



Understanding the Relationships between Psychological and Contextual Determinants, Motivation and Achievement Outcomes for Students in Vocational Training or Technical Training Programs

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Abstract

In developed countries, obtaining a job qualification is a requirement for securing worthwhile employment. Given, it leads to better social and economic conditions during the entire working life. One relevant avenue to facilitate access to a job qualification, especially for students who have school concerns, is to encourage students to take non-university qualifying training programs like Vocational Training Programs (VT) and Technical training programs (TT). In Quebec (Canada), both of these apprenticeships are carried out in educational establishments; VT being taught in VT centers and TT in colleges (Doray et al. 2008; Fédération des Cégeps 2020). Currently, relatively few studies have examined the psychological and contextual factors that explain success and persistence through graduation. In response to this lack of data, two studies were conducted with students in VT (study 1) or TT (study 2) training. These studies intended to evaluate a theoretical model to explain students' school success and persistence in a training program. The proposed model includes two psychological factors (students' career certainty and future time perspective—FTP), two contextual factors (students' perceptions of a performance-oriented classroom climate and contextualized instruction) as well as motivation (expectancies of success and subjective task value) and school achievement outcomes (grades and persistence). To evaluate the proposed theoretical model, path analyses were performed on 356 VT students and 503 TT students, enrolled in an apprenticeship in Quebec, Canada. The results of these two studies provide recent data about the factors predicting achievement and persistence according to the type of school/program and about the effects of motivation on achievement indicators in these respective programs. Furthermore, these findings will have important implications to help counselors and educators better adapt VT and TT programs to students' needs.

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Introduction

In developed countries, obtaining a job qualification is a requirement. Given, it leads to better social and economic conditions during the entire working life. Unfortunately, in some Organization for Economic Co-operation and Development (OECD) countries, up to 30% of young people leave the school system as soon as they graduate from mandatory secondary school or even before (OECD 2015). Hence, these young adults enter the labor market without vocational qualification, and this leads to a number of problems, such as precarious work (Malenfant et al. 2006), lower wages (Malenfant et al. 2006; OECD 2018), an increased risk of work accidents during employment integration (Laberge et al. 2012), a higher risk of being unemployed (OECD 2018) and a higher risk of poor health (Cutler and Lleras-Muney 2012; OECD 2017; 2015), leading to significant social costs. To offer a qualification to young people who are not interested or who do not have the skills to pursue university studies, several industrialized countries offer qualifying programs. In Quebec, Canada, two types of qualifying programs are available: 1—Vocational training programs (VT), which include programs corresponding to International Standard Classification of Education (ISCED)¹ level 3²; and 2—Technical training programs (TT), which correspond to ISCED level 4³. In Quebec, these trainings are both offered in schools, either in VT centers or in colleges. Although these two types of training lead to a qualification likely to promote successful professional and social integration, they differ in the length and complexity of the training offered, as well as in their admission requirements. Prerequisites for VT programs are not as high as for TT programs because the training offered is entirely oriented towards learning the trade; while the core curriculum of TT programs also include more general post-secondary courses. As a result, in Quebec as in other OECD countries, vocational programs are “sometimes seen as less demanding options than higher status academic routes.” (Álvarez-Galvan et al. 2015, p. 18). For this purpose, VT programs typically attract a weaker clientele, including a significant proportion of students who had dropped out of the school system (Deschenaux 2007; Hamelin 2014; Mazalon and Bourdon 2015). Paradoxically, the success rates of VT programs are higher, with about 88% of full-time students successfully completing them, compared

¹ In the International Standard Classification of Education (ISCED) of UNESCO, an education program is defined as « a coherent set or sequence of educational activities or communication designed and organized to achieve pre-determined learning objectives or accomplish a specific set of educational tasks over a sustained period. Objectives encompass improving knowledge, skills and competencies within any personal, civic, social and/or employment-related context. Learning objectives are typically linked to the purpose of preparing for more advanced studies and/or for an occupation, trade, or class of occupations or trades but may be related to personal development or leisure. A common characteristic of an education program is that, upon fulfilment of learning objectives or educational tasks, successful completion is certified. » (UNESCO 2012, p.8).

² “Training programs in level 3 are conceived to prepare for higher education, and / or to teach skills relevant to employment” (e.g.: Plumbing’s program; UNESCO 2013, p. 39).

