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## **Facing student disengagement: Vocational teachers' evolution of their classroom management**

### **Abstract**

*The present study aimed to provide deeper understanding of the factors guiding vocational teachers toward the adoption of classroom management beliefs and practices regarding the issue of student disengagement. Teachers were asked about the differences between their current and past practices, and about the reasons at the basis of their evolution. An analysis of teachers' interviews inspired a model of the change process, in which teachers' prior beliefs, triggering events, facilitators, and obstacles interacted to facilitate or impede the evolution of teachers' classroom management. Results emphasized the importance of providing teachers with sharing opportunities, of challenging their prior beliefs and of developing reflexive practice.*

### **Keywords**

*Instructional practices; In-service teacher education; Teacher beliefs; Professional development*

## **Umgang mit fehlendem Engagement von Schülerinnen und Schülern: Die Entwicklung der Klassenführung von Berufsfachschullehrpersonen**

### **Zusammenfassung**

*Die vorliegende Studie zielt auf ein tiefergehendes Verständnis von Faktoren, die Berufsfachschullehrkräfte bei der Übernahme von Klassenführungseinstellung und -praktiken hinsichtlich fehlenden Engagements von Schülerinnen und Schülern beeinflussen. Lehrkräfte wurden zu aktuellen und vergangenen Praktiken befragt sowie nach Gründen für diese Entwicklung. Aus der Analyse von Lehrkraftinterviews wurde ein Modell der Entwicklungsprozesse entwickelt,*

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*welches vorherige Überzeugungen, besondere Ereignisse, Prozessbegleiter und Hindernisse umfasst, die eine Entwicklung der Klassenführung behindern oder erleichtern. Ergebnisse zeigen die Bedeutung, Lehrkräften Möglichkeiten zum Austausch zu geben, ihre vorherigen Einstellungen in Frage zu stellen und eine reflexive Vorgehensweise zu entwickeln.*

## **Schlagworte**

*Unterrichtspraktiken, Berufsfachschullehrkräfte und Lehrerbildung, Überzeugungen von Lehrpersonen, berufliche Entwicklung*

## **1. Introduction**

*How can I change my classroom management practices to address student disengagement?* This is a question that many teachers ask themselves. Indeed, classroom management is a major concern of not only beginning but also experienced teachers (OECD, 2009). Classroom management includes multiple aspects, such as teachers' behaviors to create a structured and effective classroom environment, actions taken to promote change in students' behaviors, or measures to help students fulfill their responsibilities (Woolfolk Hoy & Weinstein, 2006). Originally, the research on classroom management aimed to identify predictors of teacher effectiveness (Emmer & Sabornie, 2015) and typically emphasized behavior control (Evertson & Neal, 2006). Nowadays, researchers increasingly agree on an approach to classroom management that encourages the development of students' self-regulation (Bear, 2015). In this paper, the emphasis is on an approach to classroom management that is consistent with motivation and self-regulation theories. How schools and teachers can promote students' motivation and engagement has become a central topic for researchers and educators (Christenson, Reschly, & Wylie, 2012). Motivational theories in the field of educational psychology have brought detailed explanations of how student motivation translates into behavioral, cognitive, and emotional engagement (Skinner, Furrer, Marchand, & Kindermann, 2008). In addition, instructional practices, notably how teachers interact with their students and manage their classrooms, have been studied as sources of student motivation and engagement (Midgley, 2002).

Research has progressed extensively in regard to understanding practices that encourage student motivation and engagement.<sup>1</sup> However, there is limited evidence to explain why teachers adopt or discard those instructional practices. If we want to guide teachers toward practices that foster student engagement, we need to ad-

1 Practices that have been shown to promote student engagement are nurturing students' intrinsic motivation, supporting their autonomy, providing rationales for learning activities, taking into account students' feelings and expressions of negative emotions, and using informative and clear language. Alternatively, practices such as imposing specific behaviors on students, failing to explain activity purposes, controlling students in order to hush their feelings and expressions of negative emotions, or using judgmental and confusing language have been shown to discourage student engagement (Reeve, 2009).

dress the following questions: What are the factors driving teachers toward the use of teaching practices? What factors are in play when one tries to change such practices?

This study aims to address these questions from a teacher perspective and to provide clues regarding which factors should be encouraged in teacher education to guide teachers' evolution toward engagement-enhancing classroom management practices. Taking into account not only teacher education but also teachers' professional lives and working contexts will enable a dynamic understanding of teacher change.

### **1.1 Why do teachers adopt certain practices and others don't? The importance of teachers' beliefs**

While extensive research has been conducted regarding which practices encourage student engagement (Reeve, 2009), further studies are needed to explain why teachers adopt or discard those instructional practices and how the process of change in practices takes place. Such an explanation might come from the research indicating that beliefs are critical in defining behavior and organizing knowledge; in this view, instructional practices are assumed to be grounded in teachers' beliefs (Buehl & Beck, 2015). Beliefs are the products of subjective evaluations and judgments and play a critical role in explaining teachers' ways of thinking, understanding and behaving (Pajares, 1992). There is some evidence that one's belief system is arranged like an idiosyncratic web in which various and inconsistent beliefs co-exist and are interrelated (Chi, 2008). In contrast, teachers' knowledge consists of empirically verifiable assertions that are based on scientific proof. Even if beliefs and knowledge are conceptually distinct, they are empirically difficult to distinguish (Calderhead, 1996; Kagan, 1992). Furthermore, while the knowledge base of teaching is learned during teacher education and beyond, beliefs are considered less malleable as they are grounded in a wide range of personal experiences including not only teacher education but also one's own schooling and well-remembered events (Calderhead, 1996; Richardson & Placier, 2001). Accordingly, by the time teachers enter teacher education, their beliefs are already well established (Pajares, 1992) and form a belief system (i.e., assemblage of beliefs) that is based primarily on their experiences as students (Lortie, 1975). Beliefs act as filters through which new formal knowledge, as presented during teacher education, is discarded or transformed in order to maintain a coherent belief system (Chi, 2008).

Beliefs can be subject to change and are expected to evolve with teacher education. However, they can also be resistant to change, and such a resistance can impede the evolution of teaching practices (Borko & Putnam, 1996). It is likely that some beliefs are more resistant to change than others, which call for a belief-specific perspective when studying the evolution of teachers' beliefs. One of the challenges of teacher education is to have teachers examine their beliefs in order to foster more favorable instructional practices.

## 1.2 What types of beliefs are important for addressing classroom management practices?

Several categories of beliefs have been identified in the literature. This section provides two examples of these beliefs, which are the most relevant for the present study.

