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A preliminary study of teachers' perception of core competencies for undergraduate students

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ABSTRACT

Background. The study reported in this paper analysed how tertiary teachers assessed a number of competencies, such as information search and communication, organization, and analysis, and decision making among others, every undergraduate student is expected to learn during his/her university studies. **Method.** Trigwell and Prosser's (2004) Approaches to Teaching Inventory (ATI) was administered to first-year lecturers along with a list of core competencies. **Results.** Analyses showed that opinions as to which competencies are highly essential for students varied in terms of teachers' approach to teaching, sex, and branch of knowledge. Most participants, however, assessed "Communication skills", "Time management", "Critical thinking", and "Application of knowledge" as the most important competencies for students. **Conclusions.** Preliminary results provide an insight into which competencies are regarded as most necessary for students and may guide universities as they prepare for the evaluation and accreditation process they are soon to face upon implementation of programmes.

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Estudio sobre la percepción que tienen los profesores sobre las competencias que deben adquirir los estudiantes universitarios

RESUMEN

Introducción. Este estudio analizó la valoración que realizan profesores universitarios de las competencias transversales que todo estudiante debe adquirir durante sus estudios universitarios. **Método.** La muestra estuvo conformada por profesores que impartían docencia en titulaciones de grado de las cinco ramas de conocimiento. Se aplicó el cuestionario Approaches to Teaching Inventory (ATI) de Trigwell y Prosser (2004) y una lista de competencias transversales. **Resultados.** Las competencias valoradas como más necesarias para los estudiantes variaron en función del enfoque de enseñanza predominante, el sexo y la rama de conocimiento del profesor, si bien la mayoría de participantes valoró la capacidad de comunicación, la gestión del tiempo, la aplicación del conocimiento y el pensamiento crítico como competencias muy necesarias para sus estudiantes. **Conclusiones.** Los resultados preliminares aportan información útil sobre la importancia que se concede a determinadas competencias y pueden ayudar en la preparación para los procesos de acreditación de títulos universitarios.

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One of the most significant changes derived from the introduction of Spanish universities into the European Space for Higher Education (ESHE) has been the introduction of student-centred teaching and learning processes. For the past decades, research into higher education has resulted in a wealth of theories focused on exploring teaching and learning from the perspective of teachers and students alike (Hernández-Pina, Martínez-Clares, Rosário, & Rubio-Espín, 2005). This has in turn contributed to understanding the challenges posed by the ESHE.

The interest in learning more about teachers' approaches to teaching has revealed itself as a very productive line of research, which has resulted in a number of studies worldwide (e.g., Hernández-Pina, Maquilón-Sánchez, Monroy-Hernández, & Izquierdo-Rus, 2010; Stes, De Maeyer, & Van Petegem, 2010; Trigwell & Prosser, 1996). Studies from the 1990s (e.g., Dall'Alba, 1991; Dunkin & Precians, 1992; Gow & Kember, 1990; Pratt, 1992; Prosser, Trigwell, & Taylor, 1994; Samuelowicz & Bain, 1992; Trigwell, Prosser, & Taylor, 1994) analysed teachers' conceptions of teaching, which may be classified into two main orientations: teacher-centred teaching, characterised by a focus on information transmission, and student-centred teaching, which focuses on learning (Kember, 1997).

Subsequent studies carried out by Trigwell and colleagues (Prosser et al., 1994; Trigwell & Prosser, 1996; Trigwell et al., 1994) identified a number of categories which they later grouped under two main approaches to teaching: a) an information transmission/teacher-focused approach, in which "the teacher adopts a teacher-focused strategy, with the intention of transmitting to the students information about the discipline; the focus is on facts and skills, but not on the relationships between them"; and b) a conceptual change/student-focused approach, in which "teachers adopt a student-focused strategy to help their students change their world views or conceptions of the phenomena they are studying." (Trigwell & Prosser, 1996, p. 80).

