Basic needs satisfaction in a military learning environment: An exploratory study

Military academies request initiatives for better pedagogy to keep their cadets motivated and successful. Identifying the facilitating and inhibiting events that foster motivation is useful to optimize the learning environment and educational practices in military academies. Following the self-determination theory, one could promote autonomous motivation by fulfilling the three basic psychological needs of students: the need for autonomy, relatedness and competence. In this qualitative research, we investigated which motivational critical events go together with a perception of high or low autonomy, relatedness and competence. To this end, we organized four focus groups with participants from the two faculties of the Royal Military Academy of Belgium (RMA): Social and Military Sciences (SMS) and Engineering (ENG). Using the critical incident method, we searched for the facilitating and inhibiting events with regard to motivation within the learning environment. Thereafter, we used the constant comparison method as an analysis technique to link the critical events to one of the three basic needs. A perception of high relatedness was the most effective in motivating SMS cadets, while the perception of high competence was the most effective in motivating ENG cadets. For both the SMS and ENG cadets, a lack of autonomy was demotivating. We discuss the results in the context of the basic needs theory.

Keywords: motivation, basic needs, learning environment, military academies

Public significance statement: The present study suggests a mediating role of basic needs satisfaction between the learning environment and students' motivation. On that premise, determining events that facilitate and inhibit motivation in the learning environment can help to optimize educational practices to set up interventions.

A military academy is an atypical higher-education environment. Although military academies all over the world take different names (academy, college, university), all of them pursue the same mission: developing effective and competent military officers. Military academies aim to provide men and women capable of leading military units in

a variety of complex and exceptional circumstances for the benefit of the national and the international community. To this end, the academies tailor the curriculum to the needs of the armed forces, to the values of the nation and those of the armed forces. The education of officers takes place in a military environment and generally builds on the development of several sets of competences: academic, military, athletic, and character (leader personality development). To succeed in the education program and become an officer, cadets are graded on all of these aspects and must succeed in all of them.

Education in a military academy is socially, physically and psychological demanding (e.g. Holtom, Smith, Lindsay, & Burton, 2014; Kelly, Bartone, & Matthews, 2014; Maddi, Matthews, Kelly, Villarreal, & White, 2012). New cadets face the same challenges and obstacles as other higher-education students, but they must also adapt to military life (Kelly et al., 2014). Cadets must perform to a high academic standard (Buch, Säfvenbom, & Boe, 2015; Kelly et al., 2014) and at the same time, distribute judiciously their time and efforts between the academic education, the military and physical training and the character development. Consequently, succeeding in a military academy requires high levels of motivation (Buch et al., 2015). Hence, military academies have every interest in caring for the cadets' motivation to optimize the education output – academic achievement, military mastery, athletic performance and leadership development – and minimize dropouts.

Arnold (2014) states that motivation is the link between what drives people to do something, how much effort they put into doing something and how long they continue to do it. Scholars consider motivation in various ways: as a cause (e.g. Fazel & Ahmadi, 2011; Hauser, 2014; Venkatesan, Varghese, & Ananthanarayanan, 2009), as a result (Hardré, Crowson, Debacker, & White, 2007; Jaakkola, 2004; Neumeister, & Finch, 2006) or as a mediating variable between causes and results (Fernandez, 2008; Saltson

& Nsiah, 2015; Syafii, Thoyib, & Nimran, 2015). In the educational context, motivation can be the cause of student success or the outcome of the educational conditions (Ryan & Patrick, 2001). In this study, we consider motivation as a result of the match between personal needs and the learning environment.

In 1985, Deci and Ryan contributed to the field of motivation theory by making a distinction between two types of motivation regulation, i.e. controlled motivation and autonomous motivation. Controlled motivation is determined on the one hand by external factors (for example, to avoid punishment or to receive a reward) and on the other hand by internal pressure (for example, to avoid guilt, shame or fear or to strengthen ego). Autonomous motivation can exist when there is a personal purpose (for example, one identifies himself with the value, the personal importance of a given behavior), when the behavior is in line with the personal values (for example, the behavior is part of who one is) or when the person does something because he/she likes to do it.

Basic human needs satisfaction has an influence on the motivation regulation type. The basic needs theory (Ryan, 1995) proposes three fundamental human needs: the need for autonomy, the need for relatedness and the need for competence. When all three needs are met, they ensure optimal functioning of individuals in different areas of life (Niemiec & Ryan, 2009; Reeve, 2005; Van den Broeck, Ferris, Chang, & Rosen, 2016).

Autonomy stands for the need of an individual to make his/her own choices. This concerns a subjective experience of psychological freedom and choice. This implies that people can also experience a sense of autonomy when they fulfill a request because they link it to their own signification (Soenens et al., 2007). Relatedness is the

need to connect to others and to belong to a community, as well as to feel that significant others care about you. Baumeister & Leary (1995) define the need for relatedness as the desire to build positive relationships with others, to be loved and cared for and to take care of others. Competence is the need to interact with the environment (Deci & Ryan, 2000; White, 1959). People tend to explore and manipulate the environment to participate in challenging tasks and expand their skills (Niemiec & Ryan, 2009). The sense of competence helps people to develop and increases their flexibility to adapt to changing environments. To stay motivated, you have to learn new things in a certain discipline to become competent.

In civilian higher-education settings, research shows that psychological needs satisfaction influences motivational regulations (Chen, 2014; Schneider & Kwan, 2013; Tessier, Sarrazin, & Ntoumanis, 2010) and academic achievements (Carreira, 2012; Dettweiler, Lauterbach, & Simon, 2017; Ng, Liu, & Wang, 2016). A lack of connection between the school and the personal needs and interests of students can lead to a motivation problem among students (Govaerts, Kyndt, Dochy, & Baert, 2011; Schuit, de Vrieze & Sleegers, 2011; Vansteenkiste, Sierens, Soenens & Lens, 2007). This could possibly lead to early school leaving, under-utilization of skills or non-acquisition of competences (e.g. Schuit et al., 2011; Vansteenkiste, Sierens, Soenens, & Lens, 2007). Therefore, we posit that the learning environment plays a major role in the satisfaction of basic needs.

The learning environment is the social, psychological or psychosocial environment in which learning and teaching take place (Cleveland & Fisher, 2014). Moos (1974/2002) describes the learning environment more broadly as a psychosocial environment with three dimensions: the relationship dimension, the growth dimension and the change dimension. The relationship dimension defines the quality of personal

relationships – between student and teacher and between students – and concerns aspects such as personal engagement, cohesion, mutual support and cooperation between people in a social environment. The growth dimension includes the way in which the environment encourages personal development and the way tasks are oriented. The change dimension concerns the clarity of expectations and rules, differentiation between lessons, etc. Research shows that cohesion, task orientation, clear rules, satisfaction and support of the teacher relates positively to the motivation and performance of the students (e.g. Herrington, Reeves, & Oliver, 2014; Loyens & Gijbels, 2008, Walker & Fraser, 2005). The learning environment is one of the most important factors of learning that affects both motivation to learn and learning outcomes (Wang, Haertel, & Walberg, 1990). Motivation can also be the result of interactions with a certain context. According to Baeten,et al. (2010), stimulating factors can be determined based on the context in which the student learns, on the perceptions of the student and on the characteristics of the student himself. Context features include, for example, feedback, evaluation, teaching method, etc. The student's perception includes issues such as perceived workload and perceived clarity of objectives. The student's characteristics are, for example, age, gender, intelligence, motivation, etc.

An autonomy-supporting climate will favor the satisfaction of basic needs by encouraging the process of internalization and intrinsic motivation (Niemic & Ryan, 2009). In such a climate, teachers are more empathetic and try to recognize possible difficulties (Leroy, 2009). Students where teachers support autonomy show a high degree of self-determination (Deci, Nezlek, & Sheinman, 1981), better academic performance (Black & Deci, 2000; Deci & Ryan, 1985; Vallerand, 1997) a higher sense of skill (Deci, Schwartz, Sheinman, & Ryan, 1981) and a meaningful rationale (Chirkov & Ryan, 2001; Reeve, 2002). However, Nguyen states (2008) that the motivation of

students may change. This means that even students who do not want to learn can change their minds when they experience a stimulating environment that captures their attention.

In the civilian educational context, some studies have investigated the relationship between the learning environment and the satisfaction of basic needs. For instance, Grolnick and Ryan (1987) studied how fostering autonomy supports learning outcomes by creating a facilitating environment. Urdan & Schoenfelder (2006) studied the influence of classroom effects on motivation and competence beliefs. Niemic and Ryan (2009) studied autonomy, competence and relatedness in the classroom and their impact on motivation. Gibbons (2014) studied relatedness-supportive learning environment.

Despite the tough challenges cadets face in military academies and the interest of military academies to achieve the best possible education of future leaders, research on cadets' motivation regulation is scarce. Some studies have addressed Grit at the United States Military Academy of West Point (e.g. Buller, 2012; Kelly et al., 2014; Maddi et al,, 2012), academic self-efficacy at the Norwegian Military Academy (e.g. Boe, Säfvenbom, Johansen, & Buch, 2018; Buch et al. 2015; Fosse, Buch, Säfvenbom, & Martinussen, 2015), retention motivations of Reserve Officer Training Corps cadets at United States Military Academy,West Point (Ngaruiya, Velez, Clerkin, & Taylor, 2014), cadet motivation and learning at United States Military Academy, West Point (Nguyen, 2008). Surprisingly, nobody has looked yet into cadets' experiences and perceptions about their academies and in the potential link between motivation, basic needs satisfaction, and the learning environment. Hence, the central question of this study is: "In what way does the learning environment impact on cadets' 'motivation?" Cadets face various challenges that require high levels of motivation (academic,

military, physical, personal), therefore we focused on academic motivation in this study. We addressed our research question by dint of a qualitative approach based on focus groups of cadets of the Royal Military Academy of Belgium. In particular, we explored with them their subjective experiences and perception of facilitating and inhibiting events on motivation. Afterwards, we used the critical analysis technique (CIT; Flanagan, 1954) to relate these facilitating and inhibiting events to one of the three basic needs. Our aim was to develop a model of motivation in military academies, in order to foster research in this field and help policy making.

METHOD

We used the critical incident technique (CIT; Flanagan, 1954) to analyze in depth facilitating and inhibiting events that influence motivation within a military academic learning environment. CIT is a widely used method to map people's experiences in a systematic way (Flanagan, 1954). Questioned about everyday events, participants tell about their implicit knowledge, without falling into socially desirable or theoretically formed answers (Zemke & Kramlinger, 1991). Butterfield et al. (2009) see the specificity of the target group as a condition for applying the CIT. The CIT is used for example, to detect facilitating and obstructing factors, to collect functional or behavioral descriptions of events or problems, to highlight successes and failures, and finally to determine characteristics that are crucial for important aspects of an activity or an event (Flanagan, 1954). By discussing and organizing example situations with the participants, this method works towards a practical overview of all individual knowledge, resulting into new knowledge created through the interaction. This method allows researchers to formulate practical recommendations to the professional field.

Participants

At the time of the data collection, 422 cadets studied at the Royal Military Academy of Belgium. The cadets followed the social and military sciences curriculum (SMS) (n = 321) or the polytechnics one (ENG) (n = 101), were in the bachelor year (i.e. college) (n = 261) or in their master year (i.e. university) (n = 161), French speaking (n = 201) or Dutch speaking (n = 221) and male (n = 351) or female (n = 71). Among this population, 376 had participated in an earlier quantitative research on motivation. Out of those 376, we selected a simple random sample of 40 cadets with a digital random number generator. We organized four focus groups of ten students, with two people per year of study (5 promotions per faculty), per faculty (SMS and ENG) and per language (French speaking and Dutch speaking). This means one group contained people from different study years, but study at the same faculty and spoke the same language. The choice of this partition was two-fold. On the one hand, the academic curriculum and the learning environment are quite different in the two faculties and on the other hand, the language aspect is a special feature of the RMA.

Procedure

We invited participants to report behaviors or events that had a positive influence (facilitating) or a negative influence (inhibiting) on their academic motivation. The same researcher, fluent in both Dutch and French, led all the focus groups in both languages. The focus groups took place in the second semester of the academic year (February to June). Because of the heavy-loaded program of the students, the duration of the focus groups was limited to two hours. After a general introduction, the researcher addressed the two following central questions:

- Give an example of a behavior or an event that motivates you within academic

education (facilitating)?

- Give an example of a behavior or an event that demotivates you within academic education (inhibiting)?

We used the words “a behavior or an event” on purpose to avoid the possible negative and dramatic connotation of an incident.

The focus groups followed the CIT three phases (Dekker et al., 2000). In phase 1, each participant received a sheet of paper and a pen and wrote down an example of a behavior or event that had to do with the central questions. In phase 2, we asked the participants to read out one of their behaviors or events to the other participants in the focus group. We then asked the other participants if they had a related example and if they wanted to read it out. When there were no more related behaviors or events reported, we invited the participants to find an appropriate label to describe the behavior or event in one or two words. In phase 3, when participants had agreed on a common appropriate label, they classified the labels according to their effectiveness, i.e. the degree of success or influence in achieving motivation or demotivation respectively.