First, it is important to consider teachers' beliefs about teaching and learning. Chan and Elliot (2004) described these beliefs as referring to 'the beliefs held by teachers about their preferred ways of teaching and learning. These include the meaning of teaching and learning and the roles of teacher and pupils' (Chan & Elliot, 2004, p. 819). Typical instances of such beliefs are general pedagogical beliefs, which refer to the teacher's conceptions about students' learning. A distinction is made between the belief that students learn simply by being exposed to formal knowledge, which conveys a picture of teaching as a mere transmission of knowledge from teacher to students (direct transmission), and the belief that a good teacher should foster students' active learning, which relates to the belief that students are active participants in the construction of knowledge (constructivism). Most studies have shown an alignment between teachers' general pedagogical beliefs and their instructional practices. Indeed, student-centered beliefs, such as constructivism, are linked to student-oriented practices, such as supporting students' autonomy. Likewise, teacher-centered beliefs, such as direct transmission, are connected to teacher-oriented practices, such as controlling strategies (Girardet & Berger, 2016; Chen, Brown, Hattie, & Millward, 2012; OECD, 2009).

Beliefs teachers hold about themselves, also called self-beliefs, are important to consider. One of these self-beliefs – self-efficacy – has been a major focus of research. Teacher self-efficacy is the "teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998, p. 233). Some studies have revealed that high self-efficacy leads to practices that are considered favorably by research (Holzberger, Philipp, & Kunter, 2014). Teachers with high self-efficacy tend to believe less in direct transmission and to focus more on supporting their students' autonomy. On the contrary, teachers with lower self-efficacy tend to use more rewards and punishments (Woolfolk & Hoy, 1990).<sup>2</sup> Self-efficacy is of the utmost importance in the perception of change. According to Gregoire's (2003) model of teacher belief change, it is the key to whether teachers treat opportunities for change as challenges or threats. Thus, beliefs about teaching and learning as well as self-beliefs are important factors to consider in the evolution of classroom management practices.

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2 The use of rewards and punishments is typically associated with controlling practices.

### 1.3 Which factors impact teachers' beliefs and practices?

Research has shown that many other factors can trigger changes in teachers' beliefs and practices (Borko & Putnam, 1996; Feiman-Nemser, 2001). When thinking about such factors, teacher education first comes to mind. Among the major objectives of teacher educators and educational policy makers is the development of teachers' competences to promote students' engagement in learning. This education requires the development of knowledge about the psychological and social processes of engagement and about research-informed knowledge, such as general pedagogical knowledge. In addition, it requires teachers to believe in their ability to influence their students' engagement, which is notably reflected in the construct of *teacher self-efficacy beliefs for student engagement* (Tschannen-Moran et al., 1998), and to acquire knowledge of how and when to use appropriate instructional practices. In other words, inciting teachers to adopt instructional practices that encourage their students' engagement depends on a complex blend of factors, such as improving teachers' general pedagogical knowledge, changing their beliefs about teaching, and increasing their self-efficacy. Research has shown controversial results related to teacher change during teacher education. Studies have shown that teacher education can impact beliefs and practices (Hollingsworth, 1989; Jones & Vesilind, 1996; Shalter Bruening, 2010). However, other studies have indicated that prior beliefs are resistant to change (Huberman, 1973; Turner, 2010) and that teacher education has a limited impact on them (Mansfield & Volet, 2010; Richardson & Placier, 2001).

One explanation for these discrepant results is that teacher education is not the only factor that is able to trigger change in instructional practices. It is important to adopt a broader perspective, considering not only what happens during teacher education but also through other teaching and learning experiences, such as sharing opportunities with significant others (Kagan, 1992) or in the context of the school where the teacher is employed (Pelletier, Séguin-Lévesque, & Legault, 2002). The following challenges and obstacles to changing teachers' classroom management practices were summarized by Lanier and Little (1986), Borko and Putnam (1996), and Richardson and Placier (2001): Strongly established prior beliefs, unrealistically high self-efficacy beliefs, incompatibility between the teacher education program and one's teaching context, and other beliefs about the inutility of teacher education, to name a few. In their review about informal learning, Kyndt, Gijbels, Grosemans, and Donche (2016) identified informal learning activities involved in teachers' change. They classified the sources of teacher change found in the literature into various activities, which include, for example, observation, collaboration with colleagues, reflection, trial and error, or browsing the internet and social media. The results of such studies show that teacher change has to be examined with a perspective englobing both formal and informal antecedents of change.

Accordingly, this study investigates whether teachers' practices change, why they do or do not change, and if they do change, how. Moreover, this study at-

tempts to grasp what happens in the change process – namely which changes occur and how they affect teachers’ practices.

## 1.4 The present study

This study is grounded in a field-based project addressing the evolution of vocational teachers’ beliefs during teacher education. In vocational education and training in Switzerland, teachers are faced with students who are often more interested in practical training than in the classes provided by the vocational school.<sup>3</sup> Furthermore, depending on the subject taught, students will perceive higher instrumental value in practical subjects (i.e., knowledge of how to do the job) than in theoretical subjects (such as LCS<sup>4</sup> classes, which have relevance for deep understanding but not for daily professional practice) (Cretten, Lens, & Simons, 2001). Facing student disengagement thus constitutes a challenge for vocational teachers.

Teacher education typically takes place after several years of teaching in vocational schools.<sup>5</sup> Vocational teachers already have teaching experience when they enter teacher education, which means that their belief system is already well established by the time they enter the program. Vocational teachers’ teaching experience is highly variable due to the diversity of their career paths. For example, Eric had worked in a lot of long-term replacement jobs as a teacher before he decided to become an editor. After several years of editing, he decided to go back to the teaching profession as a vocational teacher. This particular path resulted in a large number of years of teaching experience (i.e., 26) before entering teacher education. Teacher education involves a two- or three-year program, during which vocational teachers continue to teach in a vocational school, which can facilitate connections between theory and practice.

As encouraging practices that aim to engage students is one of our major concern, we wanted teachers to reflect on their practices when facing student disengagement. We asked vocational teachers to reflect on their present practices, to contrast them with their early practices, and to identify factors that helped or impeded their change. Based on the literature reviewed above, we expected the evolution of practices to be accompanied by changes in teachers’ beliefs about teaching and learning as well as self-beliefs, which would reflect a restructuration of teachers’ mental models.

3 In Switzerland, the apprenticeship of a new occupation after compulsory school is typically based on a dual system: Practical training at a training company (three to four days a week) and classes at a vocational school (one to two days a week).

4 LCS – instruction in language, communication and society – includes two competence areas that are each broken down into several objectives: (a) the “Language and Communication” area and (b) the “Society” area, which includes eight aspects: culture, law, ecology, economics, ethics, identity and socialization, politics, and technology.

