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Undergraduate Business Student's Self-Assessment of Meta-Competencies in the Context of the Final Year Projects

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Abstract

While research on competence-based assessment has grown, scholars have conducted fewer studies on an integrative view of competence acquisition, in the context of the final year project, that have particularly addressed the meta-competence approach. This paper examines undergraduate business students' perceived acquisition of competencies during the development of their final year project and tries to determine relevant differences among the set of competencies students' value most. The study gathered quantitative data by using a questionnaire applied to students after their presentation of the final degree project at a Spanish Business School. The findings show the emergence of three profiles of students based on their competencies acquisition. The profiles display an interconnected relation and put forward some shortfalls in competence acquisition as well as propose an emerging profile of the meta-competent student.

Introduction

The implementation of the guidelines of the European Higher Education Area (EHEA) implied shifts in the curriculum guidelines from being content-oriented to being learning-oriented, with individuals being more self-regulated in their approach to knowledge. Although many nations create their own guidelines, they are changing with global demands (Karseth & Sivesind, 2010). In this context, it has been a standard practice during the last years for social sciences programs to incorporate at least one major assessment exercise in the final (fourth) year of the studies in the form of a project (Mateo et al., 2012).

This Final Year Project (FYP) is viewed as the culminating learning experience of the undergraduate program, and the quality of student output is often used as an indicator of the quality of the program as a whole (Jawitz, Shay, & Moore, 2002). FYP was studied by different perspectives, specifically explored in natural sciences and engineering (Orsmond, Merry, & Reiling, 2004; Vitner & Rozenes, 2009; Etaio et al., 2018), but also studied in social sciences (Tejada Fernández, 2005; Mateo et al., 2012). However, we cannot find particular research exploring the connection of the FYP to the assessment of meta-competencies.

Meta-competencies in students include skills and knowledge of how to use them and when and why to use them. The study of the development of meta-competencies in students gained a certain level of recognition,

particularly in the field of entrepreneurship education (Kirby, 2004; Tubbs & Schulz, 2006; Riggs & Gholar, 2009). Studies applying a metacognitive approach considered metacognition as an advanced form of cognition that occurs when learners are aware of their own cognitive process and know when, where and how to use these processes to facilitate and support their learning. Tejada Fernández (2005) acknowledged that the FYP offers a great opportunity to work on skills such as integration capacity. For this purpose, this study objective is to understand the meta-competencies in FYP context as a metacognitive process, which requires the ability to know how to combine and relate a set of skills in different situations – rather than a specific skill for a particular competency.

Literature Review

Students Perception of Competencies Acquisition and Final Year Project

At the European level, competencies are classified into 'generic' and 'specific' according to the Tuning Education Structures in Europe (González & Wagenaar, 2003). In addition, these competencies could be classified into: instrumental (e.g., capacity for analysis and synthesis, information management skills, problem solving and decision-making), interpersonal (e.g., teamwork, interpersonal skills, appreciation of diversity and multicultural and ethical commitment) and systemic (e.g. capacity for applying knowledge into practice, capacity to adapt to new situations, leadership, ability to work autonomously, initiative and entrepreneurial spirit, concern for quality and will to succeed) (González & Wagenaar, 2003). The difficulties associated with the change of focus in teaching and evaluation increased due to the appearance of new subjects in the study plans. This is the case of the subject called FYP or Final Degree Project, which is presented as a subject that is mainly composed of generic competencies (Reyes-García & Díaz-Megolla, 2017).

The evaluation of the FYP constitutes a topic of great interest at an international level, as there are different ways in which it is designed and evaluated (Healey et al., 2013). The discussion of competencies was linked to studies of how particular soft skills can aided university undergraduate's employability (Martínez-Clares & González-Lorente, 2019), to competency acquisition in specific degrees (e.g., nursing, engineering, accounting), or to competencies linked to FYPs (Mateo et al. 2012; Rullán et al., 2010; Bonilla-Delgado & Martín-López, 2012). Some studies addressed the capacity of students to conduct a realistic assessment of their own performance during their FYPs (Ryder, 2004), and also indicated that through the FYP students must integrate and apply competencies acquired during the academic years of study, and incorporate new ones related to the FYP itself (Mateo et al., 2012).

