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FEP FACULDADE DE ECONOMIA UNIVERSIDADE DO PORTO

DOES TRAINING MATTER? FEP STUDENTS' VIEWS ON THE DEVELOPMENT OF NON-TECHNICAL COMPETENCIES

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Bibliographic note

Mariana Andreia Jesus Gomes da Costa, born on January 12th of 1996, started her academic path through the bachelor of economics, at the Faculty of Economics of the University of Porto (FEP) in 2014. During the bachelor, she decided to do the Erasmus+ Programme in Tampere, Finland, an experience that enabled her to meet new people, from different cultures and with distinct ways of being and thinking. It also allowed her to live in a completely new city, with very rigorous weather and with an autonomous and independent study programme. By living this experience, she developed abilities of adaptation, communication, responsibility, and time and organisation management.

After finishing the bachelor, in 2017, Mariana took on a master in management programme at FEP to complement her business studies and chose to work during the realization of her thesis. She joined Clube de Minigolfe do Porto (Minigolf Club of Porto) through an internship with the objective of dynamizing fundamental areas of the Club.

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Abstract

Technical knowledge and competencies are very important to succeed in the labour market. However, under an increasingly complex and ever-changing context, non-technical competencies are becoming essential to enable employees to adapt to the market flow. Once the objective of Faculty of Economics of Porto (FEP) is to train the best economics and management students to become talented workers, this dissertation intends to develop an instrument capable of assessing the development of non-technical competencies during undergraduate studies at FEP. First, an interview with lecturers and two focus groups with former students were made to acknowledge their opinions about the training outcomes of the courses of Personal and Social Competencies (PSC) I and II that are taught in the second year of the bachelor of management. Following the results of the qualitative methods, a questionnaire was created. This questionnaire was applied in two periods of time to determine students' self-assessment of their non-technical competencies before and after classes of PSC II. Two separate groups were targeted: second year management students who received the training and second year economics students who had not undergone any formal training and acted as a control group. The questionnaire was administered to both groups at pre-test (January 2019) and post-test (May 2019) to examine if students of economics and management present significant differences. Results show that the intervention of PSC and students' GPA and work experience have a significant positive effect on the development of students' psychological capital, which in turn, has a significant effect on the development of emotional intelligence and self-efficacy in transversal and professional competencies. Overall, this study has several theoretical and practical contributions as it assesses distinct non-technical competencies in two separate moments highlighting how higher education institutions can further the development of these competencies during studies.

Keywords: competencies, non-technical competencies, assessing competencies

JEL-codes: I23

Resumo

Conhecimento e competências técnicas são bastante importantes para se ser bem sucedido no mercado de trabalho. No entanto, num contexto cada vez mais complexo e sempre em constante mudança, as competências não-técnicas estão a tornar-se essenciais para permitir que os trabalhadores se adaptem ao fluxo de mercado.

Uma vez que o objetivo da Faculdade de Economia do Porto (FEP) é formar os melhores alunos de economia e gestão para se tornarem trabalhadores talentosos, esta dissertação pretende desenvolver um instrumento capaz de medir o desenvolvimento de competências não-técnicas durante as licenciaturas da FEP.

Primeiramente, uma entrevista com as professoras e dois grupos de foco com antigos alunos foram realizados para se conhecer as suas opiniões acerca dos resultados da intervenção das aulas de Competências Pessoais e Sociais (CPS) I e II.

Com os resultados dos métodos qualitativos, foi criado um questionário, aplicado em dois momentos com o intuito de determinar o auto-reporte das competências não-técnicas antes (Fevereiro de 2019) e depois (Maio de 2019) da intervenção e de estudar se os alunos de economia e os alunos de gestão apresentam diferenças significativas em relação às competências não-técnicas. Dois grupos distintos foram alvo: alunos do segundo ano da licenciatura em gestão que receberam a intervenção e alunos do segundo ano da licenciatura em economia que não tiveram qualquer tipo de intervenção, atuando como grupo de controlo.

Os resultados desta pesquisa mostraram que a intervenção, a média de curso e a experiência profissional dos alunos tiveram um efeito positivo significativo no desenvolvimento do capital psicológico que, por sua vez, teve um efeito positivo significativo no desenvolvimento da inteligência emocional e da eficácia em competências transversais e profissionais.

Este estudo tem várias contribuições teóricas e práticas pois mede competências não-técnicas, destacando como as instituições de ensino superior podem desenvolver estas competências nos seus programas.

Palavras-chave: competências, competências não técnicas, medir competências

Códigos JEL: I23

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1. Introduction

Traditionally, scientific and specific knowledge was crucial for succeeding in the labour market. However, the current situation demands also non-technical competencies because of the increasing number of graduates in the workforce raising the competition and complexity of the market (Garcia-Aracil, Mora, & Vila, 2004).

Non-technical competencies include every competency that is not specific and may be relevant for different professions, like for example time management and oral and writing communication. Besides the theoretical and technical knowledge, professionals need to have certain characteristics, attitudes and skills that enable them to perform activities that may include diversified roles in different contexts and with different interlocutors (Fallows & Steven, 2000; Heimler, 2010; Sahni, 2011; Stewart & Knowles, 2000).

In 2005, a large-scale European survey called REFLEX project, short for **R**esearch into **E**mployment and professional **FLEX**ibility, was undertaken to graduates regarding competencies' demands placed on higher education graduates and the extent to which higher education institutions (HEIs) develop competencies graduates need to succeed (Maastricht University School of Business and Economics, 2019). Velasco (2014) analysed the data of this survey for the case of Spain and the results obtained demonstrated that, for the Spanish case, interpersonal competencies seemed to be more vital at work than cognitive competencies.

Non-cognitive skills may be a determinant aspect for learning and labour market results and studies demonstrate that these skills are also correlated with noticeable economic advantages including wage premium (Bowles, Gintis, & Osborne, 2001; Heckman, Stixrud, & Urzua, 2006; Lleras, 2008).

The alliance of theoretical and specific knowledge and soft skills plays a fundamental part to excel professionally (Silva & Nascimento, 2014). According to Evers, Berdrow, and Rush (1998) and to Berdrow and Evers (2011), 'knowing' no longer seems to be sufficient. Having the capacity to administer that knowledge to analysis, decision making, and problem-solving in an intricate environment is essential to succeed.

The thought that competencies are equally meaningful as qualifications has expanded its acceptance in both the business and the academic world (Berman & Ritchie, 2006) and more and more higher education institutions are being challenged to incorporate opportunities for students to develop competencies besides technical knowledge. Thus,

HEIs are starting including the training of these skills and competencies in the curriculum. Competency-based education and training are driven by a desire to develop and enhance the competencies and the skill level and, consequently, the employability of graduates.

In the Faculty of Economics of Porto (FEP), there are two bachelor courses: management and economics. Both bachelors take three years of studies and follow a similar structure. However, the bachelor of management has, during the second year, two course units of Personal and Social Competencies I and II while the bachelor of economics has no formal course to train and develop non-technical competencies. To determine the efficacy of the training provided in the management course, those competencies and skills need to be measured (Berdrow & Evers, 2010). As Velasco (2014) mentioned, the knowledge of how educational institutions may teach and contribute to the development of non-technical skills is missing but essential.

Hence, this dissertation addresses this research and managerial gap by developing a tool to assess the level of non-technical competencies among FEP students and to understand if the formal training included in the curriculum can foster the development of students' non-technical competencies. The main research question of the present research focuses on examining if non-technical competencies can be developed through time and through the intervention of PSC training.

To answer the research question, firstly both an interview and two focus groups were conducted. The interview with lecturers of PSC took place to understand which competencies are being developed in classes and the two focus groups were undertaken in order to understand the opinion of students who experienced classes of PSC (management alumni) and those who did not (economics alumni) regarding the main competencies developed in these classes and during FEP's higher education. Following, a questionnaire was created and data were collected from current economics and management students relative to their self-assessment of non-technical competencies. Students of the second year of FEP's bachelors answered the survey in two periods of time: the first at the beginning of the second semester (after PSC I and before PSC II for management students) and the second at the end of the second semester (after PSC II).

Besides this section, this study explores the impact of higher education institutions on non-technical competencies' development and zooms in for the case of FEP, explains the methodology taken, shows the results obtained and discusses them, and presents a final section for the conclusion and the theoretical and practical implications.

2. The impact of higher education on non-technical competencies' development

More and more scientific knowledge is insufficient on its own to excel in the labour market and, consequently, graduates need to possess and develop a set of distinct competencies to attain a career of success.

Higher education institutions are being challenged to develop competencies beyond technical knowledge. They can do it through many ways as by including classes of non-technical competencies on the curriculum, by promoting the development of students' unions and organisations in the campus as well as by promoting other extra-curricular activities, such as company visits, summer internships, and international exchanges.

Several studies have examined the impact of HEIs on non-technical competencies' development. Velasco (2014) found out that Spanish universities have an important role in competencies' development. Berdrow and Evers (2010) assessed the competencies related to the management of the self, communication, management of people and tasks, and the mobilisation of innovation and change among American undergraduate students, finding a positive significant difference in the level of self-report competencies from the beginning to the end of a semester. Hence, higher education appears to be effective in developing non-technical competencies, namely trough assignment-based assessments (Salas Velasco, 2014) and through the awareness and training opportunities for practice and development of students' confidence in non-technical competencies (Berdrow & Evers, 2010).

There are some studies also regarding specific interventions made in higher education with the purpose of developing certain competencies in students. For example, regarding emotional intelligence (EI), Gilar-Corbí, Pozo-Rico, Sánchez, and Castejón (2018) presented a work where EI is developed through the 'Emotional Intelligence Training Program', a multimethodological approach using the methodologies of online, in the classroom and coaching intervention among higher education students. Psychological capital was also developed through the 'PsyCap Intervention Model' in a work made with students by Luthans et al. (2014). Both studies demonstrated a successful intervention, with levels of the competencies developed increasing from the beginning to the end of the intervention.

In terms of extra-curricular activities, Lau, Hsu, Acosta, and Hsu (2014) showed that students with higher role positions (core members) in extra-curricular activities tended to

evaluate their communication, leadership, creativity and self-promotion skills in a more positive way. Also, the results of their study show that the types of extra-curricular activities (student unions, sports, music, arts) influenced different employability skills, for example, leadership skills were more influenced by being in sports clubs while creativity skills were more connected to being involved in music clubs.

Before further exploring the impact of higher education on competencies' development, it is important to distinguish competency from competence. One thing is the job requirements at which an employee is competent, and another is the characteristics of the person which enable him or her to be competent. As Woodruffe (1993, p. 29) defined, 'a competency is the set of behaviour patterns that the incumbent needs to bring to a position in order to perform its tasks and functions with competence'. According to the same author, competency covers almost everything that may directly or indirectly influence a professional performance and is related to people's behaviours which enact a competent performance.

There are various approaches to and definitions of the concept of competency. The literature offers a broad set of different perspectives to the term and Table 1 shows some examples. This study follows the definition of competency from van Merriënboer, Klink, and Hendriks (2002), which comprises knowledge, skills, and attitudes.

Table 1 – Definitions of competency found in the literature

Definition	Study
'Competencies are context-bound; (…) indivisible (knowledge, skills and attitudes are integrated); (…) subject to change; connected to activities and tasks; competencies require learning and development processes; and competencies are interrelated'.	van Merriënboer et al. (2002, p. 67)
Competency 'is intended to relate to what a person does at work, rather than his or her knowledge or general personal characteristics'.	Arnold, Loan-Clarke, Harrington, and Hart (1999, p. 44)
'Competency is defined as the complex ability of an individual or group to identify, select and combine a set of resources (e.g. materials, knowledge, know-how, behaviour) in order to perform a task, solve a problem or accomplish a project'.	Rouvrais et al. (2006, p. 84)

Definition	Study
'Competency is knowing how to act in a responsible and recognizable way, which involves mobilizing, integrating and transferring knowledge, resources and abilities that add economic value to the organization, and social value to the individual'.	Fleury and Fleury (2001, p. 188)

Source: author own elaboration

Competencies are often labelled taking into account their application relative to a particular context (Garcia-Aracil et al., 2004). In Table 2, we can observe different classifications, some basic and others more complex and we can conclude that there is no general agreement regarding the classification of competencies.

Table 2 – Classification of competencies

Classification	Number of classifications	Study
General and firm-specific competencies	Two	Becker (1975)
Firm-specificity, task specificity, and industry specificity	Three	Nordhaug (1993)
Competencies acquired in school which are of direct use in later work, competencies acquired in school which facilitate obtaining new competencies after graduation, and competencies acquired mainly in a working context	Three	Heijke, Meng, and Ramaekers (2003)
General-cognitive, systematic-operative, professionally knowledgeable, social-reflexive and physiological-manually skilled competencies	Five	Teichler (2007)
Specialised, methodological, participative and socio-individual competencies	Four	Bunk (1994)
Technical and non-technical competencies	Two	Cabral-Cardoso, Estêvão, and Silva (2006); Rouvrais et al. (2006)

Source: author own elaboration

For the purpose of this research, the classification used is from Cabral-Cardoso et al. (2006) and Rouvrais et al. (2006) and consists of separating technical or specific competencies from non-technical ones.

According to Cassidy (2006, p. 508), 'technical skills refer to subject-specific or content-specific knowledge and competence relevant to, or within, a particular discipline'. So, these skills are those necessary to perform a function competently. According to Evers

et al. (1998) and to Neves, Garrido, and Simões (2006), these competencies are insufficient to assure a performance of success.

