; Klassen & Durksen, 2014), even though other research showed a modest change over time (Browsers & Tonic, 2000). However, the field of study still needs further research. In particular, studies focusing on factors that can predict TSE development are rare (e.g., Henson, 2002; Klassen, Tze, Betts, & Gordon, 2010). Previous studies on the development of TSE have focused on the teaching practicum at school (e.g., Hoy & Woolfolk, 1990; Fives et al., 2007; Knoblauch & Woolfolk Hoy, 2008; Klassen & Durksen, 2014), as it provides an ideal opportunity to gather mastery experiences and thus effect changes in TSE. Consistent with this work, the aim of further investigating the role of application to practice in the TSE development is also proposed. As the process that proceeds the development of TSE and its determined sources is still understudied (Pfitzner-Eden, 2016) we intend to confirm the role of application to practice in a sample of Italian pre-service teachers. Moreover, we intend to further study the topic of application to practice from a qualitative perspective in order to understand the type of learned content during the TFA course, the transferability to practice and the obstacles of this transferability. To, therefore increase the knowledge beneath the process of transfer of training and the increase of TSE in the pre-service teachers' courses.

Research questions and hypotheses

The main aim of this study is to analyse the role played by application to practice on the increase in self-efficacy during pre-service training. Specifically,

we will: a) analyse the trend of self-efficacy from the beginning of the pre-service training course to the end; b) analyse the role played by application to practice during the practicum in this trend and c) qualitatively investigate which kind of contents learned during the pre-service training course students were able to apply and how/why.

In line with this, we hypothesised that application to practice (during the practicum) will influence self-efficacy levels. Specifically:

H₁) Levels of pre-service teacher self-efficacy will increase after the pre-service training course.

H₂) Levels of pre-service teacher self-efficacy will increase through the application to practice of what has been learned during the pre-service training course. In other words, application to practice mediates the relationship between self-efficacy at the beginning of the course and increase of self-efficacy at the end of the course.

Furthermore, in order to better understand which kind of contents pre-service teachers were able to practice, we qualitatively investigate the translatability of the pedagogical and educational content delivered by the courses into school-based practices.

Method

Participants

Overall, among the 501 enrolled in the pre-service training course 394 PTs agreed to participate in the study (78.6%). Overall, 129 PTs participated in all three-measurement times (32.7%). Most of them (68.2%) are female. The mean age is 31.95 years old (SD=6.15 years). We asked participants about how long they have been working in the educational/teaching sector: 23.3% had no previous experience, 3.9% between 0 and 6 months, 18.6% between 6 and 12 months, 24% between 1 year and 3 years, 19.4% between 3 and 5 years and 10.9% more than 5 years. Furthermore, most of the participants (58.1%) were currently teaching or doing supply teaching.

Measures

The questionnaire included socio-demographical variables and scales aiming to investigate the perception of self-efficacy and application to practice during the practicum.

Self-Efficacy. This dimension was investigated at T1 and T3. In order to analyse self-efficacy, the Italian validation (Avanzi et al., 2013) of the Norwegian Teacher Self-Efficacy Scale (NTSES; Skaalvik & Skaalvik, 2007) was used. Specifically, this scale is composed of 24 items divided in 6 different dimensions ranging from 1 (not at all certain) to 7 (absolutely certain). For each of the following dimensions an example item was provided: 1) Instruction: “How certain are you that you can answer students’ questions so that they understand difficult problems?”; 2) Adapting education to individual students’ needs: “How certain are you that you can provide realistic challenges for all students even in mixed ability classes?”; 3) Cooperating with colleagues and parents: “How certain are you that you can find adequate solutions to conflicts of interest with other teachers?”; 4) Coping with changes and challenges: “How certain are you to get all students in class to work hard on their schoolwork?”; 5) Motivating students: “How certain are you that you can arouse the desire to learn even among the lowest achieving students?”; 6) Keeping discipline: “How certain are you that you can maintain discipline in any school class or group of students?”. Cronbach alpha was .956.

Application to practice. This dimension is composed of 3 items developed by Grohmann and Kauffeld (2013) adapted to the practicum. One example item is “*During the practicum, I often used the knowledge I gained in training*”. The response scale ranged from 0 (completely disagree) to 10 (completely agree). Cronbach alpha was .858.

Concerning the qualitative section, investigated at T2, the questionnaire included two open questions aiming to investigate the translatability of the pedagogical and educational content delivered by the courses into school-based practices. We asked the student PTs to indicate: 1) which educational content (of pedagogical, teaching methods or subject areas) learned during the pre-service training course they were able to put in practice during their practicum in schools and in which way this was facilitated, 2) which ones they were not able to put in practice, and why.

