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María-José Bezanilla[1], Héctor Galindo-Domínguez[2], Manuel Poblete[1]

1) Universidad de Deusto
2) Universidad Francisco de Vitoria

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Importance of Teaching Critical Thinking in Higher Education and Existing Difficulties According to Teacher´s Views

María-José Bezanilla
University of Deusto

Héctor Galindo-Domínguez
Francisco de Vitoria University

Manuel Poblete
University of Deusto

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Abstract

In our globalised, pluralistic, and often information-swamped society, critical thinking is recognised as an important competence to be developed in university education. In order to investigate this, 142 Latin American and Spanish teachers were asked about the importance of and potential for developing critical thinking in university. Their responses were subjected to an inductive analysis, which lead to 13 categories about the reasons why it is important, and 11 categories about the potential and limitations for developing it. These categories were found to remain statistically unchanged regardless of age, years of teaching experience, area of knowledge, gender and geographical area. Results show that teachers consider important to teach critical thinking at university and mainly for students to become good professionals in a complex world. Teachers believe it is possible to teach it, as long as active methodologies are used, universities lack of interest is overcome, and students bring a minimum of critical thinking level from previous educational stages. Getting to know university teacher´s views about the importance and possibilities of teaching and learning critical thinking is crucial for the establishment of meaningful curriculum plans and learning activities for its development.

Keywords: critical thinking, higher education, university, university curriculum, teaching perspectives

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Importancia del Desarrollo del Pensamiento Crítico en Educación Superior y Dificultades Existentes según la Visión del Docente

María-José Bezanilla
Universidad de Deusto

Héctor Galindo-Domínguez
Universidad Francisco de Vitoria

Manuel Poblete
Universidad de Deusto

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Resumen

En nuestra sociedad global y plural en la que nos desborda la información recibida, el pensamiento crítico es una competencia importante a ser desarrollada en la educación universitaria. Con el fin de investigar esto, se les preguntó a 142 docentes de América Latina y España por la importancia y potencial de desarrollo del pensamiento crítico en la educación universitaria. Sus respuestas fueron analizadas inductivamente, estableciendo 13 categorías sobre las razones por las que es importante, y 11 categorías sobre el potencial y limitaciones en su desarrollo. Las categorías se mantuvieron invariables independientemente de la edad, años de experiencia, área del conocimiento, género y área geográfica. Los resultados muestran que el profesorado considera importante enseñar el pensamiento crítico en la universidad para ser buenos profesionales en un mundo complejo. El profesorado cree que es posible enseñarlo, si se utilizan metodologías activas, se supera la falta de interés de las universidades y los estudiantes aportan un mínimo nivel de pensamiento crítico de etapas educativas anteriores. Conocer el punto de vista del docente es crucial para el establecimiento de planes curriculares y el desarrollo de actividades de aprendizaje significativos.

Palabras clave: pensamiento crítico, educación superior, universidad, currículum universitario, perspectiva docente

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In today's globalised and pluralistic society, in which there is a constant flow of data, the critical thinkers play a particularly important role. A critical thinker can be defined as a person who is able to carry out an intellectually disciplined process that allows to conceptualise, apply, analyse, synthesise and/or evaluate information gathered from, or generated by, observation, experience, reflection, reasoning or communication, as a guide towards belief and action (Bezanilla et al., 2018; Palacios et al., 2017). For their part, Ketabi et al. (2013) supported the idea that critical thinking is not innate, but something that needs to be acquired through daily practice. In fact, many authors have defined and explained different educational models for teaching and learning critical thinking according to their own views about it (Abrami et al., 2015; Asgharheidari & Tahiri, 2015; Ennis, 2016; Facione, 2007; Paul, R. & Elder, 2008; Thompson, 2011; Villarini, 2003).

The Importance of Developing Critical Thinking in Higher Education

The importance of developing students' critical thinking in higher education has been widely recognised. Experts have pointed to various reasons for this.

A group of authors have highlighted its importance in the development of higher order cognitive skills (reflection, self-awareness, among others), because they consider that it will contribute to the analysis and solution of social problems in the future, when students become professionals (Ennis, 2016; Velásquez & Figueroa, 2012; Villarini, 2003). Choy and Cheah (2009) have also noted the importance of critical thinking as an intellectual stimulus that can facilitate student learning.

Other authors justify its importance from the reality in which we live in. In a world where change and complexity seem to be part of people's daily lives, key competences are necessary to face new challenges, including critical thinking (Franco & Almeida, 2015). According to Tenías (2013), the current world demands fostering the habit of being well informed, of expressing one’s opinions correctly and appropriately, and having, defending and arguing one’s ideas and opinions as well as being able to understand, analyse and evaluate others’ views. To Flores (2016), critical thinking skills are indispensable for the professional development of students in the

knowledge society, as they contribute to face the challenges of a globalised world. This is a world that, in the words of Hervás and Miralles (2000), demands new skills, such as organising, processing, evaluating and transmitting increasingly abundant information, as well as having the skills to solve problems and make decisions, to understand the vast scientific literature available and to comprehend the technological world that grows around us. All of this requires that university students develop critical skills.

Moreover, in the professional field, critical thinking is not only considered an essential competence when recruiting employees, but it is the most difficult to find according to employers (Committee for Economic Development , 2015; World Economic Forum, 2016). In this regard, Tenías (2013) stated that the development of critical thinking is a socio-educational demand across the world and an undeniable condition for university education.