5 Teacher education is required, within five years of teaching, only if one teaches 4 or more hours of class per week.

## 2. Method

### 2.1 Participants

Since one aim of this study was to analyze the evolution of practices over a relatively long period (several years), we interviewed teachers who had already completed teacher education. For this reason, we collaborated with teacher educators who contacted some of their former students. At the end of the selection process, 14 full-time vocational teachers (6 women and 8 men) in a variety of professional domains took part in the study. They had from 5 to 26 years of teaching experience at the time of the interview and had completed teacher education 1 to 5 years before the interview. Table 1 shows a summary of the participants' characteristics.

Table 1: Description of the participants

Pseudo	Sex	Age	Subject taught	Teaching experience	Yrs. after graduation
Alice	F	32	LCS	6	1
John	M	39	Landscape technology	10	1
Thomas	M	31	Economy; Computer science	5	2
Lucy	F	35	Paramedical field	7	4
Philipp	M	34	Mathematics; Physics	6	3
Arthur	M	34	Automotive technology	11	3
Marie	F	49	Technical subjects for social care workers	6	1
Jimmy	M	47	Automotive technology	9	3
Elsa	F	38	Pharmacy	7	1
Jack	M	44	LCS; Mathematics	17	3
Danny	M	40	Anatomy; Physiopathology; Professional skills	9	4
Aurora	F	40	LCS	8	5
Eric	M	48	LCS	26	2
Anna	F	36	Project supervision; Art history; Photography history; Contemporary arts	6	1

Note. LCS = Instruction in language, communication and society.

### 2.2 Procedure

Interviews were deemed to be the most appropriate method by which to answer our research questions. Interviews are well suited for exploring the perceptions, attitudes, values and beliefs of respondents regarding complex issues and enable investigations for more information than that obtained through surveys (Barriball & While, 1994). Semi-structured interviews were conducted by the same interviewer and included three main themes: (a) Motivation to become a teacher, (b) classroom management, and (c) instructional planning. The part included in this study



– classroom management – was discussed during some 20 minutes of the interview. Participation in the study was voluntary. To ensure confidentiality, the interviewee chose a location where he or she felt comfortable, and the researcher assured audio privacy. Following a brief explanation of the nature of the study, the teachers were told that they could refuse to answer any question and stop the interview at any time. Moreover, confidentiality was ensured by assigning pseudonyms to all participants and that only the authors had access to the collected data.

To start the discussion and to ensure that all the teachers reflected on the same topic, we provided them with the following given situation addressing student disengagement:

You are teaching as usual when you notice that a certain student is not interested in your class. He's not causing any disturbances, but his head is in the clouds, he's not doing what you asked him to, and he's starting to fall behind his schoolmates when it comes to his schoolwork.

Based on these circumstances, the teachers were asked (a) how they would react to this situation, (b) why would they adopt this behavior, (c) how different their reaction would have been at the beginning of their teaching career, (d) why they would have adopted this behavior, and (e) for what reasons they modified their behavior. The hypothetical nature of the given situation has the limit that teachers' recollection of their practices is subjective and is necessarily influenced by their beliefs. For clarity purposes, we reconstructed teachers' discourse using the term *practices*. However, one should keep in mind that if teachers' words reflect their perceived behavior and is, in that sense, a valid way to analyse teachers' practices in relation to beliefs, we do not claim that our method delivers an accurate and unflawed picture of behavior.

The interviews were fully transcribed by the interviewer and three coworkers, all of whom followed the same rules. All the transcripts were reread to check their accuracy.

### 2.3 Coding

A coding system was built and tested by two of the researchers. Codes were deductively inferred from research in the field, but they also inductively emerged from the teachers' answers to the interview questions.

The coding of classroom management practices was based primarily on the model of Reeve, Deci, and Ryan (2004), which highlights four types of practices presented as two orthogonal continuums: (a) Autonomy support is opposed to (b) control, and (c) structure is opposed to (d) chaos. Autonomy-supportive teachers listen to their students, provide time for independent study, encourage students to find answers by themselves, and accept their students' expressions of negative emotions. Their language is informative, and they communicate empathically and

provide encouragement rather than demands. Finally, autonomy-supportive teachers seem to encourage students' intrinsic motivation and do not appear demanding or coercive (Reeve, 2002). Controlling teachers favor extrinsic motivational resources (rewards or punishments), use coercive language, give their students the answers, express judgment, and position themselves as dominant to quiet complaints and expressions of negative emotions. Structure refers to the quantity and clarity of the teacher's information about his or her expectations and about how students are supposed to achieve the sought-after outcomes (Skinner & Belmont, 1993). Thus, to implement a structured environment, the teacher gives clear, explicit, and understandable information; provides rationales and instructions for learning activities; and gives constructive feedback to help the students manage their learning and performance. Chaos is the opposite teaching practice: Teachers give confusing and contradictory information, their expectations are uttered with a lack of clarity, and their students do not know how to achieve their objectives (Skinner et al. 2008). Research has shown that both autonomy-supportive and structuring practices impact student engagement. Moreover, there is evidence that the combination of autonomy support and structure offers a positive environment for student learning (Jang, Reeve, & Deci, 2010). This theoretical framework was deemed to be appropriate for coding the interviews, since it encompasses a large number of typical classroom management practices. Moreover, it relies on the well-developed self-determination theory, which analyses teachers' practices as antecedents of student motivation. Thus, teachers' classroom management practices were delineated with regard to their impact on student motivation. The coding system of practices was inferred from the descriptions of these four practices, with the addition of some codes deductively created to accurately match teachers' answers to the interviews (i.e., help seeking, varying pedagogical methods, student differentiation). The coding of beliefs was also based on categories found in the literature. General pedagogical beliefs were divided into two sub-categories: direct transmission and constructivism (Chan & Elliott, 2004; Jensen, Sandoval-Hernandez, Knoll, & Gonzales, 2012). Beliefs about strategies to promote student motivation (intrinsic versus extrinsic) were inferred from the works of Nolen and Nicholls (1994) and of Shalter Bruening (2010). The research of Tschannen-Moran and Woolfolk Hoy (2001) served as a basis for coding self-efficacy beliefs. Finally, coding of teachers' sense of responsibility was based on the work of Lauermann and Karabenick (2011) and includes teachers' sense of responsibility for student motivation, student achievement, relationships with students, and teaching quality. Finally, the sources of teacher change were deductively coded. The coding system is presented in Table 2.