Analysis

The focus groups were recorded and the researcher completely typed out the recordings. The nature of our approach involved mentioning persons (e.g. teachers, military staff, cadets), so while typing out the conversations, we preserved the anonymity of the mentioned personnel as much as possible. We only mentioned departments when this was necessary to describe and understand the situation. When writing out the content of the focus groups, we omitted all hesitations and repetitions within a sentence to facilitate readability.

Central in a qualitative research analysis is the systematic interpretation of the studied phenomenon. We have chosen to use the constant comparison method (Glaser, 1965). Four assessors analyzed independently how quotes could be linked to a basic need from the basic needs theory (Ryan, 1995). This multi-assessors approach aimed at limiting subjectivity biases (Plochg & Van Zwieten, 2007). We chose one Dutch Msc Psychology and one Dutch MSc Pedagogical Sciences and two French Msc Psychology working at the military academy because of their insight into the psychological and pedagogical concepts and because they all had a good knowledge about the functioning at the military academy. To ensure that each assessor gave the same meaning to the basic needs, we provided an instruction sheet with additional information about the basic needs and used method. After the independent analyses, the researcher searched similarities of categorization between herself and the two different assessors. As three assessors, the researcher herself and two other assessors, were involved according to the language, we calculated the kappa statistics (Arora, Johnson, Lovinger, Humphrey, & Meltzer, 2005). In our study, the kappa score was between 0.32 and 0.65, which means that the inter-rater reliability was moderate to good (according to the criteria in Sim & Wright, 2005). Therefore, we used the basic need most frequently linked as categorization of labels. To produce our model we linked the common language labels to scholar terms, which the researchers found by literature research.

RESULTS

In this section, we present the results separately according to the faculty. Although they may refer to similar concepts, labels may differ between SMS and ENG, because participants produced them in separate focus groups. We propose a scholar term referring to the label into brackets. We report first the behavior and events having a positive influence on academic motivation (in order of decreasing effectiveness to

achieve motivation) and then behaviors and events having a negative influence on academic motivation (in order of decreasing effectiveness to achieve demotivation). The Supplemental Material (table 1, table 2, table 3 and table 4) provides an organized view of labels, associated basic psychological need and examples of illustrative quotes. Finally, we modeled the relationships between variables out of the learning environment, basic psychological needs and motivation.

Social and Military Sciences students

SMS students produced six labels for behavior and events that have a positive influence on the academic motivation. We found *the teacher's interest in their students* [teacher engagement] as most effective in achieving motivation. In addition, the existence of *didactic material* (handbooks, key questions and key solutions, etc.) [instrumental support], *a feeling of shame* [threat to the ego] when performing poorly and *cohesion* [social support] among students are effective in achieving motivation. The assessors linked the basic need relatedness as categorization for these four labels. Subsequently, we found *link with the job* [job match], i.e. the match between the content of the courses and their future job and the *evaluation* [assessment] effective in achieving motivation. The assessors linked the basic need competence as categorization of those two labels.

The SMS participants applied seven labels for events that have a negative influence on the academic motivation. The *military staff* [supervisor], who is responsible for the military training and character development of the cadets, is most effective in installing demotivation for the academic education, because the cadets sometimes feel treated like children, followed by *a lack of autonomy* [lack of agency] and *lack of physical fitness* [lack of physical fitness]. These three labels were associated with the need of autonomy. *Courses* [course content] that do not increase their sense of

competence, *evaluation* of academic performances [assessment] and *poor pedagogy* [poor teaching competence] are also effective in achieving demotivation. The assessors linked the basic need competence as categorization of those three labels. Subsequently, we found that *courses* with insufficient didactic material [poor teacher engagement], *poor pedagogy* [poor teacher engagement] and a feeling of *injustice* [incongruence] have a negative influence on the academic motivation. The assessors linked the basic need relatedness as categorization to those three labels.

Engineering students

The focus groups among ENG students produced eight labels for events that have a positive influence on the academic motivation. First, *assurance future*, which means an individual's subjective perception of his or her capacity to perform in a given setting or to attain desired results [academic self-efficacy], is most effective in achieving motivation. Followed by the *practical aspects of their education* [action learning], courses with a *link with the future job* or content [job match], the *evaluation* of academic performances [assessment], which responds to their need of competence. *Cohesion* [social support], availability of *academic material* [instrumental support], the *pedagogy as teaching style* [poor teacher engagement] and the *feeling of pride* [reinforcement of the ego] have a positive influence on the academic motivation. The assessors linked the basic need relatedness as categorization of those four labels.

Eight labels applied for events that have a negative impact on the academic motivation, with regard to the ENG students. First, we found a *lack of or poor communication* [poor information support] that is associated with their need of relatedness, followed by *poorly performing teachers* [poor teaching competences], *insufficient academic material* [poor instrumental support] and the impact of the

military staff [supervisor] on the academic education. Bad or *poor academic planning* [poor information support] that limit their academic performance is also most effective to install demotivation and is associated with a lack of autonomy, as well a *lack of free time* [lack of agency] and the limitations installed by a recent change in the ENG *curriculum* [lack of agency]. Incorrect *evaluations* or incoherence between their input and output [assessment] that do not reflect their competence is associated with their need of competence.

[INSERT FIG.1 ABOUT HERE]

DISCUSSION

This study focused on the critical events that increase or decrease the motivation of cadets in a military academy. In our sample from the RMA, we found that SMS cadets are motivated in the first place by a perception of high relatedness and secondly by a perception of high competence. We found the opposite among ENG cadets (first, high competence; secondly, high relatedness). Strikingly, cadets of both faculties do not indicate motivating critical events with regard to autonomy. For cadets of both faculties, a perception of low relatedness is demotivating. For SMS cadets this is secondly followed by a perception of low competence and thirdly by a perception of low autonomy. For ENG cadets we found the opposite, in the 2nd place by a perception of low autonomy and in 3rd place by a perception of low competence. In the following section, we discuss the findings related to each basic need.

Autonomy

In our sample, assessment is associated indirectly to autonomy. Good grades lead to rewards (e.g. free study, have dinner outside the military academy, practicing more sport, etc.). Too often teachers use external controls, close supervision and evaluations,

which go along with a reward, a punishment or a negative reinforcement to ensure learning takes place. Such practices install external pressure on students instead of facilitating student's inherent interest in learning (Niemiec & Ryan, 2009). The idea is that positive feedback (reward) increases intrinsic motivation and negative feedback reduces intrinsic motivation. By using rewards, students are more motivated to complete their education (Holter & Bruinsma, 2010).

According to the cadets in our sample, there is an inconsistent relationship between academic aptitudes on the one hand, and military aptitudes and personality development on the other hand (by example weak academic result lead to less sport opportunities), which can lead to a feeling of incongruence (i.e. one's subjective evaluation of a situation is at odds with reality). Additionally, the cadets have the perception that the academic aptitudes get the upper hand on the military aptitudes and the personal development. Students are motivated to perform well when they believe their teachers care for their personal needs, as well as academic needs (Nguyen, 2008).

A lack of feeling of agency follows a schedule imposed by the military staff who does not consider their academic agenda or does not communicate in advance. Cadets indicate that the military calendar gets priority on the academic calendar. This makes it difficult for cadets to plan their study time and has a negative impact on their leisure time. It is also important that cadets know what the school is aiming for, what they should be able to know after the semester or year and so they can tailor their learning activities accordingly. When activities are communicated in advance, the student can be the owner of his or her agenda, so that he/she can choose when he/she plans their study time, but also their leisure time.

Relatedness

A perception of high relatedness is motivating the cadets. The availability of didactic material plays the most important role here. It is a cue for the cadets that the teacher is interested in his/her students and that he/she guide them in acquiring knowledge. It reflects teacher engagement (Federici, & Skaalvik, 2014). Cadets consider the absence of appropriate didactic material as demotivating. The cadet does not feel appreciated in that case. Previous research has shown that a good relationship with the teacher and instrumental support contribute to a higher sense of well-being (Suldo et al., 2009), intrinsic motivation (Deci & Ryan, 2000) and help seeking behavior (Federici & Skaalvik, 2014). We can call this academic integration. Academic integration means that a student can participate in a broad sense in the learning environment and feels connected to the curriculum and the institution (Education Council, 2008). Davidson, Beck, & Milligan (2009) translate this into the belief that teachers are concerned about the intellectual growth of their students at school, that students can participate in discussions during the lecture and that there is a relationship between the curriculum and the future. According to Kember (1989), academic integration also exerts an influence on the intrinsic motivation of students. When students feel that the teacher believes in them and is concerned about their results, they gain more confidence and become more motivated (Thomas, 2002).

The recognition of the high academic level of studies by the teachers inside and outside the academy gives the cadets the impression that the teacher is involved with his cadets. We consider this as another signal of teacher engagement. It is remarkable that cadets and the assessors associated this aspect with relatedness and not with competence, probably because it relates more to the relationship dimension then to the growth dimension (Moos, 1974/2002). In the civilian educational context, this

perception of high relatedness is associated with a feeling that the teacher likes, values, respects the student, and leads consequently to a higher intrinsic motivation (Niemiec & Ryan, 2009). Students are motivated to learn and perform well in the academy when they feel a sense of relatedness (Ryan & Patrick, 2001).

The fact that cadets feel they belong to their group (social support) also contributes to relatedness and to the motivation of the cadet. Research shows that students with low social integration drop out more often due to a lack of interactions and because they do not feel at home (Spady, 1971; Tinto, 1975).

Poor information support leads to a perception of low relatedness. In our sample, too little, unrealistic or incorrect information is being shared and the cadets' wishes are not taken into account, for example in an exam planning. However, research shows that participation in decision-making contributes to a perception of higher relatedness (Deci & Ryan, 2000). By sharing information with their students, the teacher integrates the student within the academic framework.

Competence

Courses with professional relevance (i.e. job match) are very effective to foster motivation. Cadets want to learn those competences, as they will use them as future officers for example learn to negotiate. Cadets ask to organize the teaching in function of job match. This relates to the need for competence. A motivation problem can arise when there is a lack of agreement between the school and the individual interests of students (here the future position) (Nelis & van Sark, 2014).

Another aspect that contributes to the perceived competence is the evaluation aspect, which cadets see as a form of self-evaluation (i.e. assessment). Evaluation here

becomes a feedback for the cadet to adjust his behavior. Research shows that the quality of evaluation is predictive for study performance (Bruinsma, 2004). This leads to entrepreneurial skills among students such as autonomous and problem solving thinking. People want to be able to show their capacity to perform, which you can relate to academic self-efficacy.

Confronted with a teacher perceived as not being competent (i.e. poor teaching competences), for example because he/she is not enthusiastic to teach in his/her field, does not provide didactic resources or because he/she provides conflicting information, has a demotivating effect. Such negative perceptions can have a predictive value for the student's commitment (Lau & Roeser, 2002/2008).

Strengths and limitations

Although this research provides additional insight into the needs of cadets in military academies, it has also a number of strengths and limitations that are important to consider to improve future research.

In qualitative research, the researcher has a central role because he is at the same time an observation tool and an analysis tool in the light of the research question (Plochg & Van Zwieten, 2007). It is possible that the identity of the researcher when leading the focus groups had an impact on data collection because she was part of the teaching staff, so the cadets may have filtered the critical incidents they reported. It is also possible that the effect of the researcher's expectations plays a role in data collection (Clarke, Sproston, & Thomas, 2003). This effect occurs when the researcher influences the participants and the participants thereby deliver results that are in line with the research expectations. Body language, by example, affects this unconscious process. To remedy this shortcoming, we would recommend to let a researcher external

to the institution lead the focus groups. In the analysis of the focus groups' content, the reflexivity of the researcher was however mitigated by the use of different assessors.

We would like to emphasize the importance of qualitative research in the social sciences. Our literature review highlighted that research on cadets' motivation is scarce. The inductive approach we adopted helped us to shed light on this seldom studied phenomenon. Furthermore, qualitative approach gave a central place to the perception and experience of the participants. We are convinced that using focus group through a process of sharing and comparing information, resulted in in-depth insights on the relationships between the military learning environment variables, the satisfaction of basic needs, and motivation. Our study resulted in a model (Fig. 1) suggesting a mediating effect of basic needs satisfaction between the learning environment and motivation. Future quantitative research could explore those relationships further.