The development of critical thinking is often linked to other key competences in 21st century living. Hervás and Miralles (2000) pointed out that processing information, learning to learn, generating knowledge, meta-cognition, decision making, creativity and creative thinking, problem solving, and critical thinking are crucial elements in any current teaching-learning process. Other authors have emphasised the importance of working on this competence in all curricular areas of higher education, being the arts and humanities an excellent domain in which to promote critical thinking and the articulation of meanings (Dimitru, 2019).

For other authors, critical thinking is essential for students' overall development and for the social transformation of their environment, since universities should not only be certificate-granting institutions, but should also aim to educate people to engage in ethical and socially responsible behaviour, capable to solve complex problems, thus transforming, improving and building the societies of the future, through processes of analysis, reflection and decision making (Agredo Tobar & Burbano Mulcue, 2012; González, 2008; Indrasiene et al., 2019). Moreover, Marques Vieira et al. (2011) consider critical thinking to be a necessary competence to live in a plural society and to develop the competence of citizenship. For Franco (2016), it is essential in daily life, where multiple decisions are to be made.

In her words, critical thinking is the door to freedom, and higher education is the key.

While it is very important for higher education students to develop this competence from the very first years, the 'other side' should not be forgotten, that is, the major role that critical thinking plays in the professionalism of university teachers (González, 2008). It would be paradoxical for a teacher to aim to teach critical thinking skills without having sufficiently experienced reflexive-critical processes (Cárdenas Becerril et al, 2015; Oz & Balyer, 2018). At this respect, Bezanilla et al. (2018) found that teachers have different understandings of what critical thinking is. One of the main problems in teaching competences related to critical thinking, according to Ketabi et al. (2013), is that the vast majority of teachers have very simplistic and general conceptions and lack details about what critical thinking actually is. Some members of the teaching profession may think that they are teaching their students to think critically when in fact they are only helping them to understand a given subject (Choy & Cheah, 2009). It is therefore essential that teachers analyse their own beliefs, compare them against the academic demands of the university and reflect upon, and adapt their timing and teaching methods before they start teaching their students to think critically (Choy & Cheah, 2009). This should be applied in practical terms through appropriate teacher training, which would enable teachers to incorporate critical thinking into their teaching plans (Ketabi et al., 2013).

Finally, Paul and Elder (2008) proposed some objectives that teachers should take into account when preparing their student-centered teaching plans. These include raising and formulating vital questions and problems; gathering and evaluating information that may be relevant to a particular event; reaching conclusions and reasoned solutions by testing criteria and standards; having an open mind to consider different alternatives; recognising and valuing the assumptions, implications and practical consequences for each case; and appropriately communicating with others in the search for solutions to complex problems. Moreover, Bezanilla et al. (2019) presented a comprehensive analysis of the methodologies university teachers use for teaching critical thinking in the classroom, such as oral and written reflection and argumentation, case studies or problem/project based learning, among others.

As seen above, many previous studies have highlighted the importance of developing critical thinking at university education, but there are hardly any empirical studies that analyse the reasons why it is so important and even less so from the perspective of the teacher. This is one of the main objectives of this study.

Difficulties or Barriers to Developing Critical Thinking in University Education

After asking 100 university teachers about the barriers they perceived to teaching critical thinking in their classes, Aliakbari and Sadeghdaghighi (2013) identified that the most important barrier was related to the characteristics, attitudes and expectations of students, such as lack of motivation, concern for their marks, resistance to active learning, preference for activities and tasks requiring a simple response, and inability to tolerate difficult thinking. The second barrier (in order of importance) they found concerned the poor skills and preparation of teachers to teach students to think critically; in fact, they expressed their need for professional development and training. The third major barrier referred to teachers' lack of knowledge about the real meaning of critical thinking and the difficulty of evaluating it. In the same line, Schendel (2016) in another study on the barriers to helping university students to develop critical thinking (from the teachers' perspective), found that on many occasions, the teaching staff had a limited understanding of the reasons and purposes of the pedagogical changes that were required from them, such as working on critical thinking with students. They also showed little motivation in implementing teaching methods that increased their workload. Schendel (2016) highlighted the importance of ensuring that higher education institutions become involved and offer permanent support to teachers in their professional development.

Fraker (1995) (as cited in López, 2012) listed the main causes that could make it difficult to develop critical thinking as a competence in academic contexts. These include students' preference for socialising rather than for learning; how subjects taken by students lack of utility for their daily lives; how students are not given the opportunity to reflect and explain their views for themselves; or how students show apathy towards certain courses.

However, according to Fraker (1995), these shortcomings can be improved as long as teaching methods are varied according to the area of knowledge, the teaching context is taken into account, programmes are planned according to students' age and interests, and students are the key players in their own learning process.

It is important to highlight also the importance of ideology and politics biased curriculum as an obstacle preventing students to develop independent and critical thinking as Zhang (2017) states, in relation to Chinese curriculum, marked by political and ideological factors.

Methodology

Objectives

This study has two objectives. Firstly, it seeks to find out why it is important to develop critical thinking in hispanophone higher education. Secondly, it aims to ascertain whether it is possible to develop university students' critical thinking, and if so, what difficulties or limitations may be faced in this process. Both of the above will be investigated from the perspective of the university teacher.

