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Student and Teacher perceptions and experiences:
How do they align?

ARTICLES

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Understanding critical thinking: A comparative analysis between university students' and teachers' conception

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Abstract: Critical thinking is a key competence in higher education. However, little is known about the conception that students have of this competence. This study aims to analyze what university students understand by critical thinking and if these conceptions agree with those of university teachers analyzed in a previous study. A total of 263 participants took part in the study. The findings reveal that students tend to consider critical thinking as a competence related to *reasoning/arguing* and *questioning/asking oneself*. Also, that students' conception about critical thinking differs from that of teachers. Whereas students tend to consider critical thinking as related to *reasoning/arguing*, *questioning/asking oneself* and, to a lesser extent, to *acting/compromising*. Teachers, on the other hand, tend to consider critical thinking as related to *analyzing/organizing* and *evaluating*. No significant differences were found regarding students' gender and academic year. These results highlight the

* **María José Bezanilla** (corresponding author; marijose.bezanilla@deusto.es), PhD, is Senior Lecturer at the University of Deusto, Spain, in the Department of Education.

Héctor Galindo-Domínguez (hector.galindo@ehu.eus), PhD, is currently an adjunct teacher at the University of the Basque Country, Spain.

Lucía Campo (l.campo@deusto.es), PhD, is currently a teacher in Primary School Grade and tutor for Final Degree Project and Practice at the University of Deusto, Spain.

Donna Fernández-Nogueira (donna.fernandez@deusto.es), PhD, is currently a Professor–Researcher at the University of Deusto, Spain.

Manuel Poblete Ruiz (manuel.poblete@deusto.es), PhD, does research mainly on issues related to competencies and Learning Systems based in Competencies. He is a retired lecturer of Organizational Psychology at the University of Deusto, Spain.

More information about the authors is available at the end of this article.

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importance of considering students' views when designing the curricula and the learning activities to develop students' critical thinking.

Keywords: Critical thinking; higher education; thinking skills; university students; students' point of view; transversal competence.

I. Introduction

Critical thinking is a process that must be taught in all the different stages of education, from primary to post-graduate studies (Facione 1990). Moreover, it is necessary for students and educators to have a common understanding of this competence so as to find the most adequate methods and activities to develop it in the classroom. Literature shows that critical thinking is a polysemic concept and a complex process which is understood differently by teachers and students. Moreover, it is difficult to teach it and learn it in an effective way (Choy and Cheah 2009). Little research has been done on this particular issue, so it is necessary to advance knowledge about what teachers and students truly understand by critical thinking.

Many educational centers include critical thinking as a general strategy and include it in the different programs of the subjects taught (Bezanilla et al. 2021). From the teacher's point of view, critical thinking is linked to the integral, intellectual, and professional development of the student. For this reason, it is important to spend time teaching it in a transversal manner (Franco and Almeida 2015) and to include this competence in all the subjects taught. Beyond the analysis of contents, it is necessary to compare ideas to reach well-argued conclusions, question controversial issues, and determine the value of an issue based on criteria.

In addition, decisions should be based on analysis, argumentation, and questioning so as to reach a personal opinion, and consequently, be committed to society (Bezanilla et al. 2018). Developing critical thinking in the classroom has as an aim for students to internalize and systematically adopt this way of living and being in a reality which can sometimes be hostile.

The importance of developing critical thinking in college students has been widely recognized by experts who have pointed out several reasons for this. One of them is its importance in the development of higher order cognitive skills (reflection, self-awareness, among others), which will help them in the analysis and solution of social problems in the future when students become professionals (Ennis 2018; Morris 2017; Paul and Elder 2019; Velásquez de Suárez and Figueroa Morán 2012; Villarini 2003). Choy and Cheah (2009) add the importance of critical thinking as an intellectual stimulus that can facilitate learning. Other authors point out that in a world

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where change and complexity are part of everyday life, key competences, including critical thinking, are necessary to face new challenges (Flores 2016; Franco 2016; Franco and Almeida 2015; Hervás and Miralles 2000; Tenías 2013). More specifically, some authors focus on the growing social complexity triggered by the digital social media phenomena (denialism, post-truth, fake news, conspiracy theory, and so on) and the need for students to have tools to cope with this reality through the management of critical thinking skills (Rodríguez Ríos 2021).