Recommendations

With this study, we aimed at exploring the relationships between learning environmental conditions and basic needs satisfaction. If a military academy wants to offer education that meets the needs of the students, it has to integrate in the first place more autonomy because we found cadets do not indicate motivating critical events with regard to autonomy". We must take into account the age phase of our target group, the young adult (between the ages of 17 and 25), wherein the most important lines are outlined for their future (Stas, Serrien & Van Menxel, 2008). During this period, freedom of choice and responsibilities are central (Arnett & Taber, 1994; D'Oosterlinck, Broekaert, & Vander Haeghen, 2006). High pedagogical control with the obliged study time is the most typical example that decrease the satisfaction of the need of autonomy of our participants. Every military academy wants autonomously

motivated students, but imposes restrictions on autonomy at the same time. However, several studies show that autonomous motivation contributes to greater relatedness and commitment at school (Skinner, Connell, & Wellborn, 1990), leads to better results (Miserandino, 1996), prevents school dropout (Vallerrand & Bissonnette, 1992), entails higher-quality learning behavior (Grolnick & Ryan, 1987) and more well-being (Sheldon & Kasser, 1995; Shelden & Kasser, 1998). Moreover, when improving autonomy at school, students also recognize and appreciate this greater level of autonomy in other people and probably they will give autonomy in their future role as chef, after all, they have seen a good example (Nelis & van Sark, 2016). It is striking that in this research the military staff reduces autonomy when academic results are failing the expectations. This leads to interference between academic education and military training and therefore between academic and military assessments. This is comparable to the situation of a child of divorced parents raised within two families, and punished for something he/she did in the one family by the other family. To change behavior, it would be better to install self-reflection upon errors, with the help of teacher's (negative or positive) feedback as a way to increase autonomy. We recommend decoupling the academic education from the military training, and their respective assessments, as well as to question autonomy-restricting measures. Revising this autonomy aspect requires confidence in the cadets. Nguyen (2008) stated in his review research that motivated students attend class or study without a need for external regulation like reward or punishments.

According to Sluijsmans, Dochy, & Moerkerke (1998) and Somervell (1993), the use of self, peer and team evaluation can remove the barrier between students and teachers. Integrating evaluation within a course increases the motivation of the student to learn (Tai, Ajjawi, Boud, Dawson, & Panadero, 2017). Developing the skill of

evaluating can form an additional objective within the course and can empower the student (Tai et al., 2017). Learning to evaluate does not refer to the result, but to the thinking process and the arguments that accompany it. Students learn to take responsibility for their learning process (Sitzmann & Ely, 2011). Generally, the teacher mainly evaluates and communicates the scores to the student. We could also focus on developing an assessment portfolio (Wolf, Whinery & Hagerty, 1995). An assessment portfolio is a document that reflects the professional growth and learning process of a student. The portfolio makes the competencies, knowledge, skills and attitudes of the student visible as a developing professional. When students perceive the method of evaluation as inappropriate, they are more likely to focus on what is strictly necessary. This translates into superficial learning (Lizzio, Wilson, & Simons, 2002). Therefore, Postiaux (2016) recommends a match between the objectives, the method and the evaluation. An objective evaluation must meet the following quality criteria: validity (the right evaluation for the right measurement), reliability (multiple assessors must obtain the same evaluation) and relevance (an evaluation must be consistent with the objectives of the course) (Postiaux, 2016).

Education organized according to the High Impact Learning that Lasts (HILL) model can better adapt education to the world of work (Dochy, Berghmans, Koenen, & Segers, 2015) and tackle the perception of low competence. Firstly, by using a problem situation, a project or a case study from the professional field; one can narrow the gap between an exercise in a course and the future position. Here we think of tests in laboratories, role-playing in the classroom, etc. Studies show that students have positive perceptions about solving relevant problems, which is more related to urgency, gap, problem and agency (De Corte 2000; Vermunt 1998) and this contributes to experiential learning (Boud, 1994). Secondly, action and knowledge sharing can also contribute to

job match because it confronts the student during the course with a problem he can also encounter in his professional life. One can provide an entire course such as with problem-based learning. Finally, adding an internship period would reduce the gap between academic education and their future position.

We suggest a continuous supervision at the request of the (starting) assistant and professor. Low relatedness can be tackled by collaboration, interaction and coaching through peer learning (training given by another assistant or teacher) and peer coaching (coaching given by another assistant or teacher) (Dochy et al. 2015).

CONCLUSION

Satisfying the basic psychological needs is the motor for developing autonomous motivation; frustrating the basic needs rather causes a controlled motivation or demotivation (Deci & Ryan, 2000). The present study sheds some theoretical light on the satisfaction of the three basic psychological needs and the variables out of the learning environment. Our model suggests a mediating role of basic needs satisfaction between the learning environment and students' motivation. On that premise, determining events that facilitate and inhibit motivation in the learning environment can help to optimize educational practices to set up interventions.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, [A.L.]. The data are not publicly available due to restrictions their containing information that could compromise the privacy of research participants.

REFERENCES

Arnett, J. J., & Taber, S. (1994). Adolescence terminable and interminable: When does adolescence end? *Journal of youth and adolescence*, *23*(5), 517-537.

Arnold, J. (2014). Psychologie van Arbeid en Organisatie. Pearson Education NL.

Arora, V., Johnson, J., Lovinger, D., Humphrey, H. J., & Meltzer, D. O. (2005). Communication failures in patient sign-out and suggestions for improvement: a critical incident analysis. BMJ Quality & Safety, 14(6), 401-407.

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review*, *5*(3), 243-260.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin*, *117*(3), 497.

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education*, *84*, 740-756.

Boe, O., Säfvenbom, R., Johansen, R. B., & Buch, R. (2018). The Relationships Between Self-Concept, Self-Efficacy, and Military Skills and Abilities.

Boud, D. (1994, May). Conceptualising learning from experience: Developing a model for facilitation. In *Proceedings of the 35th adult education research conference* (pp. 49-54).

Bruinsma, M. (2004). Motivation, cognitive processing and achievement in higher education. *Learning and instruction*, *14*(6), 549-568.

Buch, R., Säfvenbom, R., & Boe, O. (2015). The relationships between academic self-efficacy, intrinsic motivation, and perceived competence. Journal of Military Studies, 6(1), 19-35.

Buller, E. F. (2012). The relationship between grit and academic, military and physical performance at the United States Military Academy (Doctoral dissertation, University of Kansas).

Butterfield, L. D., Maglio, A. S. T., Borgen, W. A., & Amundson, N. E. (2009). Using the enhanced critical incident technique in counselling psychology research. *Canadian Journal of Counselling and Psychotherapy/Revue canadienne de counseling et de psychothérapie*, *43*(4).

Carreira, J. M. (2012). Motivational orienations and psychological needs in EFL learning among elementary school students in Japan. System, 40(2), 191-202.

Chen, W. (2014). Psychological needs satisfaction, motivational regulations and physical activity intention among elementary school students. *Educational Psychology*, *34*(4), 495-511.

Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and US adolescents: Common effects on well-being and academic motivation. Journal of cross-cultural psychology, 32(5), 618-635.

Clarke, P., Sproston, K., & Thomas, R. (2003). An investigation into expectation-led interviewer effects in health surveys. *Social Science & Medicine*, 56(10), 2221-2228.

Cleveland, B., & Fisher, K. (2014). The evaluation of physical learning environments: A critical review of the literature. *Learning Environments Research*, *17*(1), 1-28.

D'Oosterlinck, F., Broekaert, E., & Vander Haeghen, C. (2006). Probleemjongeren te vroeg het te-huis uit. *Tijdschr voor Orthop Kinderpsychiatrie, en Klin Kinderpsychologie*, *31*, 58-68.

Davidson, W. B., Beck, H. P., & Milligan, M. (2009). The college persistence questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development*, *50*(4), 373-390.

De Corte, E. (2000). Marrying theory building and the improvement of school practice: A permanent challenge for instructional psychology. *Learning and instruction*, *10*(3), 249-266.

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. Journal of research in personality, 19(2), 109-134.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11(4), 227-268. doi:10.1006/ceps.1999.1020

Deci, E.L., Nezlek, J., & Sheinman, L. (1981). Characteristics of the rewarder and intrinsic motivation of the rewardee. *Journal of Personality and Social Psychology, 40,* 1-10.

Deci, E.L., Schwartz, A.J., Sheinman, L., & Ryan, R.M. (1981). An instrument to assess adults' orientations toward control versus autonomy with children: Reflections on intrinsic motivation and perceived competence. *Journal of Educational Psychology, 73,* 642-650.

Dekker, H., van Ginkel, K., Nieveen, N., Keursten, P., Rondeel, M., & Wagenaar, S. (2000). Werken aan kennis. Methoden voor het creëren, delen en toepassen van kennis. Kessels & Smit, The Learning Company.

Dettweiler, U., Lauterbach, G., Becker, C., & Simon, P. (2017). A Bayesian mixed-methods analysis of basic psychological needs satisfaction through outdoor learning and its influence on motivational behavior in science class. Frontiers in psychology, 8, 2235.

Dochy, F., Berghmans, I., Koenen, A. & Segers, M. (2015). Bouwstenen voor High Impact Learning. Het leren van de toekomst in onderwijs en organisaties. Den Haag: Boom.

Education Council (2008). Royal Military Academy of Belgium. Brussels.

Fazel, I., & Ahmadi, A. (2011). On the relationship between writing proficiency and instrumental/integrative motivation among Iranian IELTS candidates. Theory and Practice in Language Studies, 1(7), 747-757.

Federici, R. A., & Skaalvik, E. M. (2014). Students' Perceptions of Emotional and Instrumental Teacher Support: Relations with Motivational and Emotional Responses. *International Education Studies*, *7*(1), 21-36.

Fernandez, K. G. (2008). Motivation as a mediating variable between parental support and anxiety.

Flanagan, J. C. (1954). The critical Incident Technique. *Psychological Bulletin,* vol 51, Juli 1954.

Fosse, T. H., Buch, R., Säfvenbom, R., & Martinussen, M. (2015). The impact of personality and self-efficacy on academic and military performance: The mediating role of self-efficacy. Journal of Military Studies, 6(1), 47-65.

Gibbons, S. L. (2014). Relatedness-supportive learning environment for girls in physical education. LEARNing Landscapes, 7(2), 139-150.

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. Social problems, 12(4), 436-445.

Govaerts, N., Kyndt, E., Dochy, F., & Baert, H. (2011). Influence of learning and working climate on the retention of talented employees. *Journal of workplace learning*.

Grolnick, W., & Ryan, R. (1987). Autonomy in children's learning: An experimental and individual differences investigation. *Journal of Personality and Social Psychology*, 52, 890-898.

Hardré, P. L., Crowson, H. M., Debacker, T. K., & White, D. (2007). Predicting the academic motivation of rural high school students. The Journal of Experimental Education, 75(4), 247-269.

Hauser, L. (2014). Work motivation in organizational behavior. *Economics, Management, and Financial Markets*, *9*(4), 239-246.

Herrington, J., Reeves, T. C., & Oliver, R. (2014). Authentic learning environments. In *Handbook of research on educational communications and technology* (pp. 401-412). Springer, New York, NY.

Holter, N., & Bruinsma, W. (2010). Wat werkt bij het voorkomen van voortijdig schoolverlaten?. *Nederlands Jeugd Instituut. Verkregen op*, *19*.

Holtom, B. C., Smith, D. R., Lindsay, D. R., & Burton, J. P. (2014). The relative strength of job attitudes and job embeddedness in predicting turnover in a US military academy. *Military Psychology*, *26*(5-6), 397-408.

Jaakkola, T. (2004). Changes in students' exercise motivation, goal orientation, and sport competence as a result of modifications in school physical education teaching practices

Kelly, D. R., Matthews, M. D., & Bartone, P. T. (2014). Grit and hardiness as predictors of performance among West Point cadets. Military Psychology, 26(4), 327-342.

Kember, D. (1989). A longitudinal-process model of drop-out from distance education. *The Journal of Higher Education*, *60*(3), 278-301.

Lau, S., & Roeser, R. W. (2002). Cognitive abilities and motivational processes in high school students' situational engagement and achievement in science. *Educational Assessment*, *8*(2), 139-162.

Lau, S., & Roeser, R. W. (2008). Cognitive abilities and motivational processes in science achievement and engagement: A person-centered analysis. *Learning and Individual Differences*, *18*(4), 497-504.

Leroy, N. (2009). *Impact du contexte scolaire sur la motivation et ses conséquences au plan des apprentissages* (Doctoral dissertation, Université Pierre Mendès-France-Grenoble II).

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher education*, *27*(1), 27-52.

Loyens, S. M., & Gijbels, D. (2008). Understanding the effects of constructivist learning environments: Introducing a multi-directional approach. *Instructional science*, *36*(5-6), 351-357.

Maddi, S. R., Matthews, M. D., Kelly, D. R., Villarreal, B., & White, M. (2012). The role of hardiness and grit in predicting performance and retention of USMA cadets. Military psychology, 24(1), 19-28.

Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children. *Journal of educational psychology*, *88*(2), 203.

Moos, R. H. (1974). *Evaluating treatment environments: A social ecological approach*. Wiley-Interscience.