Sample

The sample for this study included a total of 142 university teachers from different public (32 cases) and private universities (110 cases), knowledge areas and geographical regions in Spain and Latin America (Argentina, Bolivia, Chile, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico and Venezuela). The sample was a convenience sample. All were teachers with which the members of the research team had previously established some kind of collaboration in teaching innovation and teacher training work. 36 of the teachers came from Spain and 106 from Latin America; a total of 67 were women and 75 were men. 35 of them taught in the area of knowledge of the arts and humanities, 14 in science, 19 in health sciences, 48 in social and legal sciences and 26 in engineering and architecture. Almost all of the teachers (87.4%) were between 31 and 60 years old. Regarding age distribution, 25.4% of the participants were between 31 and 40 years old; 26.8% of them were between 41 and 50 years

old; 35.2% were between 51 and 60 years old; and only 2.1% and 10.6% of the sample was under 30 years old and over 60 years old, respectively.

Many of them (54.3% of the total) had extensive teaching experience; specifically, they had been teaching for 11 to 30 years.

Instrument

The data collection instrument was a brief ad-hoc questionnaire with two sections, one with the sample's contextual data (type of university and country of origin, area of knowledge, gender, age and years of teaching experience), and another with two open questions regarding the importance of and potential for the application of critical thinking in university education. The questionnaire was administered online to facilitate participants' responses.

Procedure

A total of 326 university teachers from different public and private universities in Spain and Latin America were invited to participate in the study. A database was created of possible participants and a questionnaire was sent to them using the Qualtrics software. Hence, participants replied to the questionnaire by online means. For this purpose, it was explained to them the main objectives of the study and the ethical considerations of privacy and anonymity. Finally, 142 participants answered open questions about the importance of and potential for developing critical thinking in higher education institutions. Subsequently, this information was recorded in an Excel. The content analysis was carried out by all authors, first individually, and then together through meetings, allowing to clarify and debate around possible doubtful cases. The process was inductive, no categories were established beforehand. Finally, with SPSS Statistics 23.0 cross-tabulations were carried out to have a closer approach of frequencies.

Establishing categories

Once all data had been collected, they were analysed. The answers provided by the participants to two questions were analysed first:

- Why do you believe it is important to develop university students' critical thinking?

- Is it possible to develop this competence in university education?

Categories were established by an inductive process in which the participants' responses were analysed one by one. In the first sweep, 18 categories were established for the question about the importance of critical thinking and 19 categories for the question about whether it was possible to develop this skill at university and the existing limitations. In the second sweep all responses were reviewed to amend any possible errors, some of the answers were reallocated to a different category and some categories were regrouped. A total of 13 categories were left in relation to the question about the importance of critical thinking, whereas 11 categories were established for the question about the potential for developing critical thinking in the university and existing limitations. Certain longer responses fell into more than one category. This meant that the final count was greater than the number of study participants.

Results

Why it is Important to Teach Critical Thinking in Higher Education

After analysing the teachers' responses as to why they considered it important to develop critical thinking in the university, the following categories were found:

(1) *Essential* (f = 38; 24.3%): This category included those responses that considered the development of critical thinking in the university to be essential. They were usually short, simple answers, which did not provide any specific reasons as to why it was important. An example of this category is: 'It should be a basic competence in university education'.

(2) *Teachers' professionalism* (f = 4; 2.5%): This category was defined by the need for teachers to present themselves as professionals capable of introducing critical thinking in the different stages of planning, development and evaluation of educational practice, who had a positive attitude towards it. An example of this category is: 'It is very important for a teacher to be experienced and flexible.'

(3) *Students' future professionalism* (f = 22; 14.1%): This category was related to the need for students to develop critical thinking skills to be able

to meet the challenges that may arise in their future work. An example of this category is: 'It is a competence that should be strengthened in the university because it is essential for good professional performance.'

(4) *Overall development* (f = 11; 7.0%): This category referred to the need for students to develop critical thinking as a basis for their overall and comprehensive development in different areas: personal, social, emotional, and so on. An example of this category is: 'It is very important to develop this skill since childhood to ensure that they become proactive, fully developed people, who are able to make a positive contribution to society.'

(5) *Intellectual development* (f = 13; 8.3%): This category was related to the category of overall development, although it emphasised the need to develop critical thinking as the basis for the cognitive and intellectual development of the individual. An example of this category is: 'It is of utmost importance that secondary and higher education students develop these skills, as this will allow them to enhance their intellectual capacity'.

(6) *Development of autonomy* (f = 12; 7.6%): This category referred to the need to develop critical thinking with a view to ensuring that students become autonomous with the ability to think and act for themselves, without being influenced by other people. An example of this category is: 'It is essential for students to acquire critical thinking skills so that they can analyse situations properly and act following their own judgment, rather than following whatever is fashionable or what others say. To prevent them from being one of the crowd'.

(7) *Search for evidence-based truth* (f = 9; 5.7%): This category included those responses in which the importance of developing critical thinking is due to the need to seek and know the truth, based on solid data through different processes (selection of reliable sources, comparing information...). They emphasised the importance of critical thinking in conducting research processes. An example of this category is: 'The development of critical thinking means showing independence from distorting factors and relying on truth based on data, evidence and uncovering falsehoods or fallacies.'