As aforementioned, non-technical competencies include every competency that is not specific and may be relevant for different occupations. There are often labelled 'transversal competencies', 'employability skills', 'key qualifications', 'generic competencies', and 'essential skills' (Cabral-Cardoso et al., 2006; Cassidy, 2006; Suleman, 2000; Wilton, 2008), actually having a similar meaning, as shown in Table 3.

Table 3 – Different concepts to non-technical competencies

Concept	Definition and examples of competencies	Study
Transversal competencies	Transversal competencies are a set of knowledge and capabilities that should be owned by an individual in order to provide an entrance and keep him or her in the workplace. These competencies allow the individual to perform in a qualified way his or her job, to face successfully a professional situation and to manage his or her career in turbulent, flexible and evolving contexts.	Suleman (2000, p. 121)
Employability skills	'employability skills are not job specific, but are skills which cut horizontally across all industries and vertically across all jobs from entry level to chief executive officer'.	Sherer and Eadie (1987, p. 16)
	Employability skills are divided into three main competencies – basic skills, higher-order thinking skills, and affective skills and traits. Basic skills involve oral communication (speaking and listening), reading, especially understanding and following instructions, basic arithmetic, and writing; higher-order thinking skills include problem-solving, learning skills and strategies, having creative and innovative thinking, and decision making.; and affective skills and traits comprise among other competencies responsibility, positive attitude towards work, efficiency, interpersonal skills, teamwork, and ability to work without supervision.	Cotton (2001, p. 3)
Key qualifications	Key qualifications consist in 'knowledge, insight, skills and attitudes that are part of the permanent core of an occupation or a group of related jobs with the possibility of transfer to other, new jobs within that occupation, and of innovations within that occupation, which contribute to the development of an employee's competence and facilitate transitions within career'. Key qualifications were divided into six dimensions – general-instrumental, cognitive, personality, socio-communicative, socio-normative, and strategic dimension. General-instrumental dimension included interdisciplinary knowledge, occupational knowledge, skills such as arithmetic, general knowledge of languages and of computing, the ability to handle information, and the ability to plan work. Cognitive dimension comprised	van Zolingen and Klaassen (2003, p. 331)

Concept	Definition and examples of competencies	Study
	identifying and solving problems, abstract thinking, and intellectual flexibility. Personality dimension involved self-reliance, sense of responsibility, initiative, and coping with stress. Socio-communicative dimension contained the ability of a person to express him or herself orally and in writing, social skills, solidarity, and empathy. Socio-normative dimension included loyalty, dedication, complying with safety measures, and willingness to participate in further learning. And finally, the strategic dimension comprised showing a critical attitude relatively to choices and their consequences, having an active part in decision-making and in promoting one's interests.	
Generic competencies	Generic competencies include the awareness to be well-informed, the incisiveness to have a clear understanding, the reasoning to find ways forward, the organisation to work productively, the drive to achieve results, the self-confidence to lead the way, the sensitivity to identify others' viewpoints, the co-operativeness to work with other people, and the goal orientation to win in the long-term.	Woodruffe (1993, p. 30)

Source: author own elaboration

As Table 3 shows, there are many concepts for non-technical competencies and there are also many different non-technical competencies. They go from the simple ability of one person's oral and writing expression to the complex social skills and sensitivity of understanding others' points of view. In this study, the designation used is non-technical competencies because of its more general perceived meaning which contributes to diminishing students' pre-assumptions of a specific non-technical competency or of a set of competencies when faced with the term.

As previously mentioned, the knowledge of the extent to which HEIs are contributing to the development of non-technical competencies is currently insufficient. However, there are studies which explored the impact of HEIs and the impact of interventions and training on the development of non-technical competencies. Table 4 summarises studies already mentioned such as the work undertaken by Velasco (2014) as well as other identical studies reporting the methodology and the results of each research.

Table 4 – Summary of previous studies regarding non-technical competencies' development among students

Study	Aim of the study	Findings
Gilar-Corbí et al. (2018)	To test the 'Emotional Intelligence Training Program' and verify if emotional intelligence can be developed through different methods.	The 'Emotional Intelligence Training Program' can improve emotional intelligence by online, in the classroom and coaching methodologies. The coaching methodology developed emotional intelligence at a deeper level.
Luthans et al. (2014)	To study whether psychological capital can be developed among students through a micro-training intervention.	In the pre-test, there were no significant differences between groups. In the post-test, the treatment group significantly increased the level of psychological capital and no significant changes in psychological capital scores were found on the control group.
Velasco (2014)	To investigate the most required competencies beyond job-specific technical skills graduates need and to what extent HEIs provide these competencies.	The most required competencies to graduates are: (a) mobilising their own capacities, using time efficiently, and performing well under pressure; (b) mobilising others, by working productively with others, coordinating activities, and making meaning clear to others; and (c) having good specialist knowledge, through the mastery of own field, and the ability to rapidly acquire new knowledge. Spanish universities play a key role in competencies' development.
Berdrow and Evers (2010)	To investigate the application of the 'Bases of Competence' model.	There are four base competencies: (a) managing self; (b) communicating; (c) managing people and tasks; and (d) mobilising innovation and change. Students rate themselves as being stronger in communicating and in managing self and as being weaker in managing people and tasks and in mobilising innovation and change. There was a positive significant difference in all competencies from the beginning to the end of the semester.
Cabral-Cardoso et al. (2006)	To study in which extent transversal competencies are important to graduates' efficiency and efficacy in the labour market and in which extent HEIs and employers potentially develop those competencies.	Graduates and employers give more importance to the following competencies: planning, problem-solving, information and communication technologies, interpersonal relationship, motivation, and the availability for continuous learning. HEIs contribute to the development of competencies related to collection and treatment of information, teamwork, planning, availability to continuous learning, planning-action, ability to question, critical spirit, numeracy, and socialising with multiculturality.
Fallows and Steven (2000)	To integrate employability skills into the University of Luton undergraduate programmes.	Lecturers rethought their teaching and included methods to recognise students' skills. Students became more aware of their own responsibilities as learners. The skills assessment strategy is still debatable in terms of the importance each separate skill should have.

Source: author own elaboration

HEIs have been trying to adapt their curriculums to the current labour market needs of both technical and non-technical competencies. Table 4 shows examples of studies where HEIs succeeded in the development of non-technical competencies through the curriculum and interventions. Findings show that HEIs are creating an impact on non-technical competencies of their students, but it seems there is still a gap in the literature regarding the knowledge of the methods being used in HEIs to spur and develop these competencies and the ones more effective in the development of these competencies.

2.1. The case of Faculty of Economics of Porto

FEP is one of the top Portuguese higher education institutions of economics and business studies with an employability rate of its graduates surpassing 96% (Faculdade de Economia da Universidade do Porto, 2019).

Besides the specific knowledge, FEP promotes the development of non-technical competencies through the promotion of a healthy environment for student organisations to thrive (FEP has 18 student organisations), through the organisation of visits to companies (at the beginning of the school year) for its students, and through the integration of two course units of Personal and Social Competencies I and II in the bachelor of management programme.

According to the programme, the main competencies developed by these units are students' psychological capital, also known as PsyCap, mainly in the second semester, emotional intelligence (EI), with a higher focus on the first semester, and other non-technical competencies such as teamwork, leadership, and understanding of non-verbal language in both semesters (Faculdade de Economia da Universidade do Porto, 2019).

Luthans, Youssef, and Avolio (2007, p. 3) describe PsyCap as 'an individual's positive psychological state of development' which 'is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering towards goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success'. So, PsyCap is a construct built from the union of four individual psychological concepts: self-efficacy, optimism, hope, and resilience.

Self-efficacy is defined by Stadjkovic, Luthans, and Slocum (1998, p. 66) as being 'an individual's convictions (or confidence) about his or her abilities to mobilise the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context'. According to the same author, expectations of self-efficacy are a crucial point for a person to decide whether or not he or she will act and do a certain task, how much effort will he or she put to execute the task, and, when faced with adversity, how long he or she will sustain in doing the task. Low levels of self-efficacy lead to doubts related to not being enough and not having enough capabilities to succeed and high levels of self-efficacy lead to hanging on when things do not go according to plan and when the outcomes are uncertain (Stadjkovic et al., 1998).

'Optimism is an expectation of future success' (Luthans, Luthans, & Avey, 2014, p. 193). According to Carver, & Scheier (2002, p. 231), 'optimists are people who expect good things to happen to them' and 'pessimists are people who expect bad things to happen to them'. These two ways of facing reality may have an influence on academic performance. Students with a more optimistic belief tend to outperform the ones with a pessimistic belief (Ruthig, Perry, Hall, & Hladkyj, 2004; Solberg, Evans, & Segerstrom, 2009; Valentine, DuBois, & Cooper, 2004).

Hope is defined by Snyder et al. (1991) as 'a cognitive set that is composed of a reciprocally derived sense of successful (1) agency (goal-directed determination) and (2) pathways (planning of ways to meet goals)'. People with high levels of hope find the motivation to achieve the goals set for themselves and come up with different pathways to attain those goals (Luthans et al., 2014; Snyder, 2002).

Resilience is defined 'in relation to positive adaptation in the context of significant adversity' (Masten & Reed, 2002, p. 117) and as being 'the capability of individuals to cope successfully in the face of significant change, adversity, or risk' (M. Stewart, Reid, & Mangham, 1997, p. 22). According to Luthans (2002, p. 702), 'resilience is the positive psychological capacity to rebound, to 'bounce back' from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility'. So, resilient people tend to react to failures, mistakes and adversity with assurance and determination while people less resilient may be emotionally distracted by stressed situations (Luthans et al., 2014).

Summing up, Luthans et al. (2014, p. 193) note that 'individuals who possess the psychological resources that comprise PsyCap are generally more hopeful in terms of the

will and the way to accomplish their goals, are realistically optimistic about attaining positive outcomes, have efficacy beliefs to confidently pursue new objectives, and resiliently bounce back and beyond from setbacks'.

Relatively to emotional intelligence, there is no consensus in a standardized definition of the term. According to Wicks, Nakisher, and Grimm (2018), 'although not agreed on by researchers in the field, two common definitions of emotional intelligence are the ability to monitor the feelings and emotions of the self and of others and to use this information to guide one's behaviours, and the ability to identify and control emotions in oneself and in others'. Zhoc, Chung, and King (2018) found out that there is a positive relationship between emotional intelligence and academic performance.

There are different models of emotional intelligence – the performance-based ability model, which sees EI as a group of emotional skills and abilities and whose tests involve the problem-solving of emotional problems with correct and incorrect answers; the self-report ability model, which understands EI in the same way as the previous model, but tests more the personality traits through self-report tests where participants are honest about their subjective beliefs relatively to their own emotional intelligence and where there are no correct or incorrect responses; and the self-report mixed model, which uses also self-reports and focuses both on personality, skills and competencies (Gómez-Leal, Gutiérrez-Cobo, Cabello, Megías, & Fernández-Berrocal, 2018; Wicks et al., 2018). The model chosen for this research is the mixed model because it uses a self-report instrument, focuses both on personality and competencies, and has been tested by different studies, including Portuguese studies where measures in Portuguese have been tested and found out to be reliable.

2.2. Theoretical model and hypotheses

The present research intends to develop a tool to assess a set of non-technical competencies and has two main research objectives. The first objective consists in assessing FEP students' non-technical competencies in different periods of time, specifically at the beginning and at the end of the second semester of 2019, to see if these competencies evolve during this period of time and if so the extent of that evolution. The second objective is to explore if training, through the course unit of PSC II, is being

effective on the development of non-technical competencies. Specifically, the research question (RQ) of the present study is:

1. Can non-technical competencies be developed through time and through the intervention of classes of PSC?

Given this research question, before developing a questionnaire with the competencies to assess, an interview and two focus groups were conducted in order to understand which non-technical competencies are developed through FEP's higher education. The questionnaire then could be developed and was assessed before and after the intervention of PSC II both to economics and management students.

In FEP's higher education, there are two options of bachelor – economics and management. When students enter higher education, it is assumed that they have the same level of non-technical competencies. But, do they maintain this level through the academic curriculum? As mentioned above, in the bachelor of management there are two subjects of Personal and Social Competencies lectured in the first and in the second semester of the second school year of this course, which intends to develop some non-technical competencies among FEP management students. The question here is: does this discipline develops non-technical competencies among FEP students of the bachelor of management? Since the questionnaire was conducted in the second semester of the second year of the course, it is assumed ceteris paribus that students of the bachelor of management should have developed in a deeper level the non-technical competencies lectured in PSC I when compared to students of the bachelor of economics. Also, since the questionnaire was answered in two moments, one at the beginning of the second semester and one at the end of the same period, it makes sense that some non-technical competencies lectured in PSC II have been developed from pre-test to post-test regarding students of the bachelor of management. Thus, the following hypotheses can be formulated:

H1: In the pre-test, students of the bachelor of management have a higher level of non-technical competencies than students of the bachelor of economics, respectively in (a) emotional intelligence and in (b) self-efficacy in transversal and professional competencies.

H2: Classes of Personal and Social Competencies II have a positive influence on the development of non-technical competencies, so management students show a significantly higher level of non-technical competencies in post-test when compared to pre-test levels,

particularly in (a) psychological capital and in (b) self-efficacy in transversal and professional competencies.

H3: In the post-test, students of the bachelor of management have a higher level of non-technical competencies than students of the bachelor of economics, respectively in (a) psychological capital, in (b) emotional intelligence and in (c) self-efficacy in transversal and professional competencies.

The following diagram, Figure 1, summarises the theoretical model.