Moos, R. H. (2002). 2001 Invited address: the mystery of human context and coping: an unraveling of clues. *American journal of community psychology*, 30(1), 67-88.

Nelis, H., & van Sark, Y. (2016). *Puberbrein binnenstebuiten: wat beweegt jongeren van 10 tot 25 jaar?* Kosmos.

Neumeister, K. L. S., & Finch, H. (2006). Perfectionism in high-ability students: Relational precursors and influences on achievement motivation. Gifted child quarterly, 50(3), 238-251.

Ng, B. L., Liu, W. C., & Wang, J. C. (2016). Student motivation and learning in mathematics and science: A cluster analysis. *International Journal of Science and Mathematics Education*, *14*(7), 1359-1376.

Ngaruiya, K. M., Velez, A. L. K., Clerkin, R. M., & Taylor, J. K. (2014). Public service motivation and institutional-occupational motivations among undergraduate students and ROTC cadets. Public Personnel Management, 43(4), 442-458.

Nguyen, C. (2008). Student motivation and learning. This paper was completed and submitted in partial fulfillment of the Master Teacher Program, a.

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. Theory and research in Education, 7(2), 133-144.

Plochg, T., & Van Zwieten, M. C. B. (2007). Kwalitatief onderzoek. *Handboek gezondheidszorgonderzoek*, 77-93.

Postiaux, N. (2017). Problèmes pédagogiques relatifs à l'enseignement supérieur. ULB, Brussel.

Reeve, J. (2002). Self-determination theory applied to educational settings.

Reeve, J. (2005). Understanding Motivation and Emotion, John Wiley & Sons. *Hoboken NJ*.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of personality*, *63*(3), 397-427.

Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, *38*(2), 437-460.

Saltson, E., & Nsiah, S. (2015). The mediating and moderating effects of motivation in the relationship between perceived organizational support and employee job performance. International Journal of Economics, Commerce and Management, 3(7), 654-667.

Schneider, M. L., & Kwan, B. M. (2013). Psychological need satisfaction, intrinsic motivation and affective response to exercise in adolescents. *Psychology of Sport and Exercise*, *14*(5), 776-785.

Schuit, H., de Vrieze, I., & Sleegers, P. (2011). Leerlingen motiveren: een onderzoek naar de rol van leraren (Vol. 27). Ruud de Moor Centrum/Open Universiteit.

Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of personality and social psychology*, *68*(3), 531.

Sheldon, K. & Kasser, T. (1998). Pursuing personal goals: Skills enable progress, but not all progress is beneficial. *Personality and Social Psychology Bulletin, 24*, 1319-1331.

Sim, J., & Wright, C. C. (2005). The kappa statistic in reliability studies: use, interpretation, and sample size requirements. *Physical therapy*, 85(3), 257-268.

Sitzmann, T. & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: what we know and where we need to go. *Psychological Bulletin, 137* (3), 421-422.

Skinner, E. A., Connell, J. P. & Wellborn, J. G., (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of educational psychology*, *82*(1), 22.

Sluijsmans, D., Dochy, F., & Moerkerke, G. (1998). Creating a learning environment by using self-, peer-and co-assessment. Learning environments research, 1(3), 293-319.

Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Beyers, W., & Ryan, R. M. (2007). Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental psychology*, *43*(3), 633.

Somervell, H. (1993). Issues in assessment, enterprise and higher education: the case for self-, peer and collaborative assessment. *Assessment and Evaluation in Higher Education*, 18, 221–233.

Spady, W. G. (1971). Dropouts from higher education: Toward an empirical model. *Interchange*, *2*(3), 38-62.

Stas, K., Serrien, L., & Van Menxel, G. (2008). Jongvolwassenen: tussen wal en schip. *Beleidsdossier, Berchem, Steunpunt Algemeen Welzijnswerk*.

Suldo, S. M., Friedrich, A. A., White, T., Farmer, J., Minch, D., & Michalowski, J. (2009). Teacher support and adolescents' subjective well-being: A mixed-methods investigation. *School psychology review*, *38*(1), 67.

Syafii, L. I., Thoyib, A., & Nimran, U. (2015). The role of corporate culture and employee motivation as a mediating variable of leadership style related with the employee performance (studies in Perum Perhutani). Procedia-Social and Behavioral Sciences, 211, 1142-1147.

Tai, J., Ajjawi, R., Boud, D., Dawson, P., & Panadero, E. (2017). Developing evaluative judgement: enabling students to make decisions about the quality of work. Higher Education, 1-15.

Tessier, D., Sarrazin, P., & Ntoumanis, N. (2010). The effect of an intervention to improve newly qualified teachers' interpersonal style, students motivation and psychological need satisfaction in sport-based physical education. Contemporary Educational Psychology, 35(4), 242-253.

Thomas, L. (2002). Student retention in higher education: the role of institutional habitus. *Journal of Education Policy, 17,* 423-442.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of educational research, 45*(1), 89-125.

Urdan, T., & Schoenfelder, E. (2006). Classroom effects on student motivation: Goal structures, social relationships, and competence beliefs. Journal of school psychology, 44(5), 331-349.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation ». In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (vol. 29, p. 271-360). New York : Academic Press.

Vallerand, R., & Bissonnette, R. (1992). *Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study*. Journal of Personality, 60, 599-620.

Van den Broeck, A., Ferris, D. L., Chang, C. H., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management, 42*(5), 1195-1229.

Vansteenkiste, M., Sierens, E., Soenens, B., & Lens, W. (2007). Willen, moeten en structuur in de klas: over het stimuleren van een optimaal leerproces. *Begeleid zelfstandig leren*, *16*(1), 37-57.

Venkatesan, R., Varghese, K., & Ananthanarayanan, K. (2009, September). Motivation and demotivation cause factors for engineers in construction organizations. In Proceedings for the 25th Annual ARCOM Conference (pp. 145-153).

Vermunt, J. D. (1998). The regulation of constructive learning processes. *British journal of educational psychology*, *68*(2), 149-171.

Walker, S. L., & Fraser, B. J. (2005). Development and validation of an instrument for assessing distance education learning environments in higher education: The Distance Education Learning Environments Survey (DELES). *Learning Environments Research*, *8*(3), 289-308.

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1990). What influences learning? A content analysis of review literature. *The Journal of Educational Research*, *84*(1), 30-43.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological review*, *66*(5), 297.

Wolf, K., Whinery, B., & Hagerty, P. (1995). Teaching portfolios and portfolio conversations for teacher educators and teachers. *Action in teacher education*, *17*(1), 30-39.

Zemke, R., & Kramlinger, T. (1991). De critical incidents methode [The critical-incidents technique]. *Opleiders in Organisaties/Capita Selecta*, *8*, 69-80.

Basic needs satisfaction in a military learning environment: An exploratory study

Anouk Lepinoy[a]* and Salvatore Lo Bue[a]

[a] *Behavioral Sciences Department, Royal Military Academy, Brussels, Belgium.*

*Avenue de la Renaissance 30, 1000 Brussels, E-Mail : anouk.lepinoy@mil.be, Tel : +32497301739

Basic needs satisfaction in a military learning environment: An exploratory study

Military academies request initiatives for better pedagogy to keep their cadets motivated and successful. Identifying the facilitating and inhibiting events that foster motivation is useful to optimize the learning environment and educational practices in military academies. Following the self-determination theory, one could promote autonomous motivation by fulfilling the three basic psychological needs of students: the need for autonomy, relatedness and competence. In this qualitative research, we investigated which motivational critical events go together with a perception of high or low autonomy, relatedness and competence. To this end, we organized four focus groups with participants from the two faculties of the Royal Military Academy of Belgium (RMA): Social and Military Sciences (SMS) and Engineering (ENG). Using the critical incident method, we searched for the facilitating and inhibiting events with regard to motivation within the learning environment. Thereafter, we used the constant comparison method as an analysis technique to link the critical events to one of the three basic needs. A perception of high relatedness was the most effective in motivating SMS cadets, while the perception of high competence was the most effective in motivating ENG cadets. For both the SMS and ENG cadets, a lack of autonomy was demotivating. We discuss the results in the context of the basic needs theory.

Keywords: motivation, basic needs, learning environment, military academies

Public significance statement: The present study suggests a mediating role of basic needs satisfaction between the learning environment and students' motivation. On that premise, determining events that facilitate and inhibit motivation in the learning environment can help to optimize educational practices to set up interventions.

A military academy is an atypical higher-education environment. Although military academies all over the world take different names (academy, college, university), all of them pursue the same mission: developing effective and competent military officers. Military academies aim to provide men and women capable of leading military units in

a variety of complex and exceptional circumstances for the benefit of the national and the international community. To this end, the academies tailor the curriculum to the needs of the armed forces, to the values of the nation and those of the armed forces. The education of officers takes place in a military environment and generally builds on the development of several sets of competences: academic, military, athletic, and character (leader personality development). To succeed in the education program and become an officer, cadets are graded on all of these aspects and must succeed in all of them.

Education in a military academy is socially, physically and psychological demanding (e.g. Holtom, Smith, Lindsay, & Burton, 2014; Kelly, Bartone, & Matthews, 2014; Maddi, Matthews, Kelly, Villarreal, & White, 2012). New cadets face the same challenges and obstacles as other higher-education students, but they must also adapt to military life (Kelly et al., 2014). Cadets must perform to a high academic standard (Buch, Säfvenbom, & Boe, 2015; Kelly et al., 2014) and at the same time, distribute judiciously their time and efforts between the academic education, the military and physical training and the character development. Consequently, succeeding in a military academy requires high levels of motivation (Buch et al., 2015). Hence, military academies have every interest in caring for the cadets' motivation to optimize the education output – academic achievement, military mastery, athletic performance and leadership development – and minimize dropouts.

Arnold (2014) states that motivation is the link between what drives people to do something, how much effort they put into doing something and how long they continue to do it. Scholars consider motivation in various ways: as a cause (e.g. Fazel & Ahmadi, 2011; Hauser, 2014; Venkatesan, Varghese, & Ananthanarayanan, 2009), as a result (Hardré, Crowson, Debacker, & White, 2007; Jaakkola, 2004; Neumeister, & Finch, 2006) or as a mediating variable between causes and results (Fernandez, 2008; Saltson

& Nsiah, 2015; Syafii, Thoyib, & Nimran, 2015). In the educational context, motivation can be the cause of student success or the outcome of the educational conditions (Ryan & Patrick, 2001). In this study, we consider motivation as a result of the match between personal needs and the learning environment.

In 1985, Deci and Ryan contributed to the field of motivation theory by making a distinction between two types of motivation regulation, i.e. controlled motivation and autonomous motivation. Controlled motivation is determined on the one hand by external factors (for example, to avoid punishment or to receive a reward) and on the other hand by internal pressure (for example, to avoid guilt, shame or fear or to strengthen ego). Autonomous motivation can exist when there is a personal purpose (for example, one identifies himself with the value, the personal importance of a given behavior), when the behavior is in line with the personal values (for example, the behavior is part of who one is) or when the person does something because he/she likes to do it.

Basic human needs satisfaction has an influence on the motivation regulation type. The basic needs theory (Ryan, 1995) proposes three fundamental human needs: the need for autonomy, the need for relatedness and the need for competence. When all three needs are met, they ensure optimal functioning of individuals in different areas of life (Niemiec & Ryan, 2009; Reeve, 2005; Van den Broeck, Ferris, Chang, & Rosen, 2016).

Autonomy stands for the need of an individual to make his/her own choices. This concerns a subjective experience of psychological freedom and choice. This implies that people can also experience a sense of autonomy when they fulfill a request because they link it to their own signification (Soenens et al., 2007). Relatedness is the

need to connect to others and to belong to a community, as well as to feel that significant others care about you. Baumeister & Leary (1995) define the need for relatedness as the desire to build positive relationships with others, to be loved and cared for and to take care of others. Competence is the need to interact with the environment (Deci & Ryan, 2000; White, 1959). People tend to explore and manipulate the environment to participate in challenging tasks and expand their skills (Niemiec & Ryan, 2009). The sense of competence helps people to develop and increases their flexibility to adapt to changing environments. To stay motivated, you have to learn new things in a certain discipline to become competent.

In civilian higher-education settings, research shows that psychological needs satisfaction influences motivational regulations (Chen, 2014; Schneider & Kwan, 2013; Tessier, Sarrazin, & Ntoumanis, 2010) and academic achievements (Carreira, 2012; Dettweiler, Lauterbach, & Simon, 2017; Ng, Liu, & Wang, 2016). A lack of connection between the school and the personal needs and interests of students can lead to a motivation problem among students (Govaerts, Kyndt, Dochy, & Baert, 2011; Schuit, de Vrieze & Sleegers, 2011; Vansteenkiste, Sierens, Soenens & Lens, 2007). This could possibly lead to early school leaving, under-utilization of skills or non-acquisition of competences (e.g. Schuit et al., 2011; Vansteenkiste, Sierens, Soenens, & Lens, 2007). Therefore, we posit that the learning environment plays a major role in the satisfaction of basic needs.