(8) *Deficits identified in students* (f = 7; 4.4%): This category referred to the need to develop critical thinking due to the deficits or problems presented in students' simplistic reasoning, preparation and attitudes. An example of this category is: 'In general term, I see that most students' thinking is very basic; they don't give reasoned answers or actions, they don't measure commitments; so, doing some work on critical thinking would be very important'.

(9) *Transformation of reality* (f = 7; 4.4%): This category includes responses that advocate the need to develop critical thinking as a basis for knowing, acting and transforming the near and distant reality of students. An example of this category is: 'Critical thinking encourages an education in which students become more familiarised with reality and are able to contribute to transforming it.'

(10) *Creativity* (f = 4; 2.5%): This category referred to how critical thinking is essential in solving complex problems and it is necessary to provide creative and useful answers. An example of this category is: 'It has to come hand in hand with the development of creative thinking, so that they complement each other.'

(11) *Transversal nature* (f = 11; 7.0%): This category understands the reported need to develop critical thinking through other competences and areas. That is, developing critical thinking is essential, but it is worthless when it is done in isolation. It must be present in all degrees and professions. An example of this category is: 'Critical thinking should be developed by all students, regardless of their area of knowledge.'

(12) *Learning methods* (f = 11; 7.0%): This category showed the need to develop critical thinking, but through specific learning methods. An example of this category is: 'It is important that the learners, whether they are novices or not, are faced with problematic situations (according to their level) in which they have to carry out analyses, construct arguments, applications and conclusions, among other tasks, within an ethical framework.'

(13) *Others* (f = 7; 4.4%): This category included comments that did not fit into any of the categories mentioned above. An example of this category is: 'It's not easy at all.'

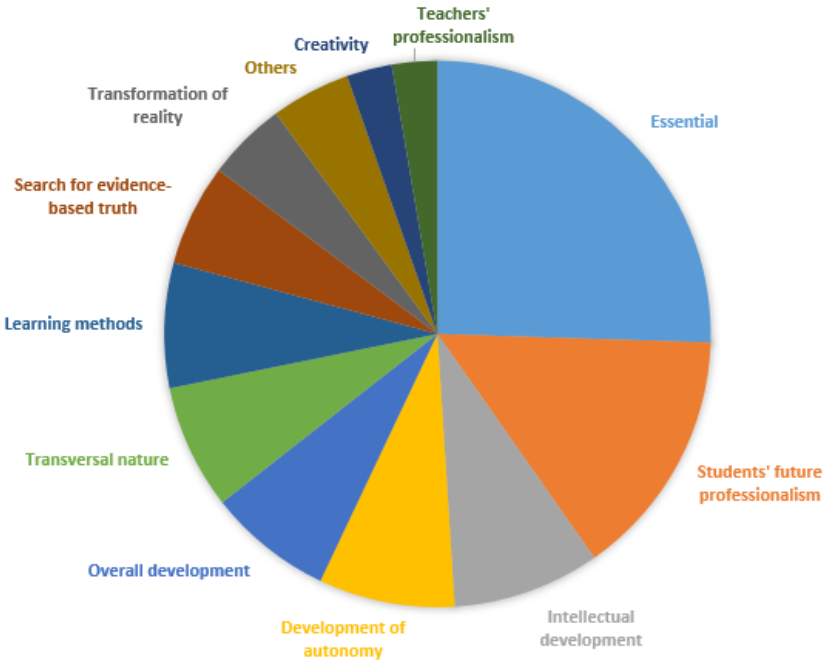

Figure 1. Reasons why it is important to teach critical thinking in higher education according to teachers

Results show that the two main reasons for teaching critical thinking in higher education according to teachers were: the essentiality of critical thinking at higher education, that is, understanding that the development of critical thinking is inherent to higher education; and the importance of developing critical thinking for being a good professional in the future, in a changing and complex world. A summary of this analysis can be found in Figure 1.

Possibility to Teach Critical Thinking in Higher Education and Major Difficulties

The categories resulting from analysing the content of the teachers' answers to the question of whether they think it is possible to teach critical thinking

to university students, and if so, which are the existing difficulties, were (see Figure 2):

(1) *Possibility* (f = 65; 32.8%): This category included simple opinions that only showed that there is potential for developing critical thinking in university education, and even that it should be compulsory. An example of this category is: 'It is both possible and essential'.

(2) *Transversal nature* (f = 7; 3.5%): This category emphasised that critical thinking can be developed in all programmes and subjects taught at university. An example of this category is: 'A multidisciplinary approach should be adopted. That is, from a specific subject and also from the other subjects, both transversal and disciplinary'.

(3) *Complexity* (f = 11; 10.6%): This category includes those responses that considered critical thinking to be a highly complex competence to be developed. An example of this category is: 'It is complex if you do not have a prior solid grounding. However, students can be helped to enhance it'.

(4) *Insufficient Time and Ratio* (f = 8; 4.0%): In this category, teachers pointed out the difficulties in terms of time and teacher/student ratio to develop critical thinking. An example of this category is: 'It should be one of the priority objectives in university education. But the resources (time, number of students ...) to do it are not always available'.

(5) *Lack of Interest/University Curriculum* (f = 10; 5.0%): This category contained the answers that referred to a lack of commitment on the part of the university, which translates into the absence of this competence in the curriculum of the different degrees. An example of this category is: 'All education institutions are governed by patterns, standards or profiles. Developing critical thinking without transgressing these profiles sometimes produces tension within the institutions that depend politically or economically on the state'.