Furthermore, analytic thinking, searching information, multitask knowledge, multidisciplinary teamwork, leadership and applying knowledge into practice were the most important capacities to learn (De la Iglesia Villasol, 2011). Decision makers who engage in metacognitive processes are more likely to recognize multiple ways to analyze a situation (Haynie, Shepherd, & Patzelt, 2012; Su, Ricci, & Mnatsakanian, 2015). Several studies explored different perspectives of assessment applied to the FYPs, including how to evaluate based on competencies (Mateo, 2009), how to assess the process (Freire-Esparís et al., 2015; Rekalde-Rodríguez, 2011; Reyes-García, 2013) or how to improve supervision and assessment process (Roca-Caparà et al., 2016; Vera &

Briones Pérez, 2015).

Other studies explored student's perspectives on assessment (Díaz-Vázquez et al., 2018; Izci & Caliskan, 2017; Reyes-García & Díaz-Megolla, 2020; Moreno-Oliver & Hernández-Leo, 2015; Rodríguez-Moreno, Molina-Jaén, & Colmenero-Ruiz, 2019; Expósito-Díaz et al., 2018) and assessment and integration of competencies in the FYP (Rekalde-Rodríguez, 2011; Rekalde-Rodriguez, Ruiz de Gauna Bahíllo, & Bilbao, 2018; Rullán et al., 2010; Valderrama et al., 2010; Bonilla-Delgado & Martín-López, 2012; Rubio et al., 2018; Reguant, Martínez-Olmo, & Contreras-Higuera, 2018). Expósito-Díaz et al. (2018) study depicted that students considered highly the accomplishments of several competencies, including autonomous learning, and organization capacity, and valued less competencies such as team working, social and environmental problems sensitivity, creativity and innovation capacity, ethic, and oral communication. On this vein, Ruiz-Lozano and Tirado-Valencia (2016) study acknowledged that the development of the FYP has led to an overall high improvement in most of students' generic competencies, however, their study also posit that students valued less innovation skills, the use of ICTs and oral communication.

Conceptual Context for the Study of Meta-Competencies

Individuals are expected to become enterprising, taking the responsibility of own learning and success (Ustav, 2018). The ability to judge the availability, use, compensation and learnability of personal competencies was called a metacompetence by Nelson and Narens (1990). Briscoe and Hall (1999) posit that metacompetencies affect the individual's ability to develop the competencies they will need in the future. According to Ustav (2018), metacompetencies are these overarching competencies that facilitate self-awareness, self-management and adaptation. Kühn et al. (2003) posit that learning was modeled in different ways and Brown and Mccartney (1995) suggested that professional and managerial capacities such as judgment, intuition and acumen are essential prerequisites for competent managers and professionals. They consider these capacities as meta-competencies because they are dynamic and interactive.

The metacognitive approach to competencies, well represented by the studies of Flavell (1979; 1987), states that variability exists between individuals in metacognitive ability. These metacognitive resources are the 'building blocks' of one's metacognitive ability – the more developed, robust and accessible these resources, the greater their metacognitive ability. Studies exploring the concept of metacognition (Nicol, Thomson, & Breslin, 2014; Borton & Anderson, 2018) assessed the importance of utilizing different forms of constructive feedback (e.g. peer evaluation, rather than grades) in order to support the development of professional skills, also assessed learning as a meta-cognition (Carneiro, 2007). Metacognitive knowledge includes knowledge of general strategies that might be used for different tasks, knowledge of the conditions under which these strategies might be applied, knowledge of the extent to which the strategies are effective and knowledge of self (Flavell 1979; Pintrich, 2002).