³ “Training programs in level 4 are generally designed to provide individuals who have completed ISCED level 3 certifications required to access higher education or employment when their ISCED level 3 certification does not give them this access” (e.g.: Nursing’s program; UNESCO 2013, p.44).

to 61% for those pursuing a TT program (Ministry of Education and Higher Education 2014). Relatively few studies have examined the psychological and contextual factors that motivate students to pursue these programs to identify the various factors that explain success and persistence through graduation. In response to this lack of data, two studies were conducted with students in VT (study 1) or TT (study 2) training.

Theoretical Background

Among contemporary motivational theories, expectancy-value models (EVM), such as the one popularized by Eccles and Wigfield (2002), are widely used. The validity of EVM was recently demonstrated in a study conducted in Quebec in the context of VT. Indeed, Dubeau et al. (2017), showed that students with positive school achievement outcomes (i.e., grades and persistence) are more motivated than those who don't.

The EVM propose a two-dimensional conception of motivation: expectancy of success and task-value (see fig. 1). Expectancy of success refers to an individual's perceptions of its own ability to succeed in, for example, a school subject or task (Wigfield et al. 2009). Task-value, which corresponds to a student's subjective assessment of how a school task meets its own needs and goals, includes four dimensions: the intrinsic value for a subject, the attainment value which corresponds to the importance of performing well in the proposed activities, the utility value of the proposed school tasks, and the cost associated with performing a task (Eccles et al. 1983; Eccles and Wigfield 2002; Jacobs and Eccles 2000). While expectancies of success significantly predict students' achievement (e.g., Plante et al. 2012), the value of the task is a central predictor of the choice to engage in a school task (e.g., Neuville 2004). Thus, these two components of motivation have distinct and complementary roles, underscoring the importance of considering both expectancies of success and the perceived value of the task in understanding students' school motivation. The interest of EVM (Eccles and Wigfield 2002) further lies in the fact that they propose that motivation is not "static", but modulated by the different psychological and contextual factors that determine it (e.g., Bourgeois 2009; Eccles and Wigfield 2002; Lazowski and Hulleman 2016). In return, school motivation influences achievement outcomes through expectancies of success and task value (Dubeau et al. 2017; Jacobs and Eccles 2000; see Fig. 1).

Although not well documented in the context of qualifying programs, like VT and TT programs, several psychological and contextual factors underlying students' motivation have been studied at various levels of instruction (e.g., Dubeau et al. 2017; Jacobs and Eccles 2000; Marsh et al. 2015; Plante et al. 2012; Wigfield and Cambria 2010). Of these factors, four determinants seem particularly relevant in the context of qualifying programs. Thus, two psychological determinants were targeted for this study: students' career certainty and students' FTP as well as two contextual determinants: students' perceptions of a performance-oriented classroom climate and students' perceptions of a contextualized instruction.

Psychological Determinants

Students' career certainty with the multitude of training programs and career choices available to young people today, some students may be ambivalent about so many

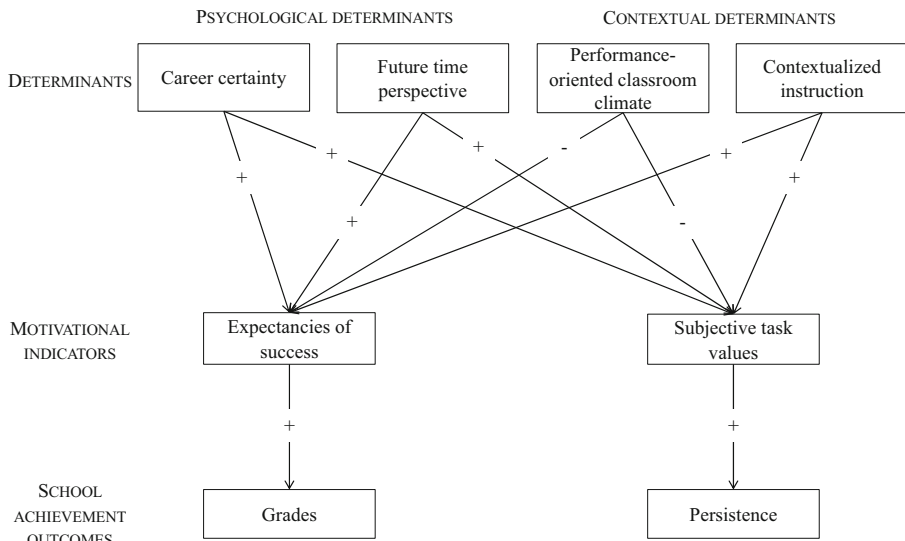


Fig. 1 Theoretical model evaluated

career opportunities, while others approach their training with little doubt about their career choice (Schald et al. 2017). In addition, the certainty of the students' professional project plays an important role in the students' motivation in their training (Germeijs and Verschueren 2007). Indeed, students with a clear project have higher expectancies of success and value the proposed task during their training (Nakajima et al. 2012).