Critical thinking is a complex and multidimensional concept. Many authors have defined critical thinking in the educational context, although, and due to the abstract nature of the concept, multiple points of view have emerged when defining it. For Flores et al. (2012, 214), critical thinking "becomes the application of knowledge in more complex ways". A criterion that is commonly accepted by many authors is that critical thinking is about a learned skill or a set of skills, which means that critical thinking can be developed and taught. For Ennis (1991, 2011, 2018), it is a complex cognitive process involving dispositions and abilities with three basic dimensions: logical (judging, relating words to statements), criterial (using opinions to judge statements), and pragmatic (understanding judgment and decision to construct and transform the environment). Paul and Elder (2019) believe that the student can be trained and guided to conceptualize, apply, analyze, synthesize and evaluate information through experience, reflection, and metacognition. Elder and Paul (2003) consider that critical thinking involves the formulation of questions with clarity and precision, evaluation of information, arriving at conclusions based on relevant criteria, thinking with an open mind, and providing solutions to complex problems. These authors add that critical thinking is self-directed, self-disciplined, self-regulating, and self-correcting (Elder and Paul 2003). For Villarini (2003), critical thinking is defined as the capacity of thought to examine and evaluate one's way of thinking and that of others. For Facione (2011), good critical thinkers are defined by what they do, how they do it, and how they arrive at a synthesis. Facione concludes that critical thinking is the process of intentional and self-regulated judgment. From these points of view, critical thinking could be transferable to other disciplines, becoming a competence for lifelong learning. Other authors defend that logic or empirical evidence are the basis of critical thinking (Halpern 2014). In addition, some authors define critical thinking as domain-specific or applicable after a deep knowledge of a topic (Willingham 2007). In spite of this, the majority of the models analyzed claim that the ability of critical reasoning, that is, the 'know-how' of the process of critical thinking, is transferable to other contents once it is

acquired (Mulnix 2012). To sum up, it could be stated that critical thinking is a type of thinking that implies the development and application of different intellectual skills and dispositions for reasoning (more than the application of logic), and it needs the exercise of metacognition by the thinker, which facilitates the transferability of the process.

The skills and dispositions that frame and define critical thinking must be practiced and assumed in the learning process in order to develop this competence. For this reason, to know the starting point and previous ideas of the protagonists of the learning process is of utmost importance for an effective implementation of the educational process (Lee et al. 2021; Moloney 2004; Stupple et al. 2017). Moreover, given the complexity and polysemy of the term, it is important to clarify from the beginning what is meant by critical thinking in the context of a particular subject (Moore 2013; Piergiovanni 2014). What students understand by critical thinking, as well as the differences and coincidences they may have with teachers' understanding of the concept, will univocally help to know what the object of working with this competence is so as to facilitate the transfer in learning. This is the purpose of the present study, and to a larger extent, the purpose of the work done on critical thinking by this research group.

II. Students' conception of critical thinking

Many studies on critical thinking in higher education are based on the analysis of students' level of critical thinking or on the ways of developing it in the classroom, but very few of them deal with how students understand this competence or what they mean by critical thinking. This is an important matter since, as seen before, critical thinking is a complex concept with different meanings and dimensions, and getting to know students' conceptions and views about it is key for an effective teaching and learning process.

There are studies that show that considering students' views can provide very useful criteria to choose activities to acquire transversal competences that can be positive for their learning process (Cangalaya 2020; Llorens-Molina 2018). Llorens-Molina (2018) studied the perception of students in acknowledging the competences that were being taught in a certain activity in a classroom in two different academic years. Although most students could identify most of the transversal competences that were taught, only a low percentage (25.5%) perceived that critical thinking skills were being enhanced. This seems to show, in spite of limitations of the study, the complexity of teaching this competence. The reason could be due, according to this author, to the scarce stimuli in ethical values, which should be included in a critical thinker.