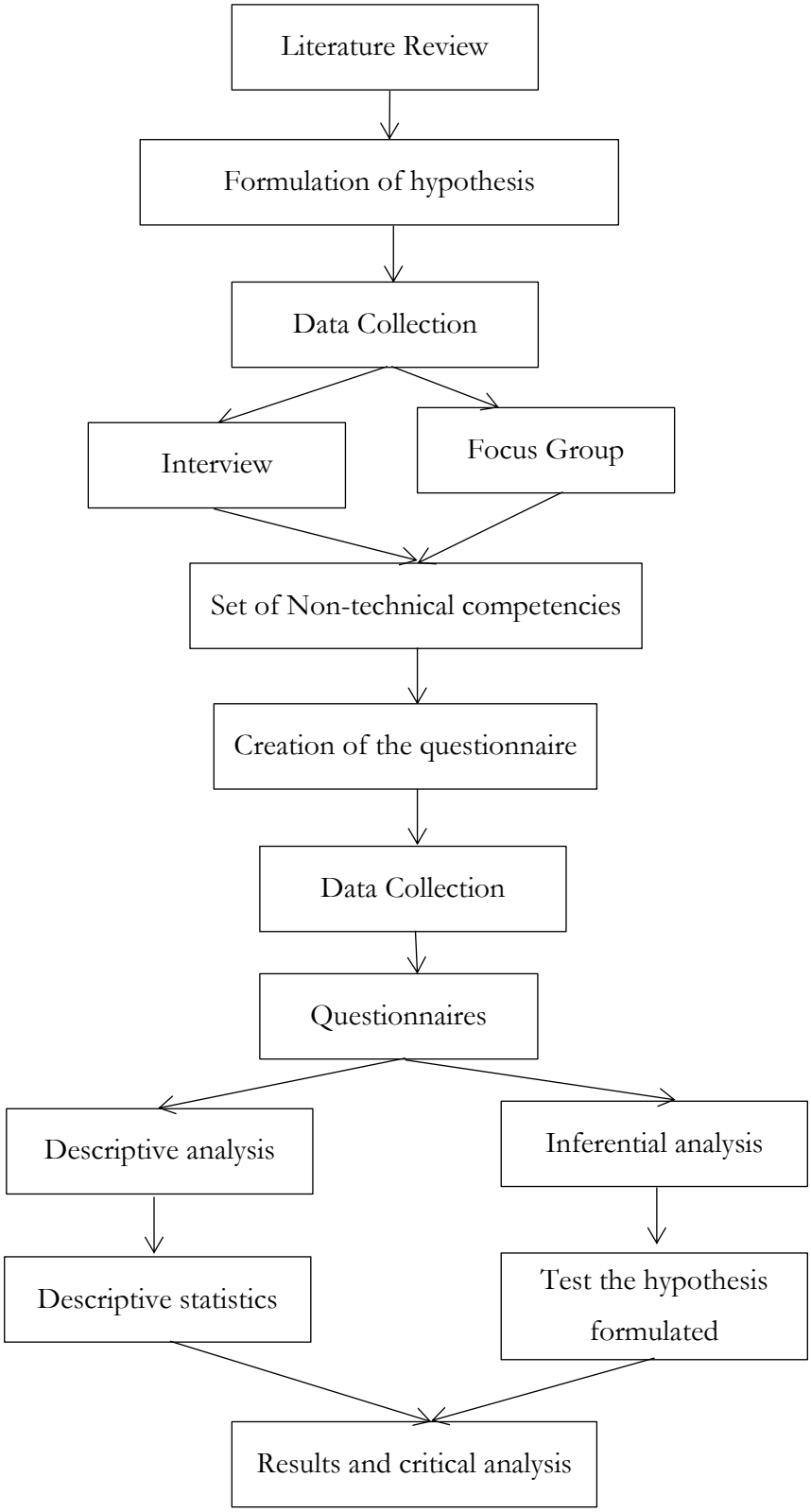

Figure 1 – Theoretical Model

Source: author own elaboration

3. Methodology

For the methodology, it was used a deductive and an inductive approach. A set of non-technical competencies was created from the content analysis of an interview and of the focus groups, in order to produce a self-report questionnaire.

3.1. Methodological approach

The research objective of this dissertation is to give an answer to the central RQ of this study:

1. Can non-technical competencies be developed through time and through the intervention of classes of PSC?

In order to address this purpose, it is essential to discover the non-technical competencies acquired by FEP business students while their higher education experience in this institution and the levels of these competencies owned by current FEP's bachelor students.

Table 5 shows the methodology used by similar studies that assessed non-technical competencies and allows a better understanding of the methods previously used to assess these competencies.

Table 5 – Summary of the methodology of previous studies regarding non-technical competencies' development among students

Study	Sample	Independent variable(s)	Dependent variable(s)	Instrument(s) of data collection
Gilar-Corbí et al. (2018)	Data was collected from a multimethodological approach using three distinct methodologies, each with 48 students plus a control group with also 48 students.	Demographic variables: age and gender.	Emotional intelligence as a perceived trait; Emotional intelligence as a skill	Questionnaire
Luthans et al. (2014)	The sample comprises 214 undergraduate business students.	Demographic variables: gender, age, work experience, weekly work schedule, and ethnicity.	Psychological capital	Self-assessment questionnaire
Velasco (2014)	Analysis of data from the European Reflex	Demographic variables:	Ability to make your meaning clear	Survey

Study	Sample	Independent variable(s)	Dependent variable(s)	Instrument(s) of data collection
	project survey for the case of Spain.	gender, age, educational background, experiences during higher education, years of work experience, among others.	to others; Ability to use time efficiently; Ability to work productively with others; Ability to perform well under pressure; Ability to rapidly acquire new knowledge; Ability to coordinate activities.	
Berdrow and Evers (2010)	Data collected from 635 students from three different courses – an undergraduate freshmen introductory business course, an undergraduate junior management course and a graduate management course.	Demographic variables: course name, date of completion, and gender.	Managing self; Communicating; Managing people and tasks; Mobilising innovation and change.	Survey self-reports
Cabral-Cardoso et al. (2006)	Data was collected from graduates and employers. The final sample includes 1770 graduate respondents and 1650 employer respondents.	Demographic variables: age, educational background, the existence of an internship on the course, the work experience, among others.	Transversal competencies	Questionnaires of self-assessment of transversal competencies in the phase of completion of a university degree and currently as well as of assessment of the importance of these competencies in the current job and the factors which contributed to competencies' development.

Source: author own elaboration

Taking into account the methodology used in previous studies, the main instrument to assess levels of non-technical competencies seems to be a self-report questionnaire. In the present research, a self-report questionnaire was also the method chosen.

However, first, a qualitative study was conducted and consisted of collecting information both from lecturers of PSC and from former FEP bachelor students regarding non-technical competencies developed in FEP's higher education. Once known the information from the qualitative study, a quantitative study was initiated and a questionnaire to assess non-technical competencies of FEP's second year students was created.

3.2. Instruments and procedures of data collection

To reach the objective of understanding the impact of FEP's higher education on the development of non-technical competencies on its students, the collaboration of former students, of lecturers of PSC and of current second year students was requested.

Qualitative study

The methods used in this study consist of an interview and on two focus groups.

The interview with lecturers of PSC was undertaken at FEP in the beginning of the school year with the objective of clarifying the set of competencies developed in classes. The first module of these classes, i.e. PSC I, consist of developing the awareness and the knowledge of the self. Competencies developed go from emotional intelligence to non-verbal language. The second module, PSC II, develops positive psychology and its impact on management, teamwork and the identification of different practices of positive leadership and critical success factors. From the interview, many competencies were discussed but the ones highlighted were emotional intelligence especially for PSC I and psychological capital, also known as PsyCap, which includes self-efficacy, hope, resilience, and optimism for PSC II.

Regarding the second qualitative method, two focus groups were conducted. According to Morgan (1996, p. 6), focus groups are 'a research technique that collects data through group interaction on a topic determined by the researcher'. The same author stated three uses for focus groups – self-contained method, where they consist in the principal source of data; supplementary source of data, where another method is taken as the principal source of data; and in multimethod studies, where it complements other types of qualitative methods. For the purpose of the present study, the focus groups were used as a supplementary source of data, since the principal source of data to the hypotheses testing is a questionnaire, a quantitative method.

The focus group method spurred students to exchange experiences and opinions regarding non-technical competencies developed during their higher education experience in the bachelor of FEP and also regarding competencies they may consider important to succeed personally and professionally. Through this method, people are encouraged to talk to each other: making questions, exchanging anecdotes, and giving opinions on the experiences and points of view of other people (Kitzinger, 1995).

Former students were asked and 10 volunteered to participate in the focus groups, with 40% being from the bachelor of economics and 60% being from the bachelor of management, from which of whom 50% attended classes of PSC I and II. Students (40% male; mean age: 23.9 years; 66% of the ones who attended classes of PSC I and II, did so in 2013 and 33% in 2017; 60% participated in student organisations; 50% performed volunteering actions; 80% executed other extra-curricular activities like sports, dance, music, and Erasmus+) highlighted competencies developed as well as suggested ways to develop non-technical competencies.

Students who had had the experience of PSC classes explained that in PSC I they developed mostly the self-knowledge and in PSC II the competencies developed were mainly communication in public and teamwork. From these classes, PSC I and II, some students argued they left with higher self-knowledge, a better idea of how to interpret the interlocutors' non-verbal language and a higher acceptance for listening and accepting others' ideas. Regarding students who did not have classes of PSC, they discussed competencies developed during their bachelor degree in FEP. The competencies highlighted consist of teamwork, time management, setting priorities, responsibility, autonomy, resilience, and critical spirit.

As suggestions to develop non-technical competencies, students enhanced the importance of integrating a student organisation, of having diversified teachers with more work experience, of having more practical classes, of integrating a communication feature in the evaluation of students, of having more team works and presentations in classes, of exploring an interaction between classes and companies, and of developing training specific sessions to specific competencies.

From the qualitative study, the competencies selected to incorporate in the self-report questionnaire were emotional intelligence, psychological capital, and transversal competencies (comprising teamwork, leadership, time management, among others).

Quantitative study

This study used a questionnaire to assess the level of the competencies highlighted in the qualitative study. The questionnaire was answered in classes of the second year of the two bachelors of FEP in order to assess both the treatment group (management students) and the control group (economics students). The questionnaire created integrated personal characteristics and experiences of students (bachelor choice, age, extra-curricular activities, among others) and three selected scales of competencies (Appendix 1):

(1) *Academic PsyCap*: measures the psychological capital of students and was adapted from Luthans, Luthans, and Jensen (2012), comprising 24 items and being the union of 4 individual psychological concepts: hope, efficacy, resilience, and optimism – the HERO –, each one with six items. The inquired students were invited to answer on a six-point Likert-scale from (1) *Strongly disagree* to (6) *Strongly agree*. Following the diversified factorial analysis, two items were removed (item 13 and item 23). The internal consistency of the Academic PsyCap (Cronbach alphas) is presented in Appendix 1 and consisted on 0.878 in February and on 0.929 in May for the overall scale, which is considered excellent (Nunnally, 1978, pp. 245-246). For dimensions of resilience and optimism of Academic PsyCap of February, Cronbach alphas were very low, but when analysed without the reversed items 13 and 23, the internal consistency increased to adequate levels.

(2) *Emotional intelligence*: assesses levels of students' emotional intelligence and was adapted from Rego and Fernandes (2005), being composed by 23 items. The respondents were asked to answer on a seven-point Likert scale from (1) *The statement does not apply to me at all* to (7) *The statement applies to me completely*. Internal consistency yielded good results (Appendix 1) with Cronbach alphas for the overall scale being of 0.837 concerning the data set collected in February and being of 0.850 regarding May's dataset (Nunnally, 1978, pp. 245-246). Its internal dimensions consist of empathy, self-control against criticism, emotional self-control, self-encouragement, understanding own emotions, and understanding others' emotions. Confirmatory factorial analysis confirms the original dimensions and demonstrates strong reliability with Cronbach alphas ranging from 0.694 to 0.905 in February and from 0.675 to 0.936 in May.

(3) *Self-efficacy in transversal and professional competencies (ACT-prof)*: adapted from Vieira (2014), this scale measures the following non-technical competencies: *active listening,*

teamwork, ethics and social responsibility, interpersonal relationship and conflict management, lifetime learning, motivation to excellence, writing communication, diversity and multiculturality, oral expression, adaptation and flexibility, decision making, problem analysis and problem-solving, leadership, planning and organisation, risk assumption, time management, creativity and innovation, foreign language mastery, communication and information technologies, competencies of the specific area of knowledge, and ability of conceptualise. The scale has 21 items and students were invited to answer on a five-point Likert scale from (1) *Not confident at all* to (5) *Totally confident*. The scale had a Cronbach alpha of 0.887 for February and of 0.873 for May which can be seen in Appendix 1 and is considered very adequate according to Nunnally (1978, pp. 245-246). The original scale has three factors for which we named self-efficacy in transversal competencies, self-efficacy in professional competencies, and self-efficacy in technical competencies. Following the diversified factorial analysis, the internal consistency for the dimension of self-efficacy in technical competencies in May was very low (Cronbach alpha of 0.486), but with the removal of item 19 the Cronbach alpha of this dimension increased to 0.609.

3.3. Sample

The questionnaire was answered by students pre and post intervention of classes of PSC II. In the pre-test, 304 answers were collected, 41.45% from management and 58.55% from economics students, while in the post-test only 228 students answered the questionnaire, with 35.53% being from the bachelor of economics, 44.74% from the bachelor of management, and 19.74% being from one or another – students have not clarified the course.

The final sample and the one being used further to analysis is composed by students who answered the questionnaire in both pre and post-test and consists in 165 students, from whom 46.06% are from economics and 53.94% are from management. The method used to be able to match students of pre-test and post-test and still maintain the anonymity of students was codification. Each student created his/her own code according to instructions and codes were matched.