(6) *Lack of interest among teachers* (f = 8; 4.0%): This category referred to the fact that teachers found it difficult to include critical thinking in their teaching and felt that this required too much commitment on their part. An example of this category is: 'It depends on the willingness and interest of the teacher'.

(7) *Teachers' lack of competence and/or experience* (f = 10; 5.0%): This category highlighted teachers' lack of ability and experience, which prevented them from being critical thinking educators in their area or discipline. An example of this category is: 'Not all teachers are trained to teach and promote it. There are programmes where working on critical thinking can be more difficult, in the exact sciences, for example'.

(8) *Students' lack of grounding/interest* (f = 22; 11.1%): This category included those answers that focused on students' poor competence level, either due to a lack of interest or to a lack of a grounding in their previous academic development. An example of this category is: 'It is very difficult, since it is necessary to be aware of the facts and search as much information as possible, and at the moment young people are living in an instantaneous world, so they hold on to the information that they initially find and do not deepen into issues '.

(9) *Methodologies* (f = 31; 15.6%): This category highlights the importance of effective learning teaching methodologies and processes that shape the development of critical thinking. An example of this category is: 'You can develop cases and hold debates and other activities that arouse a critical spirit among students.'

(10) *Dogmatism* (f = 5; 2.5%): This category contained ideas reported by respondents on how university education is based on indisputable facts and practices; and on how views and behaviours that contradict the establishment are not accepted. An example of this category is: 'It is usually discouraged when dogmatic and totalitarian attitudes and behaviours are adopted that are often relying on self-proclaimed, critical and progressive positions, when in reality they are archaic and retrograde.'

(11) *Others* (f = 11; 5.5%): This category included comments that did not fit into any of the categories mentioned above. An example of this category is: 'This is not a task that is exclusive [to university education]. The context has an unfavourable effect on it'.

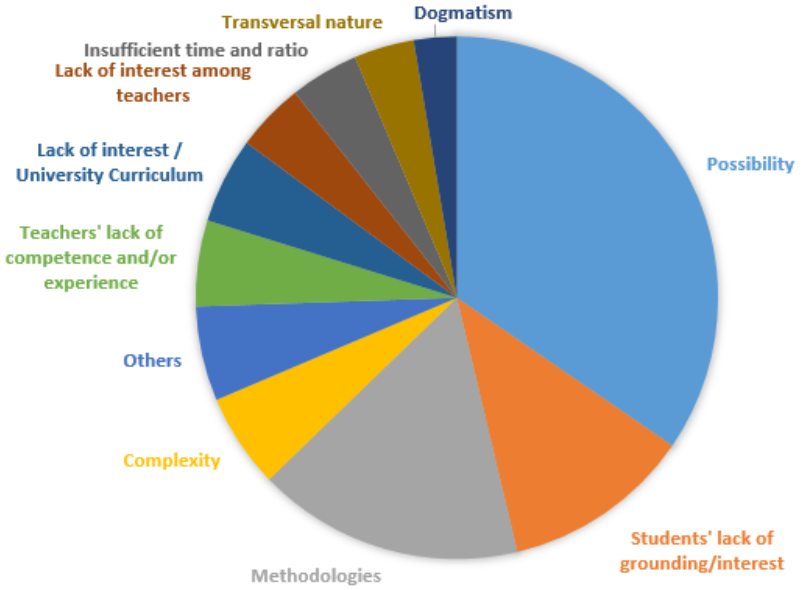

Figure 2. Possibility and difficulties of teaching critical thinking in higher education

These results show that according to teachers the responses to the possibility of teaching-learning critical thinking at university, were mainly referred to three issues: the obvious fact that it is possible and essential; the emphasis on the use of effective methodologies, that is, it is possible but if active and adequate methodologies and teaching-learning strategies are used for that purpose; and a more negative view that has to do with the lack of preparation, previous knowledge and/or interest about critical thinking that students bring to university, which makes difficult its teaching.

These frequencies meant that certain conclusions could be drawn from the point of view of university teachers. However, it was decided to go one step further and analyse possible differences or preferences for each category depending on the area of knowledge, age, years of teaching experience, gender and geographical area.

The Importance of Teaching Critical Thinking and Contextual Variables

To identify possible significant differences between the categories on the importance of critical thinking, a simple correspondence analysis was performed. Correspondence analysis is used to study the proximity of categorical variables. For this purpose, on the one hand, contextual variables, namely age, years of experience, area of knowledge, gender and geographical area, and on the other hand, critical thinking categories were considered.

Table 1: Cross tabulation between contextual variables and categories on the conceptions about the importance of critical thinking in university education.