Students' future time perspective (FTP) refers to "the degree and the way in which the future is anticipated and integrated in the psychological present of an individual (Lewin 1942). Based on past and present experiences, people translate or concretize their originally vague and general cravings into more or less specific motivational goals, means-end structures, behavioral plans, and projects" (Lens et al. 2012). This global and theoretical conceptualization of FTP represents the overall person's relationship to time and affects students' expectancies of success and the value they place on the proposed school tasks (Aboussalam 2005; Hilpert et al. 2014; Lens et al. 2012). Hence, students with more positive FTP have higher expectancies of success and value the proposed task than students with negative FTP (Husman and Lens 1999; Husman et al. 2014; Seginer 2009).

Contextual Determinants

Students' perceptions of a performance-oriented classroom climate refer to the perception of a training context that encourages peer comparison and values increased school performance rather than self-improvement and in-depth learning. Research has shown that such perceptions undermine expectancies of success and the value attributed to learning, which typically leads to student disengagement from training (see, for example, Meece 1991; Meece et al. 2006; Urdan 2010). Since VT and TT programs can lead the students to focus on performance because of the applied context (e.g., becoming an electrician or a nurse), it's important to verify the students' perceptions of a performance-oriented classroom climate and its link to their motivation.

Students' perceptions of a contextualized instruction refers as a “diverse family of instructional strategies designed to more seamlessly link the learning of foundational skills and academic or occupational content by focusing teaching and learning squarely on concrete applications in a specific context that is of interest to the student” (Mazzeo 2008, p. 3; see also Medrich et al. 2003). Previous research has shown that a high perception of the contextualization of school activities contributes to increased student motivation, through their expectancies of success and the perceived value of the task (Husman and Lens 1999; Bédard et al. 2012); Godes 2008; Acee and Weinstein 2010).

The Present Studies

Overall, two studies were conducted to evaluate the hypotheses that the psychological determinants (students' career certainty and student's FTP) and the contextual determinants (students' perceptions of a performance-oriented classroom climate and contextualized instruction) predict students' school motivation, modulating their expectancies of success and the value they place on learning tasks, respectively for students in a VT (study 1) or a TT (study 2) program. In turn, these motivational variables were hypothesized to influence the targeted success indicators. More specifically, it was expected that high expectancies of success would be particularly associated with high school performance, while the perceived value of the task would play an important role in choosing to persevere rather than giving up their VT and TT training. Thus, psychological and contextual determinants would indirectly predict success and retention through motivational variables, which would act as mediating variables in the relationship between psychological or contextual determinants and targeted school indicators. These assumptions are illustrated in Fig. 1.

Since VT and TT contexts are different, in particular because of the profile of the students who attend them and the success rates in these programs, it is necessary to examine whether the relationships postulated are the same for these two audiences to explain students' school success and persistence in each specific context. In view of their respective success rates, it is expected that the results vary from one training context to another.

Study 1

The objective of Study 1 was to test the validity of the proposed theoretical model with students involved in a High School Vocational Training program (VT) to explain students' school success and persistence in the program until graduation.

Methodology

Participants

The sample of Study 1 consisted of 356 French-speaking students (18% women; 82% men) aged 17 to 56 (M : 24.94; SD : 8.25) registered in a two-year VT program. While parity between the number of men and women is generally observed in VT programs

(Databank of Official Statistics on Quebec 2020), significant disparities are noted according to the programs explaining the gender distribution in this study. All students were enrolled in a professional training center, serving for the most part students from multiple rural and suburban cities around Montréal (Canada).

Procedure and Measures

Prior to the data collection, an ethics certificate and the necessary authorizations were obtained. Students who took part in the study answered an online questionnaire in class, assessing the selected psychological and contextual variables, as well as their motivation regarding their program. The principal investigator met with all groups of students in the school's computer laboratory where participants were informed of the objectives and methods of the research as well as their rights before data collection. After receiving information about the study and fulfilling the consent form to participate in the study (students over the age of 16 were able to consent to participate in the study), students individually completed the online questionnaire, which lasted a maximum of 20 min. When needed, the principal investigator answered the students' questions to ensure the smooth progress of data collection. For each item on the scales included in the questionnaire, participants indicated their response on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Students' Career Certainty This scale, initially developed by Schmitz (2009), included 3 items assessing the student's conviction about their chosen qualifying program ($\alpha = .83$). The scale included items such as "I definitely chose my future job."