The learning environment is the social, psychological or psychosocial environment in which learning and teaching take place (Cleveland & Fisher, 2014). Moos (1974/2002) describes the learning environment more broadly as a psychosocial environment with three dimensions: the relationship dimension, the growth dimension and the change dimension. The relationship dimension defines the quality of personal

relationships – between student and teacher and between students – and concerns aspects such as personal engagement, cohesion, mutual support and cooperation between people in a social environment. The growth dimension includes the way in which the environment encourages personal development and the way tasks are oriented. The change dimension concerns the clarity of expectations and rules, differentiation between lessons, etc. Research shows that cohesion, task orientation, clear rules, satisfaction and support of the teacher relates positively to the motivation and performance of the students (e.g. Herrington, Reeves, & Oliver, 2014; Loyens & Gijbels, 2008, Walker & Fraser, 2005). The learning environment is one of the most important factors of learning that affects both motivation to learn and learning outcomes (Wang, Haertel, & Walberg, 1990). Motivation can also be the result of interactions with a certain context. According to Baeten,et al. (2010), stimulating factors can be determined based on the context in which the student learns, on the perceptions of the student and on the characteristics of the student himself. Context features include, for example, feedback, evaluation, teaching method, etc. The student's perception includes issues such as perceived workload and perceived clarity of objectives. The student's characteristics are, for example, age, gender, intelligence, motivation, etc.

An autonomy-supporting climate will favor the satisfaction of basic needs by encouraging the process of internalization and intrinsic motivation (Niemic & Ryan, 2009). In such a climate, teachers are more empathetic and try to recognize possible difficulties (Leroy, 2009). Students where teachers support autonomy show a high degree of self-determination (Deci, Nezlek, & Sheinman, 1981), better academic performance (Black & Deci, 2000; Deci & Ryan, 1985; Vallerand, 1997) a higher sense of skill (Deci, Schwartz, Sheinman, & Ryan, 1981) and a meaningful rationale (Chirkov & Ryan, 2001; Reeve, 2002). However, Nguyen states (2008) that the motivation of

students may change. This means that even students who do not want to learn can change their minds when they experience a stimulating environment that captures their attention.

In the civilian educational context, some studies have investigated the relationship between the learning environment and the satisfaction of basic needs. For instance, Grolnick and Ryan (1987) studied how fostering autonomy supports learning outcomes by creating a facilitating environment. Urdan & Schoenfelder (2006) studied the influence of classroom effects on motivation and competence beliefs. Niemic and Ryan (2009) studied autonomy, competence and relatedness in the classroom and their impact on motivation. Gibbons (2014) studied relatedness-supportive learning environment.

Despite the tough challenges cadets face in military academies and the interest of military academies to achieve the best possible education of future leaders, research on cadets' motivation regulation is scarce. Some studies have addressed Grit at the United States Military Academy of West Point (e.g. Buller, 2012; Kelly et al., 2014; Maddi et al,, 2012), academic self-efficacy at the Norwegian Military Academy (e.g. Boe, Säfvenbom, Johansen, & Buch, 2018; Buch et al. 2015; Fosse, Buch, Säfvenbom, & Martinussen, 2015), retention motivations of Reserve Officer Training Corps cadets at United States Military Academy,West Point (Ngaruiya, Velez, Clerkin, & Taylor, 2014), cadet motivation and learning at United States Military Academy, West Point (Nguyen, 2008). Surprisingly, nobody has looked yet into cadets' experiences and perceptions about their academies and in the potential link between motivation, basic needs satisfaction, and the learning environment. Hence, the central question of this study is: "In what way does the learning environment impact on cadets' 'motivation?" Cadets face various challenges that require high levels of motivation (academic,

military, physical, personal), therefore we focused on academic motivation in this study. We addressed our research question by dint of a qualitative approach based on focus groups of cadets of the Royal Military Academy of Belgium. In particular, we explored with them their subjective experiences and perception of facilitating and inhibiting events on motivation. Afterwards, we used the critical analysis technique (CIT; Flanagan, 1954) to relate these facilitating and inhibiting events to one of the three basic needs. Our aim was to develop a model of motivation in military academies, in order to foster research in this field and help policy making.

METHOD

We used the critical incident technique (CIT; Flanagan, 1954) to analyze in depth facilitating and inhibiting events that influence motivation within a military academic learning environment. CIT is a widely used method to map people's experiences in a systematic way (Flanagan, 1954). Questioned about everyday events, participants tell about their implicit knowledge, without falling into socially desirable or theoretically formed answers (Zemke & Kramlinger, 1991). Butterfield et al. (2009) see the specificity of the target group as a condition for applying the CIT. The CIT is used for example, to detect facilitating and obstructing factors, to collect functional or behavioral descriptions of events or problems, to highlight successes and failures, and finally to determine characteristics that are crucial for important aspects of an activity or an event (Flanagan, 1954). By discussing and organizing example situations with the participants, this method works towards a practical overview of all individual knowledge, resulting into new knowledge created through the interaction. This method allows researchers to formulate practical recommendations to the professional field.

Participants

At the time of the data collection, 422 cadets studied at the Royal Military Academy of Belgium. The cadets followed the social and military sciences curriculum (SMS) (n = 321) or the polytechnics one (ENG) (n = 101), were in the bachelor year (i.e. college) (n = 261) or in their master year (i.e. university) (n = 161), French speaking (n = 201) or Dutch speaking (n = 221) and male (n = 351) or female (n = 71). Among this population, 376 had participated in an earlier quantitative research on motivation. Out of those 376, we selected a simple random sample of 40 cadets with a digital random number generator. We organized four focus groups of ten students, with two people per year of study (5 promotions per faculty), per faculty (SMS and ENG) and per language (French speaking and Dutch speaking). This means one group contained people from different study years, but study at the same faculty and spoke the same language. The choice of this partition was two-fold. On the one hand, the academic curriculum and the learning environment are quite different in the two faculties and on the other hand, the language aspect is a special feature of the RMA.

Procedure

We invited participants to report behaviors or events that had a positive influence (facilitating) or a negative influence (inhibiting) on their academic motivation. The same researcher, fluent in both Dutch and French, led all the focus groups in both languages. The focus groups took place in the second semester of the academic year (February to June). Because of the heavy-loaded program of the students, the duration of the focus groups was limited to two hours. After a general introduction, the researcher addressed the two following central questions:

- Give an example of a behavior or an event that motivates you within academic

education (facilitating)?

- Give an example of a behavior or an event that demotivates you within academic education (inhibiting)?

We used the words “a behavior or an event” on purpose to avoid the possible negative and dramatic connotation of an incident.

The focus groups followed the CIT three phases (Dekker et al., 2000). In phase 1, each participant received a sheet of paper and a pen and wrote down an example of a behavior or event that had to do with the central questions. In phase 2, we asked the participants to read out one of their behaviors or events to the other participants in the focus group. We then asked the other participants if they had a related example and if they wanted to read it out. When there were no more related behaviors or events reported, we invited the participants to find an appropriate label to describe the behavior or event in one or two words. In phase 3, when participants had agreed on a common appropriate label, they classified the labels according to their effectiveness, i.e. the degree of success or influence in achieving motivation or demotivation respectively.

Analysis

The focus groups were recorded and the researcher completely typed out the recordings. The nature of our approach involved mentioning persons (e.g. teachers, military staff, cadets), so while typing out the conversations, we preserved the anonymity of the mentioned personnel as much as possible. We only mentioned departments when this was necessary to describe and understand the situation. When writing out the content of the focus groups, we omitted all hesitations and repetitions within a sentence to facilitate readability.

Central in a qualitative research analysis is the systematic interpretation of the studied phenomenon. We have chosen to use the constant comparison method (Glaser, 1965). Four assessors analyzed independently how quotes could be linked to a basic need from the basic needs theory (Ryan, 1995). This multi-assessors approach aimed at limiting subjectivity biases (Plochg & Van Zwieten, 2007). We chose one Dutch Msc Psychology and one Dutch MSc Pedagogical Sciences and two French Msc Psychology working at the military academy because of their insight into the psychological and pedagogical concepts and because they all had a good knowledge about the functioning at the military academy. To ensure that each assessor gave the same meaning to the basic needs, we provided an instruction sheet with additional information about the basic needs and used method. After the independent analyses, the researcher searched similarities of categorization between herself and the two different assessors. As three assessors, the researcher herself and two other assessors, were involved according to the language, we calculated the kappa statistics (Arora, Johnson, Lovinger, Humphrey, & Meltzer, 2005). In our study, the kappa score was between 0.32 and 0.65, which means that the inter-rater reliability was moderate to good (according to the criteria in Sim & Wright, 2005). Therefore, we used the basic need most frequently linked as categorization of labels. To produce our model we linked the common language labels to scholar terms, which the researchers found by literature research.

RESULTS

In this section, we present the results separately according to the faculty. Although they may refer to similar concepts, labels may differ between SMS and ENG, because participants produced them in separate focus groups. We propose a scholar term referring to the label into brackets. We report first the behavior and events having a positive influence on academic motivation (in order of decreasing effectiveness to

achieve motivation) and then behaviors and events having a negative influence on academic motivation (in order of decreasing effectiveness to achieve demotivation). The Supplemental Material (table 1, table 2, table 3 and table 4) provides an organized view of labels, associated basic psychological need and examples of illustrative quotes. Finally, we modeled the relationships between variables out of the learning environment, basic psychological needs and motivation.

Social and Military Sciences students

SMS students produced six labels for behavior and events that have a positive influence on the academic motivation. We found *the teacher's interest in their students* [teacher engagement] as most effective in achieving motivation. In addition, the existence of *didactic material* (handbooks, key questions and key solutions, etc.) [instrumental support], *a feeling of shame* [threat to the ego] when performing poorly and *cohesion* [social support] among students are effective in achieving motivation. The assessors linked the basic need relatedness as categorization for these four labels. Subsequently, we found *link with the job* [job match], i.e. the match between the content of the courses and their future job and the *evaluation* [assessment] effective in achieving motivation. The assessors linked the basic need competence as categorization of those two labels.

The SMS participants applied seven labels for events that have a negative influence on the academic motivation. The *military staff* [supervisor], who is responsible for the military training and character development of the cadets, is most effective in installing demotivation for the academic education, because the cadets sometimes feel treated like children, followed by *a lack of autonomy* [lack of agency] and *lack of physical fitness* [lack of physical fitness]. These three labels were associated with the need of autonomy. *Courses* [course content] that do not increase their sense of

competence, *evaluation* of academic performances [assessment] and *poor pedagogy* [poor teaching competence] are also effective in achieving demotivation. The assessors linked the basic need competence as categorization of those three labels. Subsequently, we found that *courses* with insufficient didactic material [poor teacher engagement], *poor pedagogy* [poor teacher engagement] and a feeling of *injustice* [incongruence] have a negative influence on the academic motivation. The assessors linked the basic need relatedness as categorization to those three labels.

Engineering students

The focus groups among ENG students produced eight labels for events that have a positive influence on the academic motivation. First, *assurance future*, which means an individual's subjective perception of his or her capacity to perform in a given setting or to attain desired results [academic self-efficacy], is most effective in achieving motivation. Followed by the *practical aspects of their education* [action learning], courses with a *link with the future job* or content [job match], the *evaluation* of academic performances [assessment], which responds to their need of competence. *Cohesion* [social support], availability of *academic material* [instrumental support], the *pedagogy as teaching style* [poor teacher engagement] and the *feeling of pride* [reinforcement of the ego] have a positive influence on the academic motivation. The assessors linked the basic need relatedness as categorization of those four labels.

Eight labels applied for events that have a negative impact on the academic motivation, with regard to the ENG students. First, we found a *lack of or poor communication* [poor information support] that is associated with their need of relatedness, followed by *poorly performing teachers* [poor teaching competences], *insufficient academic material* [poor instrumental support] and the impact of the

military staff [supervisor] on the academic education. Bad or *poor academic planning* [poor information support] that limit their academic performance is also most effective to install demotivation and is associated with a lack of autonomy, as well a *lack of free time* [lack of agency] and the limitations installed by a recent change in the ENG *curriculum* [lack of agency]. Incorrect *evaluations* or incoherence between their input and output [assessment] that do not reflect their competence is associated with their need of competence.

[INSERT FIG.1 ABOUT HERE]

DISCUSSION

This study focused on the critical events that increase or decrease the motivation of cadets in a military academy. In our sample from the RMA, we found that SMS cadets are motivated in the first place by a perception of high relatedness and secondly by a perception of high competence. We found the opposite among ENG cadets (first, high competence; secondly, high relatedness). Strikingly, cadets of both faculties do not indicate motivating critical events with regard to autonomy. For cadets of both faculties, a perception of low relatedness is demotivating. For SMS cadets this is secondly followed by a perception of low competence and thirdly by a perception of low autonomy. For ENG cadets we found the opposite, in the 2nd place by a perception of low autonomy and in 3rd place by a perception of low competence. In the following section, we discuss the findings related to each basic need.