Table 2: Coding categories

Categories	Codes	Examples of content
Objects of change		
Classroom management practices	Control	Punishments, detentions, coerciveness
	Autonomy support	Ask for student's opinion, caring
	Structure	Remind of classroom rules
	Chaos	Don't act
	Help seeking	Ask for external help (e.g., school mediator, school nurse)
Classroom management beliefs	Vary pedagogical methods	Change the dynamics of the class
	Student differentiation	Adapt teaching to each student
	General pedagogical beliefs	Constructivist, student-centered versus transmissive, teacher-centered
	Beliefs about student motivation	Beliefs in the use of intrinsic versus extrinsic motivation
	Self-efficacy beliefs	Perception of own ability to manage the classroom or to engage students
	Sense of responsibility	Responsibility for students' engagement, motivation, or achievement
Factors influencing teacher change in classroom management		
Triggers of classroom management evolution	Teacher education	Formal knowledge acquisition, visit of teacher educators
	Teaching experience	Experiments, class events
	Teaching context	Directives of the institution
	Sharing	Influence of a mentor, colleague, peers
Facilitators and obstacles of classroom management evolution	Personality	Sense of questioning, trait of rigidity
	General pedagogical beliefs	Change in beliefs about pedagogy
	Beliefs about student motivation	Change in beliefs about strategies to motivate students
	Self-efficacy	Change in beliefs about own abilities to manage the classroom
	Sense of responsibility	Realization of teacher responsibility

Both coders had expertise in the evolution of teachers' knowledge, beliefs, and practices. One researcher coded parts of the transcripts, which led to discussions and revisions of the coding system by both researchers. After several iterations of coding and discussions, interrater reliability was tested on 22 units of coding (for example, the unit of coding: "I would come next to the student and knock on the table, saying something like 'time to wake up!'") was coded as a controlling teaching practice), selected randomly among the 142 units of coding included in the study, and resulted in an agreement of 100 %. A single researcher then coded all the transcripts.

### 3. Results and discussion

In the following results and discussion section, the terms *triggers*, *facilitators*, and *obstacles* are mobilized when addressing teacher change. Thus, we begin with a brief explanation of what these terms refer to.

Table 3: Cross-case matrix (most favorable and strongest changes to least favorable and weakest changes)

Pseudo	Present practices	Evolution pattern	Strength	Triggers	Facilitators	Obstacles
Jack	1. Structure 2. <i>Autonomy support</i> + Autonomy-support	High control toward autonomy support	Strong	Teacher education Sharing Experience	Formal knowledge acquisition Reflexive practice Self-efficacy General pedagogical beliefs	
Philipp	<i>Control</i> + Autonomy support	Chaos toward more autonomy support	Strong	Sharing Teacher education Experience	Self-efficacy Sense of responsibility	
Lucy	1. <i>Control</i> + Autonomy support 2. Structure	Chaos toward more autonomy support	Strong	Experience Teacher education Sharing	Reflexive practice Self-efficacy Sense of responsibility	
John	1. <i>Control</i> 2. Autonomy support	Toward more autonomy support	Strong	Sharing	Reflexive practice General pedagogical beliefs	
Danny	<i>Autonomy support</i> + <i>Control</i>	Toward more autonomy support	Strong	Sharing Teacher education	Formal knowledge acquisition Reflexive practice Self-efficacy Beliefs about student motivation	
Arthur	<i>Control</i> or Chaos	High control, toward less control	Medium	Experience Teacher education Sharing	Sense of responsibility	
Jimmy	<i>Control</i> + Autonomy support	Toward variation of methods	Medium	Sharing Teacher education	Knowledge acquisition Beliefs about student motivation General pedagogical beliefs	
Elsa	1. Chaos 2. Autonomy support	Toward variation of methods	Medium	Experience	General pedagogical beliefs	
Aurora	1. <i>Control</i> 2. <i>Structure</i> 3. Chaos	Toward less control	Medium	Experience		
Thomas	1. <i>Control</i> 2. Autonomy support + Chaos	Chaos toward more control and autonomy support	Weak	Experience Sharing Teacher education	Formal knowledge acquisition Increase of self-efficacy General pedagogical beliefs	Beliefs about constructivism
Alice	1. <i>Control</i> 2. Structure 3. Autonomy support	High control toward less control	Weak	Experience		Self-efficacy beliefs
Anna	Chaos	Toward more chaos	Weak	Teacher education Experience	Reflexive practice	Beliefs about students
Marie	<i>Control</i> + Autonomy support		None			Belief about teacher education's adequacy
Eric	1. Chaos 2. <i>Control</i>		None			Beliefs about constructivism

Note. Present practices; Numbers represent the chronology of the practices. Practices used on the spot are italicized.

Overtime, teachers build a complex web of beliefs, or mental model (Chi, 2008), which impacts who they are as teachers, what they know, what they believe to be true, their priorities, and the way they act. In the present study, certain factors altered the teachers' mental model, such as teacher education, significant others, or events in the teacher's daily life. We refer to the elements that made teachers modify their mental model as *triggers*. Triggers provided teachers with new pieces of information that fit smoothly into their mental model and encouraged them to continue in the same direction; however, some teachers came across pieces of information that did not seem to fit their mental model. In such cases, teachers discarded or ignored the new piece of information. Sometimes a mismatching piece of information can make teachers notice a mistake in their mental model. This can trigger a reflection on the teacher's mental model, allowing them to rearrange the model to make space for the new piece of information. Thus, each new piece teachers came across was an element capable of strengthening or altering their whole assemblage of beliefs. When a piece of information represented a favorable outcome for the overall mental model, we named it a *facilitator*. On the contrary, a piece of information that prevented a favorable evolution of the mental model was referred to as an *obstacle*. Obstacles typically represented strongly assembled existing beliefs that prevented teachers from considering the incorporation of new information that could have benefited the overall mental model.

The results are presented in the following cross-cased matrix (Table 3), which summarizes teachers' present practices, evolution patterns, and the perceived or inferred strength of the change, which was gauged by a basic analysis of the wording used to describe the evolution (for example, if the teacher described his or her evolution as being "radical," "strong," or "important," we inferred that the strength of the change was high. Conversely, if the teacher used words such as "somewhat," or "little" in his or her description, we inferred that the strength of change was low). Moreover, it summarizes the triggers of the evolutions, the facilitators, and the obstacles to change.

### 3.1 Present classroom management practices

Before addressing the evolution of practices, we paid attention to teachers' answers to the questions about their present classroom management practices. When asked how they would react to the given situation, most participants mentioned several types of practices. Controlling practices, such as "I would try to threaten and interest him to make him follow the course" (Thomas), were mentioned by the majority of the teachers. Most interviewees also mentioned autonomy-supportive behaviors; Marie, for instance, stated that she would "certainly, at the end of the class, ask him to have a little chat to see where he is, if he has other preoccupations, why he's not interested in the course." Chaos – e.g., "the students who sleep during class, I leave them alone, I don't wake them up" (Elsa) – was cited by some teachers. Structuring practices were described by only a few teachers, including Aurora,

who stated that she “would explain to him that if he continues like this, he will fall behind his schoolmates.” Autonomy support and control were often cited together. During the interviews, some teachers talked about their reactions to disruptive students. In this case, the teachers mentioned control and structure as their most commonly used types of practice. Structure was mostly used in the context of disturbance, while autonomy support was mentioned in the case of inattention. Therefore, it seems that several types of classroom management practices coexist, but these depend on the type of problem encountered.