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Another important fact is related to the teaching-learning process of critical thinking. As Choy and Cheah (2009, 205) indicate, teachers may think that they are "helping students think critically, but they could be focusing on their comprehension of the subject matter instead". In addition, Stupple et al. (2017) studied the attitudes and beliefs of critical thinking with a sample of psychology undergraduates at the University of Derby, U.K. They measured their confidence in critical thinking, how they recognized the importance of this competence, and finally, the misconceptions of critical thinking. The conclusion they made was very simple: "students desired critical thinking to be taught more explicitly" (Stupple et al. 2017, 104). In fact, Danczak et al. (2017) also highlight the fact that students do not identify the activities in which critical thinking is being taught.

It is essential to know if educational institutions, especially universities, are forming in an effective way, especially when the instruction is focused on improving certain skills (Saiz and Rivas 2008). When analyzing the perception of students in different periods of their academic life and in different countries, there are generally very slight variances. Sampson et al. (2007) asked students in business courses in a public college in Jacksonville (USA) to define critical thinking. The results were that more than 40% included terms, such as applying, analyzing, and synthesizing; 39% included interpreting information, making inferences and translations; 26% elements of making judgments; 19% comprehending the content and intent of the concept and understanding; and more outstanding, there were no answers that included "reflective thinking, reviewing and determining one's reasons and reasoning process" (Sampson et al. 2007, 49). The conclusion of this study is that the student "may have an unclear perception of the concept of critical thinking" (Sampson et al. 2007, 50), and to be able to measure or to evaluate it, it is essential that they understand the concept, and thus, give valid responses that may enhance their learning experience.

The way students perceive critical thinking is essential for acquiring this skill. In the area of Medicine and nursery, Olivares-Olivares and López-Cabrera (2017) believe that students of Medicine in Mexico think that critical thinking skills are related to analyzing and justifying the relevance of their arguments. They also thought that critical thinking was mainly based on using their common sense when reviewing and evaluating information, instead of using reliable evidence and information. This misconception is quite revealing as it shows that students do not always use critical thinking skills when evaluating information.

Díaz-Larenas et al. (2020) analyzed the concept of critical thinking from a group of Chilean fourth-year students of Pedagogy. They defined this

competence as to analyze, reflect or reason about a topic or problem with the aim of basing their point of view on reliable information, measuring the consequences and effects of their acts, and thus, be able to change individual or collective behavior. The latter is interesting as it is not common in students' definitions or perceptions of critical thinking to understand that critical thinking may also be action-oriented. These students also added factors such as the capacity to listen to other's opinions, to interpret evidence in order to reach conclusions, to give arguments, and freedom of speech. For these students, being critical is highly related to their future role as teachers, which is to educate with high intellectual, social, and ethical expectations.

Not so encouraging were the results of a study from Schreglmann and Kanatili-Óztürk (2018). They conveyed a qualitative study of gifted students' perceptions on critical thinking enrolled in the Science and Arts Centre in Turkey. Although the results did not differ from those of the literature, according to the authors, it revealed that the concept critic was perceived as negative by some students. On the positive side, gifted students used concepts such as "'scientific proofs, mental processes, constructive evaluation for both positive and negative opinions, questioning' frequently and defined critical thinking skills properly" (Schreglmann and Kanatili-Óztürk 2018, 11), and students believed that critical thinking was needed for objectivity and improvement as well as to avoid mistakes and have innovative ideas.

Indrašienė et al. (2021) studied the interaction between the understanding of critical thinking and the teaching and learning of the competence in higher education in Lithuania. According to these authors, teachers and students understand critical thinking as a dynamic competence that encompasses both cognitive skills and dispositions. All of the stakeholder groups, including students, consider inference and argumentation to be the most important critical thinking skills and self-confidence and fairness to be the most valued dispositions.