Students' FTP The notion of FTP was measured using scale previously validated with French-speaking Canadians (Dubeau et al. 2015). This 12-item scale, adapted from Husman and Shell's work (Husman and Shell 2008), assesses students' perceptions of the future ($\alpha = .82$). An example of item is "It is important to have goals for where one wants to be in five or ten years." When scoring the measure, researchers like Carstensen and Lang (1996) and Peetsma (2000) calculate the participant's mean scores of the components. The combination of the four dimensions of the FTP (extension, speed, connectedness, and value; Husman and Shell 2008) allows to evaluate the overall person's relationship to time. A low score indicates a negative future time perspective, while a high score represents a positive future time perspective.

Students' Perceptions of a Performance-Oriented Classroom Climate This scale developed by Galand and Frenay (2005) consists of 3 items ($\alpha = .66$) that evaluate the students' perceptions of a training context that encourages peer comparison and values increased school performance rather than self-improvement and in-depth learning. This scale includes items such as "Teachers favor students who perform well the most."

Contextualized Instruction A five-item scale was used ($\alpha = .87$) to assess students' perceptions of teachers' strategies for highlighting the context of knowledge mobilization (Ibid.). An example of an item on this scale is "Teachers present us with a wide variety of practical applications of the subject."

Motivation Students' achievement motivation was derived from two scales evaluating respectively their self-efficacy beliefs and task values. These two scales were originally developed by Eccles and Wigfield (1995). The French versions of these scales were validated among French-speaking students by Dubeau et al. (2017). The measure of self-efficacy included 6 items ($\alpha = .84$) assessing the extent to which the students feel capable of successfully completing the various tasks and courses of the study program. This scale includes items such as "I think I will be able to cope with the demands of my study program." The task values scale comprised 8 items ($\alpha = .72$) each reflecting to either one of its four dimensions: importance, interest, cost, and perceived utility value of the training program. An example of item is: "I attach importance to doing well this year."

School Achievement Outcomes The participating schools provided us with students' school records to obtain a measure of their achievement in their training program. For students enrolled in a VT program, a binary system is used in which a pass/fail grade is given based on a final exam for each course of the program. Although the exams are not identical from one school to another, training programs guide the development of the exams and assignments which contribute to the academic achievement. Moreover, students who fail the exam have the possibility of retaking once or more times until they successfully achieve the test. Based on prior work conducted with a similar population of students (Ibid.), students' school performance was measured using a score reflecting the average number of attempts before successfully achieving each course. Thus, students who obtained a value of "1" passed their final exam on their first attempt. The closer the value was to zero, the more times the student had to retake the exam before achievement their course.

Persistence in the Program Based on students' school records, persistence in the program was measured by verifying whether they had withdrawn from their training program (coded as a score of 0) or were still enrolled in their program six months later (coded as a score of 1).

Analyses

Path analyses were performed using Amos software version 20.0 (Arbuckle 2011). The maximum likelihood estimation method was used and all analyses were based on the variance-covariance matrix to test whether the proposed theoretical model adequately fits the data. As suggested by experts in this type of analysis, the validity of the proposed model was examined using several indices. Thus, the Chi-square test (χ^2), the number of degrees of freedom (df), the Chi-square ratio and its number of degrees of freedom (χ^2/df), the Normed Fit Index (NFI; Bentler and Bonett 1980), the Bentler-Tucker-Lewis coefficient (TLI; Hu and Bentler 1999), the Comparative Fit Index (CFI; Bentler 1990) and the Root mean Square Error Approximation (RMSEA; Ullman 2007) were considered. The chi square is a test of the level of discrepancy between the fitted covariance, as specified in the hypothesized model, and the sample covariance. A finding of non-significance corresponds to an adequate model. Furthermore, the authors suggest that a ratio

of χ^2/df below 3 (Kline 2005) and values of NFI, TLI and CFI above 0.90 (Hu and Bentler 1999; Ullman 2007) indicate an appropriate model. In addition, RMSEA values less than 0.05 mean that the model fits well with the data (Ullman 2007). If the proposed model does not meet the suggested adequacy standards, modification indices described by Jöreskog and Sörbom (Joreskog and Sorbom 1984) are provided. However, the decision to include model changes should be made with caution and based on theoretical foundations (Curran et al. 1996; Enders and Bandalos 2001; McDonald and Ho 2002). Additionally, our mediational hypothesis (i.e., the indirect links between the psychological and contextual determinants and the two school indicators, namely grades and persistence) was tested by performing bootstrap analyses that simulated 2000 samples, as recommended (Preacher and Hayes 2008). The bootstrapping method tests whether the indirect relationship between a predictor variable and the outcome variable is significant in the context of a model that controls for multiple covariates (Cheung and Lau 2008).