Using a qualitative methodology, Trigwell and Prosser (1996) developed the Approaches to Teaching Inventory (ATI) to measure approaches to teaching (teacher-focused approach, ITTF, and student-focused approach, CCSF) of university teachers in the UK. Later studies (e.g., Gibbs & Coffey, 2004; Hernández-Pina, Maquilón-Sánchez, García-Sanz, & Monroy-Hernández, 2010; Trigwell, Prosser, & Waterhouse, 1999) identified a relation between approaches to teaching and approaches to learning. More specifically, ATI showed that "adopting a Conceptual Change/Student-Focused approach to teaching is more likely to lead to high quality student learning and to greater teaching satisfaction than the adoption of an Information Transmission/Teacher-Focused approach" (Trigwell & Prosser, 2004, p. 419). It is therefore crucial to analyse teachers' teaching intentions and strategies, and how these may relate to students' learning needs.

The Sorbonne-Bologna-Prague-Berlin process triggered the creation and development of the ESHE along with profound changes in the Spanish educational system and the introduction of core and discipline-based competencies at undergraduate and postgraduate level. The reform process initiated a decade ago set educational objectives for higher education and also defined which academic profiles are demanded by society (Medina-Rivilla, Domínguez-Garrido, & Sánchez-Romero, 2013). Such profiles describe the competencies university students should develop, as well as the learning outcomes students ought to achieve.

One of the objectives posed in the Tuning Report (Universidad de Deusto & Universidad de Groninger, 2003) was to formulate proposals in order to later design undergraduate courses which would make degrees compatible and comparable in and amongst different countries in the European Union. The development of competencies and skills is one of the cornerstones of the reform process introduced in Spanish universities in 2010. Academic courses are now defined in terms of "learning outcomes" and acquisition of "general and specific competencies", namely, core and discipline-based competencies. The

main advantage of a competency-based education is the development of a new paradigm based on learning and knowledge management (Universidad de Deusto & Universidad de Groninger, 2003). One of the most significant contributions in this process was the introduction of 30 core competencies every undergraduate student should learn and develop during his/her course of studies. Competencies may be described as "learning needs" and are based on cross-curricular competencies.

In light of the different competencies promoted in the Tuning Report and their educational value, as well as the evidence of association between how teachers teach and how students learn, there is a growing interest in learning about how university teachers approach their teaching and how they assess different competencies at the onset of undergraduate studies. As the interest lies on gaining an insight into how important core competencies may be for students from the point of view of teachers, the main objective of this study was to descriptively analyse teachers' assessment of different competencies undergraduate students ought to acquire during the course of their studies. Analyses were conducted in terms of teachers' sex, branch of knowledge in which they taught, and dominant approach to teaching.

Method

Participants

Seventy lecturers (29 males, 41.4%, 35 females, 50%, and 6 lost cases, 8.6%) from a Spanish state university took part in this study. At the time of data collection all participants were teaching first-year courses in compliance with the new qualifications framework introduced by the Bologna process.

A non-probability sampling procedure based on convenience was used, as teachers voluntarily responded to an invitation sent to them to participate in the study. The degrees in which participants taught may be classified into the following categories (see Table 1): a) Arts and Humanities – Philosophy, English Studies, Fine Arts; b) Social and Legal Sciences – Pedagogy, Primary Education, Law, Management, and Business Administration; c) Sciences – Biology, Mathematics, Optics, and Optometry; d) Health Science – Nursing, Pharmaceutical Sciences, Science and Food Technology; and e) Engineering and Architecture – Computer Engineering, Chemical Engineering.

Instruments

Participants completed two instruments: 1) a Spanish version of Trigwell and Prosser's (2004) Approaches to Teaching Inventory (ATI) and 2) an ad hoc list of 18 core competencies all students should acquire during their university studies.

The Approaches to Teaching Inventory (ATI) measures teachers' approaches to teaching in terms of two scales which represent two fundamentally different approaches: a Conceptual Change/Student-Focused approach (CCSF) and an Information Transmission/Teacher-Focused approach (ITTF) (Trigwell & Prosser, 2004). The questionnaires consist of 16 items scored on a 5-point Likert scale from 1 (*never or*

Table 1
Distribution of Participants as per Branch of Knowledge

Branch of Knowledge	<i>f</i>	%
Arts and Humanities	18	25.7
Social and Legal Sciences	16	22.8
Sciences	10	14.3
Health Science	20	28.6
Engineering and Architecture	6	8.6
TOTAL	70	100

rarely) to 5 (*always or almost always*). ATI had been translated into Spanish by Hernández-Pina in 2006 and later administered to a sample of university teachers by her research team (Hernández-Pina, Maquilón-Sánchez et al., 2010).