The literature depicts that there are different theoretical developments in studying meta-competencies. Specifically, in the field of management research, the conceptualization of meta-competencies was studied as

meta-qualities (Pedler, Burgoyne, & Boydell, 1994). Meta-competencies seen as meta-qualities include creativity, mental agility, balanced learning, and self-knowledge. Le Deist and Winterton (2005) study acknowledged that the competencies required of an occupation include both conceptual (cognitive, knowledge and understanding) and operational (functional, psychomotor and applied skill) competencies. Accordingly, they suggested that meta-competence is rather different from the first three dimensions (cognitive, functional and social), since it is concerned with facilitating the acquisition of the other substantive competencies. Tubbs and Schulz, (2006) study explored seven areas which included big picture understanding, attitudes and leadership, communication, innovation and creativity, mental agility, balanced learning and self-knowledge.

In the field of educational research, we also see different approaches to the study of the meta-competencies concept (Kyrö, Seikkula-Leino, & Mylläri, 2011; Bogo et al., 2013; Ustav & Venesaar, 2013) via exploring metacognition, metaconation, meta-affection, learning and growth as a professional and intentional use of self. Ustav (2018) depicted that there were several inconsistencies of meta-competencies interpretation, particularly regarding essential differences in competency-skill, and the aspects which stand for meta (the consciousness). Meta-competencies, therefore, are characterized by self-awareness and self-management, involving cognitive, behavioral, and affective aspects, leading to more effective behaviour in various situations (Daher, Anabousy, & Jabarin, 2018; Bourantas & Agapitou, 2016; Nielsen, 2014; Intezari & Pauleen, 2013). Metacompetencies are transferable competencies associated with skillful learning in diverse contexts (Ustav & Venassar, 2018).

The base model initially described three components, i.e. cognition, conation and affection, as reactions to everything (Rosenberg & Hovland, 1960). Metacognition involves knowing about own knowledge and about knowing self and self-awareness; metaconation comprises awareness of own motivations and own volition and meta-affection encompasses emotional awareness, risk tolerance, mood management, curiosity and interest, feeling of success or not giving up contexts (Ustav & Venesaar, 2018). Kolb (2015) suggested that, in addition to knowing how we think and feel, we must recognize when behavior is governed by thought vs. feeling. This tripartite interplay was conceptualized as meta-competencies in entrepreneurship education by Kyrö, Seikkula-Leino, & Mylläri (2011).

Study Purpose

The majority of research on meta-competencies has focused on educational research and management research, however, no specific research was found related to the importance of the context of the FYP development to understand the relevance of the meta-competencies of undergraduate business studies as future young professionals. This study investigates what are the student's perceptions of their meta-competencies during the development of their FYPs, in order to classify meta-competent professionals based on their perceived learning. Therefore, this study examines the following research questions:

1. How meta-competent are the undergraduate business students based on their perceived acquisition of competencies during the development of their FYP?
2. To what extent there are relevant differences among the set of competencies students' value most during the development of their FYPs, based on student meta-competent profile?

Methodology

Research Design

Study participants (see Table 1) were students enrolled in the FYP calls during 2018 and 2019 terms in the Business Management Degree program at the EAE Business School, associated center to the Universitat Politècnica de Catalunya (UPC), Spain.

Table 1. Students Enrolled in the FYP and Sample Size

Academic year	2017/2018	2018/2019
Enrolled (E)	102	126
Graduated (G)	75	93
Not presented (NG)	27	33

The compulsory FYP module (12 ECTS - European Credit Transfer System) takes place over the last two semesters of the final year and its structure is based on the integration of the learning structure described in Table 2.

Table 2. Final Year Project Learning Structure

Phase	Activity	
Topic selection and work plan	Guided	Compulsory modules. Guidelines on how to structure the projects.
Work plan development	Mentoring	Tutor supervision
	Autonomous work	Students' capability of contextualizing the theoretical framework; establishing clear objectives, empirical approach, analysis and interpretation; and extracting the corresponding conclusions.
Project public presentation	Oral defense	Tutor and the examining board assessment

The constructed variables were developed by integrating Tuning competency framework (González & Wagenaar, 2003; 2005), the competency set adapted by the UPC to its undergraduate degree program and the generic competencies provided within the literature, which were then combined to form a list of items to be assessed by the students. Before the implementation, the questionnaire validity was tested by carrying out a pilot test with a 10% of the student's sample size in order to ensure constructs understanding. After the pilot test, the final instrument was composed of 29 items written as statements about generic competencies and metacognition, metaconation and meta-affection (Ustav, 2018) processes that, in total, comprise a holistic approach to the meta-competent student profile, which the students should analyze and reflect upon (see table 3).