		ESS	LP	SFP	OD	ID	DA	SET	SD	TR	CR	TN	LM	OTH	T
Age	< 30	1	0	2	1	1	0	0	0	0	0	0	0	0	5
	31-40	6	2	4	1	3	0	4	0	0	2	4	5	2	33
	41-50	15	2	7	3	2	7	1	5	1	2	5	1	1	52
	51-60	13	0	6	3	4	3	2	2	4	0	1	5	3	46
	> 60	3	0	3	3	3	2	2	0	2	0	1	0	1	20
	T	38	4	22	11	13	12	9	7	7	4	11	11	7	156
Experience	< 5	1	1	3	1	1	1	0	0	0	0	1	1	0	10
	6-10	7	1	4	1	2	2	2	3	0	2	2	5	2	34
	11-20	16	2	7	4	5	5	2	3	5	2	7	0	1	59
	21-30	6	0	3	2	2	2	2	1	2	0	1	4	3	27
	>31	8	0	4	3	3	3	3	0	0	0	0	1	1	26
	T	38	4	22	11	13	13	9	7	7	4	11	11	7	156

Note: ESS: Essential; LP: Teachers' professionalism; SFP: Students' Future Professionalism; OD: Overall development; ID: Intellectual Development; DA: Development of Autonomy; SET: Search for evidence-based truth; SD: Students' deficits; TR: Transformation of reality; CR: Creativity, TN: Transversal nature; LM: Learning methods; OTH: Others. T: Total; A&H: Arts and Humanities; SCI: Science, HS: Health Sciences; SLSCI: Social and Legal Sciences; E&A: Engineering and Architecture: W: Women; M: Men; LM: Latin America; SP: Spain.

Table 1: Cross tabulation between contextual variables and categories on the conceptions about the importance of critical thinking in university education (continuation).

		ESS	LP	SFP	OD	ID	DA	SET	SD	TR	CR	TN	LM	OTH	T
Area	A&H	10	2	4	5	6	5	0	0	3	1	2	2	1	41
	SCI	6	1	1	1	2	0	1	1	0	0	0	1	0	14
	HS	6	1	4	0	1	2	1	2	0	1	1	1	1	21
	SLSCI	10	0	9	1	2	2	3	3	3	1	5	3	4	46
	E&A	6	0	4	4	2	3	4	1	1	1	3	4	1	34
	T	38	4	22	11	13	12	9	7	7	4	11	11	7	156
Sex	W	18	1	8	3	6	5	6	3	4	1	6	5	5	71
	M	20	3	14	8	7	7	3	4	3	3	5	6	2	85
	T	38	4	22	11	13	12	9	7	7	4	11	11	7	156
Location	LM	28	4	16	9	12	12	4	5	4	4	7	10	5	121
	SP	10	0	6	2	1	0	5	2	2	0	4	1	2	35
	T	38	4	22	11	13	12	9	7	7	4	11	11	7	156

Note: ESS: Essential; LP: Teachers' professionalism; SFP: Students' Future Professionalism; OD: Overall development; ID: Intellectual Development; DA: Development of Autonomy; SET: Search for evidence-based truth; SD: Students' deficits; TR: Transformation of reality; CR: Creativity, TN: Transversal nature; LM: Learning methods; OTH: Others. T: Total; A&H: Arts and Humanities; SCI: Science, HS: Health Sciences; SLSCI: Social and Legal Sciences; E&A: Engineering and Architecture: W: Women; M: Men; LM: Latin America; SP: Spain.

Table 1 shows the results of the frequency distributions of each variable for each category. This analysis was complemented with the data produced by the correspondence analysis, shown in Table 2.

Table 2: Total variance explained and significance of the correspondence analysis between the contextual variables and the categories on the conceptions about the importance of CT in university education

	Total Variance Explained	**Significance**
Age	76.6%	.273
Experience	69.0%	.612
Areas of Knowledge	74.4%	.272
Sex	100%	.786
Geographical area	100%	.164

These data show that, while the proposed statistical models can explain a large part of the total variance, none of them was statistically significant. This indicates, therefore, that the categories proposed about the conception of the importance of critical thinking are invariable in terms of age ($p = .273$), experience ($p = .612$), area of knowledge ($p = .272$), sex ($p = .786$) and/or geographical area ($p = .164$). These data lead to the acceptance of the hypothesis that the different views underlying the importance of critical thinking in university education are not related to any of the contextual variables studied, and that teachers' conceptions may have been consolidated due to the influence of other causes or variables different from those studied.

Differences Identified in Connection with the Potential for Developing Critical Thinking and Existing Difficulties

In order to identify about any possible significant differences between the various categories established on the potential for developing critical thinking and its limitations, a simple correspondence analysis was performed, based on each of the different contextual variables taken into account. In this analysis, age, years of teaching experience, area of knowledge, sex and geographical area were studied as contextual variables.

Table 3 shows the results of the frequency distributions of each variable for each category. This analysis was complemented with the data produced by the correspondence analysis, shown in Table 4.

Table 3. Cross tabulation between contextual variables and categories about the potential for developing critical thinking in university education.

		POS	TR	COM	ITR	LIC	LIL	LCE	SLI	MET	DOG	OTH	T
Age	< 30	3	0	1	0	1	0	0	1	0	0	0	6
	31-40	15	2	7	2	3	1	1	6	9	2	2	50
	41-50	21	2	6	3	3	2	4	7	10	0	2	60
	51-60	18	0	4	3	2	4	3	7	10	2	6	59
	> 60	8	3	3	0	1	1	2	1	2	1	1	23
	T	65	7	21	8	10	8	10	22	31	5	11	198
Experience	< 5	6	1	1	1	1	0	0	1	0	0	1	12
	6-10	17	2	6	3	3	1	1	6	10	2	1	52
	11-20	21	3	7	1	4	2	4	8	13	0	3	66
	21-30	10	0	4	2	1	3	3	5	5	0	5	38
	>31	11	1	3	1	1	2	2	2	3	3	1	30
	T	65	7	21	8	10	8	10	22	31	5	11	198
Area	A&H	15	2	5	0	3	2	2	5	6	0	7	47
	SCI	6	0	2	3	0	0	1	1	4	0	1	18
	HSs	7	1	3	2	1	1	2	5	6	0	0	28
	SLSCI	25	4	7	3	5	3	2	8	7	5	3	72
	E&A	12	0	4	0	1	2	3	3	8	0	0	33
	T	65	7	21	8	10	8	10	22	31	5	11	198

Table 3. Cross tabulation between contextual variables and categories about the potential for developing critical thinking in university education (continuation).