Another important fact concerning the conception and development of critical thinking may be the cultural and educational context. A study applied in the UK suggests that differences between conceptions are explained because students from other cultures had no exposure to critical thinking in their studies before arriving at Britain, a country which has critical thinking embedded in all the subjects along their educational system. When applying it, their main difficulties had to do with understanding when synthesizing and evaluating different sources as well as structuring ideas. Thus, the authors believed that there was a need for guidelines to evaluate, synthesize sources and build arguments, and that critical thinking should be integrated in academic disciplines (Islamiyah and Al Fajri 2020). Tian and Low (2011),

think that Chinese students' critical thinking skills when studying in the UK were not fully developed. These authors believe that one of the factors is that Chinese or Asian students, in general, do not demonstrate their critical thinking skills when going abroad, in spite of the fact that there are many elements of critical thinking skills in Asian culture.

Regarding the sources implied in the conception for the development of critical thinking, Danczak et al. (2017) propose that for the effectiveness of critical thinking in education, there should be a three-way understanding of this concept: students, the teaching staff, and employers. In their study, the authors found that there was not a shared understanding among the three groups of participants. For students, the highest score was analysis and problem solving; for the teaching staff, critique and evaluation; and for employers, problem solving, analysis, arriving at an outcome, and identifying opportunities.

From the teacher's point of view, Moore (2003), after interviewing 17 academics from three subject areas (history, philosophy, and cultural and literary studies) distinguished seven categories in teachers' vision and conceptualization of critical thinking: making judgments; having a skeptical and questioning view of reality; being original and producing knowledge; reading a text sensibly and carefully; rationality and a way of reasoning; adopting an ethical and activist stance; and as self-reflection and self-awareness (Moore 2013). Moreover, Bezanilla et al. (2018), found 6 categories in university teachers' conception of critical thinking: analyzing/organizing; reasoning/arguing; questioning/asking oneself; evaluating; taking a position/taking decisions and acting/compromising. These studies show the variety of answers teachers give to define the competence, as well as the complexity and polysemy of the concept.

In short, it is necessary for both teachers and students to share a common understanding of the competence of critical thinking, and in addition to this, for students to know exactly when it is taught and how it is evaluated. Listening to and understanding students' conceptions about critical thinking is an aspect that science has not given enough importance to, but that could be of special significance to advance in the theoretical knowledge about teaching and learning processes (Lee et al. 2021).

III. Purpose of the study

Based on the previous literature review, the present study aims to answer four main questions:

- RQ1: What is the university students' conceptionof critical thinking?

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- RQ2: Is the conception of critical thinking the same depending on the gender of university students?
- RQ3: Is the conception of critical thinking the same depending on the academic year of university students?
- RQ4: Is the students' view of critical thinking identical to the teachers' view?

Taking these four research questions into consideration, the objectives of the present research are:

- Objective #1: To identify the university students' conception of critical thinking.
- Objective #2: To analyze whether the conception of critical thinking is the same depending on the gender of the university students.
- Objective #3: To examine whether the conception of critical thinking is the same depending on the academic year of the university students.
- Objective #4: To compare the conception of critical thinking between the university students and teachers.

IV. Methodology

IV.1. Design of the study

The present study can be classified as quasi-experimental in that the sample selection was not randomly selected, and there may be an influence of uncontrolled external variables. Likewise, the design of this study is cross-sectional in that it attempts to measure a variable at a specific time.

IV.2. Sample

A total of 263 Spanish Education university students (Age = 20.40; SD = 1.38) participated in the study. There were 187 women and 76 men. 42 of them were in 1st year, 62 in 2nd year, 107 in 3rd year, and 52 in their 4th year. In relation to their university degree, 33 of them were studying the Degree in Early Childhood Education, 205 of them were studying the Degree or Double Degree in Primary Education and Sciences of Physical Activity and Sports, and 25 of them were studying the Degree or Double Degree in Social Education and Social Work. Convenience sampling was used for this sample selection. That is, data were collected from participants based on their proximity to the researchers. Specifically, information was collected

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from students who belonged to the classes in which the researchers of this study were teaching during the year of data collection. Therefore, this sample represents a portion of the total population of students (n = 1085).

The results were compared with those of a similar previous study (Bezanilla et al. 2018) with a sample of 230 university teachers that were also selected by convenience sampling methods.