Participants usually obtain two scale scores (CCSF and ITTF), but for the purpose of this study only the scale with the highest score was identified as the dominant teaching approach. Hence, 57% of participants used an ITTF approach ($M = 34.25$, $SD = 3.47$), while the remaining 43% adopted a CCSF approach ($M = 33.06$, $SD = 4.11$). Cronbach alpha for the ITTF scale was .605 and .724 for the CCSF scale, thus reliability coefficients were similar to those obtained by Trigwell and Prosser (2004), namely, ITTF = .73 and CCSF = .75.

Taking the Tuning project (2003) and Royal Decree (Real Decreto) 1393/2007 as a basis, the authors chose 18 competencies which students should learn during their studies and which belong to one of the following categories:

A. Information search and communication competencies: finding information in different sources, questioning, and analysis of materials. These competencies are represented by items 1, 7, 12, 13, 14, 15, 16, and 18 of the questionnaire.

B. Information assimilation and retention competencies: listening, recalling, coding, representing concepts, reading comprehension, information recording. Questionnaire items: 8, 9, and 17.

C. Organisational, creative and analytical competencies: prioritising, scheduling, organisation of resources, inductive reasoning, generation of ideas and hypotheses, use of analogies, development of a critical attitude, deductive reasoning, and assessment of ideas and hypotheses. Questionnaire items: 2, 3, 4, 10, and 11.

D. Decision-making and social competencies: cooperation, conflict resolution, motivation, identification of different options, and rational choices. Questionnaire items: 5 and 6.

The above competencies were referred to as “Students’ Learning Needs” (see Appendix) and assessed by participants on a 5-point Likert scale, so that they could note the extent to which they considered them necessary (1 was *not necessary* and 5 was *very necessary*). Cronbach’s alpha coefficient revealed a reliability of .611, which may be regarded as moderate.

Procedure

This study used a survey design and was conducted in several stages. First, researchers selected the 18 competencies that would make up the list of competencies for teachers to assess. After informing the deans of several faculties at the same state-owned university, ATI and the list of competencies were sent to staff by post or email. Appropriate precautions to protect the confidentiality of participants’ data were ensured. Participation rate was 90%. Data storage and statistical analyses were performed using software package SPSS 20.

Results

Analyses revealed that about 60% of participants assessed all 18 competencies as quite necessary or very necessary (i.e., Likert value 4 and 5 respectively). In order to get a clearer picture, the number of participants who had assessed competencies with a 4 and a 5 were added, thus 80% of the sample assessed the following competencies as quite or very necessary: “Communication skills”, “Knowledge understanding”, “Time management”, “Critical thinking”, “Problem-solving”, “Ability to make judgments”, “Application of knowledge”, and “Commitment and motivation” (Table 2). These competencies refer to communication, organization, and motivation, and are usually regarded as essential for undergraduate students. Competencies assessed as not necessary or slightly necessary (i.e., Likert values 1 and 2 respectively) were those from group A (Information search and Communication competencies), as well as “Exam preparation” (group B), and “Decision-making” (group D).

Results were further analysed in terms of teachers’ sex, branch of knowledge in which teachers taught, and dominant approach to teaching. Analyses of assessment of competencies in terms of sex (Table 2) revealed results similar to those found in the group as a whole. In particular, men rated as quite necessary or very necessary the same competencies as the group as a whole, except for the “Commitment and motivation” competency. Women also rated social competencies (“Decision-making”, and “Commitment and motivation”) and “Submission of written assignments” as quite or very necessary, but, unlike men, they did not consider “Knowledge understanding”, “Problem-solving”, or “Ability to make judgments” quite or very necessary.

As to which competencies should be described as necessary for first-year students when classifying the sample into the five branches of knowledge (Table 3), results showed a lack of agreement amongst staff. Four branches of knowledge agreed on “Communication skills” and “Critical thinking” (marked¹ in Table 3) as the most necessary competencies, while three branches agreed on five competencies: “Knowledge understanding”, “Time management”, “Problem-solving”, “Ability to make judgments”, and “Application of knowledge” (marked² in Table 3).