Interestingly, teachers adopt various types of classroom management practices in different contexts. When a problem occurs, controlling practices are used *on the spot* as a way to call to order. This strategy was usually mentioned first. In contrast, outside of the classroom, autonomy support is used in the form of a discussion between the teacher and the student. In the situation of an inattentive student, the main trend adopted by the teachers is, first, an attempt to get his or her attention (control) with – usually when the class is over – an autonomy-supportive behavior. This is illustrated by Alice’s statement: “I think that there is the disciplinary punishment first, and only then ... well, the normative frame comes first, and if it doesn’t work, then I get affective.” The results of this study remind us to be careful when interpreting other research findings: Autonomy support and control, which are commonly described as conceptually opposed in the literature (Reeve et al., 2004), are viewed as complementary by teachers in this study and are used in different settings (i.e., *on the spot* vs. after class). In the classroom management literature, responding immediately to early signs of misbehavior is sometimes depicted as a favorable and desired teaching practice (Bear, 2015). It seems that our participants’ beliefs about effective classroom management practices match this point of view. However, it is interesting to note that the literature on classroom management mainly focuses on strategies that are useful and effective for the teacher, while the current study focuses on strategies that are useful and effective for student motivation and engagement. A quick response to early signs of misbehavior, such as a verbal prompt, a pressuring warning, or threats, typically aims to get the student extrinsically motivated, which may undermine students’ intrinsic motivation to engage in the classroom activities (Deci & Ryan, 2000). Certainly, calling a student’s name to regain his or her attention does not have the same implications as other strategies coded as control, such as forcing a student to remain in the classroom until he or she has finished his or her exercises, even if both practices are a form of control and can potentially hinder students’ intrinsic motivation. Thus, if one is to get a fine-grained picture of classroom management practices, the great variety of teaching practices and putting them back into context should be taken into account.

### 3.2 The triggers of the evolutions of classroom management practices

Except for two participants, all the teachers in our study perceived some changes in their way of managing a student's disengagement. Teachers tended to evolve toward practices that are considered favorably by research, such as increasing their autonomy support or reducing their provision of control. Three triggers were identified in the teachers' answers: Teacher education, sharing opportunities, and teaching experience. Teacher education refers to specific classes, learning activities, teacher educators' visits to the teachers' classrooms, or inspiring teacher educators, for example. Change triggered by such antecedents can be classified as formal learning. The two remaining triggers can be considered to generate informal learning. Sharing opportunities includes all types of exchange between the teacher and significant others (e.g., colleagues, peers, teacher educators, school director). Finally, experience refers to class events, difficult students, or experimenting with a new practice, for instance. In their literature review about informal learning, Kyndt and colleagues (2016) found similar triggers of change. *Interacting and discussing with others* includes collaborating, discussing, or sharing with colleagues, students, parents, mentors, or others, and *practicing and testing* englobes doing, experiencing and experimenting. The authors also identified sources of change that were not salient in the present study, such as *learning from others*, *no interaction*, *consulting offline/online information sources*, or *engaging in extracurricular activities*.

Some teachers experienced stronger changes than others. The analysis of the perceived strength of the evolution (Table 2) revealed that the three triggers mentioned by the participants did not have the same impact on the evolution of teachers' practices. In our study, teaching experience was the most cited trigger. However, teachers who mentioned only teaching experience described weak evolutions of their practices. Teacher education was also underscored, especially for the practices that are considered the most favorable. This reveals a positive effect of teacher education on instructional practices. The trigger that seems to have the strongest impact on the evolution of practices is sharing. Sharing can take the form of discussions with a role model (mentor teacher within the school, colleagues within the school, teacher educators) or other sharing opportunities, such as exchanges with peers, teachers, teacher educators, mentors, colleagues. Sharing was often cited as essential for triggering positive change. Sharing with a teacher educator in her own classroom played a part in Lucy's evolution toward more autonomy support, which she described in the following way: "It's two different worlds." Philipp also emphasized the importance of sharing, especially with more experienced colleagues, in his "enormous changes" toward more autonomy support. This result corroborates those of other research, which concluded that sharing opportunities help teachers reflect on their teaching and are among the best facilitators of professional development (Kagan, 1992).

### **3.3 Successful evolution of practices: Facilitators of change**

Triggers are required for teachers to be able to start their evolution toward new beliefs and practices. Such triggers are able to generate formal knowledge acquisition and the development of reflexive practice, which in turn enable modifications in the teacher's belief system. Under certain conditions, these modifications in belief will facilitate the evolution of teaching practices. An important aim of our analysis consisted of modeling these triggers and facilitators to obtain a comprehensive image of the change process. The following subsections will discuss the role of reflexive practice as a prerequisite for the evolution of teachers' mental model, several facilitators of teacher change, and possible obstacles to the evolution of teachers' beliefs and practices. Finally, we will discuss the interaction between these factors in teachers' change process and will end with a proposed model of the change process.

#### **3.3.1 Reflexive practice as a prerequisite for the evolution of teachers' mental model**

Reflexive practice appears on the list of informal learning activities emerging from the literature on teacher change (Kyndt et al., 2016). Among the facilitators of change, reflexive practice is portrayed as a prerequisite for belief change. Teachers engaging in reflexive practice usually show openness toward change and are ready to acknowledge a need for new pieces of information in order to refine their mental model. Lucy and Jack benefited from an evolution of their ability to reflect on their own teaching practices in light of the formal knowledge acquired during teacher education. For Lucy, teacher education triggered formal knowledge acquisition, which developed her ability to reflect on her practices. As she stated,

Now, things we did intuitively are clearly transposable in the theories [refers to theories of education seen during formal teacher education]. Now it is ... it is the pleasure to give the course that surpasses the fear to teach, actually. [Then] there was a lack of assurance, because I was not sure of what I was building with people. (Lucy)

Before entering teacher education, Jack wanted to quit teaching. He felt lost and did not know how to deal with his particularly difficult students. Teacher education acted as a very strong trigger for him:

He [referring to a particular teacher educator] allowed me to put words to what I was doing, which I thought was wrong. ... Then a lot of things changed. At a pedagogical level, it was to confirm, to reassure me, that I was going in the right direction. (Jack)



Instead of triggering a change in practices, reflecting on one's practices in light of new pieces of information seemed to facilitate the occurrence of belief change. Indeed, it is easier to change one's beliefs about some aspects of teaching if one is conscious of the reasons behind one's teaching practices.