Results

Descriptive statistics and correlations are presented in Table 1.

The results of the initial model tested with students in a VT program did not allow to conclude whether it adequately fits the data, since the adequacy indices did not meet the standards set, $\chi^2(10) = 44.27$, $p < .001$; $\chi^2/df = 4.43$; NFI = 0.91; TLI = 0.79; CFI = 0.93; RMSEA = 0.10. The review of the indices of change suggested the addition of a direct link between the certainty of occupational choice and the choice of continuing or leaving the VT training

Table 1 Descriptive statistics and correlations for all variables assessed in Study 1

Study 1									
Variables	Mean (SD)	Correlations							
		1	2	3	4	5	6	7	8
1. Career certainty	5.87 (1.03)	—							
2. Future time perspective	5.63 (0.79)	.38**	—						
3. Performance-oriented classroom climate	2.85 (1.36)	-.14**	-.11*	—					
4. Contextualized instruction	5.89 (0.88)	.32**	.26**	-.43**	—				
5. Expectancies of success	6.04 (0.72)	.39**	.25**	-.09**	.31**	—			
6. Task-value	5.70 (0.71)	.36**	.45**	-.29**	.32**	.27**	—		
7. Grades	0.83 (0.15)	.01	-.03	-.04	.02	.22**	.10	—	
8. Persistence	P: 86.5% D: 13.5%	.28**	.12*	.05	.01	.18**	.14**	.19**	—

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. P = Persistence, D = Dropout

program, a theoretically valid choice. The evaluation of the new model including the addition of this link provided adequacy indices that meet established standards, $\chi^2(9) = 14.01$, $p = .122$; $\chi^2/df = 1.56$; NFI = 0.97; TLI = 0.97; CFI = 0.99; RMSEA = 0.04. This model was thus considered as final. Results are presented in Fig. 2.

As can be seen in Fig. 2, all four targeted determinants (students' career certainty, students' FTP, students' perceptions of a performance-oriented classroom climate and, contextualized instruction) significantly predicted at least one of the two motivation indicators, namely expectancies of success or subjective task values. In turn, students' expectancies of success were significantly linked to students' achievement. Less expectedly, task values did not significantly predict their choice to persevere or drop out of their training program. In addition, career certainty was also directly linked to students' choice to persevere or drop out of their training program. Consequently, bootstrapping did not reveal any significant indirect relationship between the targeted determinants and persistence in the VT program. In addition, the relationship between grades and the targeted determinants were significantly mediated by expectancies of success and task values for students' career certainty and contextualized instruction, as well as marginally mediated for students' FTP. Detailed results for indirect links are presented in Table 2.

Study 2

Like Study 1, the objective of Study 2 was to test the validity of the proposed theoretical model with students involved in Technical Training Programs (TT).