IV.3. Instrument

To carry out this study, a brief *ad-hoc* questionnaire was designed consisting of two parts. It began by collecting a series of contextual variables from the participants: age, gender, course, university degree and university of origin.

Afterwards, the students were asked about their conception of critical thinking by means of the following question: *What is critical thinking for you?* (For them, in Spanish, *¿Qué es para ti el pensamiento crítico?*). To respond to this item, they were given a list of the 6 different dimensions of the model proposed by Bezanilla et al. (2018). The dimensions were the following ones:

- Analyzing/organizing: These are answers that refer to critical thinking as a way of examining something in detail (a text, a reality...) considering its parts in order to know its characteristics and draw conclusions. In some cases, they include aspects related to the structuring and organization of information, but do not go beyond that (e.g., I analyze the information by contrasting different sources).
- Reasoning/arguing: These definitions add to the analysis the relation and comparison of ideas and experiences based on arguments, to obtain conclusions and form a reasoned judgment. It involves expressing in words or in writing reasons for or against something, or justifying it as a reasonable action to convey a content and promote understanding (e.g., When I give my opinion I provide reasons or arguments that justify it).
- Questioning/asking oneself: Critical thinking is understood as the questioning of an issue that is controversial or commonly accepted. It means to question things, to ask oneself questions about the reality in which one lives (e.g., When reading an article I ask myself questions about the topics covered).
- Evaluating: It means to value, to weigh, to determine the value of something, to estimate the importance of a fact, taking into account various elements or criteria. It is more than an argumentation (deducing

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pros and cons of a reality) because it implies determining the value of something according to certain criteria (e.g., Before making a decision, I evaluate the pros and cons of the situation).

- Taking a position/taking decisions: It implies not only analyzing, reasoning, questioning or evaluating, but also making a decision about it. It means to give a solution or make a definitive judgment on a matter in a certain way, including a position or proposed solution (e.g., When I make a decision, I take it and move forward, despite the fact that others may think differently).

- Acting/compromising: Critical thinking is understood as a means of transforming reality through social commitment. It is to take action, to act, to behave by performing voluntary and conscious acts in a determined and committed manner. It implies the adoption of a certain attitude or position before a certain matter (e.g., I get involved to respond to a situation of injustice or inequality).

After giving students this information, they could select, by means of checkboxes, a maximum of three dimensions or skills which better represented their conception of critical thinking.

Despite the fact that for the present study, only the above question was answered, in this process of collecting information, another series of variables were collected that were analyzed in different studies.

Finally, in relation to the conception of critical thinking held by university teachers, data were taken from the study by Bezanilla et al. (2018). These researchers, instead of giving the dimensions of critical thinking to the participants, collected open-ended responses to the question *What is critical thinking for you?* and performed an inductive analysis to extract the dimensions of critical thinking. In this regard, the possible answer options given to the students were based on the previous inductive analysis carried out with the teachers.

IV.4. Procedure

The procedure of data gathering of students began in May 2021 when the deans and degree coordinators of the faculties gave their permission to collect data for this study. The students were then asked, through their voluntary participation, and always respecting their anonymity and privacy, to accept the terms of the study. They completed the ad-hoc instrument by digital means through Google Forms outside university hours. It should be

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added that students were asked for their email if they wanted to receive a report with the main results of the study.

IV.5. Data analysis

The data analysis process started with the sum of the frequency of the different dimensions of critical thinking from the students' view. This analysis was complemented with the study of differences by gender and by course, using a Chi-Square test. Secondly, in order to check the association or dissociation between the different dimensions of critical thinking and the role (students or teachers) of the respondent, a cross table and a Chi-Square test was carried out.

V. Results

In order to respond to RQ1, which showed the university students conception of critical thinking, it can be seen through the study of frequencies that the majority of students perceive critical thinking as reasoning/arguing (f = 218) and questioning/asking oneself (f = 203), far from the two dimensions less represented by the students, which were acting/compromising (f = 57) and evaluating (f = 56). The data from this analysis is collected in Table 1.