Table 6 shows the demographics of the two groups (economics and management students) as well as of the total sample.

Table 6 – Sample Demographics

	Economics Students				Management Students				Total			
	n	%	*Mean*	*SD*	*n*	%	*Mean*	*SD*	*n*	%	*Mean*	*SD*
Age	76		19.96	1.51	89		19.72	1.22	165		19.83	1.36
Gender												
Female	44	26.7%			54	32.7%			98	59.4%		
Male	32	19.4%			35	21.2%			67	40.6%		
Father Education												
Non-HE	38	23.5%			61	37.7%			99	61.1%		
HE	35	21.6%			28	17.3%			63	38.9%		
Mother Education												
Non-HE	29	18.0%			53	32.9%			82	50.9%		
HE	44	27.3%			35	21.7%			79	49.1%		
Family Net Monthly Income												
Lower than 1.000€	5	3.2%			16	10.4%			21	13.6%		
Between 1.000€-2.000€	24	15.6%			34	22.1%			58	37.7%		
Higher than 2.000€	40	26.0%			35	22.7%			75	48.7%		
Number of Siblings	76		.93	.79	89		1.22	.86	165		1.09	.84
Present Residence												
Porto Area	53	33.3%			65	40.9%			118	74.2%		
Other	20	12.6%			21	13.2%			41	25.8%		
Previous Residence												
Other in PTG	22	14.9%			30	20.3%			52	35.1%		
The same	42	28.4%			47	31.8%			89	60.1%		
Foreign residence	4	2.7%			3	2.0%			7	4.7%		
Number of Spoken Foreign Languages	76		1.13	.64	89		1.05	.60	165		1.08	.62
GPA	76		13.84	1.78	89		14.06	1.64	165		13.96	1.70
ECAS	76		2.65	1.57	89		2.92	1.59	165		2.80	1.58
Work Experience (in months)	76		.39	2.81	89		3.52	10.06	165		2.04	7.71
Previous International Experience (in months)	76		.15	.40	89		.15	.42	165		.15	.41

Source: author own elaboration

Of the 165 inquired students, 76 were from the bachelor of economics while 89 were from the bachelor of management.

The mean age of the sample is 19.83 years, with economics having a higher mean and standard deviation which means that the bachelor of economics has students with more dispersed ages, i.e. more older students.

Regarding gender, 59.4% (n = 98) of students were female, from which 26.7% (n = 44) were from economics and 32.7% (n = 54) were from management. Male students represent 40.6% of the sample (n = 67) with 19.4% (n = 32) from economics and 21.2% (n = 35) from management.

In terms of fathers' and mothers' education, the majority of students' parents did not have higher education (fathers with no higher education n = 99, 61.1%; and mothers with no higher education n = 82, 50.9%). Management students had higher percentages of parents with no higher education (fathers n = 61, 37.7%; and mothers n = 53, 32.9%)

while economics students had higher percentages of parents with higher education (fathers with higher education n = 35, 21.6%; and mothers with higher education n = 44, 27.3%).

Relatively to family net monthly income, the majority of students families had more than 2000€ per month of income (n = 75, 48.7%) and only a small percentage had less than 1000€ of net monthly income (n = 21, 13.6%). Economics students had higher levels of family net monthly income (economics students with more than 2000€/month = 40, 26.6%; management students with more than 2000€/month = 35, 22.7%) and management students had a higher percentage of lower levels of family net monthly income (management students with less than 1000€/month n = 16, 10.4%; economics students with less than 1000€/month n = 5, 3.2%).

The mean of the number of siblings was 1.09, which means that, on average, each student has at least one sibling and management students are the ones contributing to that with a mean number of siblings of 1.22.

The majority of students lived in the Porto area during their faculty period, so they lived relatively close to FEP (n = 118, 74.2%), but 39.8% (n = 59) of students did not live in Porto before they started their higher education course in FEP – 35.1% (n = 52) lived in other areas of Portugal and 4.7% (n = 7) lived abroad.

The mean of the number of spoken foreign languages is 1.08, which means that besides Portuguese, on average, each student can speak at least one foreign language.

Regarding grade point average (GPA), the sample inquired has a good mean, which is 13.96 values out of 20.

In terms of extra-curricular activities, on average, each student had 2.80 activities and these include being or having been in a student organisation, being or having been connected to volunteering actions, being or having been involved with sports activities, having or having had hobbies like sports' coaching, music, dance, reading, among others.

In spite of students being young in FEP (mean age = 19.83 years), some students already have some work experience. It was noticed that management students had more work experience in months (mean = 3.52, SD = 10.06) than economics students (mean = 0.39, SD = 2.81).

Relatively to international experiences students may have had, the mean was 0.15 months for management, economics and the overall students. It is important to note that the opportunity that FEP gives to its bachelor students of having an international

experience like Erasmus+ or other international mobility is mostly offered in the third year of the program, so the inquired students did not have this opportunity yet.

3.4. Data analysis

In order to be able to analyse the research question of the study, all questionnaires' answers were manually inserted into the Statistical Package for the Social Sciences (SPSS) and all statistics were performed using this software.

Reliability analysis for each scale was computed and the Cronbach alphas are reported in Appendix 1.

Descriptive statistics were run to analyse the sample, t-tests were made to determine if there are demographic differences between economics and management students, and correlations using Spearman's ordinal correlation coefficient were conducted to analyse the association between numeric and categorical ordinal demographic variables – Table 7.

For the 3 scales of measures, correlations using Pearson's correlation coefficient were computed – Tables 8 and 9.

Statistical significance was considered for Pearson's and Spearman's tests for *p-values* lower than 0.05 and lower than 0.01 ($*p < .05$, $**p < .01$). According to Pestana and Gageiro (2008), different studies show that parametric methods are strong against the normality assumption when absolute values of skewness are lower than three and absolute values of kurtosis are lower than 7-10, which were the case in this study.

Means and standard deviations were also calculated regarding the numeric variables – Table 10 – and t-tests were computed to analyse if there are significant differences in means between courses and to evaluate the evolution of students competencies' levels from pre to post-test – Tables 11 and 12.

Multivariate analysis of covariance for the three scales was carried out including demographic variables as covariates to see if there are differences between groups and within groups regarding variances and to understand the variables explaining those differences – Tables 13, 14 and 15.

Finally, multiple linear regressions were made to understand the extent to which demographic variables, the course of economics or management, the PsyCap, and the EI of a student explain his or her level of non-technical competencies – Table 16.

4. Results

The main research question aims to understand if non-technical competencies can be developed through time and through the intervention of classes of PSC.

4.1. Correlational analysis

Correlations between demographic variables were run and, as we can see from Table 7, age is positively and strongly correlated with the number of foreign languages spoken (r = 0.231; $p < 0.01$) and with work experience (r = 0.334; $p < 0.001$) and negatively and strongly correlated with GPA (r = - 0.292; $p < 0.001$), which means that the older the students, the higher the number of foreign languages spoken, the higher the number of months of work experience, and the lower the GPA. Nationality is positively and strongly associated with international experience (r = 0.467; $p < 0.001$), which means that students who are not Portuguese tend to have more international experience. Fathers' education is also positively and strongly associated with mothers' education (r = 0.398; $p < 0.001$) and has a positive significant association with the students' nationality (r = 0.169; $p < 0.05$) and with the residence of students before entering higher education (r = 0.197; $p < 0.05$) and a negative significant association with students' work experience (r = - 0.188; $p < 0.05$), which means that students' with fathers with no higher education tend to remain in the family's residence when entering the university and tend to have more work experience and that students who are not Portuguese tend to have fathers with higher education. Family net monthly income has a positive strong association with both fathers' and mothers' education (r = 0.381; $p < 0.001$ | r = 0.438; $p < 0.001$) and a positive significant association with the number of foreign languages spoken by students (r = 0.174; $p < 0.05$), so students with a higher family net monthly income tend to have parents with higher education and to speak more foreign languages. Extra-curricular activities have a positive significant association with the number of foreign languages students speak (r = 0.180; $p < 0.05$) and with the extent of students' international experience (r = 0.211; $p < 0.05$), meaning that students with more extra-curricular activities speak more foreign languages and have more international experience. The past residence is positively and strongly associated with the present residence of students (r = 0.480; $p < 0.001$) which translates to students who lived

in Porto remained in Porto and students from outside of Porto tended to remain living outside of the Porto area.

To determine demographic differences between groups (economics vs management students), several t-tests for equality of means were run, which confirmed that the groups differed regarding fathers' education (t = 2.159, p =.032), mothers' education (t = 2.630, p = .009), family net monthly income (t = 2.089, p =.038), number of siblings (t = -2.242, p =.026), and work experience (t = -2.583, p =.011). In general, economics students seem to be from families in which both parents are highly educated and have a higher net monthly income, while, comparatively, management students seem to have more siblings and more work experience.

Table 7 – Associations between demographic variables

Demographic Variables	*N*	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	165	19.83	1.36		0.121	0.066	-0.119	-0.018	0.022	0.231**	-0.092	-0.292***	-0.037	0.007	0.021	0.334***	0.148
2. Gender	165	0.41	0.49			0.019	0.076	0.003	0.048	0.059	0.064	-0.032	0.057	-0.108	0.037	-0.051	0.120
3. Nationality	165	0.05	0.23				.169*	.119	.123	.130	.089	-.111	-.002	.136	-.134	.059	.467***
4. Father Education	162	0.39	0.49					.398***	.381***	-.021	.108	-.087	.152	.154	.197*	-.188*	.159
5. Mother Education	161	0.49	0.50						.438***	.122	.101	-.145	.127	.231**	-.005	-.129	.054
6. Family Income	154	0.49	0.50							.174*	.106	-.143	.107	-.012	-.092	-.089	.039
7. Foreign Languages	154	1.08	0.62								.044	-.011	.180*	.026	-.036	.018	.013
8. Siblings	165	1.09	0.84									-.105	.083	-.015	-.186*	.028	.042
9. GPA	163	13.96	1.71										-.122	-.085	-.009	-.042	-.065
10. ECAs	161	2.80	1.58											.085	-.019	.012	.211*
11. Present residence	159	0.74	0.44												.480***	-.028	.095
12. Past residence	158	0.41	0.49													-.076	-.087
13. Work experience	157	2.04	7.71														.019
14. International Experience	148	0.15	0.41														

Notes: *Spearman's Rho* measures of association. Gender (dummy coded 0 = female, 1 = male), Nationality (dummy coded 0 = Portuguese, 1 = other), Father Education (dummy coded 0 = no higher education, 1 = higer education), Mother Education (dummy coded 0 = no higher education, 1 = higer education), Family Income (dummy coded 0 = equal or lower than 2000€, 1 = higher than 2000€), Present residence (dummy coded 0 = other, 1 = Porto area), Past residence (dummy coded 0 = other, 1 = Porto area)

*p < .05. **p < .01. ***p < .001. n = 165

Source: author own elaboration

In terms of the scales assessed, as aforementioned, the answers for psychological capital were on a six-point Likert-scale from (1) *Strongly disagree* to (6) *Strongly agree*, the answers for emotional intelligence were on a seven-point Likert scale from (1) *The statement does not apply to me at all* to (7) *The statement applies to me completely*, and the answers for self-efficacy in transversal and professional competencies were on a five-point Likert scale from (1) *Not confident at all* to (5) *Totally confident*.

Correlations for the dependent variables for pre-test and post-test were computed and are shown in Tables 8 and 9.

In the pre-test, psychological capital is positively and strongly correlated with its dimensions – self-efficacy ($r = 0.792$; $p < 0.001$), hope ($r = 0.840$; $p < 0.001$), resilience ($r = 0.811$; $p < 0.001$), and optimism ($r = 0.767$; $p < 0.001$) –, with emotional intelligence ($r = 0.462$; $p < 0.001$) and its dimensions of emotional self-control ($r = 0.270$; $p < 0.01$), of self-encouragement ($r = 0.537$; $p < 0.001$), and of understanding own emotions ($r = 0.366$; $p < 0.001$), and with self-efficacy in transversal and professional competencies ($r = 0.579$; $p < 0.001$) and all its dimensions – self-efficacy in transversal competencies ($r = 0.534$; $p < 0.001$), self-efficacy in professional competencies ($r = 0.559$; $p < 0.001$), and self-efficacy in technical competencies ($r = 0.338$; $p < 0.001$) –, which means that students with higher levels of PsyCap have higher levels of the dimensions and overall scales mentioned above. Still in the pre-test, emotional intelligence is positively and strongly correlated with all its dimensions – empathy ($r = 0.519$; $p < 0.001$), self-control against criticism ($r = 0.660$; $p < 0.001$), emotional self-control ($r = 0.445$; $p < 0.001$), self-encouragement ($r = 0.520$; $p < 0.001$), understanding own emotions ($r = 0.712$; $p < 0.001$), and understanding others' emotions ($r = 0.503$; $p < 0.001$) –, with psychological capital and its dimensions – self-efficacy ($r = 0.315$; $p < 0.001$), hope ($r = 0.267$; $p < 0.01$), resilience ($r = 0.461$; $p < 0.001$), and optimism ($r = 0.456$; $p < 0.001$) –, and with self-efficacy in transversal and professional competencies ($r = 0.454$; $p < 0.001$) and its dimensions of self-efficacy in transversal competencies ($r = 0.562$; $p < 0.001$) and of self-efficacy in professional competencies ($r = 0.338$; $p < 0.001$), having a positive significant correlation with the dimension of self-efficacy in technical competencies ($r = 0.168$, $p < 0.05$), so students with higher levels of emotional intelligence have higher levels of the dimensions of EI and of all the other scales and their dimensions. Also in the pre-test, self-efficacy in transversal and professional competencies is positively and strongly correlated with its dimensions – self-efficacy in transversal competencies ($r = 0.921$; $p < 0.001$), self-efficacy in professional competencies