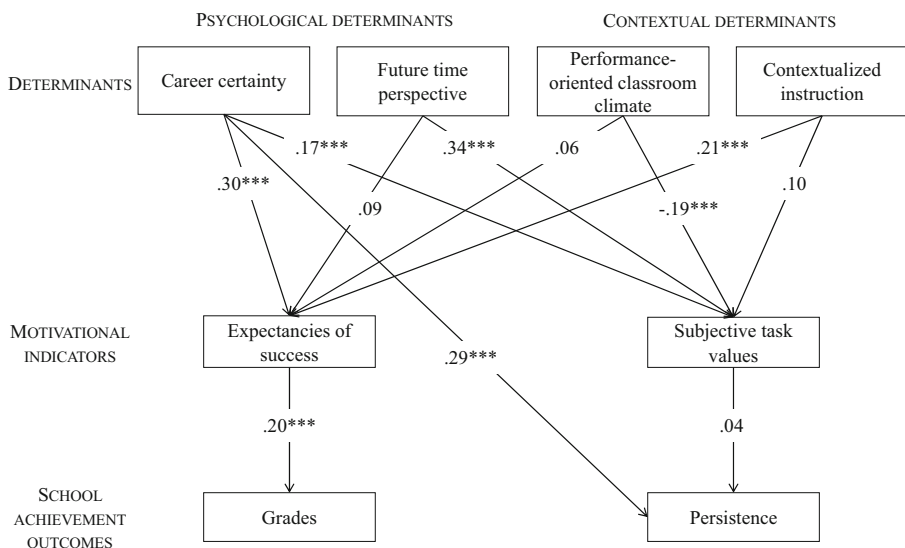


Fig. 2 Final model for students enrolled in a VT program with maximum likelihood estimates (standardized estimates). * $p < .05$, ** $p < .01$, *** $p < .001$. Co-variance terms were included between the four determinants, the two motivational indicators and the two achievement outcomes. All error terms were significant at $p < .001$

Table 2 Bootstrapping results to test for the indirect relationships between the four determinants and the two achievement outcomes

	Career certainty	Future time perspective	Performance-oriented classroom climate	Contextualized instruction
Grades	$\beta = .06, p = .001$; CI: .027, .10	$\beta = .02, p = .081$; CI: $-.00, .03$	$\beta = .01, p = .338$; CI: $-.01, .04$	$\beta = .04, p = .002$; CI: .01, .08
Persistence	$\beta = .01, p = .361$; CI: $-.03, .01$	$\beta = .02, p = .361$; CI: $-.05, .02$	$\beta = -.01, p = .361; CI: -.05, .02$	$\beta = -.00, p = .413; CI: -.02, .01$

Note. Bootstrap analyses included 2000 samples; confidence intervals (CI) were set to 95%

Methodology

Participants

The sample of study 2 comprised of 503 students (68.4% women; 31.6% men) aged from 17 to 56 years old ($M: 22.15$; $SD: 5.30$) enrolled in a three-year Career-Technical program (TC) from a three French-language post-secondary institutions (College) deserving mostly students from many rural and suburban cities around Montréal and Ottawa (Canada).

Procedure, Measures and Analyses

The procedure, the scales used and the analyses conducted in Study 2 were identical to those presented in Study 1. In addition, all scales provided satisfactory reliability with the study 2 sample: students' career certainty ($\alpha = .85$), students' FTP ($\alpha = .84$), students' perceptions of a performance-oriented classroom climate ($\alpha = .75$), contextualized instruction ($\alpha = .82$), expectancies of success ($\alpha = .75$) and task values ($\alpha = .83$).

School Achievement Outcomes In TT programs, achievement corresponded to grades given on the basis of the evaluation method (assignments, tests, final exam) determines by the teacher of each class. Results are expressed as a percentage (a score of 100), as it appeared in students' school records.

Persistence in the Program Persistence was measured, as in study 1, by verifying whether they had withdrawn from their training program (coded as a score of 0) or were still enrolled in their program six months later (coded as a score of 1).

Results

Descriptive statistics and correlations are presented in Table 3.

The results of the model tested with students involved in a TT program reveal that despite several acceptable indicators, the chi-square test was significant, suggesting that the proposed model does not adequately fit the data, $\chi^2(10) = 19.13, p = .039$; $\chi^2/df =$

Table 3 Descriptive statistics and correlations for all variables assessed in Study 2**Study 2**

Variables	M e a n (SD)	Correlations							
		1	2	3	4	5	6	7	8
1. Career certainty	5.53 (1.32)	—							
2. Future time perspective	5.27 (1.04)	.36**	—						
3. Performance-oriented classroom climate	3.87 (1.79)	.02	.07	—					
4. Contextualized instruction	6.07 (0.77)	.33**	.24**	.04	—				
5. Expectancies of success	5.65 (0.94)	.24**	.07	-.61**	.20**	—			
6. Task-value	4.68 (1.35)	.03	.07	-.70**	.01	.63**	—		
7. Grades	72.87% (8.49)	.05	.01	.05	-.03	.03	-.04	—	
8. Persistence	P: 75.2% D: 24.8%	-.03	.01	-.14**	-.06	.07	.05	-.17**	—

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; P = Persistence, D = Dropout

1.91; NFI = 0.98; TLI = 0.97; CFI = 0.99; RMSEA = 0.04. In addition, the analysis of change indices suggested the addition of a direct link between the students' perceptions of a performance-oriented classroom climate and the choice to continue or discontinue the TT training program. Since this change is theoretically valid, the model has been modified to include it. The adequacy indices of this new model meet the established standards and are considered final, $\chi^2(9) = 10.47, p = .313$; $\chi^2/df = 1.16$; NFI = 0.99; TLI = 0.99; CFI = 0.99; RMSEA = 0.02. Results of the final model are presented in Fig. 3.