Table 1

Frequencies of the different conceptions of critical thinking from the students' view

Conceptions	Frequency	%
reasoning/arguing	218	29.5%
questioning/asking oneself	203	27.5%
analyzing/organizing	113	15.3%
taking a position/taking decisions	91	12.3%
acting/compromising	57	7.7%
evaluating	56	7.5%

In order to respond to RQ2, which exposed whether the conception of critical thinking was the same depending on the gender of the university students, it was found after carrying out a Chi-Square test that there were no

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statistically significant differences in any of the analyzed dimensions (reasoning/arguing, p = .717; questioning/asking oneself, p = .590; analyzing/organizing, p = .924; taking a position/taking decisions, p = .626; acting/compromising, p = .414; evaluating, p = .085).

In order to respond to RQ3, which showed whether the conception of critical thinking was the same depending on the academic year of the university students, no statistically significant differences were found in the vast majority of dimensions after carrying out a Chi-Square test (reasoning/arguing, p = 921; analyzing/organizing, p = .854; questioning/asking oneself = .300; evaluating, p = .420; taking a position/taking decisions, p = .184), but in acting/compromising (p = .036). In this regard, a Kruskal-Wallis H was carried out in order to analyze the Mean Ranks. This analysis revealed that students from 3rd (M = 140.37) and 4th year (M = 138.90) tend to consider critical thinking not only from its theoretical point of view (reasoning, analyzing, questioning, and so on), but also as a practical ability that aims in acting against social injustices, in contrast with students from 1st (M = 119.15) and 2nd year (M = 120.47).

Finally, in order to respond to RQ4, which referred to whether the students' conception of critical thinking was identical to the teachers' conception, a Chi-Square test was carried out comparing the different dimensions of the critical thinking model proposed by Bezanilla et al. (2018), based on their role, as a student, a social science teacher or a teacher (social science teachers included). This analysis can be seen in table 2. It is noteworthy to mention that as students came from the social sciences area, it was coherent to organize the sample of teachers consequently, generating a subsample of social science teachers (n=82) and a total sample of teachers (n=230).

Table 2

Cross Table and Chi-Square test between critical thinking conceptions and student/teacher role

	Student/Teacher role				X^2	
	Student (n = 263)	Social Science Teacher (n = 82)	Teachers (n = 230)	Total		
analyzing/ organizing	113 (134)	50 (41.8)	130 (117.2)	293	12.86 (p = .002)	Teachers > Students
reasoning/ arguing	218 (177.9)	48 (55.5)	123 (155.6)	389	52.13 (p = .000)	Students > Teachers

	Student/Teacher role				X^2	
	Student (n = 263)	Social Science Teacher (n = 82)	Teachers (n = 230)	Total		
questioning/ asking oneself	203 (129.0)	25 (40.2)	54 (112.8)	282	154.80 (p = .000)	Students > Teachers
evaluating	56 (70.4)	26 (22.0)	72 (61.6)	154	7.45 (p = .024)	Teachers > Students
taking a position/taking decisions	91 (90.6)	19 (28.2)	88 (79.2)	198	6.10 (p = .047)	Not clear differences
acting/ compromising	57 (35.7)	4 (11.1)	17 (31.2)	78	27.50 (p = .000)	Students > Teachers

In the first analysis, there were no significant statistical differences found between the views of social sciences teachers and the general teacher sample, but in the case of taking a position/taking decisions, general teachers scored higher, which was an unexpected result.

From this analysis, it can be seen that there are statistically significant differences in all the dimensions of critical thinking. This means that students' and teachers' perception about critical thinking is different. Teachers tend to consider critical thinking as a group of abilities that help students in analyzing/organizing ($X2 = 12.86$; $p = .002$) and evaluating ($X2 = 7.45$; $p = .024$) processes, more than students do. In addition, taking into consideration the results from table 1 and the high values of the Chi-Square test, students specially tend to consider critical thinking as a group of abilities that help them in their critical skills: reasoning/arguing ($X2 = 52.13$; $p < .000$) and questioning/asking oneself ($X2 = 154.80$; $p < .000$). Moreover, significant statistical differences were found in the dimension of acting/ compromising ($X2 = 27.50$; $p < .000$) in favor of students, and no clear statistical differences were found in the dimension of taking a position/taking decisions ($X2 = 6.10$; $p = .047$).