Table 3. Survey Items

Predictors	ID	Items on survey
Instrumental competencies (Tuning, 2005); Tubbs and Schultz, 2006; Ustav, 2018; Ustav & Venesaar, 2018	A1	Often set personal goals and objectives (MCO)
	A4	I organize my time to better meet my goals (MCO)
	A7	I'm good at organizing and managing information (MCG)
	A8	I think of several ways to solve a problem and I choose the best option (MCG)
	A9	I can get better returns when I already have prior knowledge of the task (MCG)
	A10	I ask myself questions about how well I am doing while I am doing a novel task (MCO)
	A14	If there are no facilitated procedures to carry out a task, I create them to achieve a better performance (MCO)
	A18	I am able to analyse different strategies when making a decision (MCG)
	A19	I believe I have a high capacity for organization and planning (MCG)
	A29	I have excellent written communication skills (MCG)
Interpersonal competencies (Tuning, 2005); Tubbs and Schultz, 2006; Ustav, 2018; Ustav & Venesaar, 2018	A2	I wonder how well I have developed my objectives once I have completed the tasks. (MCO)
	A3	When performing a task, I often evaluate my progress in relation to my goals (MCO)
	A21	I always try to maintain an ethical commitment (MAF)
	A22	I have an excellent level of relational skills (listening skills, communication and feedback)(MCG)
	A25	I define myself as a person with a high capacity to teamwork (MCG)
	A28	I have an excellent oral skills and public speaking skill (MCG)
	A20	I think I have a high capacity for criticism and self-criticism (MCG)
Systemic competencies (Tuning, 2005); Tubbs and Schultz, 2006; Ustav, 2018; Ustav & Venesaar, 2018	A17	I always compare the results of my tasks with those obtained by others in order to learn and improve (MCO)
	A26	I like to take the initiative and considerer my entrepreneurial spirit is high (MAF)
	A5	I try to deal with the problems that may arise through their appreciation in separate parts, in order to better deal with each aspect of the problem (MCG)
	A6	I take into account the meaning and importance of new information and knowledge (MCG)
	A11	Do not resist much hard work before leaving it. (MAF)
	A12	If the task is very difficult, I don't want to start(MAF)
	A13	I think you can accomplish almost anything if you want (MAF)
	A15	I like to face new challenges (MAF)
	A16	I like to generate new ideas (creativity)(MAF)
	A23	I am a person able to work independently (MCO)
	A24	I always try to adapt to new situations (MCO)
	A27	For me quality is always important in all tasks (MCO)

Note: concepts of meta-competencies: metacognition (MCG), metaconation (MCO) and meta-affection (MAF) are indicated as MCG; MCO and MAF respectively.

Students were asked to score their assessment on a scale from 1 to 5 (highest positive affirmation). The unit of analysis focused on understanding the components linked to the profiles of meta-competent students based on their self-knowledge perceptions. The reliability analysis can be considered satisfactory (Cronbach alpha = 0.833) which might indicate internal consistency. The eventual elimination of variables does not increase considerably this coefficient.

Data Analysis

We applied principal component analysis (PCA) with a data reduction principle to explore underlying relationships among the meta-competence variables (for technical details of the PCA extraction, see Table 4). We employed exploratory factor analysis statistical technique to categorize the identified variables into principal components. Each profile or main component does not refer to answers or particular student profiles; rather, it gathers aspects of all the students grouped in each profile or main component. Bartlett`s test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample accuracy were used to test the appropriateness of the factor extraction. The value of the KMO statistics is $0.815 \geq 0.8$; this is considered satisfactory for the factor analysis. The value of the test statistics for Bartlett's sphericity shows that if Sig. (P-value = 0.000) <0.05 we accept H0 (null hypothesis) so factor analysis can be applied.