Procedure

Data were collected during the TFA course in year 2015 at three different times: T1 in February 2015, T2 in April 2015 and T3 in July 2015. Data were collected anonymously through both online and paper-and-pencil questionnaires. Anonymity was guaranteed through a code composed by three sections: 1) the

first letter of the participant's mother's name; 2) the first letter of the participant's father's name; 3) the number of the day of birth.

Strategy of analysis

SPSS software (version 20.0) was used to analyse the quantitative data. Firstly, we performed a descriptive statistics and correlation analysis, then in order to test the first hypothesis a paired sample T-test analysis was performed. Subsequently, the Preacher and Hayes (2004) analytical approach was used to test our second hypothesis. This mediation approach tests the indirect effect between the predictor and the criterion variables through the mediator, using a bootstrapping procedure that addresses some weaknesses associated with the Sobel test (Preacher & Hayes, 2004). The model most useful to test our research hypothesis was model 4, which consisted of SPSS macros for bootstrapping (Hayes, 2013) and allows for compute a mediation analysis. To calculate the direct and indirect effects, all path coefficients in the model were estimated concurrently. Furthermore, the bootstrapping procedure was used to perform formal statistical tests of the specific indirect effects. This method can produce an estimate of the indirect effect, including the 95% confidence interval. When the 95% confidence interval does not include zero, the indirect effect is significantly different from zero at .05 level. In order to analyse the increase in self-efficacy, delta values were calculated (self-efficacy at T3 - self-efficacy at T1). Furthermore, four control variables were included: gender, age, tenure and experience (considering whether pre-service teachers already have teaching or supply teaching experience).

Regarding the qualitative analysis, first of all a randomised code was given to all the qualitative answers. This code corresponds to the progressive number referring to the data collection. Secondly, the data was analysed on two levels using the thematic analysis technique.

During the first level of analysis, data were analysed following the phenomenological approach (Tarozzi & Mortari, 2010) aiming firstly at familiarisation and identification of the different units of meaning through keywords. Following this first-level thematic analysis, a second-level analysis was performed according to the conceptual framework of Clarke and Hollingsworth (2002), which refers to three distinct domains that will be described in the results section (external domain, domain of practices and personal domain).

Results

Quantitative results

Table 1 reports the descriptive results. Pearson correlation results show that self-efficacy before the beginning of the pre-service training course is positively related to application to practice and negatively related to increased self-efficacy after the pre-service training course. Application to practice seems to be related only to self-efficacy before the pre-service training course.

Table 1. Correlation matrix

	M %	ds	1	2	3	4	5	6
1. Gender	31.8%	-	-					
2. Age	31.95	6.15	-.076	-				
3. Tenure	20.9	-	-.205*	.541***	-			
4. Experience	58.1%	-	-.028	.299**	.372***	-		
5. T1 Self-Efficacy	4.518	.837	-.163	.088	.329***	.165	-	
6. T2 Appl. to practice	4.512	2.364	-.047	.024	.005	-.020	.244**	-
7. Δ Self-efficacy	.401	.867	.087	.176*	-.031	.096	-.522***	.027

Notes: p*** < .001; p** < .01; p* < .05; ¹ 1=male; ² 1=0-6 months; ³ 1=teaches and/or makes substitutions

Furthermore, the data showed a negative relationship between self-efficacy before the pre-service training course and the increase of self-efficacy at the end of the course. A paired sample T-test analysis was conducted to further analyse the trend of self-efficacy before and after the pre-service training course. The results in Table 2 show that there is an increase in perceived self-efficacy both considering all the sub-dimensions and the overall construct. The main differences could be found in the sub-dimension of “Adapting education to individual students’ needs” (t=-6.675), while the smallest increase can be found in the dimension of “cooperating with colleagues and parents” (t=-2.392).

Table 2. Differences between pre-service self-efficacy measured before the education course and the end of the education course

Variables	T1			T3			t	p
	M	SD	α	M	SD	α		
Instruction	5.099	.884	.827	5.388	.867	.855	-3.595	.000
Adapting	4.353	1.004	.862	4.967	.934	.847	-6.675	.000
Cooperating	4.733	1.018	.861	4.945	.983	.840	-2.392	.024
Coping	4.263	.983	.807	4.753	.871	.807	-5.586	.000
Motivating	4.407	.898	.821	4.893	.921	.819	-5.573	.000
Discipline	4.254	1.158	.925	4.521	1.165	.926	-2.499	.014
Self-efficacy	4.452	.837	.956	4.911	.833	.960	-5.161	.000

A mediation analysis was conducted to analyse the role played by application to practice during the practicum in the trend of self-efficacy before and after the training course. The results (presented in Table 3) show that self-efficacy before the pre-service training course affected application to practice during the practicum.