### **3.3.2 The successful evolution of teachers' beliefs about teaching and learning**

Danny's beliefs about student motivation evolved as a result of formal knowledge acquisition. The evolution of Danny's beliefs about student motivation made him adjust his practices. The following is Danny's description of his hypothetical reaction to an inattentive student at the very beginning of his teaching career: "I think I would have left him alone. ... I've been told that it is a course for adults ... they listen, they don't listen; it's their problem. So I would have left it there." After he realized that inattention does not necessarily reflect a lack of interest, his reaction to the hypothetical inattentive student changed: "So I'll stimulate him to see his reaction, and after I will adapt behind closed doors. ... It could be something, anything, and it's worth investigating. Because we can still go ... and help him invest more." Thus, Danny's practices evolved toward more autonomy support. This example is representative of the combination of factors involved in the change process: Teacher education provided formal knowledge about student motivation, which resulted in a modification of Danny's beliefs. He became conscious of the impact of his instruction on student motivation, and he modified his classroom management practices accordingly.

An evolution of general pedagogical beliefs can also play a role in the modification of classroom management practices. Before teacher education, Jack had some misconceptions about his students' knowledge. When asked about the factors at the root of his change toward more autonomy support, Jack answered as follows:

I told myself that ... hmm, it's sad to say, but I had human beings in front of me who had thoughts, who had knowledge, who did not come to my classroom being ignorant. Because, for me, before, a student was an ignorant person.  
(Jack)

Seeing the student as ignorant reflects a direct transmission view of teaching in which the teacher delivers knowledge to unknowing students. With teacher education, Jack realised that his conceptions were flawed, and he revised his beliefs, which allowed him to shift his practices toward more autonomy support.

The previous examples of belief change all resulted from the inputs of teacher education. However, such changes can also be triggered by other inputs. Indeed, John stated that his beliefs radically changed after he encountered a role model at his workplace before he started teacher education:

Before I started to work here, I worked as a substitute teacher in public schools. And there, I was teaching like I thought I was supposed to teach, and ... being with this person [referring to his mentor] gave me the courage to get away from this model [referring to the model of teaching to which he had been exposed]. (John)

John was highly receptive to the teacher education program since he was already engaged in the process of changing his teaching practices.

Jack and John both revised their beliefs about pedagogy, but the changes were not triggered by the same factors. Jack changed his beliefs as a result of teacher education – he “met exceptional teachers who were, and still are, passionate” – and John changed his vision of teaching thanks to a role model at his workplace before he started teacher education. Therefore, belief change can be triggered by different factors or a combination of factors, and it can have an important role in the evolution of classroom management practices.

### **3.3.3 The evolution of teachers’ self-beliefs and its impact on teaching practices**

The evolution of teachers’ self-efficacy can be triggered by teacher education and can be derived from formal knowledge acquisition and reflexive practice. However, such change can also be derived from other factors. Self-efficacy beliefs can be transformed by communicating or sharing with other persons, such as teacher educators, colleagues, peers, or students:

This self-confidence came because I asked my students to evaluate my teaching, and because, globally, these evaluations were rather positive; and at SFIVET [Swiss Federal Institute for Vocational Education and Training – the institution delivering the teacher education program], the teacher educators who came to visit my classes found that it was good too. (Thomas)

Thomas’s self-efficacy beliefs also depended on his past teaching experiences. Indeed, Thomas stated, “My self-confidence is pretty good, but I haven’t met big difficulties yet, and I have the impression that this confidence could take a blow in case of ... of a bad experience.” Thomas is aware that the occurrence of a difficult experience could challenge his self-efficacy beliefs. Research has also shown that teachers rely heavily on their past to judge whether they are effective (Bandura, 1993). Self-efficacy was portrayed by most teachers as unstable: it seems to be dependent on a variety of factors and can fluctuate over the duration of one’s teaching career. This observation is corroborated by Holzberger and colleagues (2014), who indicated that teachers modify their self-efficacy beliefs over the course of the school year.

High self-efficacy has been shown to facilitate the adoption of favorable teaching practices (Holzberger et al., 2014). The results of the present study partially corroborate this finding: Thomas' change from chaos to control and autonomy support was only slight. Thomas started to react to his students' inattention because, in his words, "First, I think it is a question of assurance; because it is difficult, you need energy for this type of student. It is easier to let it go." Jack and Lucy also mentioned that when one no longer worries about problems of self-efficacy, one can take care of classroom management. In the present study, low self-efficacy beliefs are depicted as obstacles preventing teachers from focusing on classroom management. An evolution of these beliefs seems to release part of the teachers' attention and energy, which helps them to modify their teaching practices. This corroborates the work on self-efficacy carried out by Bandura (1977), who concluded that the strength of people's beliefs in their abilities is likely to impact whether they will even try to cope with a given situation. The evolution of self-efficacy beliefs allows for the release of part of teachers' pool of attention and reduces teachers' tendency to *let go*.

Another self-belief that plays a role in the evolution of teachers' practices is their sense of responsibility. Teachers do not all feel responsible for the same outcomes and do not consider their role in the same way. Whether teachers feel responsible for student achievement, worry more about the quality of their instruction, or focus on being liked by their students, for instance, can impact the way in which they deliver their instruction (Lauermann & Karabenick, 2011). The participants who mentioned a change in their sense of responsibility described it as a crucial turning point. Unlike self-efficacy beliefs, which vary throughout the teaching career, one's sense of responsibility seems to undergo a sudden shift, taking the form of a realisation: "At a given moment, there was a change in my professional identity, and my conceptions were completely modified" (Lucy). As Arthur mentioned, "It is a reassessment ... you have to manage your classroom, actually. You are, after all, the master and commander, if I may say so." For Philipp, the key to optimal classroom management is a combination of the realisation of one's responsibility as a teacher and having a high self-efficacy:

Once you have understood that you are the teacher and that you don't have the same role as the students, and that your role in the classroom is to bring something and to keep them active ... once you've understood that, and you dare to do it, the rest will be fine. ... It's [referring to the occurrence of change] when we realise that we are the one who carries out the lesson. (Philipp)

For Philipp, Lucy, and Arthur, this realisation of their responsibilities as teachers was at the root of the evolution of their practices toward more autonomy support (Philipp and Lucy) and less control (Arthur).

### 3.4 Modeling the change process

Numerous factors play a part in the evolution of classroom management practices. Grasping and modeling the change process is difficult: Elements are interrelated and have reciprocal influences. Moreover, the process is not unidirectional. The teacher keeps reflecting on his or her classroom management practices, and new triggers can appear at any moment, altering the teacher’s mental model and leading to new adjustments of classroom management practices. We propose a model of the change process based on the teachers’ answers to the interview questions. Figure 1 presents a model of the factors that are relevant for understanding change in classroom management practices according to the results of the present study. It does not pretend to be exhaustive, as studies from different contexts could have found other factors influencing teacher change. Thus, the aim of this model was to picture the results derived from our specific data.