Table 4. PCA Extraction and Properties of the Principal Components Analysis per Academic Term

Academic year	Principal component analysis						
	Included Observations	Number	Value	Difference	Proportion	Cumulative value	Cumulative proportion
2017/2018	71 after adjustments	PC1	6.469	3.8	0.223	6.469	0.223
		PC2	2.669	0.529	0.092	9.139	0.315
		PC3	2.14	0.421	0.074	11.279	0.389
2018/2019	80 after adjustments	PC1	6.956	4.011	0.24	6.956	0.24
		PC2	2.945	0.917	0.102	9.901	0.341
		PC3	2.027	0.35	0.07	11.928	0.411
Cumulative 2017/18	151 after adjustments	PC1	6.797	4.232	0.234	6.797	0.234
		PC2	2.515	0.727	0.087	9.312	0.32
		PC3	1.789	0.279	0.062	11.101	0.383

The next step is factor extraction to obtain a reduced number of factors to represent the 29 variables and thereby achieve easy interpretation. The main rule establishes the number of components with eigenvalue greater than 1 (EV > 1), so that 8 principal components collect the greater variability of the sample (60%). Once the results have been reviewed, components 4 to 8 are rejected: each one shows scanty representativeness (less than 5%), jointly achieved 21% (versus 38% accumulated by components 1 to 3).

In addition, there were embedded eccentric profiles, with very high positive and very low negative charges. We were aware of this breach in methodological terms (Henson & Roberts, 2006), but we were more interested in studying few coherent profiles – not deviant – although this causes a loss in terms of representativeness. In order to comply with the study objectives, we focused further analysis on the 3 principal components.

We also considered the possibility of rotating the PCA, however it gave rise to more extreme theoretical and confronted profiles very distant from each other. They would collect the same variability of the sample but with highly fragmented pieces that would blur the meta-competent profiles, reason why we have not used it in this work. We labeled each component (see Table 5) based on the interrelated characteristics coupled with the value loading. Each component profile was the result of the combination of the student's subjective self-evaluation awareness of a particular set of competence acquisition.

Results

Meta-Competent Profiles

Table 5 displays the whole data extraction of the set of variables from the survey items in 3 main components from the accumulated sample.

Table 5. PCA Results and Undergraduate Business Students' Profiles

Competencies	Principal components			Loadings		
	PC1 (meta competent ideal)	PC2 (Unbalanced manager)	PC3 (Enthusiastic leader)	PC1	PC2	PC3
Instrumental	A1 (MCO)			0.206	0.071	-0.266
	A4 (MCO)			0.158	0.278	-0.279
		A7 (MCG)		0.168	0.26	-0.231
	A8 (MCG)			0.179	0.041	0.136
	A9 (MCG)			0.195	-0.242	-0.152
	A10 (MCO)			0.166	0.027	-0.234
	A14 (MCO)			0.200	-0.036	0.024
	A18 (MCG)			0.245	0.106	0.096
		A19 (MCG)		0.171	0.277	-0.190
		A29 (MCG)		0.132	0.268	0.096
Interpersonal	A2 (MCO)			0.169	0.112	-0.176
		A3 (MCO)		0.211	0.213	-0.073
	A21 (MAF)			0.164	-0.159	0.043
			A22 (MCG)	0.177	0.122	0.401
	A25 (MCG)			0.208	-0.078	0.128
			A28 (MCG)	0.152	0.235	0.327

Competencies	Principal components			Loadings		
			A20 (MCG)	0.169	-0.028	0.197
Systemic	A17 (MCO)			0.151	0.082	-0.051
			A26 (MAF)	0.174	-0.149	0.258
		A5 (MCG)		0.166	0.267	-0.042
	A6 (MCG)			0.195	-0.18	-0.087
	A11 (MAF)			-0.141	0.285	0.170
	A12 (MAF)			-0.153	0.399	0.206
	A13 (MAF)			0.194	-0.156	0.007
	A15 (MAF)			0.229	-0.189	-0.007
			A16 (MAF)	0.200	-0.128	0.272
	A23 (MCO)			0.195	0.022	0.163
	A24 (MCO)			0.234	-0.085	0.097
	A27 (MCO)			0.220	-0.102	-0.161

Research question 1 wanted to explore how meta-competent are the undergraduate business students based on their perceived acquisition of competencies during the development of their FYP. The PCA analysis identified three undergraduate business students profile, followed described.