		POS	TR	COM	ITR	LIC	LIL	LCE	SLI	MET	DOG	OTH	T
Sex	W	29	0	13	4	6	4	5	15	10	2	4	92
	M	36	7	8	4	4	4	5	7	21	3	7	106
	T	65	7	21	8	10	8	10	22	31	5	11	198
Location	LM	51	4	15	5	9	6	9	14	25	2	9	149
	SP	14	3	6	3	1	2	1	8	6	3	2	49
	T	65	7	21	8	10	8	10	22	31	5	11	198

Note: POS: Possibility, TR: Transversality; COM: Complexity; ITR: Insufficient Time and Ratio; LIC: Lack of Interest/University Curriculum, LIL: Lack of interest among teachers; LCE: Teachers' lack of competence and/or experience; SLI: Students' lack of grounding/interest, MET: Methodologies, DOG: Dogmatism, OTH: Others, T: Total, A&Hs: Arts and Humanities; SCI: Science, HSs: Health Sciences, SLSCIs: Social and Legal Sciences; E&A: Engineering and Architecture; WOM: Women; MEN: Men; LAM: Latin America; SP: Spain.

These data show how, even though the proposed statistical models were able to explain a large part of the total variance, none of them was statistically significant. This indicated that the categories on the conceptions about the potential to develop critical thinking in university education were invariable based on age ($p = .934$), experience (.765), area of knowledge (.244), sex ($p = .092$) and/or geographical area ($p = .401$). This data lead us to the acceptance of the hypothesis that the different opinions views that underlie the importance of critical thinking in the university education were not related to any of the contextual variables studied, and that teachers' teachers' conceptions may have been consolidated due to the influence of other causes or variables different from those studied.

Table 4: Total variance explained and significance of the correspondence analysis between the contextual variables and the categories on the conceptions about the potential to develop CT in university education

	Total Variance Explained	**Significance**
Age	76.8	.934
Experience	73.3%	.765
Areas of Knowledge	72.5	.244
Sex	100%	.092
Geographical area	100%	.401

However, it is striking that sex was the only variable that had a small degree of influence. Although this variable was not significant, a trend value was obtained ($p = .092$), something that revealed certain remarkable differences in some of the proposed categories. This was the case for the categories of Transversality, Complexity, Students' Lack of Grounding/ Interest and Methodologies.

As can be seen in Table 5, frequency scores were higher than expected for transversality and methodologies among men, whereas they were lower than expected among women. This indicated that men tended to think more than women about how critical thinking can be developed in university education, among other aspects, especially using a transversal approach and choosing the most appropriate teaching-learning methodologies.

In contrast, the expected frequency for complexity and students' lack of foundation/interest was lower among men than the frequency observed in women. This indicates that women had a particular tendency to believe that it is possible to teach critical thinking at university, despite the difficulties involved, and to perceive a greater lack of interest and/or grounding among students in this regard.

The categories not mentioned here had expected frequencies that were very similar to the observed frequencies, and therefore it was assumed that there were no major differences by sex.

Table 5: Cross tabulation between some categories on the potential for developing critical thinking in university education and sex.

Category	Women	Men	Total
Transversality	0 (3.3)	7 (3.7)	7
Complexity	13 (9.8)	8 (11.2)	21
Students' Lack of Grounding/ Interest	15 (10.2)	7 (11.8)	22
Methodologies	10 (14.4)	21 (16.6)	31

Note: The expected frequency for each box is shown in brackets.

Discussion

This study had two objectives. Firstly, to identify the reasons why it is important to develop critical thinking in university education. And secondly, to discover whether there was some potential for developing critical thinking at university, as well as, if so, which were existing difficulties. The perspective adopted in both cases was that of university teachers. Understanding the teacher's point of view about the importance of and potential for developing critical thinking among university students is key to make improvements in teaching and avoid teachers' resistance to innovation and change (Schendel, 2016).

In view of the categories found, it can be stated that, in general, the participant teachers believe that it is very important to develop critical thinking in university education, and some of them say so unambiguously (f = 38; 24.3%). This is mainly because this competence is closely linked to students' overall (f = 11; 7.0%), intellectual (f = 13; 8.3%) and professional development (f = 22; 14.1%) in all areas (f = 11; 7.0%). Therefore,

developing critical thinking allows students to develop cognitively, personally and emotionally, in addition to enabling them to become more competent and professional in their future work. At the same time, this skill also encourages students to be increasingly autonomous (*f* = 12; 7.6%) and to a lesser extent, to be more creative (*f* = 4; 2.5%). Having this competence helps students to research a particular problem, as it encourages them to constantly look for possible evidence-based solutions (*f* = 9; 5.7%). It also promotes social change and transformation through knowledge of the environment in which they live (*f* = 7; 4.4%).