VI. Discussion

The main aim of this research has been to analyze the university students'conception of critical thinking, and subsequently, if this conception was consistent with that of teachers. As already mentioned, results showed

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that the majority of students perceived critical thinking as related to reasoning/arguing and questioning/asking oneself. These results coincide with those of a recent study in which gifted secondary school students associated critical thinking with concepts such as scientific proofs, mental processes, constructive evaluation for both positive and negative opinions and questioning (Schreglmann and Öztürk 2018). In this study, it must be said, however, that some students perceived the meaning of the word critical negatively, which is an important fact, as it seems to show that students do not totally understand the concept. Moreover, another study on critical reading revealed the difficulties that many students had in defining this concept (Moloney 2014). A study by Sampson et al. (2007) found that students have an unclear perception of the concept of critical thinking. They appear to understand that applying, analyzing, synthesizing, and communicating information are elements of critical thinking but not so evaluation, reflection, and judging the value of information. Some other students, however, were able to define critical reading in terms of questioning, evaluating, and judging the information they read (Moloney 2004). This conception of critical by students showed similarities with the findings of the present study. Similarly, another study with Chilean Pedagogy students shows that they understand critical thinking as analyzing, reflecting, reasoning, generating changes, and solving problems. They also considered the critical thinker as someone who is cognitively and socially competent (Díaz-Larenas et al. 2019). This showed the complexity of understanding the concept of critical thinking and the variety of meanings it has, even among the same group of people, in this case, university students. Furthermore, analysis seemed to have the highest score among students' conception of critical thinking (Danczak et al. 2017; Olivares-Olivares and Lopez Cabrera 2017; Rodzalan and Saat 2015; Sampson et al. 2007) although this did not occur in the present study, in which analyzing/organizing took a third place after reasoning/arguing and questioning/asking oneself.

Regarding the comparison between teachers' (Bezanilla et al. 2018) and students' views of critical thinking, the results in this study did not coincide. Teachers believed that analyzing/organizing, reasoning/arguing, and taking a position/taking decisions were the three most important categories. Students, on the other hand, considered as the most important reasoning/arguing; then questioning/asking oneself, which for teachers was fifth; and analyzing/organizing, which for teachers was the most important factor. The findings suggested that, indeed, students had a critical thinking conception that differed from that of teachers. In particular, students tended to understand critical thinking mainly as the union of two areas of skills, reasoning/arguing

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and questioning/asking oneself, while teachers tended to understand critical thinking mainly as analyzing/organizing information and reasoning/arguing. The point on which teachers and students agreed the most was in the category of reasoning/arguing, which seemed to be understood by both groups as an important element of critical thinking. It was surprising, however, that the ability of questioning/asking oneself was not so present in teachers' conception of critical thinking. Moreover, it is significant to point out that acting/compromising was more important for students than for teachers, and that evaluating, which is fourth for teachers, showed the lowest position for students.

Díaz-Larenas et al. (2019) results were that students in the area of Education believed that critical thinking should be action-oriented. According to these authors, students in education considered that the objective of this competence was to have a positive impact on individual and collective behavior. That is, that the critical thinking competence was action-oriented with social and ethical implications. In accordance with this, it may be advisable to go a step further in the teaching and acquisition of critical thinking in order not to teach in a passive way, but in an active and compromising manner that may affect the future behavior of students (Kim et al. 2013).

The flexibility of teachers was considered by Indrašienė et al. (2021) as an element to take into account. These authors highlight two factors that impact the teaching and learning of this competence: the rigidity and elasticity of the conception by teachers for students to acquire critical thinking. In their study, moreover, teachers gave more importance to argumentation, interpretations and inference skills, and less to skills that are related to assessing or presenting a context as well as the different attitudes or perspectives of others. Thus, they doubt the "understanding that teachers have about the essence of critical thinking". (37)

Finally, another important difference was that related to evaluation, as a category of critical thinking, which was higher for teachers than for students, probably as the latter identify evaluation as the grade they receive for their performance and not as to make a reliable judgment based on evidence.