($r = 0.874$; $p < 0.001$), and self-efficacy in technical competencies ($r = 0.734$; $p < 0.001$) –, with PsyCap and its dimensions – self-efficacy ($r = 0.547$; $p < 0.001$), hope ($r = 0.453$; $p < 0.001$), resilience ($r = 0.481$; $p < 0.001$), and optimism ($r = 0.370$; $p < 0.001$) –, and with emotional intelligence and its dimenions of emotional self-control ($r = 0.238$; $p < 0.01$), of self-encouragement ($r = 0.410$; $p < 0.001$), of understanding own emotions ($r = 0.375$; $p < 0.001$), and of understanding others' emotions ($r = 0.317$; $p < 0.001$), having also a positive significant correlation with empathy ($r = 0.176$; $p < 0.05$), meaning that students with higher levels of ACT-prof have higher levels of the overall scales and dimensions mentioned previously. In terms of internal correlations in scales, in the pre-test, all dimensions of PsyCap were positively and strongly correlated with each other – self-efficacy with hope ($r = 0.601$; $p < 0.001$), self-efficacy with resilience ($r = 0.510$; $p < 0.001$), self-efficacy with optimism ($r = 0.413$; $p < 0.001$), hope with resilience ($r = 0.577$; $p < 0.001$), hope with optimism ($r = 0.497$; $p < 0.001$), and resilience with optimism ($r = 0.514$; $p < 0.001$) –, some dimensions of emotional intelligence were positively and strongly correlated with each other – empathy with self-control against criticism ($r = 0.261$; $p < 0.01$), empathy with understanding others' emotions ($r = 0.487$; $p < 0.001$), self-control against criticism with self-encouragement ($r = 0.205$; $p < 0.01$), self-control against criticism and understanding others' emotions ($r = 0.218$; $p < 0.01$), emotional self-control with understanding own emotions ($r = 0.266$; $p < 0.01$), self-encouragement and understanding own emotions ($r = 0.289$; $p < 0.001$), and understanding own emotions with understanding others' emotions ($r = 0.235$; $p < 0.01$) –, some other dimensions of emotional intelligence had also positive significant correlations with each other – empathy with self-encouragement ($r = 0.176$; $p < 0.05$), self-control against criticism with emotional self-control ($r = 0.193$; $p < 0.05$), self-control against criticism with understanding own emotions ($r = 0.195$; $p < 0.05$), and self-encouragement with understanding others' emotions ($r = 0.155$; $p < 0.05$) –, and all dimensions of self-efficacy in transversal and professional competencies were positively and strongly correlated with each other – self-efficacy in transversal competencies with self-efficacy in professional competencies ($r = 0.693$; $p < 0.001$) and with self-efficacy in technical competencies ($r = 0.553$; $p < 0.001$), and self-efficacy in professional competencies with self-efficacy in technical competencies ($r = 0.493$; $p < 0.001$). There are also positive and strong correlations between dimensions of one scale with dimensions of another scale which can be seen in Table 8.

Correlations in the post-test have some similarities with the ones which occurred in the pre-test but differs to some extent. In the post-test, for example, the dimension of self-efficacy in technical competencies of ACT-prof shows no correlation with any of the other variables except with the overall scale of ACT-prof ($r = 0.513$; $p < 0.001$), which was not the case in the pre-test. Also, the dimension of empathy of EI did not show any significant correlations with PsyCap and its dimensions in pre-test but in the post-test it showed positive strong correlations with the overall scale ($r = 0.220$; $p < 0.01$) and with self-efficacy ($r = 0.222$; $p < 0.01$) and positive significant correlations with hope ($r = 0.155$; $p < 0.05$) and with resilience ($r = 0.196$; $p < 0.05$). There are also some other changes that can be seen from observing Tables 8 and 9.

Table 8 – Correlations between dependent variables in the pre-test

Pre-test_ Main Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Self-Efficacy	4.29	0.75		0.601***	0.510***	0.413***	0.792***	0.059	0.089	0.101	0.361***	0.279***	0.182*	0.315***	0.489***	0.529***	0.368***	0.547***
2. Hope	4.01	0.75			0.577***	0.497***	0.840***	0.002	-0.031	0.133	0.499***	0.222**	0.109	0.267**	0.379***	0.464***	0.297***	0.453***
3. Resilience	4.05	0.84				0.514***	0.811***	0.132	0.145	0.323***	0.397***	0.389***	0.120	0.461***	0.469***	0.463***	0.236**	0.481***
4. Optimism	3.89	0.91					0.767***	0.082	0.234**	0.323***	0.470***	0.287***	0.083	0.456***	0.382***	0.328***	0.190*	0.370***
5. PsyCap (Overall)	4.06	0.65						0.094	0.123	0.270**	0.537***	0.366***	0.147	0.462***	0.534***	0.559***	0.338***	0.579***
6. Empathy	5.79	0.80							0.261**	-0.013	0.176*	0.140	0.487***	0.519***	0.277**	0.140	-0.038	0.176*
7. Self-control against criticism	5.19	1.03								0.193*	0.205**	0.195*	0.218**	0.660***	0.215***	0.006	-0.051	0.084
8. Emotional self-control	4.54	1.21									0.001	0.266**	-0.024	0.445***	0.259**	0.137	0.196*	0.238**
9. Self-encouragement	5.74	1.12										0.289***	0.155*	0.52***	0.415***	0.429***	0.135	0.410***
10. Understanding own emotions	5.20	1.14											0.235**	0.712***	0.399***	0.290***	0.237**	0.375***
11. Understanding others emotions	5.91	0.78												0.503***	0.427***	0.190*	0.069	0.317***
12. EI_Emotional Inteligence (Overall)	5.38	0.59													0.562***	0.338***	0.168*	0.454***
13. Self-efficacy in transversal competencies	3.79	0.56														0.693***	0.553***	0.921***
14. Self-efficacy in professional competencies	3.44	0.64															0.493***	0.874***
15. Self-efficacy in technical competencies	3.37	0.73																0.734***
16. ACT_Self-efficacy in competencies (Overall)	3.59	0.53																

*p < .05. **p < .01. *p < .001. n = 165

Source: author own elaboration

Table 9 – Correlations between dependent variables in post-test

Post-test_ Main Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Self-Efficacy	4.53	0.71		0.668***	0.570***	0.475***	0.816***	0.222**	0.041	0.238**	0.457***	0.382***	0.167*	0.382***	0.303***	0.542***	0.073	0.386***
2. Hope	4.12	0.84			0.652***	0.564***	0.869***	0.155*	0.083	0.303***	0.604***	0.354***	0.121	0.423***	0.199*	0.578***	0.051	0.325***
3. Resilience	4.21	0.81				0.572***	0.823***	0.196*	0.136	0.517***	0.501***	0.383***	0.111	0.499***	0.190*	0.543***	0.089	0.359***
4. Optimism	4.09	0.97					0.795***	0.133	0.169*	0.338***	0.482***	0.375***	0.132	0.461***	0.280***	0.451***	0.011	0.320***
5. PsyCap (Overall)	4.27	0.68						0.220**	0.145	0.394***	0.616***	0.424***	0.158*	0.523***	0.285***	0.625***	0.064	0.406***
6. Empathy	5.73	0.78							0.042	0.060	0.261**	0.053	0.516***	0.387***	0.199*	0.120	0.113	0.231**
7. Self-control	5.28	1.81								0.063	0.145	0.138	0.108	0.697***	0.059	0.086	0.009	0.059
8. Emotional self-control	4.41	1.22									0.134	0.339***	0.069	0.444***	0.115	0.260**	0.017	0.187*
9. Self-encouragement	5.69	1.11										0.306***	0.326***	0.538***	0.231**	0.447***	0.073	0.313***
10. Understanding own emotions	5.04	1.15											0.236**	0.635***	0.230**	0.276***	0.059	0.274***
11. Understanding others emotions	5.82	0.76												0.483***	0.146	0.176*	0.053	0.158*
12. EI_Emotional Inteligence (Overall)	5.32	0.68													0.255**	0.356***	0.076	0.313***
13. Self-efficacy in transversal competencies	3.99	1.79														0.344***	0.001	0.834***
14. Self-efficacy in professional competencies	3.44	0.70															0.056	0.513***
15. Self-efficacy in technical competencies	3.66	2.69																0.513***
16. ACT_Self-efficacy in competencies (Overall)	3.72	1.03																

*p < .05. **p < .01. *p < .001. n = 165

Source: author own elaboration

4.2. Differences between and within groups

First, by looking at the means and standard deviations obtained for the overall scales as well as their dimensions presented in Table 10, both in pre-test and in post-test management students report higher psychological capital levels than economics students. In terms of emotional intelligence, both in pre and post-test, management students have higher levels of the overall scale and of the empathy, self-encouragement, and understanding own emotions dimensions. Still regarding EI, in the pre-test, management students report higher levels of self-control against criticism while economics students have higher levels of emotional self-control and understanding others' emotions and, in the post-test, management students report higher levels of emotional self-control and of understanding others' emotions while economics students have higher levels of self-control against criticism. Relatively to the self-efficacy in transversal and professional competencies scale, both in pre and post-test, management students demonstrate higher levels of self-efficacy in transversal competencies and self-efficacy in professional competencies while economics students have higher levels of self-efficacy in technical competencies and in the overall scale.

However, these differences in means are not sufficient to state that there are significant differences among groups. For this purpose independent samples t-tests were made to understand if, in each period of time, students of management and of economics presented significant differences relative to the measures assessed – Table 11.

Regarding the course, in the pre-test, management students have significantly higher levels of the overall PsyCap (t = - 2.495; df = 157; p = 0.014), of the dimension of optimism of PsyCap (t = - 2.932 ; df = 162; p = 0.004), of the overall scale of EI (t = - 2.016; df = 160; p = 0.046), and of dimensions of self-control against criticism (t = - 2.516 ; df = 162; p = 0.013), and of self-encouragement (t = - 3.817; df = 163; p = 0.000) of EI when compared to economics students. In the post-test, management students present significantly higher levels of the overall PsyCap (t = - 3.676; df = 157; p = 0.000) and all its dimensions – self-efficacy (t = - 3.247; df = 162; p = 0.001), hope (t = - 2.482; df = 161; p = 0.014), resilience (t = - 2.635; df = 159; p = 0.009) and optimism (t = - 3.157; df = 163; p = 0.002) – as well as higher levels of the dimension of self-encouragement from EI (t = - 2.985; df = 163; p = 0.003) when compared to economics students.

Now, if we see the evolution of the variables from pre to post-test in terms of means – Table 10 –, both management and economics students increased their levels of psychological capital and its internal dimensions, but for emotional intelligence, the results are far from being the same. Both management and economics students decreased their levels of emotional intelligence except for dimensions of self-control against criticism and self-encouragement for economics students and of emotional self-control for management students. It is important to note that in spite of this decrease, management students maintained higher mean levels of EI for the overall scale and all the dimensions except self-control against criticism in post-test when compared with economics students. Regarding self-efficacy in transversal and professional competencies, management students increased their levels for the overall scale and all the internal dimensions while economics students increased only levels of self-efficacy in transversal competencies and self-efficacy in technical competencies, maintaining the level for the overall scale and decreasing for the dimension of self-efficacy in professional competencies.

Nonetheless, in terms of significant differences in the evolution of competencies, paired samples t-tests were conducted since by the means' analysis one cannot conclude if the differences presented are significant. T-tests determined whether measures' levels had significantly changed from the beginning to the end of the semester for each course – Table 12.

After the intervention, management students significantly improved their levels of PsyCap for all the dimensions – self-efficacy (t = - 6.086; df = 86; p = 0.000), hope (t = - 2.413; df = 85; p = 0.018), resilience (t = - 2.619; df = 85; p = 0.010), and optimism (t = - 3.065; df = 87; p = 0.003) – and the overall scale (t = - 5.510; df = 80; p = 0.000), while economics students showed no improvements, except for the dimension of optimism (t = - 1.977; df = 75; p = 0.052). Regarding EI, for the overall scale neither of the groups showed significant improvements in the levels of emotional intelligence, but management students decreased significantly levels of self-control against criticism (t = 2.376; df = 88; p = 0.020) and economics students decreased significantly levels of emotional self-control (t = 2.710; df = 75; p = 0.008) and of understanding own emotions (t = 2.043; df = 74; p = 0.045). Scale of ACT showed no significant changes from pre-test to post-test.