Figure 1: Factors involved in the evolution of teachers’ classroom management practices

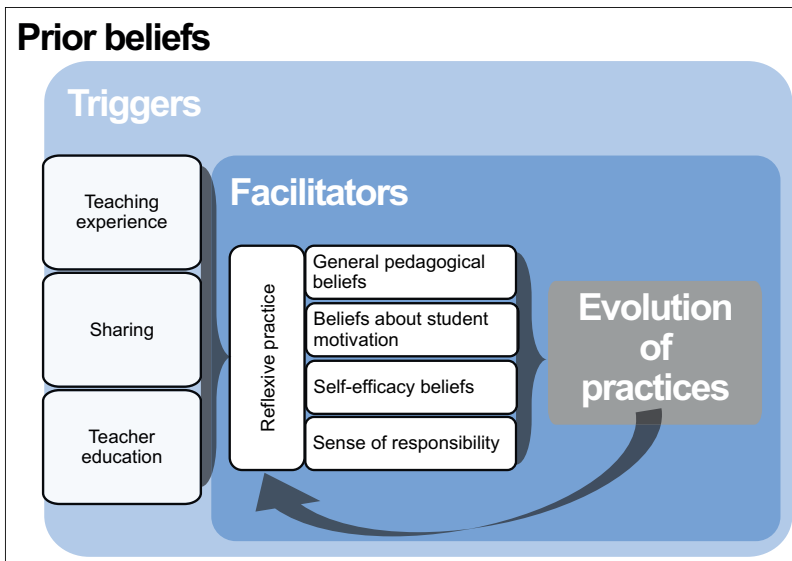


Figure 1 illustrates teachers’ change process, from their prior beliefs to the evolution of their teaching practices. Triggers – events such as sharing opportunities, teacher education, or teaching experience – can bring teachers to engage in reflexive practice in light of the knowledge (formal or informal) acquired from the triggers. Such cognitive activation enables a revision of a teacher’s mental model – a web of diverse facilitators of change – which assists the evolution toward new teaching practices. The arrow suggests that the change process is unending. New triggers continuously appear in the teacher’s life, resulting in new adjustments of his or her mental model, thereby facilitating new evolutions of practices. For

instance, the input of a class about the benefits of autonomy support (event) can trigger, through reflexive practice, an evolution of the teachers' general pedagogical beliefs (revision of the mental model), which can lead the teacher to try implementing such practices in a lesson. A teacher educator's positive feedback on this lesson (event) can trigger an increase in the teacher's self-efficacy to manage his or her classroom (revision of the mental model), which can, in turn, facilitate his or her long-term implementation of autonomy-supportive practices. Facilitators can thus both be influenced by triggers and participate in the evolution of the overall mental model. This illustrates the complexity of intertwined factors playing a role in changing classroom management; Figure 1 can only represent this complexity in a simple model.

### 3.5 Resistance to change: How prior beliefs can act as obstacles

As many studies have concluded (e.g., Borko & Putnam, 1996; Chi, 2008; Mansfield & Volet, 2010), the analysis of the interviews suggests that prior beliefs have an extreme filtering power on new information. In our study, two teachers reported no change of practices, and three teachers stated that their practices changed only slightly.

Eric provides a good example of the crucial role of prior beliefs: "I had great teachers when I was in school, and I simply reproduced what they were doing" (Eric). Eric reported the use of chaos and control in the case of the given situation (he would let the student sleep during class as long as he was not disturbing the others. At the end of the class, he would ask him to write a full report of the class for the following week). And he did not change his teaching practices:

I always acted like this, because when I was in upper-secondary school, it was the behavior of my teachers and deans and others ... if we did not want to study, we did not study. We took the exams at the end; if we passed, great, and if we failed, well, we should have been awake before. ... It's something I did and still do, and I think it's correct. (Eric)

The models of his former teachers gave him an image of teaching that he found optimal and from which he had not deviated in his career. Lortie called this phenomenon "the Apprenticeship of Observation" (1975, p. 61). Before entering teacher education, teachers have been students for many years. They already have ideas about how to teach. Thus, becoming a teacher relies more heavily on memories of former teachers' personalities than on an understanding of pedagogical aspects. On top of being particularly vulnerable to the apprenticeship of observation, Eric has been teaching for 26 years and entered teacher education after 22 years of teaching experience. His belief system may have been maintained too long for it to be challenged. This supports the conclusion of Pajares (1992), who indicated that the earlier a belief is integrated into the mental model, the more difficult it is to modify.

Eric's firmly anchored beliefs caused him to reject all the inputs of teacher education regarding classroom management:

The course about classroom management, well, unfortunately the course I followed here, well it was given by a very nice person, full of good intentions. But, in my opinion, she never taught upper-secondary students. Well, I even wonder if she even taught lower secondary, if she did not only teach at primary school. ... Regarding classroom management ... well, you look at the activities [referring to group activities based on a constructivist view of teaching] and you think, "This is what we did in primary school," so you tell yourself that there's a problem: "If I give this to adults, it's over." (Eric)

Eric seems to believe that creating activities that favor students' engagement in learning, as encouraged in constructivist theories, can only be applied to children and would be rejected by young adults. This single belief prevented him from benefiting from teacher education, and as a result, Eric's practices and belief system were resistant to change.

Like those of Eric, Marie's practices did not evolve, either. Coming from the social work field, she had already taken some teacher education classes within her workplace. Marie was reluctant to follow the teacher education program from the beginning because she believed that it was not adapted for teachers of social-work apprentices: "They taught us about adolescents, but we are teaching this subject to our apprentices, so, well, yes, there's a little ... a big discrepancy" (Marie). The belief that the program was not well suited to her needs made her reject the inputs from teacher education.

The overall mental model can remain quite stable even if some beliefs change. This was the case for Thomas, Anna, and Alice. When discussing his prior teaching practices, Thomas stated, "I acted according to the models to which I was exposed as a student. They were the only models I had. I mean that we had a teacher who transmitted his knowledge to a student, basically." Thomas is aware that reproducing the teaching model to which he remembers being exposed did not lead to optimal teaching practices. His words suggest that he does not believe in the direct-transmission model of teaching. However, Thomas reported only a weak evolution of practices in the direction of more control and autonomy support. His belief change might not have been sufficient to trigger a significant positive change in practices. Thomas' belief system included another belief, which represented an obstacle to the implementation of new practices: "Those somewhat constructivist theories, they are great, but they are time-consuming" (Thomas). Thomas believes in the usefulness of constructivist theories. Nevertheless, his belief system includes other beliefs about such theories – namely that they take too much time to be put into practice in his teaching context. As a result, Thomas' practices were partially resistant to change. This result corroborates Chi's (2008) findings by suggesting that a mental model that contains contradictory beliefs can result in the rejection of an innovation. Thomas' school context can also have a role in Thomas' resis-

tance to change. Indeed, school culture, norms, internal regulations, or the policy for nonteaching time, for instance, are elements found to inhibit teacher change (Kyndt et al., 2016) and could explain Thomas's perception that he does not have enough time to implement constructivist practices.