As demonstrated in Fig. 3, all four determinants predicted either one or both motivational indicators. However, students' expectancies of success did not predict school achievement whereas task values were not significantly link to their persistence in the TT program. Therefore, our mediational hypotheses did not apply to students enrolled in a TT program. Less expectedly, a direct link between students' perceptions of a performance-oriented classroom climate and students' persistence in the TT program was found. This result means that regardless of the competitiveness of the learning context it affects students' motivation, and this translates into a lower tendency to persevere into the TT program.

Discussion

This study aimed to examine the potential influence of four determinants, two psychological (career certainty and FTP) and two contextual (performance-oriented classroom

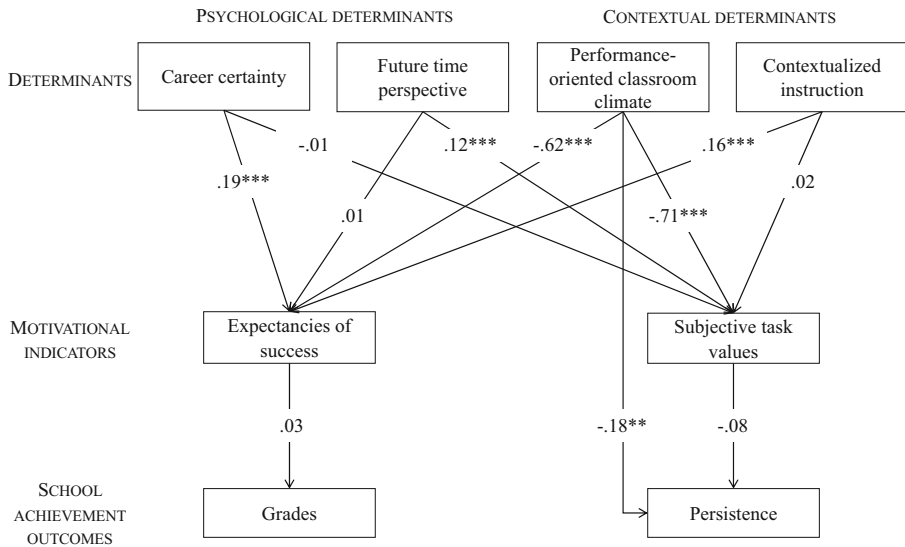


Fig. 3 Final model for students enrolled in a TT program with maximum likelihood estimates (standardized estimates). * $p < .05$, ** $p < .01$, *** $p < .001$. Co-variance terms were included between the four determinants, the two motivational indicators and the two achievement outcomes. All error terms were significant at $p < .001$

climate and contextualized instruction), on school performance and the school persistence in the context of VT (study 1) and TT (study 2). In accordance with the EVM, the mediation hypothesis that was postulated suggested that the targeted determinants would indirectly affect achievement outcomes through expectancies of success and the value placed on learning. Overall, the results provided mixed results, partially supporting the mediation hypothesis suggested by the theoretical model.

Discussion of the Results for Students Enrolled in a VT Program

In VT programs, the mediation hypothesis could be empirically confirmed to explain the links between targeted determinants and school performance. Indeed, the results of Study 1 revealed that when the determinants affected performance, they acted indirectly on this variable, via expectancies of success. Specifically, achievement is indirectly influenced by students' certainty of educational choice, the contextualization of instruction, and, marginally, students' FTP. However, the expected indirect link between the perceived level of competition in the classroom and students' performance could not be confirmed by the results of this study. Overall, these results are consistent with EVM that assumes that contextual elements are internalized through expectancies of success that themselves predict student achievement in school contexts other than VT programs such as elementary and secondary education (Plante et al. 2012; Wigfield et al. 2017; Wigfield et al. 2016).

The results concerning student persistence in their program are more surprising. Indeed, even if the targeted determinants modulate the perceived value of the task, they do not indirectly translate into better student retention in the program, since the value of the task does not significantly influence student retention. This contrasts with available

results from other school contexts such as primary or secondary school (Wigfield et al. 2017; Wigfield et al. 2016) which have empirically demonstrated the role of task values in student retention. Despite the absence of an indirect link between the targeted determinants and student retention, a student's persistence is a direct result of the certainty of their career choice. These results suggest that interventions that target certainty of choice appear to be a relevant avenue to support persistence until the completion of VT programs. Indeed, working upstream—before the beginning of the training—to help the student target a profession that suits them is likely to promote their school perseverance until graduation. On the other hand, enrolling in training without first having the conviction of wanting to practice the targeted trade seems counterproductive in terms of motivation, success, and school perseverance in the context of VT.