Autonomy

In our sample, assessment is associated indirectly to autonomy. Good grades lead to rewards (e.g. free study, have dinner outside the military academy, practicing more sport, etc.). Too often teachers use external controls, close supervision and evaluations,

which go along with a reward, a punishment or a negative reinforcement to ensure learning takes place. Such practices install external pressure on students instead of facilitating student's inherent interest in learning (Niemiec & Ryan, 2009). The idea is that positive feedback (reward) increases intrinsic motivation and negative feedback reduces intrinsic motivation. By using rewards, students are more motivated to complete their education (Holter & Bruinsma, 2010).

According to the cadets in our sample, there is an inconsistent relationship between academic aptitudes on the one hand, and military aptitudes and personality development on the other hand (by example weak academic result lead to less sport opportunities), which can lead to a feeling of incongruence (i.e. one's subjective evaluation of a situation is at odds with reality). Additionally, the cadets have the perception that the academic aptitudes get the upper hand on the military aptitudes and the personal development. Students are motivated to perform well when they believe their teachers care for their personal needs, as well as academic needs (Nguyen, 2008).

A lack of feeling of agency follows a schedule imposed by the military staff who does not consider their academic agenda or does not communicate in advance. Cadets indicate that the military calendar gets priority on the academic calendar. This makes it difficult for cadets to plan their study time and has a negative impact on their leisure time. It is also important that cadets know what the school is aiming for, what they should be able to know after the semester or year and so they can tailor their learning activities accordingly. When activities are communicated in advance, the student can be the owner of his or her agenda, so that he/she can choose when he/she plans their study time, but also their leisure time.

Relatedness

A perception of high relatedness is motivating the cadets. The availability of didactic material plays the most important role here. It is a cue for the cadets that the teacher is interested in his/her students and that he/she guide them in acquiring knowledge. It reflects teacher engagement (Federici, & Skaalvik, 2014). Cadets consider the absence of appropriate didactic material as demotivating. The cadet does not feel appreciated in that case. Previous research has shown that a good relationship with the teacher and instrumental support contribute to a higher sense of well-being (Suldo et al., 2009), intrinsic motivation (Deci & Ryan, 2000) and help seeking behavior (Federici & Skaalvik, 2014). We can call this academic integration. Academic integration means that a student can participate in a broad sense in the learning environment and feels connected to the curriculum and the institution (Education Council, 2008). Davidson, Beck, & Milligan (2009) translate this into the belief that teachers are concerned about the intellectual growth of their students at school, that students can participate in discussions during the lecture and that there is a relationship between the curriculum and the future. According to Kember (1989), academic integration also exerts an influence on the intrinsic motivation of students. When students feel that the teacher believes in them and is concerned about their results, they gain more confidence and become more motivated (Thomas, 2002).

The recognition of the high academic level of studies by the teachers inside and outside the academy gives the cadets the impression that the teacher is involved with his cadets. We consider this as another signal of teacher engagement. It is remarkable that cadets and the assessors associated this aspect with relatedness and not with competence, probably because it relates more to the relationship dimension then to the growth dimension (Moos, 1974/2002). In the civilian educational context, this

perception of high relatedness is associated with a feeling that the teacher likes, values, respects the student, and leads consequently to a higher intrinsic motivation (Niemiec & Ryan, 2009). Students are motivated to learn and perform well in the academy when they feel a sense of relatedness (Ryan & Patrick, 2001).

The fact that cadets feel they belong to their group (social support) also contributes to relatedness and to the motivation of the cadet. Research shows that students with low social integration drop out more often due to a lack of interactions and because they do not feel at home (Spady, 1971; Tinto, 1975).

Poor information support leads to a perception of low relatedness. In our sample, too little, unrealistic or incorrect information is being shared and the cadets' wishes are not taken into account, for example in an exam planning. However, research shows that participation in decision-making contributes to a perception of higher relatedness (Deci & Ryan, 2000). By sharing information with their students, the teacher integrates the student within the academic framework.

Competence

Courses with professional relevance (i.e. job match) are very effective to foster motivation. Cadets want to learn those competences, as they will use them as future officers for example learn to negotiate. Cadets ask to organize the teaching in function of job match. This relates to the need for competence. A motivation problem can arise when there is a lack of agreement between the school and the individual interests of students (here the future position) (Nelis & van Sark, 2014).

Another aspect that contributes to the perceived competence is the evaluation aspect, which cadets see as a form of self-evaluation (i.e. assessment). Evaluation here

becomes a feedback for the cadet to adjust his behavior. Research shows that the quality of evaluation is predictive for study performance (Bruinsma, 2004). This leads to entrepreneurial skills among students such as autonomous and problem solving thinking. People want to be able to show their capacity to perform, which you can relate to academic self-efficacy.

Confronted with a teacher perceived as not being competent (i.e. poor teaching competences), for example because he/she is not enthusiastic to teach in his/her field, does not provide didactic resources or because he/she provides conflicting information, has a demotivating effect. Such negative perceptions can have a predictive value for the student's commitment (Lau & Roeser, 2002/2008).

Strengths and limitations

Although this research provides additional insight into the needs of cadets in military academies, it has also a number of strengths and limitations that are important to consider to improve future research.

In qualitative research, the researcher has a central role because he is at the same time an observation tool and an analysis tool in the light of the research question (Plochg & Van Zwieten, 2007). It is possible that the identity of the researcher when leading the focus groups had an impact on data collection because she was part of the teaching staff, so the cadets may have filtered the critical incidents they reported. It is also possible that the effect of the researcher's expectations plays a role in data collection (Clarke, Sproston, & Thomas, 2003). This effect occurs when the researcher influences the participants and the participants thereby deliver results that are in line with the research expectations. Body language, by example, affects this unconscious process. To remedy this shortcoming, we would recommend to let a researcher external

to the institution lead the focus groups. In the analysis of the focus groups' content, the reflexivity of the researcher was however mitigated by the use of different assessors.

We would like to emphasize the importance of qualitative research in the social sciences. Our literature review highlighted that research on cadets' motivation is scarce. The inductive approach we adopted helped us to shed light on this seldom studied phenomenon. Furthermore, qualitative approach gave a central place to the perception and experience of the participants. We are convinced that using focus group through a process of sharing and comparing information, resulted in in-depth insights on the relationships between the military learning environment variables, the satisfaction of basic needs, and motivation. Our study resulted in a model (Fig. 1) suggesting a mediating effect of basic needs satisfaction between the learning environment and motivation. Future quantitative research could explore those relationships further.

Recommendations

With this study, we aimed at exploring the relationships between learning environmental conditions and basic needs satisfaction. If a military academy wants to offer education that meets the needs of the students, it has to integrate in the first place more autonomy because we found cadets do not indicate motivating critical events with regard to autonomy". We must take into account the age phase of our target group, the young adult (between the ages of 17 and 25), wherein the most important lines are outlined for their future (Stas, Serrien & Van Menxel, 2008). During this period, freedom of choice and responsibilities are central (Arnett & Taber, 1994; D'Oosterlinck, Broekaert, & Vander Haeghen, 2006). High pedagogical control with the obliged study time is the most typical example that decrease the satisfaction of the need of autonomy of our participants. Every military academy wants autonomously

motivated students, but imposes restrictions on autonomy at the same time. However, several studies show that autonomous motivation contributes to greater relatedness and commitment at school (Skinner, Connell, & Wellborn, 1990), leads to better results (Miserandino, 1996), prevents school dropout (Vallerrand & Bissonnette, 1992), entails higher-quality learning behavior (Grolnick & Ryan, 1987) and more well-being (Sheldon & Kasser, 1995; Shelden & Kasser, 1998). Moreover, when improving autonomy at school, students also recognize and appreciate this greater level of autonomy in other people and probably they will give autonomy in their future role as chef, after all, they have seen a good example (Nelis & van Sark, 2016). It is striking that in this research the military staff reduces autonomy when academic results are failing the expectations. This leads to interference between academic education and military training and therefore between academic and military assessments. This is comparable to the situation of a child of divorced parents raised within two families, and punished for something he/she did in the one family by the other family. To change behavior, it would be better to install self-reflection upon errors, with the help of teacher's (negative or positive) feedback as a way to increase autonomy. We recommend decoupling the academic education from the military training, and their respective assessments, as well as to question autonomy-restricting measures. Revising this autonomy aspect requires confidence in the cadets. Nguyen (2008) stated in his review research that motivated students attend class or study without a need for external regulation like reward or punishments.

According to Sluijsmans, Dochy, & Moerkerke (1998) and Somervell (1993), the use of self, peer and team evaluation can remove the barrier between students and teachers. Integrating evaluation within a course increases the motivation of the student to learn (Tai, Ajjawi, Boud, Dawson, & Panadero, 2017). Developing the skill of

evaluating can form an additional objective within the course and can empower the student (Tai et al., 2017). Learning to evaluate does not refer to the result, but to the thinking process and the arguments that accompany it. Students learn to take responsibility for their learning process (Sitzmann & Ely, 2011). Generally, the teacher mainly evaluates and communicates the scores to the student. We could also focus on developing an assessment portfolio (Wolf, Whinery & Hagerty, 1995). An assessment portfolio is a document that reflects the professional growth and learning process of a student. The portfolio makes the competencies, knowledge, skills and attitudes of the student visible as a developing professional. When students perceive the method of evaluation as inappropriate, they are more likely to focus on what is strictly necessary. This translates into superficial learning (Lizzio, Wilson, & Simons, 2002). Therefore, Postiaux (2016) recommends a match between the objectives, the method and the evaluation. An objective evaluation must meet the following quality criteria: validity (the right evaluation for the right measurement), reliability (multiple assessors must obtain the same evaluation) and relevance (an evaluation must be consistent with the objectives of the course) (Postiaux, 2016).

Education organized according to the High Impact Learning that Lasts (HILL) model can better adapt education to the world of work (Dochy, Berghmans, Koenen, & Segers, 2015) and tackle the perception of low competence. Firstly, by using a problem situation, a project or a case study from the professional field; one can narrow the gap between an exercise in a course and the future position. Here we think of tests in laboratories, role-playing in the classroom, etc. Studies show that students have positive perceptions about solving relevant problems, which is more related to urgency, gap, problem and agency (De Corte 2000; Vermunt 1998) and this contributes to experiential learning (Boud, 1994). Secondly, action and knowledge sharing can also contribute to

job match because it confronts the student during the course with a problem he can also encounter in his professional life. One can provide an entire course such as with problem-based learning. Finally, adding an internship period would reduce the gap between academic education and their future position.

We suggest a continuous supervision at the request of the (starting) assistant and professor. Low relatedness can be tackled by collaboration, interaction and coaching through peer learning (training given by another assistant or teacher) and peer coaching (coaching given by another assistant or teacher) (Dochy et al. 2015).

CONCLUSION

Satisfying the basic psychological needs is the motor for developing autonomous motivation; frustrating the basic needs rather causes a controlled motivation or demotivation (Deci & Ryan, 2000). The present study sheds some theoretical light on the satisfaction of the three basic psychological needs and the variables out of the learning environment. Our model suggests a mediating role of basic needs satisfaction between the learning environment and students' motivation. On that premise, determining events that facilitate and inhibit motivation in the learning environment can help to optimize educational practices to set up interventions.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, [A.L.]. The data are not publicly available due to restrictions their containing information that could compromise the privacy of research participants.

REFERENCES

Arnett, J. J., & Taber, S. (1994). Adolescence terminable and interminable: When does adolescence end? *Journal of youth and adolescence*, *23*(5), 517-537.

Arnold, J. (2014). Psychologie van Arbeid en Organisatie. Pearson Education NL.

Arora, V., Johnson, J., Lovinger, D., Humphrey, H. J., & Meltzer, D. O. (2005). Communication failures in patient sign-out and suggestions for improvement: a critical incident analysis. BMJ Quality & Safety, 14(6), 401-407.

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review*, *5*(3), 243-260.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin*, *117*(3), 497.

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education*, *84*, 740-756.

Boe, O., Säfvenbom, R., Johansen, R. B., & Buch, R. (2018). The Relationships Between Self-Concept, Self-Efficacy, and Military Skills and Abilities.

Boud, D. (1994, May). Conceptualising learning from experience: Developing a model for facilitation. In *Proceedings of the 35th adult education research conference* (pp. 49-54).

Bruinsma, M. (2004). Motivation, cognitive processing and achievement in higher education. *Learning and instruction*, *14*(6), 549-568.

Buch, R., Säfvenbom, R., & Boe, O. (2015). The relationships between academic self-efficacy, intrinsic motivation, and perceived competence. Journal of Military Studies, 6(1), 19-35.

Buller, E. F. (2012). The relationship between grit and academic, military and physical performance at the United States Military Academy (Doctoral dissertation, University of Kansas).