Table 10 – Means and standard deviations

Research Variables	Pre-test									Post-test								
	Economics			Management			Overall			Economics			Management			Overall		
	N	M	SD	*N*	M	SD	*N*	M	SD	*N*	M	SD	*N*	M	SD	*N*	M	SD
Self-Efficacy	75	4.19	0.91	88	4.37	0.57	163	4.29	0.75	76	4.34	0.84	88	4.69	0.54	164	4.53	0.71
Hope	75	3.88	0.83	88	4.11	0.66	163	4.01	0.75	76	3.95	0.95	87	4.27	0.70	163	4.12	0.84
Resilience	76	3.93	0.94	88	4.17	0.74	164	4.05	0.84	74	4.03	0.90	87	4.37	0.70	161	4.21	0.81
Optimism	76	3.67	0.88	88	4.08	0.89	164	3.89	0.91	76	3.84	0.99	89	4.31	0.91	165	4.09	0.97
PsyCap (Overall)	74	3.92	0.74	85	4.17	0.54	159	4.06	0.65	74	4.06	0.78	85	4.44	0.51	159	4.27	0.68
Empathy	76	5.77	0.80	88	5.80	0.80	164	5.79	0.80	76	5.67	0.85	89	5.79	0.72	165	5.73	0.78
Self-control against criticism	75	4.97	1.07	89	5.37	0.96	164	5.19	1.03	76	5.37	2.47	89	5.20	0.94	165	5.28	1.81
Emotional self-control	76	4.61	1.21	89	4.47	1.22	165	4.54	1.21	76	4.31	1.31	89	4.50	1.13	165	4.41	1.22
Self-encouragement	76	5.39	1.23	89	6.03	0.91	165	5.74	1.12	76	5.42	1.25	89	5.93	0.91	165	5.69	1.11
Understanding own emotions	75	5.12	1.24	89	5.26	1.05	164	5.20	1.14	76	4.90	1.36	89	5.16	0.93	165	5.04	1.15
Understanding others emotions	76	5.94	0.82	89	5.89	0.75	165	5.91	0.78	76	5.77	0.83	89	5.85	0.71	165	5.82	0.76
EI_Emotional Inteligence (Overall)	74	5.28	0.62	88	5.46	0.56	162	5.38	0.59	76	5.24	0.82	89	5.38	0.54	165	5.32	0.68
Self-efficacy in transversal competencies	76	3.77	0.65	89	3.81	0.47	165	3.79	0.56	76	3.83	0.61	89	4.13	2.37	165	3.99	1.79
Self-efficacy in professional competencies	76	3.40	0.70	88	3.47	0.59	164	3.44	0.64	76	3.38	0.73	88	3.49	0.67	164	3.44	0.70
Self-efficacy in technical competencies	76	3.45	0.72	87	3.30	0.73	163	3.37	0.73	76	4.04	3.87	89	3.33	0.69	165	3.66	2.69
ACT-prof_Self-efficacy in competencies (Overall)	76	3.72	0.86	87	3.59	0.46	163	3.59	0.53	76	3.72	0.86	88	3.71	1.16	164	3.72	1.03

Source: author own elaboration

Table 11 – Course effect

Independent-Samples t-tests

Research Variables	Pre-test							Post-test						
	Economics		Management		*t*	*df*	*p*	Economics		Management		*t*	*df*	*p*
	M	SD	M	SD				M	SD	M	SD			
Self-Efficacy	4.19	0.91	4.37	0.57	-1.537	161	0.126	4.34	0.84	4.69	0.54	-3.247	162	0.001
Hope	3.88	0.83	4.11	0.66	-1.930	161	0.055	3.95	0.95	4.27	0.70	-2.482	161	0.014
Resilience	3.93	0.94	4.17	0.74	-1.826	162	0.070	4.03	0.90	4.37	0.70	-2.635	159	0.009
Optimism	3.67	0.88	4.08	0.89	-2.932	162	0.004	3.84	0.99	4.31	0.91	-3.157	163	0.002
PsyCap (Overall)	3.92	0.74	4.17	0.54	-2.495	157	0.014	4.06	0.78	4.44	0.51	-3.676	157	0.000
Empathy	5.77	0.80	5.80	0.80	-0.227	162	0.821	5.67	0.85	5.79	0.72	-0.917	163	0.361
Self-control against criticism	4.97	1.07	5.37	0.96	-2.516	162	0.013	5.37	2.47	5.20	0.94	0.629	163	0.530
Emotional self-control	4.61	1.21	4.47	1.22	0.726	163	0.469	4.31	1.31	4.50	1.13	-0.982	163	0.328
Self-encouragement	5.39	1.23	6.03	0.91	-3.817	163	0.000	5.42	1.25	5.93	0.91	-2.985	163	0.003
Understanding own emotions	5.12	1.24	5.26	1.05	-0.786	162	0.433	4.90	1.36	5.16	0.93	-1.473	163	0.143
Understanding others emotions	5.94	0.82	5.89	0.75	0.388	163	0.699	5.77	0.83	5.85	0.71	-0.686	163	0.493
EI_Emotional Inteligence (Overall)	5.28	0.62	5.46	0.56	-2.016	160	0.046	5.24	0.82	5.38	0.54	-1.307	163	0.193
Self-efficacy in transversal competencies	3.77	0.65	3.81	0.47	-0.499	163	0.619	3.83	0.61	4.13	2.37	-1.081	163	0.281
Self-efficacy in professional competencies	3.40	0.70	3.47	0.59	-0.738	162	0.461	3.38	0.73	3.49	0.67	-0.950	162	0.344
Self-efficacy in technical competencies	3.45	0.72	3.30	0.73	1.277	161	0.203	4.04	3.87	3.33	0.69	1.704	163	0.090
ACT-prof_Self-efficacy in competencies (Overall)	3.72	0.86	3.59	0.46	-0.085	161	0.933	3.72	0.86	3.71	1.16	0.049	162	0.961

n = 161-164

Source: author own elaboration

Table 12 – Time effect

Paired-Samples t-tests

Research Variables	Economics							Management						
	Pre-test		Post-test		*t*	*df*	*p*	Pre-test		Post-test		*t*	*df*	*p*
	M	SD	M	SD				M	SD	M	SD			
Self-Efficacy	4.19	0.91	4.34	0.84	-1.764	74	0.082	4.37	0.57	4.69	0.54	-6.086	86	0.000
Hope	3.88	0.83	3.95	0.95	-0.554	74	0.582	4.11	0.66	4.27	0.70	-2.413	85	0.018
Resilience	3.93	0.94	4.03	0.90	-1.094	73	0.278	4.17	0.74	4.37	0.70	-2.619	85	0.010
Optimism	3.67	0.88	3.84	0.99	-1.977	75	0.052	4.08	0.89	4.31	0.91	-3.065	87	0.003
PsyCap (Overall)	3.92	0.74	4.06	0.78	-1.895	71	0.062	4.17	0.54	4.44	0.51	-5.510	80	0.000
Empathy	5.77	0.80	5.67	0.85	1.430	75	0.157	5.80	0.80	5.79	0.72	0.053	87	0.958
Self-control against criticism	4.97	1.07	5.37	2.47	-1.456	74	0.150	5.37	0.96	5.20	0.94	2.376	88	0.020
Emotional self-control	4.61	1.21	4.31	1.31	2.710	75	0.008	4.47	1.22	4.50	1.13	-0.247	88	0.806
Self-encouragement	5.39	1.23	5.42	1.25	-0.241	75	0.810	6.03	0.91	5.93	0.91	1.608	88	0.111
Understanding own emotions	5.12	1.24	4.90	1.36	2.043	74	0.045	5.26	1.05	5.16	0.93	1.175	88	0.243
Understanding others emotions	5.94	0.82	5.77	0.83	1.904	75	0.061	5.89	0.75	5.85	0.71	0.464	88	0.644
EI_Emotional Inteligence (Overall)	5.28	0.62	5.24	0.82	0.372	73	0.711	5.46	0.56	5.38	0.54	1.878	87	0.064
Self-efficacy in transversal competencies	3.77	0.65	3.83	0.61	-1.065	75	0.290	3.81	0.47	4.13	2.37	-1.314	88	0.192
Self-efficacy in professional competencies	3.40	0.70	3.38	0.73	0.239	75	0.812	3.47	0.59	3.49	0.67	-0.184	86	0.854
Self-efficacy in technical competencies	3.45	0.72	4.04	3.87	-1.301	75	0.197	3.30	0.73	3.33	0.69	-0.178	86	0.860
ACT_Self-efficacy in competencies (Overall)	3.72	0.86	3.72	0.86	-1.303	75	0.196	3.59	0.46	3.71	1.16	-0.980	85	0.330

n = 153-165

Source: author own elaboration

Finally, multivariate analysis of covariance for each of the scales incorporating the demographics as covariates were also performed and are presented in Tables 13, 14, and 15. This analysis compares sample variances while t-tests compared means.

Table 13 – Multivariate analysis of covariance for Psychological Capital

Summary of multivariate analysis of covariance for the dimensions of PsyCap for each group after incorporating the participants demographics as covariates.

Effects Between Conditions	PsyCap						
	N	M	SD	*df*	*F*	*p*	η_p^2
Diferences between groups: Pre-test							
Economics	57	3.93	0.75	15	1.356	0.184	0.166
Management	61	4.18	0.56				
Diferences between groups: Post-Test							
Economics	58	4.03	0.83	15	2.088	0.016	0.233
Management	61	4.42	0.51				
Differences within groups: Economics							
Pre-test (B)	56	3.94	0.76	1	0.278	0.601	0.007
Post test (D)	56	4.02	0.84				
Differences within groups: Management							
Pre-test (A)	59	4.18	0.57	1	2.783	0.102	0.059
Post-test (C)	59	4.43	0.51				

M average, *SD* standard deviation, *F* F ratio, *df* degrees of freedom, *p* significance level, ηp^2 partial eta squared effect size. All values were computed for the corrected model.

Source: author own elaboration

Regarding PsyCap, as we can see from Table 13, there were no significant differences between groups at the beginning of the semester but there were significant differences between economics and management students at the end of the semester, with management students having higher levels of the overall PsyCap as well as of the dimension of optimism.

It is important to note that, in the pre-test, PsyCap is not explained by the course choice, but by demographic variables, particularly the GPA of students ($F = 4.027$; $p = 0.047$; $\eta p^2 = 0.038$) and their work experience ($F = 4.084$; $p = 0.046$; $\eta p^2 = 0.039$). In terms

of its dimensions, neither of them is explained by the course choice of bachelor. Self-efficacy is explained by fathers' education (F = 9.969; p = 0.002; ηp^2 = 0.089), hope is explained by students' GPA (F = 14.319; p = 0.000; ηp^2 = 0.123) and by the duration of their work experience (F = 7.113; p = 0.009; ηp^2 = 0.065), and optimism is explained by the duration of students' work experience (F = 4.851; p = 0.030; ηp^2 = 0.045). Resilience is not explained by any of the variables.

In the post-test, PsyCap is explained by the GPA (F = 4.171; p = 0.044; ηp^2 = 0.039), by the duration of the work experience (F = 4.165; p = 0.044; ηp^2 = 0.039), and by the course choice (F = 5.507; p = 0.021; ηp^2 = 0.051). With regard to its dimensions, self-efficacy is explained by the GPA (F = 7.020; p = 0.009; ηp^2 = 0.064), hope is explained by students' GPA (F = 12.030; p = 0.001; ηp^2 = 0.105) and by the work experience of students (F = 8.743; p = 0.004; ηp^2 = 0.078), resilience is explained by the extra-curricular activities (F = 3.880; p = 0.052; ηp^2 = 0.036), and optimism is explained by the course choice (F = 5.924; p = 0.014; ηp^2 = 0.054).

With regard to differences within groups, there were no significant differences within economics and within management students in terms of psychological capital, but management students differed within themselves regarding work experience (F = 3.925; p = 0.054; ηp^2 = 0.082).

Table 14 – Multivariate analysis of covariance for Emotional Intelligence

Summary of multivariate analyses of covariance for the dimensions of PsyCap for each group after incorporating the participants demographics as a covariates.

Effects Between Conditions	EI_Emotional Inteligence						
	N	M	SD	*df*	*F*	*p*	η_p^2
Diferences between groups: Pre-test							
Economics	58	5.26	0.65	15	1.690	0.064	0.196
Management	62	5.47	0.53				
Diferences between groups: Post-Test							
Economics	59	5.22	0.87	15	1.674	0.067	0.192
Management	63	5.39	0.51				
Differences within groups: Economics							
Pre-test (B)	58	5.26	0.65	1	7.442	0.009	0.148
Post-test (D)	58	5.22	0.88				
Differences within groups: Management							
Pre-test (A)	62	5.47	0.53	1	14.961	0.000	0.241
Post-test (C)	62	5.39	0.52				

M average, *SD* standard deviation, *F* F ratio, *df* degrees of freedom, *p* significance level, ηp^2 partial eta squared effect size. All values were computed for the corrected model.

Source: author own elaboration

In terms of the overall scale of emotional intelligence, there are no significant differences between groups both in pre and post-test, but when looking at its dimensions, groups present differences in terms of empathy (F = 2.284; p = 0.008; ηp^2 = 0.248), self-encouragement, (F = 2.178; p = 0.011; ηp^2 = 0.239) and understanding own emotions (F = 1.768; p = 0.049; ηp^2 = 0.203) in pre-test, with management students having higher levels when compared to economics students, and differences in empathy (F = 2.520; p = 0.003; ηp^2 = 0.263), self-control against criticism (F = 2.276; p = 0.008; ηp^2 = 0.244), emotional self-control (F = 1.739; p = 0.054; ηp^2 = 0.197), self-encouragement (F = 1.959; p = 0.025; ηp^2 = 0.217), and understanding others' emotions (F = 2.159; p = 0.012; ηp^2 = 0.234) in post-test, with management students having higher levels except for the dimension of self-control against criticism.

In the pre-test, the overall scale of EI is explained by GPA (F = 9.510; p = 0.003; ηp^2 = 0.084) and the duration of the work experience students have (F = 5.052; p = 0.027; ηp^2 = 0.046). Empathy is explained by gender (F = 9.482; p = 0.003; ηp^2 = 0.084), mothers' education (F = 3.928; p = 0.050; ηp^2 = 0.036), and students' GPA (F = 9.721; p = 0.002; ηp^2 = 0.085). Self-control against criticism is explained by the course choice (F = 5.575; p = 0.020; ηp^2 = 0.051). Emotional self-control is explained by gender (F = 8.521; p = 0.004; ηp^2 = 0.084). Self-encouragement is explained by gender (F = 4.229; p = 0.042; ηp^2 = 0.039) and course choice (F = 7.136; p = 0.009; ηp^2 = 0.064). Understanding own emotions is explained by GPA (F = 11.985; p = 0.001; ηp^2 = 0.103). And understanding others' emotions is explained by gender (F = 5.299; p = 0.023; ηp^2 = 0.048) and duration of work experience (F = 5.304; p = 0.023; ηp^2 = 0.049).