Resistance to change can also derive from other types of beliefs, such as beliefs about students. Anna believes that students cannot remain engaged for a long period; as she stated, "asking them to be constantly focused is illusory." As a result of this belief, she decided not to react to inattentive students, as "there is a percentage of students who are going to stop listening anyway." Thus, her belief about students' abilities to stay focused prevented her from trying to react to the given situation.

Finally, low self-efficacy can also present an obstacle to the evolution of teaching practices. Before teacher education, Alice had a great deal of confidence in her ability to manage a classroom. Her workplace provides her with a very rigid framework, including rules about punishment in cases of disturbances or deficient schoolwork. Thus, she did not worry about classroom management. However, her self-efficacy decreased when she started teacher education: "Anxiety-provoking is not the right word, but it is quite unsettling. ... I felt less effective during teacher education." Alice felt uncomfortable with the teaching practices she had to implement, which she found threatening. After teacher education, Alice reverted to her previous teaching practices and regained her confidence.

## 4. Conclusion

The purpose of this study was to analyse teachers' perceptions of the evolution of their classroom management practices from the beginning of their teaching careers and to identify the factors that teachers perceive to be at the root of their change in practices. Moreover, this study aimed to examine the role of teacher education in the evolution of teachers' knowledge, beliefs, and practices. The results revealed that most teachers' practices became more favorable over time. Sharing is portrayed as an important trigger for the change process, which is in line with current research (Kagan, 1992; Kyndt et al., 2016; Pelletier et al., 2002). Teacher education (formal knowledge and teacher educators' influence) was also an important factor for the participants, suggesting that the goals of the teacher education program were at least partially fulfilled. A model emerging from teachers' answers to the interview questions allowed us to articulate the factors influencing the evolution of beliefs practices. To change teachers' beliefs and practices, a variety of factors need to coexist. First, one or several triggers – such as teaching experience, sharing, or teacher education – are needed. Knowledge acquisition (formal or informal) resulting from these triggers generates reflexive thinking mechanisms, which in turn impact teacher's mental model (i.e., beliefs about teaching and learning and beliefs



about oneself). These revisions then give space for an evolution of teaching practices.

Teachers' words emphasize the crucial role of their prior beliefs in the change process. Throughout their lives, teachers built a particular mental model that consists of entangled beliefs (Chi, 2008). Teachers' prior beliefs have the power to dismiss inputs from teacher education and to impede the evolution of practices (Borko & Putnam, 1996). Our model of teacher change starts with prior beliefs already established in a teacher's mental model. However, considering the importance of prior beliefs in the study of teacher change, it would be interesting to include the antecedents of those prior beliefs. Richardson (1996) categorized the antecedents of teachers' prior beliefs in the following way: (a) *Personal experience*, including elements such as understandings of education, culture, but also worldviews and personal life histories, (b) *experience with schooling and instruction*, which includes, for instance, experiences with teachers as pupils, and (c) *experience with formal knowledge* in school subjects and outside readings, for example. These three types of experience contribute to building teachers' prior beliefs in the same way teaching experience or teacher education contribute to changing (or reaffirming) those prior beliefs. Indeed, prior beliefs can be changed (Borko & Putnam, 1996; Feiman-Nemser, 2001), namely with the help of the triggers described in the present study. Then, once the teacher is engaged in the change process, a combination of factors will interact and might result in an evolution of practices. The current literature on teacher learning identifies other elements involved in teacher change. For example, individual characteristics such as one's willingness to learn, motivation to improve, resistance to change, or sense of initiative were found to act as antecedents of teachers' informal learning (Kyndt et al., 2016). In our study, personality was mentioned only by only one respondent, which explains why we did not include this element in our model. To our knowledge, existing models of teacher change mainly list factors contributing to the evolution. The distinction between triggers and facilitators is quite new in the field. It suggests that not all elements have the same role in the evolution of teachers' beliefs and practices. Rather, some elements can trigger processes which, in turn, might result in teacher change.

These results highlight the important role of teacher education in the evolution of teachers' practices. Providing sharing opportunities for teachers appears to be a crucial aspect on which to focus, considering their strong triggering power. Working on developing the ability to reflect on one's own practices in light of formal knowledge also seems to facilitate teachers' evolution. Thus, teacher educators should encourage teachers to link teaching content to their teaching practices in order to create deep cognitive engagement. Finally, teacher educators should pay close attention to their student teachers' prior beliefs and provide learning activities that aim to challenge these beliefs directly.

These results are to be interpreted with the following limits in mind. A single (though classical) classroom management situation was submitted to the teachers for the discussion of their practices. However, different hypothetical situations might have led participants to report different practices. Moreover, the giv-



en situation encourages the teachers to reflect on reactive classroom management practices. Therefore, this format of questioning does not allow much space for the teachers' classroom management strategies that aim at preventing problematic situations from occurring. Accordingly, classroom management practices were probably not exhaustively represented. Furthermore, the findings are fundamentally subjective, as the teachers reported how they perceived their own change. Nevertheless, this point of view might well be the most relevant in understanding change in teaching practices. The teachers were asked to imagine themselves at the beginning of their teaching career, which involved going back several years in their memory. Thus, it is possible that the difficulty of this exercise resulted in some inaccuracies. Moreover, teachers' recollections of their practices can be argued to represent beliefs as well as practices. Finally, the study was based on a single measurement occasion. While semi-structured interviews have been used to study of teacher change (e.g., Everitt, 2012; Holt-Reynolds, 1992), it would be useful to re-examine the findings of the present study with a longitudinal study design.<sup>6</sup>

While the results cannot be generalized, it seems that the issues and challenges reported by these vocational teachers might be largely similar to those of teachers in lower-secondary and upper-secondary education. Accordingly, the process of change might not be fundamentally specific to the population of vocational education and training teachers. The findings of this study constitute important information for teacher educators in the sense that they reveal processes that are largely hidden to them (i.e., the impact or effect of the teacher education program) and thus provide feedback that can be used to tailor the program. Future research in different contexts might help refine the tentative model based on the results of the present study.

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6 The present study served as a basis for a larger longitudinal mixed-method study, which will examine the evolution of vocational teachers' classroom management-related beliefs and practices during teacher education by means of surveys and interviews.

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