Butterfield, L. D., Maglio, A. S. T., Borgen, W. A., & Amundson, N. E. (2009). Using the enhanced critical incident technique in counselling psychology research. *Canadian Journal of Counselling and Psychotherapy/Revue canadienne de counseling et de psychothérapie*, *43*(4).

Carreira, J. M. (2012). Motivational orienations and psychological needs in EFL learning among elementary school students in Japan. System, 40(2), 191-202.

Chen, W. (2014). Psychological needs satisfaction, motivational regulations and physical activity intention among elementary school students. *Educational Psychology*, *34*(4), 495-511.

Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and US adolescents: Common effects on well-being and academic motivation. Journal of cross-cultural psychology, 32(5), 618-635.

Clarke, P., Sproston, K., & Thomas, R. (2003). An investigation into expectation-led interviewer effects in health surveys. *Social Science & Medicine*, 56(10), 2221-2228.

Cleveland, B., & Fisher, K. (2014). The evaluation of physical learning environments: A critical review of the literature. *Learning Environments Research*, *17*(1), 1-28.

D'Oosterlinck, F., Broekaert, E., & Vander Haeghen, C. (2006). Probleemjongeren te vroeg het te-huis uit. *Tijdschr voor Orthop Kinderpsychiatrie, en Klin Kinderpsychologie*, *31*, 58-68.

Davidson, W. B., Beck, H. P., & Milligan, M. (2009). The college persistence questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development*, *50*(4), 373-390.

De Corte, E. (2000). Marrying theory building and the improvement of school practice: A permanent challenge for instructional psychology. *Learning and instruction*, *10*(3), 249-266.

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. Journal of research in personality, 19(2), 109-134.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11(4), 227-268. doi:10.1006/ceps.1999.1020

Deci, E.L., Nezlek, J., & Sheinman, L. (1981). Characteristics of the rewarder and intrinsic motivation of the rewardee. *Journal of Personality and Social Psychology, 40,* 1-10.

Deci, E.L., Schwartz, A.J., Sheinman, L., & Ryan, R.M. (1981). An instrument to assess adults' orientations toward control versus autonomy with children: Reflections on intrinsic motivation and perceived competence. *Journal of Educational Psychology, 73,* 642-650.

Dekker, H., van Ginkel, K., Nieveen, N., Keursten, P., Rondeel, M., & Wagenaar, S. (2000). Werken aan kennis. Methoden voor het creëren, delen en toepassen van kennis. Kessels & Smit, The Learning Company.

Dettweiler, U., Lauterbach, G., Becker, C., & Simon, P. (2017). A Bayesian mixed-methods analysis of basic psychological needs satisfaction through outdoor learning and its influence on motivational behavior in science class. Frontiers in psychology, 8, 2235.

Dochy, F., Berghmans, I., Koenen, A. & Segers, M. (2015). Bouwstenen voor High Impact Learning. Het leren van de toekomst in onderwijs en organisaties. Den Haag: Boom.

Education Council (2008). Royal Military Academy of Belgium. Brussels.

Fazel, I., & Ahmadi, A. (2011). On the relationship between writing proficiency and instrumental/integrative motivation among Iranian IELTS candidates. Theory and Practice in Language Studies, 1(7), 747-757.

Federici, R. A., & Skaalvik, E. M. (2014). Students' Perceptions of Emotional and Instrumental Teacher Support: Relations with Motivational and Emotional Responses. *International Education Studies*, *7*(1), 21-36.

Fernandez, K. G. (2008). Motivation as a mediating variable between parental support and anxiety.

Flanagan, J. C. (1954). The critical Incident Technique. *Psychological Bulletin,* vol 51, Juli 1954.

Fosse, T. H., Buch, R., Säfvenbom, R., & Martinussen, M. (2015). The impact of personality and self-efficacy on academic and military performance: The mediating role of self-efficacy. Journal of Military Studies, 6(1), 47-65.

Gibbons, S. L. (2014). Relatedness-supportive learning environment for girls in physical education. LEARNing Landscapes, 7(2), 139-150.

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. Social problems, 12(4), 436-445.

Govaerts, N., Kyndt, E., Dochy, F., & Baert, H. (2011). Influence of learning and working climate on the retention of talented employees. *Journal of workplace learning*.

Grolnick, W., & Ryan, R. (1987). Autonomy in children's learning: An experimental and individual differences investigation. *Journal of Personality and Social Psychology*, 52, 890-898.

Hardré, P. L., Crowson, H. M., Debacker, T. K., & White, D. (2007). Predicting the academic motivation of rural high school students. The Journal of Experimental Education, 75(4), 247-269.

Hauser, L. (2014). Work motivation in organizational behavior. *Economics, Management, and Financial Markets*, *9*(4), 239-246.

Herrington, J., Reeves, T. C., & Oliver, R. (2014). Authentic learning environments. In *Handbook of research on educational communications and technology* (pp. 401-412). Springer, New York, NY.

Holter, N., & Bruinsma, W. (2010). Wat werkt bij het voorkomen van voortijdig schoolverlaten?. *Nederlands Jeugd Instituut. Verkregen op*, *19*.

Holtom, B. C., Smith, D. R., Lindsay, D. R., & Burton, J. P. (2014). The relative strength of job attitudes and job embeddedness in predicting turnover in a US military academy. *Military Psychology*, *26*(5-6), 397-408.

Jaakkola, T. (2004). Changes in students' exercise motivation, goal orientation, and sport competence as a result of modifications in school physical education teaching practices

Kelly, D. R., Matthews, M. D., & Bartone, P. T. (2014). Grit and hardiness as predictors of performance among West Point cadets. Military Psychology, 26(4), 327-342.

Kember, D. (1989). A longitudinal-process model of drop-out from distance education. *The Journal of Higher Education*, *60*(3), 278-301.

Lau, S., & Roeser, R. W. (2002). Cognitive abilities and motivational processes in high school students' situational engagement and achievement in science. *Educational Assessment*, *8*(2), 139-162.

Lau, S., & Roeser, R. W. (2008). Cognitive abilities and motivational processes in science achievement and engagement: A person-centered analysis. *Learning and Individual Differences*, *18*(4), 497-504.

Leroy, N. (2009). *Impact du contexte scolaire sur la motivation et ses conséquences au plan des apprentissages* (Doctoral dissertation, Université Pierre Mendès-France-Grenoble II).

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher education*, *27*(1), 27-52.

Loyens, S. M., & Gijbels, D. (2008). Understanding the effects of constructivist learning environments: Introducing a multi-directional approach. *Instructional science*, *36*(5-6), 351-357.

Maddi, S. R., Matthews, M. D., Kelly, D. R., Villarreal, B., & White, M. (2012). The role of hardiness and grit in predicting performance and retention of USMA cadets. Military psychology, 24(1), 19-28.

Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children. *Journal of educational psychology*, *88*(2), 203.

Moos, R. H. (1974). *Evaluating treatment environments: A social ecological approach*. Wiley-Interscience.

Moos, R. H. (2002). 2001 Invited address: the mystery of human context and coping: an unraveling of clues. *American journal of community psychology*, 30(1), 67-88.

Nelis, H., & van Sark, Y. (2016). *Puberbrein binnenstebuiten: wat beweegt jongeren van 10 tot 25 jaar?* Kosmos.

Neumeister, K. L. S., & Finch, H. (2006). Perfectionism in high-ability students: Relational precursors and influences on achievement motivation. Gifted child quarterly, 50(3), 238-251.

Ng, B. L., Liu, W. C., & Wang, J. C. (2016). Student motivation and learning in mathematics and science: A cluster analysis. *International Journal of Science and Mathematics Education*, *14*(7), 1359-1376.

Ngaruiya, K. M., Velez, A. L. K., Clerkin, R. M., & Taylor, J. K. (2014). Public service motivation and institutional-occupational motivations among undergraduate students and ROTC cadets. Public Personnel Management, 43(4), 442-458.

Nguyen, C. (2008). Student motivation and learning. This paper was completed and submitted in partial fulfillment of the Master Teacher Program, a.

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. Theory and research in Education, 7(2), 133-144.

Plochg, T., & Van Zwieten, M. C. B. (2007). Kwalitatief onderzoek. *Handboek gezondheidszorgonderzoek*, 77-93.

Postiaux, N. (2017). Problèmes pédagogiques relatifs à l'enseignement supérieur. ULB, Brussel.

Reeve, J. (2002). Self-determination theory applied to educational settings.

Reeve, J. (2005). Understanding Motivation and Emotion, John Wiley & Sons. *Hoboken NJ*.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of personality*, *63*(3), 397-427.

Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, *38*(2), 437-460.

Saltson, E., & Nsiah, S. (2015). The mediating and moderating effects of motivation in the relationship between perceived organizational support and employee job performance. International Journal of Economics, Commerce and Management, 3(7), 654-667.

Schneider, M. L., & Kwan, B. M. (2013). Psychological need satisfaction, intrinsic motivation and affective response to exercise in adolescents. *Psychology of Sport and Exercise*, *14*(5), 776-785.

Schuit, H., de Vrieze, I., & Sleegers, P. (2011). Leerlingen motiveren: een onderzoek naar de rol van leraren (Vol. 27). Ruud de Moor Centrum/Open Universiteit.

Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of personality and social psychology*, *68*(3), 531.

Sheldon, K. & Kasser, T. (1998). Pursuing personal goals: Skills enable progress, but not all progress is beneficial. *Personality and Social Psychology Bulletin, 24*, 1319-1331.

Sim, J., & Wright, C. C. (2005). The kappa statistic in reliability studies: use, interpretation, and sample size requirements. *Physical therapy*, 85(3), 257-268.

Sitzmann, T. & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: what we know and where we need to go. *Psychological Bulletin, 137* (3), 421-422.

Skinner, E. A., Connell, J. P. & Wellborn, J. G., (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of educational psychology*, *82*(1), 22.

Sluijsmans, D., Dochy, F., & Moerkerke, G. (1998). Creating a learning environment by using self-, peer-and co-assessment. Learning environments research, 1(3), 293-319.

Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Beyers, W., & Ryan, R. M. (2007). Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental psychology*, *43*(3), 633.

Somervell, H. (1993). Issues in assessment, enterprise and higher education: the case for self-, peer and collaborative assessment. *Assessment and Evaluation in Higher Education*, 18, 221–233.

Spady, W. G. (1971). Dropouts from higher education: Toward an empirical model. *Interchange*, *2*(3), 38-62.

Stas, K., Serrien, L., & Van Menxel, G. (2008). Jongvolwassenen: tussen wal en schip. *Beleidsdossier, Berchem, Steunpunt Algemeen Welzijnswerk*.

Suldo, S. M., Friedrich, A. A., White, T., Farmer, J., Minch, D., & Michalowski, J. (2009). Teacher support and adolescents' subjective well-being: A mixed-methods investigation. *School psychology review*, *38*(1), 67.

Syafii, L. I., Thoyib, A., & Nimran, U. (2015). The role of corporate culture and employee motivation as a mediating variable of leadership style related with the employee performance (studies in Perum Perhutani). Procedia-Social and Behavioral Sciences, 211, 1142-1147.

Tai, J., Ajjawi, R., Boud, D., Dawson, P., & Panadero, E. (2017). Developing evaluative judgement: enabling students to make decisions about the quality of work. Higher Education, 1-15.

Tessier, D., Sarrazin, P., & Ntoumanis, N. (2010). The effect of an intervention to improve newly qualified teachers' interpersonal style, students motivation and psychological need satisfaction in sport-based physical education. Contemporary Educational Psychology, 35(4), 242-253.

Thomas, L. (2002). Student retention in higher education: the role of institutional habitus. *Journal of Education Policy, 17,* 423-442.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of educational research, 45*(1), 89-125.

Urdan, T., & Schoenfelder, E. (2006). Classroom effects on student motivation: Goal structures, social relationships, and competence beliefs. Journal of school psychology, 44(5), 331-349.

Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation ». In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (vol. 29, p. 271-360). New York : Academic Press.

Vallerand, R., & Bissonnette, R. (1992). *Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study*. Journal of Personality, 60, 599-620.

Van den Broeck, A., Ferris, D. L., Chang, C. H., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management, 42*(5), 1195-1229.

Vansteenkiste, M., Sierens, E., Soenens, B., & Lens, W. (2007). Willen, moeten en structuur in de klas: over het stimuleren van een optimaal leerproces. *Begeleid zelfstandig leren*, *16*(1), 37-57.

Venkatesan, R., Varghese, K., & Ananthanarayanan, K. (2009, September). Motivation and demotivation cause factors for engineers in construction organizations. In Proceedings for the 25th Annual ARCOM Conference (pp. 145-153).

Vermunt, J. D. (1998). The regulation of constructive learning processes. *British journal of educational psychology*, *68*(2), 149-171.

Walker, S. L., & Fraser, B. J. (2005). Development and validation of an instrument for assessing distance education learning environments in higher education: The Distance Education Learning Environments Survey (DELES). *Learning Environments Research*, *8*(3), 289-308.