PC 1 – Meta-Competent Ideal

PC1 accounts for 23.3% of the sample variability and it obtained the maximum score in 19 of the 29 questions. The items are higher loaded in almost all the skills: instrumental, interpersonal and systemic (see Table 5). The relation among loadings received for each item allows us to qualify this profile as a professional that is characterised as being analytical, reflective, organised, planner, documented, methodologist, evaluator, strategist, resilient, creative, ethical, team-oriented, tenacious, determined, entrepreneur, pro-excellence and self-reliant. Due to the relationship observed between the combinations of a wider set of complementary competencies, we interpreted this combination to be the foremost representation of the meta-competent profile. Additionally, this profile concentrated the three elements of the meta-competence construct: metacognition, metaconation and meta-affection. It is interesting to observe that aspects related to metaconation were more concentrated, which outlines this profile with a behaviour of achievement orientation towards actions, objectives and goals.

PC 2 – Unbalanced Manager

PC2 accounted for 8.7% of the total observed variance and contained 4 higher loaded items, more associated with basic management skills: organisation and planning, information management skills, capacity to learn and project design. Based on the relationship among the items that received higher values with those with medium and minimum values, we could link this profile to a professional portrayed as being organised, planner, more individualistic than team-oriented, risk adverse, not higher ethically concerned, more unreliable, passive and

conformist. Due to some contradictory aspects of this profile, we named it an 'unbalanced manager'.

This profile concentrated aspects related to metacognition, with lower presence of metaconation and no inclusion of meta-affection, which devises student's consciousness and cognitive understanding of the importance of dealing with people, particularly relating to communication elements, tasks and strategies. Accordingly, this profile, in a lower level, outlines the student's ability to self-regulation in terms of motivations and attitudes towards self-controlling their progress against goals. Nevertheless, the analysis results did not depicted aspects of meta-affection, which might add an imbalance characteristic to this profile, as it lacks the consciousness related to emotions and other affective states.

PC 3 – Irregular Enthusiastic Leader

PC3 accounted for 6.2% of the total observed variance and accommodated four higher loaded items: oral, written and relational skills, creativity and leadership skills. We related this profile to a professional characterised as impulsive, improviser, practical, adaptive, inconstant, hesitant as well as self-reliant. Due to the blending of the factors, we labelled this profile as being an enthusiastic leader, for his/her impulsive, creative and relational character; nonetheless, this profile also presented some inconsistencies or hesitations.

This profile accumulated aspects of metacognition, devising the consciousness and empowerment towards particular skills related to communication and relational skills, but also it outlined student's awareness towards criticising their own learning and performance. Additionally, this profile also included aspects of meta-affection, particularly depicting curiosity towards entrepreneurship and creativity, which might be important aspects for the business environment. Nonetheless, this profile did not incorporate metaconation elements, characteristics that represent a shortage in managing motivation and volition.

Differences Among the Set of Competencies

Research question 2 explored to what extent there were relevant differences among the set of competencies students' value most during the development of their FYPs, based on student meta-competent profile. To understand the relevant differences among the set of competencies students' value most, we focused on the analysis of the ranking of competencies and its composition represented by each component. Table 6 lays out each profile competencies ranking, based on the line-up of the highest loaded values per profile.