In the post-test, the overall EI is not explained by any demographic variable or the course choice, but its dimensions are. Empathy is explained by gender (F = 12.743; p = 0.001; ηp^2 = 0.107), mothers' education (F = 9.252; p = 0.003; ηp^2 = 0.080), and family net monthly income (F = 6.813; p = 0.010; ηp^2 = 0.060). Self-control against criticism is explained by gender (F = 3.795; p = 0.054; ηp^2 = 0.035), nationality (F = 14.920; p = 0.000; ηp^2 = 0.123), residence previous to higher education experience (F =4.701; p = 0.032; ηp^2 = 0.042), and international experience (F = 6.012; p = 0.016; ηp^2 = 0.054). Emotional self-control is explained by gender (F = 8.552; p = 0.004; ηp^2 = 0.075). Self-encouragement is explained by students' work experience (F = 5.755; p = 0.018; ηp^2 = 0.051). Understanding own emotions is explained by gender (F = 4.841; p = 0.030; ηp^2 = 0.044) and GPA (F = 3.998; p = 0.048; ηp^2 = 0.036). And understanding others' emotions is explained by gender (F = 9.190; p = 0.003; ηp^2 = 0.080), mothers' education (F = 4.582; p = 0.035; ηp^2 = 0.041), and work experience (F = 9.707; p = 0.002; ηp^2 = 0.084).

Regarding analysis within groups for emotional intelligence, economics (F = 7.442; p = 0.009; ηp^2 = 0.148) and management students (F = 14.961; p = 0.000; ηp^2 = 0.241) present differences within each other. From pre to post-test, both groups decreased their levels of EI. Management students also differed in gender (F = 5.228; p = 0.027; ηp^2 = 0.100), GPA (F = 4.885; p = 0.032; ηp^2 = 0.094), and duration of work experience (F = 5.598; p = 0.022; ηp^2 = 0.106), but with bonferroni multiple comparison post-hoc test there were no significant differences among management students (p = 0.107). With regard to EI dimensions and course and demographic variables, empathy showed significant differences

between economics students in terms of course (F = 5.421; p = 0.025; ηp^2 = 0.110) and mothers' education (F = 3.918; p = 0.054; ηp^2 = 0.82), but had a multiple comparison Bonferroni test with no significant differences (p = 0.204), and showed significant differences between management students with regard to course (F = 14.320; p = 0.000; ηp^2 = 0.234), gender (F = 15.953; p = 0.000; ηp^2 = 0.253), and GPA (F = 8.758; p = 0.005; ηp^2 = 0.157), but Bonferroni test also showed no significant differences between management students (p = 0.664). In terms of self-control against criticism, economics students had significant differences in nationality (F = 17.027; p = 0.000; ηp^2 = 0.279) but a Bonferroni test with no significant differences (p = 0.113), and management students showed sgnificant differences in course (F = 5.747; p = 0.020; ηp^2 = 0.107), gender (F = 7.465; p = 0.009; ηp^2 = 0.135), and GPA (F = 6.527; p = 0.014; ηp^2 = 0.120), with a Bonferroni test not confirming significant differences within the group (p = 0.095). Emotional self-control showed no significant differences to management students but presented significant differences to economics students in terms of gender (F = 7.790; p = 0.008; ηp^2 = 0.150) and GPA (F = 5.464; p = 0.024; ηp^2 = 0.110) and the Bonferroni test confirmed differences between economics students (p = 0.024). Self-encouragement presented no differences between economics students, but between management students it showed significant differences regarding gender (F = 11.406; p = 0.001; ηp^2 = 0.192), fathers' education (F = 4.891; p = 0.032; ηp^2 = 0.092), and work experience (F = 3.911; p = 0.054; ηp^2 = 0.075), but multiple comparison Bonferroni test showed no significant differences between management students (p = 0.219). Understanding own emotions had significant differences for economics students in terms of course (F = 4.634; p = 0.037; ηp^2 = 0.097), family net monthly income (F = 3.986; p = 0.052; ηp^2 = 0.085), and GPA (F = 5.892; p = 0.019; ηp^2 = 0.121), with Bonferroni test confirming there were significant differences between economics students (p = 0.046), and showed for management students significant differences in terms of course choice (F = 5.107; p = 0.028; ηp^2 = 0.096), but Bonferroni test did not demonstrate significant diffeerences between management students (p = 0.167). Understanding others' emotions presented significant differences with regard to course to economics students (F = 7.275; p = 0.010; ηp^2 = 0.142) and to management students (F = 10.512; p = 0.002; ηp^2 = 0.180) and management students have also shown differences in gender (F = 11.912; p = 0.001; ηp^2 = 0.199) and work experience (F = 8.986;

p = 0.004; ηp^2 = 0.158), but Bonferroni test did not show significant differences between economics (p = 0.099) and between management students (p = 1.000).

Table 15 – Multivariate analysis of covariance for Self-efficacy in transversal and professional competencies (ACT-prof)

Summary of multivariate analysis of covariance for the dimensions of ACT for each group after incorporating the participants demographics as covariates.

Effects Between Conditions	ACT-prof_Self-efficacy in competencies						
	N	M	SD	*df*	*F*	*p*	η_p^2
Diferences between groups: Pre-test							
Economics	59	3.59	0.60	15	1.197	0.286	0.146
Management	62	3.58	0.44				
Diferences between groups: Post-Test							
Economics	59	3.69	0.76	15	0.730	0.749	0.094
Management	62	3.76	1.32				
Differences within groups: Economics							
Pre-test (B)	59	3.59	0.60	1	2.389	0.129	0.051
Post-test (D)	59	3.69	0.76				
Differences within groups: Management							
Pre-test (A)	61	3.58	0.44	1	2.419	0.127	0.050
Post-test (C)	61	3.76	1.33				

M average, *SD* standard deviation, *F* F ratio, *df* degrees of freedom, *p* significance level, ηp^2 partial eta squared effect size. All values were computed for the corrected model.

Source: author own elaboration

Relatively to the measure of self-efficacy in transversal and professional competencies (ACT-prof), there were no significant differences either between neither within groups for the overall scale, but when looking at its dimensions, in the pre-test, there were significant differences between groups for self-efficacy in technical competencies (F = 1.902; p = 0.031; ηp^2 = 0.214), with economics students having higher levels than management students. Self-efficacy in transversal competencies is explained by the duration of students' work experience (F = 4.053; p = 0.047; ηp^2 = 0.037) and self-efficacy in technical

competencies is explained by gender (F = 5.014; p = 0.027; ηp^2 = 0.046). Self-efficacy in professional competencies and the overall scale in the pre-test and the overall scale and all its dimensions in the post-test are not explained by any variable in particular.

4.3. Multiple regressions

Multiple linear regressions were made to understand the predictors for each scale and results are presented in Table 16. Step 1 included only demographic variables while step 2 integrated demographic variables and the course choice and step 3 added also the levels of PsyCap in EI and the levels of PsyCap and the levels of EI in ACT-prof.

When looking only to demographic variables, step 1, the duration of students' work experience is a significant predictor of students' PsyCap (β = 0.231; p = 0.013) and of students' EI (β = 0.193; p = 0.038). This demographic variable influences positively levels of psychological capital and of emotional intelligence.

In step 2, when the intervention is also tested, PsyCap is significantly predicted by students' GPA (β = 0.196; p = 0.044), by students' work experience (β = 0.186; p = 0.044), and by the intervention (β = 0.220; p = 0.021), which means that management students and students with higher GPA and more work experience tend to have higher levels of psychological capital. The intervention, GPA and students' work experience explain 12.1% of the variance of students' PsyCap. Additionally, the intervention does not seem to be a significant predictor either to students' EI or to students' ACT-prof.

Regarding step 3, EI is significantly predicted by gender (β = - 0.156; p = 0.054), by mothers' education (β = 0.238; p = 0.019), and by students' GPA (β = - 0.241; p = 0.005), meaning that female students and students with higher GPA and mothers with higher education tend to have higher levels of emotional intelligence. The intervention of PSC II does not seem to significantly predict levels of EI, but levels of PsyCap strongly and positively predict levels of EI (β = 0.574; p = 0.000). Gender, mothers' education, GPA and PsyCap explain 36.1% of the variance of students' emotional intelligence. The fact of adding PsyCap as a predictor made a huge difference, which can be seen by the *Change in* R^2 of 25.3% in this step.

Finally, also relative to step 3, self-efficacy in transversal and professional competencies (ACT-prof) is significantly predicted by PsyCap (β = 0.343; p = 0.001), translating to students with higher levels of psychological capital tend to have higher levels of self-

efficacy in transversal and professional capital. EI was not a significant predictor, but the fact of adding PsyCap and EI as predictors made a difference (*Change in* R^2 = 16.6%). The PsyCap measure explains 13.9% of the variance of students' self-efficacy in transversal and professional competencies.

Table 16 – Multivariate linear regressions

Multiple linear regressions between respondents demographics, PsyCap, EI, and ACT-prof

Predictors	**PsyCap**		**EI_Emotional Inteligence**			**ACT-prof**		
	Step 1	***Step 2***	***Step 1***	***Step 2***	***Step 3***	***Step 1***	***Step 2***	***Step 3***
Intercept	3.168*	2.545	5.586*	5.172*	3.699*	5.234*	5.315*	2.061
Demographics								
Age	-0.039	0.000	0.015	0.040	0.040	-0.103	-0.108	-0.089
Gender	0.102	0.103	-0.097	-0.097	-0.156*	0.069	0.069	0.071
Nationality	0.017	0.019	0.180	0.181	0.170	0.011	0.009	-0.054
Father Education	0.043	0.075	0.029	0.050	0.007	0.098	0.095	0.099
Mother Education	-0.120	-0.093	0.167	0.185	0.238*	-0.064	-0.069	-0.055
Family Income	-0.072	-0.053	-0.070	-0.058	-0.027	0.009	0.008	0.008
Foreign Languages	0.076	0.074	0.052	0.051	0.009	0.110	0.111	0.061
Siblings	0.150	0.126	0.124	0.108	0.036	0.052	0.057	0.005
GPA	0.190	0.196*	-0.133	-0.129	-0.241*	-0.041	-0.040	-0.065
ECAs	0.182	0.167	0.056	0.046	-0.050	0.108	0.110	0.055
Present residence	-0.032	-0.025	-0.067	-0.062	-0.048	-0.112	-0.111	-0.078
Past residence	0.065	0.059	0.162	0.158	0.125	0.031	0.033	-0.031
Work experience	0.231*	0.186*	0.193*	0.164	0.057	0.062	0.068	0.007
International Experience	-0.189	-0.194	-0.188	-0.191	-0.079	-0.086	-0.085	0.011
Predictor								
Intervention		0.220*		0.145	0.019		-0.028	-0.112
PsyCap					0.574*			0.343*
EI								0.157
Overall F	1.767*	2.088*	1.602	1.666	5.170*	0.707	0.663	2.563*
R^2	0.192	0.233	0.177	0.195	0.448	0.062	0.063	0.229
Adjusted R^2	0.083	0.121	0.067	0.078	0.361	-0.026	-0.032	0.139
Change in R^2	0.192	0.041	0.177	0.018	0.253	0.062	0.001	0.166

Notes. Significant at: $*p < .05$, $**p < .01$, $***p < .001$; standardized β coefficients are reported for each step and after Z-score transformation, n = 204. Gender (0 = Female; 1 = Male); Nationality (0 = Portuguese, 1 = other, 2 = Brazilian, 3 = French, 4 = Mozambican, 5 = Angolan, 6 = Russian), Father Education (0 = no higher education, 1 = higher education), Mother Education (0 = no higher education, 1 = higher education), Family Income (1 = lower than 1000€, 2 = Between 1000€ and 2000€, 3 = higher than 2000€), Present residence (0 = other, 1 = Porto area), Past residence (0 = other in Portugal, 1 = the same, 2 = Foreign residence).

Source: author own elaboration

4.4. Test of hypotheses

Hypothesis 1 predicted that in the pre-test, students of the bachelor of management would have a higher level of non-technical competencies when compared to students of the bachelor of economics, particularly in (a) emotional intelligence and in (b) self-efficacy in transversal and professional competencies, since the bachelor of management has PSC classes in the first (PSC I) and in the second semester (PSC II) of the second year of this course with the purpose of developing non-technical competencies among students.

With regard to emotional intelligence, the overall scale showed no significant differences in variances between groups in both pre and post-test periods. However, in the pre-test, the dimensions of empathy (F = 2.284; p = 0.008; ηp^2 = 0.248), self-encouragement (F = 2.178; p = 0.011; ηp^2 = 0.239), and understanding own emotions (F = 1.768; p = 0.049; ηp^2 = 0.203) presented significant differences between groups, with management students having higher levels of the above competencies.

Nonetheless, what is important to understand is the extent to which the course choice had an important role in the significant differences of these competencies on the pre-test. Of the above differences between economics and management students, only self-encouragement in pre-test is explained by the course choice (F = 7.136; p = 0.009; ηp^2 = 0.064) and this is not the only factor explaining this dimension. We do not have data regarding the impact of the intervention of PSC I, but assuming management and economics students had the same level of emotional intelligence at the beginning of the second school year, this intervention of PSC I does not seem to be very effective on developing EI.