These results highlight the differences in prioritisation amongst the various branches of knowledge (and thus disciplines) as to which competencies should be essential for university student. So far, differences such as these could only be suspected. The results in this study provide preliminary empirical evidence, yet further research is necessary in order to explore further differences between degrees and course years.

Finally, teachers’ assessment of competencies in terms of their teaching approach (Table 4) showed that regardless of dominant approach, all participants assessed five competencies (“Communication skills”, “Knowledge understanding”, “Time management”, “Critical thinking”, and “Application of knowledge”) as quite or very necessary. By subgroups, ITTF teachers rated as very necessary students’

Table 2
Teachers’ Assessment of Core Competencies. Analysis in Terms of Sex

Group	Item	Competencies	Global > 80%	M	F
A	1	Teamwork			
A	7	Use of ICT			
A	12	Note-taking			
A	13	Information search			
A	14	Writing assignments			
A	15	Submission of written assignments			
A	16	Oral presentations			
A	18	Planning and conducting a research study			
B	8	Communication skills			
B	9	Knowledge understanding			
B	17	Exam preparation			
C	2	Time management			
C	3	Critical thinking			
C	4	Problem-solving			
C	10	Ability to make judgments			
C	11	Application of knowledge			
D	5	Decision-making			
D	6	Commitment and Motivation			

Note. M (Male), F (Female)

Table 3
Teachers' Assessment of Core Competencies. Analysis in Terms of Branch of Knowledge

Comp.	Item	Competencies	Global	AH	CS	CC	SA	AI
A	1	Teamwork						
A	7	Use of ICT						
A	12	Note-taking						
A	13	Information search						
A	14	Writing assignments						
A	15	Submission of written assignments						
A	16	Oral presentations						
A	18	Planning and conducting a research study						
B	8	Communication skills ¹						
B	9	Knowledge understanding ²						
B	17	Exam preparation						
C	2	Time management ²						
C	3	Critical thinking ¹						
C	4	Problem-solving ²						
C	10	Ability to make judgments ²						
C	11	Application of knowledge ²						
D	5	Decision-making						
D	6	Commitment and motivation						

Note. AH (Arts and Humanities), CS (Social Sciences), CC (Sciences), SA (Health Science), AI (Engineering and Architecture).

¹Agreement amongst four branches of knowledge. ²Agreement amongst three branches of knowledge.

“Commitment and motivation” (D6), as well as the five aforementioned competencies. In contrast, CCSF teachers regarded as very necessary additional competencies such as “Problem-solving” (C4), “Ability to

make judgments” (C10), the ability to give “Oral presentations” (A16), and “Decision-making” (D5). The competencies preferred by CCSF participants reflect the core themes behind a learning-centred and student-focused approach to teaching, which places a particular emphasis on helping students develop their critical thinking and problem-solving ability.

Finally, when comparing the competencies regarded as very necessary by the group as a whole and by subgroups (Table 5), only four competencies were assessed as quite necessary or very necessary by over 80% of participants: “Communication skills” (B8), “Time management” (C2), “Critical thinking” (C3), and “Application of knowledge” (C11). In contrast, “Information search” (A13) was described by all subgroups as a slightly necessary or not necessary competency for students, while the rest of group A competencies (information search and communication competencies) were assessed as necessary or very necessary by a very small number of participants (between 10% and 20%). This is an interesting, yet surprising outcome, as all undergraduate students are required to write and give an oral presentation of a final-year dissertation which involves information search and communication.

Discussion

This study shows that over half of first-year staff adopted an information transmission approach to teaching during the 2009–2010 academic year, just after the introduction and implementation of a new educational system in Spanish universities in conformity with European guidelines. Evidence of the relation between approaches to teaching and approaches to learning suggests that an educational system with a majority of student-focused (CCSF) teachers is a must, as they would in turn promote the adoption of a deep approach to learning amongst students.