Table 3. Direct and indirect effects of the mediation of application to practice between self-efficacy and increased self-efficacy at the end of the education course

	Path Coefficients		Indirect Effects	
	Δ Self-efficacy (Δ SE)	T2 Appl. to practice (PRA)	Effect	Confidence Intervals
T1 Self-efficacy (SE)	-.629***	.790**		
T2 Appl. to practice (PRA)	.064*	-		
Gender ¹	.035	-.103		
Age	.024	.028		
Tenure ²	.015	-.161		
Experience ³	.243	-.223		
SE→PRA→ Δ SE			.051	.005; .136

Notes: *** p< .001; ** p< .01; * p< .05; ¹ 1=male; ² 1=0-6 months; ³ 1=teaches and/or makes substitutions

Application to practice positively affected increased self-efficacy. The results show a positive indirect effect of application to practice, which means that self-efficacy before the pre-service training course increased application to practice during the practicum, which in turn positively affected the levels of increased self-efficacy at the end of the pre-service training course.

Qualitative results

Students' responses to the open-ended questionnaire were clustered into seven categories, which emerged from the thematic analysis of written excerpts. Five out of seven categories refer to the specific contents learned - and delivered through the course - that the students mentioned in relation to transferability into practicum activities carried out in schools: pedagogical theories, teaching methodologies, special needs education, educational evaluation, subject teaching. The responses which did not fall in any of these categories were clustered in two additional categories: 'none of the learned contents was transferable' and 'every content learnt was transferable' into practicum activities.

The results between the two sections of the qualitative data - what the students did apply into practicum and what they did not apply - are reported in the Table 4 with specific reference to the prevalence of the responses for each category.

Table 4. Learned content during the practicum

LEARNED CONTENT	APPLIED INTO PRACTICUM ACTIVITIES	NOT APPLIED INTO PRACTICUM ACTIVITIES
Teaching methodologies	42	31
Subject teaching	23	11
Special need education	18	21
No content applicable	17	26
Pedagogical theories	12	14
Educational evaluation	12	12
No content un-applicable	/	3
No answer	4	10
TOTAL RESPONSES	128	128

The category referred to *teaching methodologies* is the most frequently mentioned by the TFA students in relation to transferability of learned contents into practices, often in association with elements of *pedagogical theories*:

I tried to implement the principles of pedagogical communication (meaning trying to avoid Pygmalion effects and disconfirming responses), to carry out group work and design lessons which meet the individual needs of students (using diversified methodologies in order to effectively lead the entire group of students toward achieving subject-specific learning outcomes) (4.195)

With specific reference to the latter, the written statements underline the usefulness of pedagogical theories on communication and interactions (e.g. active listening, empathic understanding) as well as on motivation and active learning in order to fully capture the complex interplay between teaching and learning processes. This, in turn, allows the trainee to adopt appropriate methodologies that address the specific learning needs of each student in the class (e.g. cooperative learning, experiential learning, metacognitive learning strategies). Special attention emerges in relation to the needs of those children who have learning difficulties and require additional support in the classroom: in this regard, the usefulness of *special needs education* contents is emphasised:

[In practice, I was able to use the contents about] inclusion: by supporting students with special educational needs or with specific learning disorders in understanding and dealing with the tasks they were confronted with, by encouraging them. (9.179)

At the same time, the students used the contents learned in relation to *educational evaluation* during the realisation of their teaching project in schools, as a tool for re-orienting their teaching strategies more effectively:

The formative evaluation [techniques] learned during the docimology course were useful for adjusting my teaching strategies (41.88)

It emerges clearly from written excerpts that the concrete focus of the lectures on *subject teaching* methods were particularly appreciated by students, who took inspiration for designing their teaching project in the classroom:

I applied some exercises that were presented in relation to the teaching of spoken language as well as some contents related to literature teaching; in my opinion, these contents were most closely related to the reality of the schools. (79.180)