In Component 1 students assessed the set of competencies in a more distributed and homogeneous manner. Systemic competencies were better appraised, followed by interpersonal and instrumental competences. The interpretation of the ranking aided the understanding of the profile character of the meta-competent ideal, which emulates the combination of competencies such as decision making, will to succeed, concern for quality, capacity to learn, teamwork, creativity, problem solving, capacity to adapt to new situations and ability to work autonomously. Complemented by ethical commitment, communication skills, initiative and entrepreneurial spirit, Component 1 profile presented higher values in almost all the subgroups of the competencies. The only

interpersonal skill that was higher loaded in Component 3 was 'relational skills'. Components 2 and 3 assessed higher instrumental competencies. Component 2 presented a higher awareness of the instrumental competence related to high capacity for organization and planning as well as for organizing and managing information.

Table 6. Competencies Ranking per Profile

ID	Competencies	PC1 Meta-competent ideal	PC2 Unbalanced manager	PC3 Enthusiastic leader
A18	Strategic decision making skills	1	10	11
A24	Adaptation capacity	2	19	10
A15	Risk taking	3	26	16
A27	Concern for quality	4	20	22
A3	Self-control in continuous learning	5	7	19
A25	Teamwork	6	18	9
A1	Organization capacity when setting personal goals	7	12	28
A16	Creativity	8	21	3
A14	Initiative in problem solving	9	17	14
A6	Capacity to apply knowledge to practice	10	25	20
A23	Ability to work autonomously	11	15	7
A9	Grounding in basic knowledge ability	12	27	21
A13	Will to succeed	13	23	15
A8	Analytical thinking for problem solving	14	13	8
A22	Leadership and relational skills	15	8	1
A26	Initiative in entrepreneurship	16	22	4
A19	Organization and planning	17	2	24
A2	Self-criticism in continuous learning	18	9	23
A20	Criticism and self-criticism skills	19	16	5
A7	Organizing and managing information	20	5	26
A10	Security and self-assessment for continuous improvement	21	14	27
A5	Problem solving	22	4	17
A21	Ethical commitment.	23	24	13
A4	Organization capacity for time management	24	1	29
A12	Tolerance of failure	25	29	25
A28	Oral & public speaking skills	26	6	2
A17	Capacity to continuous learning	27	11	18
A11	Perseverance and persistence	28	28	6
A29	Written communication skills	29	3	12

Caption: 1. Instrumental / 2. Interpersonal / 3. Systemic

Concerning the systemic competencies, the higher loading for Component 2 was related to dealing with problems in separated parts, and for Component 3 was concerned with taking the initiative, entrepreneurship and capacity to generate new ideas and creativity. Students with lower assessment in most all the subgroups of the competencies assessed, presented lower awareness on their set of competencies and consequently a lower level of meta-competencies. This might indicate that groups with a combined profile of higher and/or lower scores demand different approaches to learning.

Discussion and Conclusions

The first results indicated that the profile that better integrated instrumental, systemic and interpersonal competencies and specifically encompassed the elements of the meta-competence construct (metacognition, metaconation and meta-affection) was the one considered as possessing a higher meta-competent profile. This result adds further to the importance of understanding that students can be differentiated based on levels of meta-competencies (Ustav &Venesaar, 2018; Ustav, 2018). The importance of our results lies in highlighting differences across the student's profiles concerning diverse aspects of their meta-competencies, acknowledging some profiles with shortages in metaconation and meta-affection. It brings further implications for more integrative teaching and assessment models related to the FYP that might reinforce, besides cognitive aspects, emotions, attitudes and motivations in relation to the professional challenges undergraduate students are to pursue.

The elaboration of the meta-competent profile reveals the set of competencies of which students were aware as well as their level of development, suggesting that they might be part of the learning outcomes. Focused on the top-ranked competencies within the meta-competent profile, we might note the acknowledgement of decision-making, success orientation, quality-driven, continuous learning capacity, team-working and creativity. Across the analysis of the three main components, we observed the results to coincide with Ryder's study (2004); however, we might suggest that the highest correlation in terms of learning outcomes can be linked with creativity and capacity to adapt to new environments or context. This is an interesting result, as the FYP should strive for conceptual application in different practical contexts, leading to the learning outcome of capacity to adaptation, as well as the creative thinking development.