However, it is also important to work on critical thinking at university not only with a focus on students. It is also necessary to ensure that teachers are increasingly competent in critical thinking (*f* = 4; 2.5%) and provide them with the knowledge, practical resources and methodologies that best allow them to implement it in their teaching practice (*f* = 11; 7.0%).

Regarding the potential to work on critical thinking in universities, participants placed special emphasis on the fact that not only is there potential to teach it (*f* = 65; 32.8%), but it should be considered essential and necessary, even though they were aware that it is a complex construct (*f* = 11; 5.5%) and it only makes sense to adopt a transversal approach to its teaching (*f* = 7; 3.5%). Time therefore needs to be provided to teach it, and student/teacher ratio per discipline needs to be reduced (*f* = 8; 4.0%). There should also be a move away from dogmatism (*f* = 5; 2.5%) and a shift in the universities' lack of interest in introducing critical thinking in the curricula (*f* = 10; 5.0%). Solutions need to be found to counter low interest and lack of grounding in students' pre-university education (*f* = 22; 11.1%). Education in critical thinking needs to be available to university teachers, who should be provided with specific active tools and methodologies for teaching critical thinking (*f* = 31; 15.6%). This would increase their competence in and experience of teaching it (*f* = 10; 5.0%) and would also overcome the lack of interest in specific groups of teachers (*f* = 8; 4.0%).

Knowing teachers views about the importance and real possibilities of developing critical thinking in higher education is crucial to understand the way critical thinking is being taught at universities nowadays. This fact could lead us to design adequate curricular and teaching-learning strategies for the

classroom, considering as a starting point teachers` views and preconceptions about critical thinking.

The data show that the categories presented are invariable and therefore do not indicate any preferences based on the contextual variables studied, namely age, years of teaching experience, area of knowledge, sex and geographical area. These results support the solidity of the proposed categories, regardless of the variables studied.

The results shown in this paper may have certain implications both at a theoretical and at a practical level. From a theoretical point of view, the wide range of assumptions established about the importance of and potential for developing critical thinking in the university based on the opinion of education professionals provides some additional nuances that may be taken into account in future studies within the theoretical models proposed by various authors (Bezanilla et al., 2018; Ennis, 2016; Zapalska et al., 2018). These theoretical models could lead to the creation of new measuring instruments that are more closely linked to actual university practices, thus fostering new theories born out of empirical studies. From a practical point of view, the present study can promote the formal and official incorporation of critical thinking into the teaching curricula and programmes at macro, meso and micro levels. This study has identified some reasons why it is important to introduce critical thinking into university education, as well as the limitations that the current approaches have from the perspective of teaching professionals. In fact, scientific evidence has demonstrated that it is possible to significantly improve this competence at the university level by establishing specific and previously planned programmes and using varied methodologies (Bezanilla et al., 2019; Guzmán, & Sánchez, 2006; Howard, Li-Ping, & Jill, 2015).

Future studies could aim to further the current knowledge about the effectiveness of interventions in the degree of development of critical thinking, as well as their impact on other psychological, social and personal aspects. These interventions could be partly supported by the data shown in the present study. This would shed some light on whether addressing the difficulties and constrains explained here could be more useful to students and teachers, than not doing so. Similarly, future studies could replicate the present study in other geographical areas, in order to discover if these results

could be extrapolated to areas with different cultures and levels of development.

Finally, this paper has certain limitations. Probabilistic sampling was not used in the selection process, and participants were proposed based on their proximity to the researchers involved in this study. Although the sample comes from different locations across the world, it might be interesting to employ a somewhat larger sample in future studies.

Conclusions

When establishing curricula and teaching-learning activities to develop critical thinking at university, it is very important to take into account the opinion of teachers on the importance they give to this competence, the possibilities they see for teaching it in the classroom and the difficulties they perceive in this process. This is one of the main contributions of this study to the subject of the development of critical thinking at university level.

As can be seen, on the one hand, there are different reasons why critical thinking should be worked in the classroom according to teachers, such as its importance for the future professional of the student, the development of their intellectual capacity and autonomy, and its transversal ability to transfer it to various subjects as well as areas of life.

On the other hand, the different difficulties faced by teachers in this process have also become evident. Although the vast majority of teachers consider that teaching critical thinking at university is possible, some of them point out, amongst the main difficulties, the lack of prior training and interest in the subject on the part of the students, as well as the lack of experience and training of teachers on this competence. The very complexity of the critical thinking as such also appears as one of the difficulties in working with it in the classroom as well as the lack of interest and support from the university institutions themselves.

Perhaps this diversity of opinions regarding the importance of teaching critical thinking in higher education and the difficulties for doing it, is one of the reasons why it is so difficult to work on it in a focused, systematic and coherent way at university education.

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María-José Bezanilla es Profesora en la Facultad de Psicología y Educación de la Universidad de Deusto

Héctor Galindo-Domínguez es Profesor en la Facultad de Humanidades, Educación y Psicología; Universidad Francisco de Vitoria.

Manuel Poblete es Profesor en la Facultad de Psicología y Educación de la Universidad de Deusto

Contact Address: Avenida Universidades, 24. 48007 Bilbao, España.

Email: marijose.bezanilla@deusto.es