After this first-level thematic analysis, a second-level analysis was carried out with the aim of identifying which factors acted as enablers or as barriers in the translation of the contents learned into practices during their placement in schools. In this phase, the conceptual framework that was used for data interpretation partially drew on the interconnected model of professional growth (Clarke & Hollingsworth, 2002), suggesting there are three distinct domains that mediate teachers' processes of reflection and enactment: 1) external domain (referring to information and stimulus from external sources, e.g. taught courses and workshops); 2) domain of practices (opportunities or constraints for professional experimentation in the classroom context, e.g. tutor's attitude and expectations, curriculum implemented, the school's institutional practices and working environment); 3) personal domain (teachers' knowledge, beliefs and attitudes which, in the specific case of this study - refer to the students on placement rather than to in-service teachers). In relation to the three domains presented, the second-level analysis highlighted that enabling factors and obstacles appear to be two sides of the same coin.

External domain. The way the pedagogical, educational and teaching contents are delivered within the courses can be either an enabling factor for implementation (when the content presented is perceived as connected to the school reality, see excerpt 79.180) or a hindering factor (when the content presented is perceived as more academic-oriented rather than specifically focused on learning to teach). Nearly all the contents presented in subject teaching methods were too distant from the educational reality: the lectures were more enriching for our personal knowledge than helpful for teaching (108.29).

Domain of practice. The schools in which students carried out their practicum are presented either as facilitating contexts for the application of the contents learned (when the tutors have an open-minded attitude and the working

environment is supportive of innovation) or as a constraint for professional experimentation (when the tutors more or less explicitly deny students' access to teaching in the classroom, or when the institutional culture is reluctant to innovation).

I did not manage to activate a connection between knowledge, skills and competences [in my teaching project] because of a practicum environment which was very reluctant about this approach [to learning]. (101.42)

Personal domain. The written excerpts very rarely refer to enabling factors and obstacles specifically related to students' knowledge, beliefs and attitudes, although one of them reports:

I did not implement cooperative learning activities as I was intimidated by the large number of students in the classroom (2.165).

It is noteworthy that the absolute majority of the statements discussing the barriers to the translatability of the contents learned during the TFA courses into the practicum reflect a strong criticism of organisational arrangements. The fact that courses taught at university and practicum activities in schools were concentrated in an extremely tight period (6 months) made it impossible - in their opinion - to offer a proper reflection linking theory to practices, although this was the main intended aim of the TFA:

Generally, I had very limited opportunities to translate the contents learned in the courses into practicum activities, because the accelerated organisation of the TFA did not give me the opportunity to reflect on – and re-process – these contents in order to apply them in practice. In particular, I was not able to implement the teaching project I have planned, as this topic [planning a teaching project] was dealt in the courses when my practicum was already finished. (55.99)

On the other hand, it must be said the organisation of the course presented these shortcomings and limitations because of external constraints related to the delay in implementation of governmental regulations and funding, which did not allow Universities to plan their courses in advance and coherently with the intended goals.

Discussion

The presented study investigated the role of application to practice during the practicum of a pre-service training course and its relationship to self-efficacy in an Italian sample both quantitatively and qualitatively. Among the main

findings of the study, the results show that there is a process that leads to an increase in perceived self-efficacy among pre-service teachers, explained by the opportunity to practice during the practicum. Specifically, self-efficacy positively influenced the levels of application of what had been learned during the course, which in turn increased the levels of self-efficacy at the end of the training course. Moreover, this study has revealed a change in the six dimensions of TSE during a program of teacher education in Italy, in line with other European studies (e.g. Pfitzner-Eden, 2016).

Interestingly, findings showed that self-efficacy, before the beginning of the course, is negatively related to the increase in self-efficacy at the end of the course. This result could be explained by the fact that the perception of pre-service teachers with higher levels of self-efficacy could increase less. Furthermore, this result could also be explained through the participation at the pre-service training course (which also includes the practicum), pre-service teachers reporting high levels of self-efficacy at the beginning probably had the opportunity to reconsider their own abilities through their direct experience during the practicum. This could also be explained by the qualitative data that showed similar results, especially considering the personal domain. In fact, pre-service teachers rarely made statements that highlighted obstacles related to their own knowledge and beliefs.

However, the overall results reported an increase in self-efficacy during the pre-service training course, confirmed both by the difference between means before and after the course and the mediation analysis. This result is in line with previous studies (e.g. Main & Hammond, 2008), which reported that self-efficacy beliefs were generally high and were even higher after the practicum. Pfitzner-Eden (2016) reported that during both courses at University and the practicum at school, changes in TSE occurred. In our case the training course was intensive and the university courses and practicum at school overlapped, thus our evaluation was one, before and after the training course that included the two entwining parts.