Preceding studies tried to identify the generic and specific competences associated with development of the FYP, however lacking student's integrative understanding (Mateo et al. 2012; Rullán et al. 2010; Reyes-García & Díaz-Megolla, 2020; Expósito-Díaz et al., 2018; Ruiz-Lozano & Tirado-Valencia, 2016). Conversely, our results depicted an integrative understanding of student's perceptions, assessing not only if they consider, for instance, if decision-making is important, or learning capacity, but rather given a step further in understanding how they use different skills in combination when developing particular tasks – in this case, different activities, conceptual approaches and guidelines around the FYP development. The characteristic of the meta-competent profile that encompasses aspects of self-awareness, analytical thinking and problem solving reinforces the metacognitive knowledge approach studied by Pintrich et al. (2000). However, the overall results across the three different profiles also show that students may not always be aware of the importance of the integrative

view of their competency acquisition. Accordingly, the profile of the unbalanced manager exhibited flaws in competencies related to resilience capacity, ethical commitment, leadership, creativity, autonomous work or analytical skills. Conversely, the profile of the irregular enthusiastic leader displayed deficiencies within decision-making capacity, problem solving, learning scope, organization and planning, initiative and information management. We might also observe that both profiles correlate low-loading values within a set of competencies linked with success orientation, initiative and entrepreneurship, problem solving and concern for quality.

Previous studies identified that students perceived to have improved most of their generic skills when developing their FYP (Ruiz-Lozano & Tirado-Valencia 2016; Expósito-Díaz et al., 2018), and depicted shortages in skills related to innovation, creativity, ethical commitment or oral communication. These results coincide in part with our findings, as overall students' perceived improvements across different competencies and also entrepreneurial related skills were lower-valued by the three profiles identified. Our results highlight differences across the profiles, which related skills differ from previous studies, such as creativity, which ranks high in two identified profiles and ethical commitment, and that besides low valued by two profiles, is well perceived by the profile of the enthusiastic leader. It is also interesting to note that initiative and entrepreneurial spirit were ranked very low by the three profiles of students. This is a compelling contrast when it comes to understanding the importance of these competencies in the future professional profile of an undergraduate business student. Rullán et al. (2010) pointed out that interpersonal abilities and critical appraisal were mostly left aside in health degree FYPs; such critical appraisal might be correlated to these aforementioned competencies when it applies to business and management degrees.

Our results bring implications for the betterment of the learning structure of the FYP, when it comes to foster awareness of the different competence-based learning. Moreover, due to the unbalanced profiles of competence awareness emerging from our study, we might argue that a higher collaboration among students would be needed in order to reinforce the championing of the meta-competent profile. Reinforcing collaboration and cooperative learning (Nicol et al. 2014; Borton and Anderson, 2018; Etaio et al., 2018) within the guided and mentoring activities would help to foster a more balanced result when it comes to developing students' awareness concerning their set of knowledge, skills as well as behavioral and attitudinal competencies.

The development of the profile of the meta-competent students and its conflicting unbalanced and irregular profiles provides an interesting view into the current situation of meta-competence acquisition and highlights the efforts that still must be made to fully adapt higher education learning methodologies to the European Frame for Higher Education requirements regarding competence-based learning and assessment. However, the current project did not focus on understanding deeply the learning structure for increasing meta-competencies, which would require further research, particularly focusing on: how to integrate the teaching of awareness and regulation of the integrative view on the meta-competent profile within business education, and the need to promote student self-critical and knowledge abilities within the business degree FYP, which could be interesting to further relate it with employability potential.

Students were asked to self-assess their perception of competencies acquisition in the context of the FYP using a list of given statements. Other means of assessment such as interviews and observations can be utilized for future research as well as further studies could assess the students' final grades, to look at the influences of the different meta-competencies profiles on the students' performance. In future research, students' demographics variables should be considered when comparing results, to explore further the influence of for instance, gender, age, nationality on the meta-competencies awareness. Finally, in the current context of the transformation and adaptation of teaching and learning due the Covid-19 pandemic, other forms of synchronous vs. asynchronous format of learning when developing the FYP should also be considered when studying the meta-competent profiles.

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