In terms of the third scale, self-efficacy in transversal and professional competencies, there were no significant differences in variances for the overall scale relatively to groups, and the only dimension that showed significant differences – self-efficacy in technical competencies (F = 1.902; p = 0.031; ηp^2 = 0.214) – favoured economics students with gender being the factor that explains this dimension (F = 5.014; p = 0.027; ηp^2 = 0.046). In this case, it seems that, as for the case of EI, the intervention of PSC I is not significantly influencing self-efficacy in transversal and professional competencies.

Hypothesis 2 predicted that the intervention of PSC II would have a positive influence on the development of non-technical competencies, namely on (a) psychological capital

and on (b) self-efficacy in transversal and professional competencies. As was mentioned in the analysis of the multiple linear regressions and can be seen in Table 15, the intervention only influenced levels of PsyCap (β = 0.220; p = 0.021). Both emotional intelligence and self-efficacy in transversal and professional competencies were not influenced by classes of PSC II. Therefore, the intervention of PSC II seems to be partially successful since it contributed to the development of a specific competency (PsyCap) as was expected but was not successful in directly developing other more general competencies. However, it is important to note that data also showed that levels of PsyCap influence levels of EI and of ACT-prof, meaning that indirectly the intervention had an influence on these other competencies.

Hypothesis 3 predicted that in post-test, students of the bachelor of management would have a higher level of non-technical competencies when compared to students of the bachelor of economics, respectively in (a) psychological capital, in (b) emotional intelligence and in (c) self-efficacy in transversal and professional competencies, since both interventions PSC I and II had already been performed.

Significant differences between economics and management students were tested through t-tests (Table 11) and, in the post-test, management students presented significantly higher levels of the overall PsyCap (t = - 3.676; df = 157; p = 0.000) and all its dimensions – self-efficacy (t = - 3.247; df = 162; p = 0.001), hope (t = - 2.482; df = 161; p = 0.014), resilience (t = - 2.635; df = 159; p = 0.009) and optimism (t = - 3.157; df = 163; p = 0.002) –, meaning that this hypothesis is confirmed for the measure of Academic PsyCap. Regarding EI, only the dimension of self-encouragement showed significant differences in the post-test (t = - 2.985; df = 163; p = 0.003) with management students having higher levels when compared to economics students, which means that apart from self-encouragement there are no significant differences between economics and management students. In terms of self-efficacy in transversal and professional competencies, there are no significant differences between economics and management students, so this hypothesis is not confirmed for the ACT-prof measure.

5. Discussion

This research intends to study the impact of higher education institutions, particularly the impact of FEP's higher education programmes, on the development of non-technical competencies among students.

Following this purpose, the main research question of the present study focuses on discovering if non-technical competencies can be developed through time and through the intervention of Personal and Social Competencies II classes.

To answer the research question, several findings should be highlighted.

Firstly, in terms of time, results of independent t-tests showed that, from the beginning to the end of the semester, management students improved their levels of psychological capital globally and also of all its individual dimensions (*p-values* < 0.05) while economics students presented no improvements, except for the dimension of optimism (t = - 1.977; df = 75; p = 0.052). In terms of emotional intelligence, from pre to post-test, neither of the groups showed improvements in the levels of the overall scale. On the contrary, an important finding to highlight is the fact that both management and economics students decreased emotional intelligence levels with management students decreasing significantly levels of self-control against criticism (t = 2.376; df = 88; p = 0.020) and economics students decreasing significantly levels of emotional self-control (t = 2.710; df = 75; p = 0.008) and of understanding own emotions (t = 2.043; df = 74; p = 0.045). With regards to self-efficacy in transversal and professional competencies, from pre to post-test, ACT-prof presented no significant changes.

Secondly, results from the multiple linear regressions show that the predictors of psychological capital are GPA, work experience and the intervention, the predictors of emotional intelligence consist of gender, mothers' education, GPA and levels of PsyCap, and that the predictor of self-efficacy in transversal and professional competencies is the levels of students' PsyCap.

Summing up, time and the intervention only positively influenced levels of PsyCap. Emotional intelligence levels and self-efficacy in transversal and professional competencies levels seem to be directly unaffected by classes of PSC II. The intervention studied in this research seems to be developing specific competencies since the other competencies assessed were not significantly predicted by the course choice of students. This finding may explain the existence of studies in the literature focusing only on the development of one

specific competency like Gilar-Corbí et al. (2018) relatively to EI and Luthans et al. (2014) in terms of PsyCap. However, PsyCap was found to be a predictor both of emotional intelligence and of self-efficacy in transversal and professional competencies, so even if the intervention did not directly predict levels of these competencies, it certainly influenced indirectly the development of EI and of ACT-prof.

Additionally, regarding the findings for emotional intelligence, this competency was mentioned in the qualitative study as being developed at a deeper level in the first semester of the second year of the bachelor of management (PSC I). Since the intervention studied corresponds only to PSC II, we do not know if in PSC I this competency was developed and if the reason for the decrease in the levels of management students is due to: (a) the fact that emotional intelligence may have been developed through intervention but its effects did not remain through time or (b) if FEP's higher education of the second year of the bachelor may be leading to the decrease in levels of emotional intelligence, particularly some dimensions, and the possible intervention of PSC I may have prevented management students from decreasing at a higher scale their levels of EI, since economics students significantly decreased both levels of emotional self-control and of understanding own emotions while management students only significantly decreased levels of self-control against criticism. Both hypotheses are valid and future research should investigate the reasons for this decrease.

In terms of analysing results of ACT-prof, the findings of not showing significant differences in students from pre to post-test and also of not having other predictors besides levels of PsyCap may arise because this scale incorporates a lot of distinct non-technical competencies. According to Cabral-Cardoso et al. (2006), the non-technical competencies in which HEIs play an important role in terms of influencing their development are collection and treatment of information, teamwork, planning and organisation, availability to continuous learning, planning-action, questioning ability, critical spirit, numeracy, and socialise with multiculturality while non-technical competencies in which HEIs contribute the least to their development consist of foreign languages, personal presentation, leadership, business sensibility, adaptation to change, client orientation, conflict management, oral communication, persuasion, stress tolerance, and initiative. As aforementioned, self-efficacy in transversal and professional competencies incorporates both competencies in which HEIs contribute the most and the least in accordance with the study of Cabral-Cardoso et al. (2006) and this may have contributed to

the results obtained, since it makes it difficult for tests to conclude any differences when some items may be leading to one way and other items pull the results to the opposite direction.

Furthermore, findings also suggest that work experience is a predictor of PsyCap and of EI, contributing to developing positively these non-technical competencies' levels. The literature supports this finding and states work experience as one of the most effective contributors to non-technical competencies' acquisition (eg. Cabral-Cardoso et al., 2006). Higher education institutions should take this finding into consideration, promoting feasible ways of encouraging students to have at least one work experience during their bachelor degree, for example through internships.

Moreover, results showed that GPA significantly positively predicted levels of PsyCap and negatively predicted levels of EI, meaning that students with higher GPA tended to have higher levels of psychological capital and lower levels of emotional intelligence. The lower levels of emotional intelligence might be explained by the faculty in which the study took place. FEP's curriculum does not rely on subjects related to emotional processing, i.e. the curriculum is still very focused on technical competencies, and, according to Arora et al. (2010), 'higher EI is potentially associated with various facets of academic performance, most notably those involving emotions and emotional processing'.

Interestingly, other demographic variables also predict EI, such as gender. Findings report that female students possess higher levels of emotional intelligence than male students and literature supports this difference in EI regarding gender (eg. Arora et al., 2010).

From the correlational analysis, EI was strongly and positively correlated with ACT-prof, which includes among other competencies teamwork, communication, and interpersonal skills, which was not a surprising result once researchers have already demonstrated it (Arora et al., 2010). Unfortunately, EI did not appear as a predictor of ACT-prof.

6. Conclusion

This research intended to determine the impact of FEP's higher education on the development of non-technical competencies among students.

The results of this study highlighted the fact that the intervention of PSC II only significantly developed levels of PsyCap from the measures assessed, but results also revealed psychological capital as a predictor of emotional intelligence and of self-efficacy in transversal and professional competencies.

Additionally, the study also underlines demographic variables as predictors of non-technical competencies: work experience has a very important positive influence on the development of non-technical competencies, namely psychological capital and emotional intelligence; GPA influences positively levels of psychological capital and negatively levels of emotional intelligence; gender influences levels of emotional intelligence, with female students having higher levels of EI; and mothers' education influences positively levels of students' emotional intelligence, which means that students with mothers with a higher education degree tend to have higher levels of EI.

Based on this study, we now also have a better understanding of the complexity of developing non-technical competencies during a bachelor degree through an intervention, since other external factors may also influence this development in a positive or negative way, for example, work experience and the students' GPA.

Furthermore, with this research, a more concrete vision and knowledge of the development of non-technical competencies from the beginning to the end of the second semester of the second school year of FEP's bachelors was possible to be acquired and a surprising result showed that students' emotional intelligence levels decrease in this period.

Overall, the findings of this study offer a compelling understanding of the contributors to the development of psychological capital, emotional intelligence and self-efficacy in transversal and professional competencies. In addition to the contributions to the literature, this study's findings have also practical implications for higher education institutions, especially for FEP, aiming to attract and retain the best students as well as providing them with the best opportunities in terms of employment and career development.

6.1. Limitations and future research

The results obtained in this research should be interpreted taking into account its limitations.

Firstly, this study is limited by time. The intervention was only assessed during the second semester, so the previous intervention (PSC I) was not tested and its results are unknown. Hence, it would be interesting to explore the intervention in its two phases in future research. Also, it would be interesting to assess competencies of FEP's bachelor students at the beginning of the course to see if economics and management students are similar when entering higher education and to assess non-technical competencies yearly to see their evolution as well as their main predictors.

Secondly, this research is limited in terms of the sample size, i.e. the number of students inquired both in pre and in post-test. We had a massive loss in the number of questionnaires from the beginning to the end of the semester, which may have influenced the number of significant predictors of non-technical competencies' development and which may have diminished the reliability of results. Also, some significant effects regarding some parameters could have not been detected.

Finally, it is important to highlight the fact that assessment was made through self-reports, which may be misleading in some cases once students who are more modest and have a higher insight could have reported lower levels of the competencies assessed while students with less insight could have reported higher levels of the same competencies.

6.2. Theoretical contributions

This research studied the development of a set of distinct non-technical competencies, since psychological capital to emotional intelligence and self-efficacy in transversal and professional competencies. The results are important additions to the literature because, usually, one focuses on one specific competency or in a set of similar non-technical competencies and studies the development of that competency. Here, it was studied different non-technical competencies and how an intervention could have affected the development of these competencies. The intervention was found to only have developed one specific competency in spite of its generic approach.

Besides the intervention, some demographic factors and levels of some competencies assessed were studied and found to have contributed to higher levels of the competencies

assessed, which as aforementioned strengthens some conclusions of literature studies but also which contributes with new findings to the literature, for example with the finding that levels of psychological capital predict both levels of emotional intelligence and of self-efficacy in transversal and professional competencies.

Summing up, this study contributes to the clarification of the predictors to the development of psychological capital, of emotional intelligence and of self-efficacy in transversal and professional competencies.

6.3. Practical contributions

The present research provides practical contributions that may be significant for higher education institutions, particularly the Faculty of Economics of Porto.

The findings show that the intervention of classes of Personal and Social Competencies in the second semester (PSC II) only significantly influenced levels of psychological capital. However, it was also found that although PSC II was not directly related to the other measures, PsyCap levels do influence levels of emotional intelligence and levels of self-efficacy in transversal and professional competencies. Hence, indirectly the intervention might be having an effect on non-technical competencies' development.

Additionally, other contributors were tested and, for example, students' work experience – a variable in which HEIs have the power to encourage or discourage through their curriculums – was found to be positively contributing to the development of different non-technical competencies, which had been studied and stated by previous studies. Following this finding and the literature, it is arguable that students and higher education institutions should take and promote, respectively, work experiences during the bachelor degree.

To conclude, aside the importance of students combining both technical and non-technical competencies, this study highlights the fact that this intervention is advantageous and should continue in the curriculum of the bachelor of management. However, HEIs should be more aware and investigate more profoundly what other variables also predict levels of non-technical competencies such as students' work experience, gender, GPA and mothers' education discovered in the present study and should adapt and change the opportunities given to students at the bachelor level in order to promote the development of non-technical competencies.

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Appendixes

Appendix 1 – Main research measures and internal reliability

Measure	Dimensions	Adapted from	N of items	Original Cronbach Alphas	Cronbach Alphas obtained in February	Cronbach Alphas obtained in May
Academic PsyCap	Self-efficacy	Luthans et al. (2014)	6	Ranges from 0.89 to 0.93	0.836	0.845
	Hope		6		0.792	0.868
	Resilience		6		0.586	0.787
	Resilience without item 13		5		0.786	0.791
	Optimism		6		0.566	0.834
	Optimism without item 23		5		0.776	0.842
	Overall		24		0.878	0.929
	Overall excluding items 13 and 23		22		0.911	0.928
Emotional intelligence	Empathy	Rego and Fernandes (2005)	4	0.73	0.694	0.720
	Self-control		5	0.79	0.757	0.675
	Emotional self-control		3	0.70	0.732	0.762
	Self-encouragement		3	0.77	0.799	0.860
	Understanding one's emotions		5	0.82	0.905	0.936
	Understanding others' emotions		3	0.67	0.785	0.824
	Overall		23	0.84	0.837	0.850
Self-efficacy in transversal and professional competencies	Transversal competencies	Vieira (2014)	10	0.91	0.785	0.726
	Professional competencies		7	0.88	0.792	0.827
	Technical competencies		4	0.75	0.727	0.486
	Overall		21	0.95	0.887	0.873