Discussion of the Results for Students Enrolled in a TT Program

In sum, the results of Study 2 revealed that the four targeted determinants were significantly related to at least one of the two motivational indicators. However, contrary to the hypotheses formulated, the expectancies of success and the perceived value of the task did not significantly explain students' performance or perseverance in their TT program. Thus, even if the psychological and contextual determinants provide a positive motivational experience for the students, they do not directly translate into higher achievement or increased retention in the program. In addition, a direct link between students' perceptions of a performance-oriented classroom climate and persistence in the TT program was observed. Indeed, a competitive classroom environment seems to undermine perseverance which may incite students to drop out of their program before the end of TT training as mentioned by Cossette et al. (2004) or Dulay and Karadağ (2017).

Thus, these results raise important questions about the process of student motivation, success, and retention in TT programs. To better understand this process, the potential predictors of achievement and retention of TT students—other than the degree of competitiveness of the context offered to students in the classroom—should be considered first. For example, TT students are perhaps more engaged in their training in response to external pressures, such as pleasing their parents, rather than for intrinsic reasons. Thus, studies using Self-Determination Theory may provide a more accurate picture of the most significant types of motivations among TT students, on the one hand, and the forms of self-regulation that underlie the success and the retention of students in these programs, on the other hand. The results of Larose et al. (2018), also point in the direction of earlier determinants in explaining perseverance and success in a TT context. Indeed, these researchers showed that family background and the high school achievement profile were good predictors of TT success. Based on these results, interventions from secondary school onwards would therefore be relevant to increase performance and retention in TT programs. Similar studies including these distal variables would also be required in the context of VT to assess the generalizability of these conclusions derived exclusively from TT.

Integration of the Results

Overall, the four targeted determinants are appropriate to influence the motivational indicators of VT and TT students. However, the mediation hypothesis is partially

supported. Indeed, for VT students, one school achievement outcome (grades) is linked to the motivational indicators and indirectly linked to the targeted determinants. For TT students, none of the school achievement outcome was linked to the motivational indicators. However, persistence is directly and differently related to one of the targeted determinants depending on the type of qualifying program pursued. For VT students, the certainty of vocational choice is directly related to their persistence. For TT students, it is the class climate that is directly related to their persistence. Globally, this underlines the importance of considering the targeted determinants in order to better understand school persistence, which seems to be influenced differently according to the type of qualifying program pursued. Consequently, these results underline the importance of continuing studies with each of these audiences in order to clearly understand the specificities that characterize perseverance and success in each school context.

Limitations and Future Directions

This study has some limitations that should be considered in future research. First, despite the use of path analysis, the correlational nature of the data does not make it possible to determine the direction of the relationships between the variables or the nature of the causality between the established links. The use of an experimental estimate to modulate the psychological and contextual determinants would make it possible to evaluate their effects and thus circumvent this limitation. Another limitation is the use of self-reported instruments to measure the determinants and motivational variables of studies. This contributes to increasing the risk of social desirability. To overcome this limitation, more studies using other types of objective measurements obtained either from teachers or by direct observation from the researcher would be needed. This would provide an alternative perspective on variables that reflect students' perceptions. Also, in future studies, considering the multiple dimensions of the value of the task could allow important advances in our comprehension of a complex motivational process, it may be relevant to study more carefully the subjective task value and, considering individually its multiple dimensions. Despite these limitations, the two studies conducted were innovative in examining the psychological and contextual factors that influence student motivation and, consequently, favor their success and their retention in a VT or a TT program. Overall, the results partially validated the validity of the EVM that assumes that motivational indicators act as mediators in the relationships between determinants and achievement outcomes. On the one hand, this highlights the need to deepen the study of these specific training contexts in order to better understand the motivational process of the students who enroll. On the other hand, another relevant research path would be to better document the other potential determinants of performance, and, more importantly, of student retention in VT and TT programs, since this indicator was not significantly affected by the variables considered in the studies conducted. Consideration of socio-demographic variables such as age, gender or ethnic background as control variables could provide a more accurate picture and should be included for future research.

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