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1990). What influences learning? A content analysis of review literature. *The Journal of Educational Research*, *84*(1), 30-43.

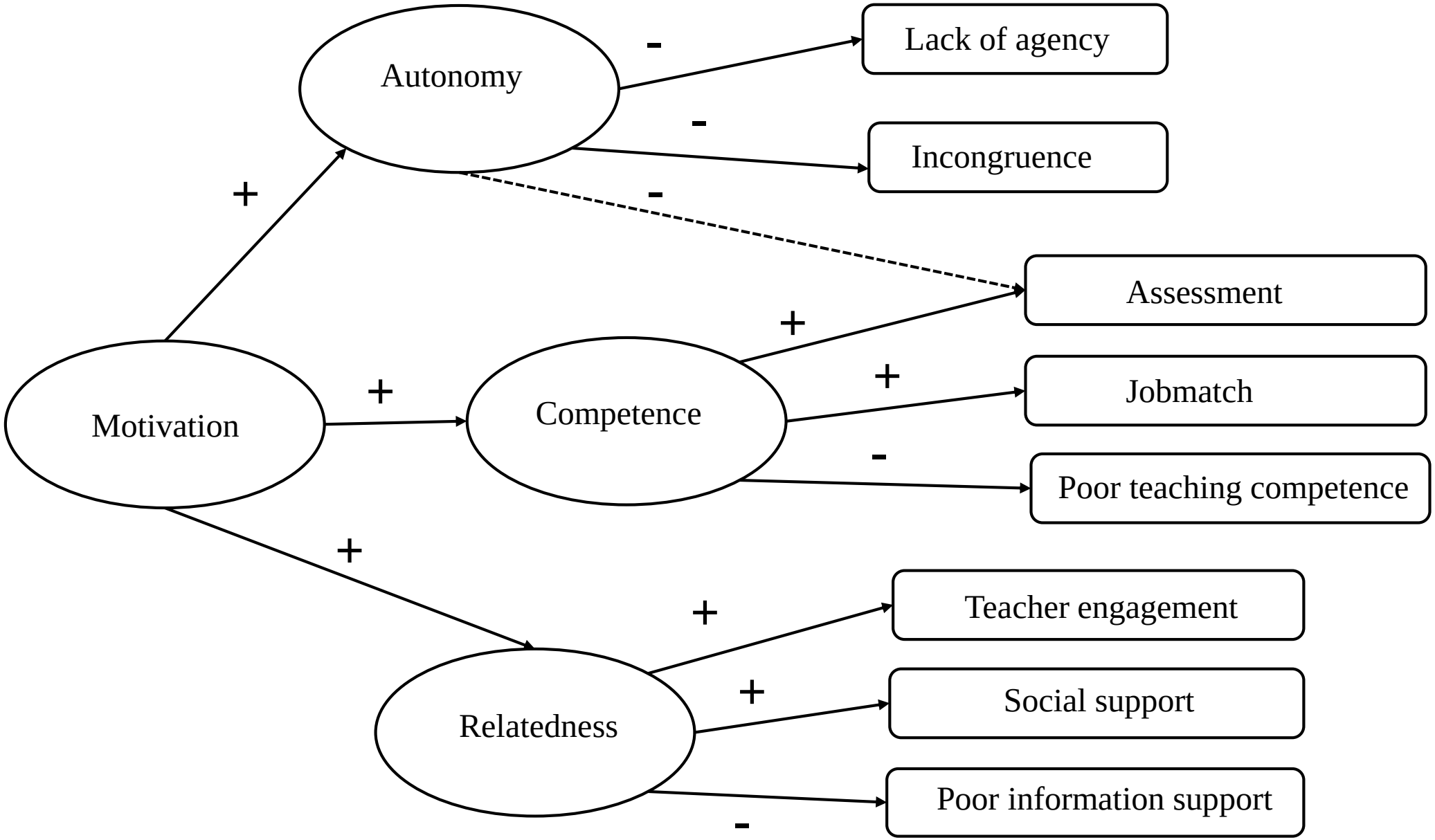
White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological review*, *66*(5), 297.

Wolf, K., Whinery, B., & Hagerty, P. (1995). Teaching portfolios and portfolio conversations for teacher educators and teachers. *Action in teacher education*, *17*(1), 30-39.

Zemke, R., & Kramlinger, T. (1991). De critical incidents methode [The critical-incidents technique]. *Opleiders in Organisaties/Capita Selecta*, *8*, 69-80.

Figure

MODEL Basic Needs


Autonomy
Lack of agency
Incongruence
Assessment
Motivation
Competence
Jobmatch
Poor teaching competence
Relatedness
Teacher engagement
Social support
Poor information support
+
-
+
-
-
+
+
-
+
+
+
-

Table

Label (n)	Need	Quote from a representative event
Student interests (4)	Relatedness	QSN10 *The fact that you have to write a paper for a course and more specifically that you experience that the teacher has read all sources and content. In that way it feels like not only the student spends extra time on his work, but also the teachers spend extra time to read your work. You notice this because the teacher provides additional articles and gives feedback. "I had the impression that the teacher had even spent more time than the students themselves".*
Didactic material (1)	Relatedness	QSN13 *As a student who takes part in the new introduced curriculum, I find it motivating when the professor gives us a typed course.*
Shame (4)	Relatedness	QSF12 *I have always studied better for an oral exam because I do not want to seem stupid. For a written exam, when I leave a blank paper, it is my own problem. I get my points in another course.*
Cohesion (2)	Relatedness	QSF17 *For me cohesion, settles rather after, for example a meal with the promotion; it is the integration into the promotion that motivates me.*
Link with the job (7)	Competence	QSN1 *As a candidate student pilot, when you see certain aspects that you need for your job or you get class by an assistant who was a pilot himself and who gives examples of how the lesson was actually applied during the job, that is motivating.*
Evaluation (13)	Competence	QSN4 *Your first exam session when it went well. Then I think: "I can handle this".*

Table 1: Label SMS participants, need and quote of representative event that had a positive influence on the academic motivation for SMS students. (n) = the number of quotes per label.

Label (n)	Need	Quote from a representative event

Military staff (12)	Autonomy	QSN16 *Stop treating students like children. Everyone has their own study method and it is not by giving mandatory study that you will achieve better marks, as if you do not have a bad study method when you have obtained bad points. They do not allow you to develop your own study method to achieve good marks.*
Lack of autonomy (8)	Autonomy	QSF28 *Group study is not productive. It depends of course on the person. Some people need to be forced, but at the same time, it penalizes many of the people who need a calm environment. When you arrive at 9 p.m. in your room, it does not mean the workday is over. It is possible we have to study until 9:30 p.m. or 10 p.m. At that moment I do not want to study anymore, I want to play sports.*
Lack of sport (1)	Autonomy	*QSF51 For me the academic education is linked to the physical training. Since two weeks, the sport infrastructure at the school is closed. Normally, I used to go after class, nowadays I do not go.*
Courses (11)	Competence	*QSF21 Classes are sometimes too easy. In advance, the teachers tell you that you do not need to study. This decreases interest in the course.*
	Relatedness	*QSN40 In the 1st Ba in the new curriculum, no professor had bothered to write a syllabus, while the students were immediately thrown into the new system.*
Evaluation (18)	Competence	QSN30 *Different courses use different score scales. For course X you were expected to develop your own theory to achieve more than 17/20. We cannot develop our own theory based on an*

		extensive literature study in little time. Too high targets are set here.
Pedagogy (10)	Relatedness	QSN46 *When it is clear that a course is not given correctly, the students do not have a channel to pass on this feedback. The year coordinators can play a more active role there. We do not have our year coordinator this semester and then it is more difficult to report this information. Some year coordinators do not take their assignment that seriously.*
	Competence	QSF46 *Small tests interrogations each time before class; we do not really see the use interest. It is just to keep us busy, to inflate the time we work.*
Injustice (6)	Relatedness	QSF36 The promotion staff makes a difference between the students on their academic marks. The promotion staff puts this student on a higher-level even though he is not good in other parts of the training. He is a null in sports; he is not interested in to cohesion. The military academy promotes the academic education.

Table 2: Label SMS participants, need and quote of representative event that had a negative influence on the academic motivation for SMS students. (n) = the number of quotes per label.

Label (n)	Need	Quote from a representative event
Assurance future (3)	Competence	QPN1 *When you arrive at the military academy, you do not know if you will be able to succeed. When you notice it works over the years, this is a motivation for me to continue.*
Practice (9)	Competence	QPF10 *In 2nd bachelor year, we have courses that are more practical. We have almost no contact*

		with the teacher or the assistant. We do the tests in the labs.
Link future job (9)	Competence	QPN9 *From the 3rd bachelor year you will receive courses that depend on the component that you have been assigned to. You want to score well in these courses, because they supply theory that you will need later in your job.*
Evaluation (4)	Competence	QPF22 *Me, when I fail a course that interests me, it does not demotivate me. It just means : "Get your act together and work more!"*
Promotion/group (7)	Relatedness	QPN34 *The fact that you work in small groups. I do not know if that has anything to do with it. This makes education more personal. I never felt like I was being treated like a child. Your relationship is more personal with the professor because the group has become smaller. The relationship is deeper.*
Academic material (1)	Relatedness	QPN37 *Physics is an example of how it should be done with regard to didactic material. The physics courses are the best in the military academy. Statistics has an English book and that is a good book. That course also fits very well with the lessons that are given.*
Teachers (6)	Relatedness	QPF17 A teacher who makes a positive remark to you. For example, at the start, we felt lost in the system and a positive remark gives energy.
Pride/respect (11)	Relatedness	QPN16 *There is such a thing as engineering pride among the professors. Each professor has been an engineer himself and tells you during the 1st class from which promotion he comes. You have the*

		feeling that the engineers are one big family, no matter which military grade you have.

Table 3: Label ENG participants, need and quote of representative event that had a positive influence on the academic motivation for Eng students. (n) = the number of quotes per label.

Label (n)	Need	Quote from a representative event
Communication (15)	Relatedness	QPN39 *We often feel that our concerns disappear somehow. Sometimes we write down our feedback that cause people to say, "that is a problem!" and you do not hear about it anymore. If you mention a problem on our annual reunion, they tell you: "this problem was also reported last year!" That must have been the same commentary for 10 years, the feedback gets stuck at a hierarchical level.*
	Autonomy	QPN43 *We have passed all professors, because half of them fail to communicate. As a 1st year student, you are not allowed to contact a professor directly. You must first pass by your promotion staff. If you do, they will punish you. I know a literal case of a student who received a punishment because a question went straight to the assistant. He had sent an email without putting the promotion commander in CC and had to stay a weekend at the military academy.*
Teachers (17)	Relatedness	QPN76 *Some professors are simply not interested whether you understand it or not. For example, at chair X when you ask the assistant or professor to make 1 extra exercise, we look for 3 hours to the assignment and he does not write anything down. Some professors are so stubborn. We asked for standard solutions. He gives us an exercise and when we cannot solve the assignment after 2 hours*

		he leaves. The next lesson he says if you want to go to your room, no problem.
	Competence	QPF65 *The level of computing may be too advanced. The teacher is too advanced. Suddenly, he assumes that we have already acquired these skills. Most of us have not worked with computers in that way.*
Academic material (10)	Relatedness	QPN64 *In my opinion sometimes the courses are not enough. You only get slides and if you miss a lesson, you cannot understand it on an individual basis. I had to look it up on YouTube to understand that subject.*
Military staff (9)	Relatedness	QPF40 *The military staff has a direct impact on the academic education. They can really demotivate and they do not care.*
Planning (25)	Autonomy	QPF25 *It shortens the exam period. Honestly, a 4-week exam period would be more serious and doable for taking the exams. Here it is different; you have one week of study and three weeks of exams. Now they are talking about shortening the exam period to three weeks in favor of the administration. Already, the last week we do nothing for school!*
Lack of free time (8)	Autonomy	QPF71 *We get up in the morning for the gathering, and then we have to go eat breakfast at the mess. After 10 minutes in the room, there is the flag greeting. At 7.45 am, you are in class. At noon there is the gathering again and we have to go eat at the mess. In the evening, we think we are cool but no, we have to do the obliged study.*

Curriculum (16)	Autonomy	QPN93 *I think that the left out of many subjects in the master years is very demotivating for the students who are in the new curriculum.* There is a large number of modules we cannot choose any longer. *There are people who have subscribed according to the old curriculum and thought to choose ballistics or mechanics, but cannot choose this anymore.*
Evaluation (11)	Competence	QPN83 *An incorrect assessment. You cannot argue with many teachers. If one cannot argue why you get that rating, it is demotivating. They do not bother to look at your reasoning when you have an erroneous outcome.*

Table 4: Label ENG participants, need and quote of representative event that had a negative influence on the academic motivation for Eng students. (n) = the number of quotes per label.