Furthermore, the results showed that self-efficacy at the beginning of the pre-service training course is related to higher levels of application to practice. This result is in line with other studies such as the one developed by Main and Hammond (2008), which showed that pre-service teachers with higher self-efficacy highlighted class characteristics as mastery experiences during the practicum. On the other hand, pre-service teachers with lower levels of self-

efficacy reported class characteristics and teaching practice during the practicum as failure experiences. Accordingly, the qualitative results highlighted that the main issues of pre-service teachers are mostly related to external dimensions such as the organisation of the pre-service course or the organisation of the practicum they did in school rather than other issues (such as personal domain).

Considering the sub-dimensions of self-efficacy, despite an overall increase in each of them between the beginning and the end of the training course we found major increases in the “adapting education to individual students’ needs” dimension, while lower increases were found in the dimension of “cooperating with colleagues and parents”. This could be explained by the fact that during the pre-service training course many classes aimed to enhance abilities in teaching methods, while students had little opportunity to cooperate with colleagues and parents, due also to the limited time of the practicum which lasted less than the school year.

Results of this study highlighted a process that could lead to enhanced pre-service teachers’ self-efficacy, which in turn could be related to higher performance. Thus, our results suggest that to make pre-service teachers’ courses as effective as possible they must be designed with the opportunity to put in practice what has been learned during the course. Accordingly, practicum plays a key role in teacher education programmes (Main & Hammond, 2008). At the same time, practicum activity should be supported by activities aiming to improve reflective skills and practice. These kinds of practices could allow pre-service teachers to balance organisational and personal domains in discussing teaching methodology and pedagogical issues in relation to organisational ones. Furthermore, in line with what Woodcock (2001) suggested, there is a need to design pre-service teaching courses that focus more clearly on developing self-efficacy levels also through practical school experiences.

The results of qualitative analysis show that “teaching methodologies” is the category most frequently mentioned as learned content transferred into practice in association with elements of pedagogical theories. The enabling or hindering factors are two sides of the same coins. In particular, in relation to “external domain” it is the way pedagogical and educational contents are delivered which influences the transferability. At the same time in “domain of practice” the school where the practicum was carried out effects the transfer of training. Moreover, the analysis of qualitative findings sheds light on the importance of designing initial teacher education by linking coherently the

dimension of learned contents (pedagogical theories, teaching methodologies, subject teaching, special needs education, and educational evaluation) with the dimension of workplace-based learning within secondary school institutions. Along this line, the key-role played by students' critical reflection on their learning process across two environments - university courses and secondary school institution - should not be under-estimated and ad-hoc opportunities should be created for promoting peer-exchanges on placement activities under the facilitation of university tutors. The findings of the study therefore offer an important contribution for the restructuring of secondary school teachers' education within the new Specialisation Course envisaged by the current reform (Law Decree 59/2017; art. 9, lett. c). At the same time, it is to be stressed that rigorous monitoring and evaluation procedures - allowing the ongoing improvement of existing practices - should accompany the process of re-designing the curriculum for the initial education of secondary school teacher.

Conclusion and limitations of the study

In conclusion, the findings of this study highlighted the importance of application to practice during the practicum in order to increase the self-efficacy levels of pre-service teachers. This is also supported by Sokal, Woloshyn and Funk-Unrau (2013), whose study suggested high-quality inclusive *practica* as an essential feature of effective inclusive teacher training programmes. The results, on the one hand, contribute to increase of knowledge regarding the formation of TSE beliefs reported as one key problem hampering progress in this field of research (Pfitzner-Eden, 2016). On the other hand, the subject of "application to practice" emerged as a mediator in the development of teacher self-efficacy is furthermore studied also from a qualitative perspective showing it as being influenced by external domains (such as courses taught) and domains of practice (such as the school where the practicum was carried out).

This study investigated the self-efficacy of pre-service teachers only during the training course and did not monitor the question after the end of the course. Future studies should also focus on measuring self-efficacy in a follow-up period, as previous studies (e.g. Blume et al., 2010) found that the relationship between post-training self-efficacy and transfer declined when the time between training and transfer was greater. These results suggest the importance of starting

work as soon as possible after the pre-service course for pre-service teachers who weren't already teaching or doing supply work at the time of enrolling.

The study presents some limitations. First of all, the sample is quite small and it considers only pre-service teachers taking part in a pre-service training course held in only one Italian city. Furthermore, we did not, however, measure self-efficacy after the end of the course in order to analyse the retention of the contents acquired, in line with the transfer process model.

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