The most highly rated competencies are “Communication skills”, “Time management”, “Critical thinking”, and “Application of knowledge”. In contrast, information search and communication competencies achieved a moderate-low scoring, which suggests the

Table 4
Teachers' Assessment of Core Competencies. Analysis in Terms of Dominant Teaching Approach

Comp.	Item	Competencies	Global	ITTF	CCSF
A	1	Teamwork			
A	7	Use of ICT			
A	12	Note-taking			
A	13	Information search			
A	14	Writing assignments			
A	15	Submission of written assignments			
A	16	Oral presentations			
A	18	Planning and conducting a research study			
B	8	Communication skills			
B	9	Knowledge understanding			
B	17	Exam preparation			
C	2	Time management			
C	3	Critical thinking			
C	4	Problem-solving			
C	10	Ability to make judgments			
C	11	Application of knowledge			
D	5	Decision-making			
D	6	Commitment and motivation			

Note. ITTF (Information Transmission/Teacher-Focused approach), CCSF (Conceptual Change/Student-Focused approach). Boldface: competencies rated *quite* or *very* necessary.

Table 5
Teachers' Assessment of Core Competencies

Comp.	Item	Competencies	Global	M	F	AH	CS	C	SA	AI	ITTF	CCSF	%
A	1	Teamwork											10
A	7	Use of ICT											20
A	12	Note-taking											20
A	13	Information search											0
A	14	Writing assignments											10
A	15	Submission of written assignments											10
A	16	Oral presentations											10
A	18	Planning and conducting a research study											10
B	8	Communication skills											90
B	9	Knowledge understanding											60
B	17	Exam preparation											20
C	2	Time management											80
C	3	Critical thinking											90
C	4	Problem-solving											60
C	10	Ability to make judgments											60
C	11	Application of knowledge											80
D	5	Decision-making											30
D	6	Commitment & motivation											50

Note. M (Male), F (Female), AH (Arts and Humanities), CS (Social Sciences), CC (Sciences), SA (Health Science), AI (Engineering and Architecture), ITTF (Information Transmission/Teacher-Focused approach), CCSF (Conceptual Change/Student-Focused approach).

sample does not regard them as a priority in the learning process of undergraduate students.

This study provides the first evidence of how university teachers from different areas assess a number of competencies which undergraduate students ought to learn and develop while at university. In future research it would be desirable to analyse the differences between degrees which belong to the same branch of knowledge and between different course years in a single discipline. There is evidence (Samuelowicz & Bain, 1992) that teachers' conceptions of teaching vary from one context to another, as well as from undergraduate to postgraduate courses, so there might also be differences in teachers' opinions as to how necessary core competencies are to first-, second-, and third-year students. It would therefore be interesting to delve into the differences in ratings amongst teachers at different levels.

Amongst the main limitations of this study are the sampling procedure and sample size, as well as the fact that the analysis focused on a single Spanish university. Since this descriptive study was conducted with non-randomly selected first-year teachers, the authors do not intend to generalise results to a population or other higher education contexts, but to describe a particular aspect (assessment of competencies) following the introduction of European changes to the Spanish educational system. Nevertheless, results provide an initial overview of teachers' current views on how important and necessary certain competencies might be for their students. This is particularly relevant at the present time, as many Spanish universities are undergoing an evaluation, certification, and accreditation process following a complete implementation of their programmes, conducted by the National Agency for Quality Assessment and Accreditation of Spain (ANECA), or similar foundations. As universities prepare for such a process, careful attention should be paid to which competencies students should learn, so that programmes may be updated accordingly. Other educational implications may be the introduction of specific programmes, which would support teachers so that they may, in turn, help their students with particular difficulties in their studies. Also, induction courses or support programmes may be offered to students, in order that competencies may be learnt and developed. These courses should be long-term and highlight the

peculiarities and differences amongst disciplines, so that students become proficient learners in their field of study. As a result, this would have a positive impact on learning outcomes and thus on the quality of our educational system as a whole.

Conflict of Interest

The authors of this article declare no conflict of interest.

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Appendix

Students' Learning Needs

Core competencies/Learning needs	Not necessary 1	Slightly necessary 2	Fairly necessary 3	Quite necessary 4	Very necessary 5
(1) Teamwork					
(2) Time management					
(3) Critical thinking					
(4) Problem-solving					
(5) Decision-making					
(6) Commitment and motivation					
(7) Use of ICT					
(8) Communication skills					
(9) Knowledge understanding					
(10) Ability to make judgments					
(11) Application of knowledge					
(12) Note-taking					
(13) Information search					
(14) Writing assignments					
(15) Submission of written assignments					
(16) Oral presentations					
(17) Exam preparation					
(18) Planning and conducting a research study					