VI.1. Theoretical and practical implications

This research has important theoretical and practical implications. With regard to theoretical implications, these findings show the idea that critical thinking is a competence that can be understood in different ways, based on the role of the person. In this sense, this study highlights the differences

between teachers and students in the conceptualization of critical thinking and suggests a six skills-based competence to define critical thinking, with significant differences between roles. These results are important in order to determine theoretically what critical thinking is.

With regard to practical implications, these findings could be useful so as to plan and develop critical thinking programs. The effectiveness of these programs has been previously observed in the literature, such as in the study of James et al. (2010), who highlight how students, after a critical thinking-based program, perceived a significant improvement in their critical thinking skills. Specifically, an improvement in their comprehension (87%), analysis (75%), evaluation (75%), justification (73%), and synthesis (62%).

It is very challenging for students to understand what is expected of them if students and teachers do not share the same perception and knowledge of the concept of critical thinking. If students have an unclear understanding of this competence or have a different perception than teachers, it is very difficult for them to acquire it in an effective way (Choy and Cheah 2009). Thus, it could be understood that students need to be taught this competence in an explicit way. Thus, it is essential for students and teachers to know what critical thinking is, as well as to make it explicit and share the aims related to critical thinking and the ways to evaluate the competence.

Since different conceptions on critical thinking do exist, even among students and among teachers, focused dialogue needs to take place between teachers and students in order to organize curriculum experiences for critical thinking. Moreover, such dialogue may give more space for students to take charge of their own learning.

VI.2. Limitations and prospective

The present study is not exempt from limitations. The first limitation refers to the scarcity and age of many documents in the literature on theoretical models that analyze the concept of critical thinking. This fact highlights the growing need to continue advancing in the elaboration of theoretical models that unify the conceptions of teachers and students in view of the challenges that the society of the 21st century faces. Hence, future studies need to continue to investigate the conception of critical thinking, taking into consideration the various theoretical models found in the literature and putting special interest in cross-cultural analysis and/or taking into account the diversity of personal and social characteristics.

The second limitation is linked to the methodology followed in the study. Specifically, the results should be cautiously interpreted as the theoretical

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model underneath the questionnaire that was presented to the students was developed based on an inductive analysis of the opinions of the teaching staff. However, there could be differences if the theoretical model had been based on students' and not teachers' conception of the competence. On this matter, using the theoretical model used in the present study, future work could follow longitudinal designs in which, over time, it could be observed whether the conception of critical thinking remains stable or not in both teachers and students. Moreover, focus groups between students and teachers could be done in order to obtain deeper information on their conception and interpretation of critical thinking.

Third, another limitation of the study is related to the sample. In this specific case, the complete sample is made up of students from universities in one of the autonomous communities of Spain. Furthermore, in relation to the sample, it should be noted that it was not completely representative of the population of Spanish university students. Consequently, to guarantee the robustness of these results, future studies could reproduce this type of study in other national and international contexts, expanding the sample of participants.

Despite all these limitations, the findings obtained in this study are expected to serve as a reference point for education professionals to continue working on critical thinking in their classrooms. Consequently, it would be necessary for students and teachers to have the same understanding of critical thinking so as to be able to facilitate their students' learning, academic and personal growth. As Choy and Cheah (2009) indicate, many teachers may think they are helping their students to think critically, but they are in reality focusing on their subjects as they believe that they cannot think critically on their own.

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About the authors

MARÍA JOSÉ BEZANILLA (corresponding author; marijose.bezanilla@deusto.es) has a PhD in Education from the Institute of Education of the University of London and is Senior Lecturer at the University of Deusto in the Department of Education. She is currently the coordinator of the PhD in Education at the Faculty of Education and Sport of the same university. As member of eDucaR research team, she participates in research projects and has numerous publications on critical thinking, the use of ICT in the university context and the development of competences in higher education. Shares her teaching and research activities with management tasks in the Teaching Innovation Unit of the University of Deusto, with particular emphasis on the publications area and the development of transversal competences.

HÉCTOR GALINDO-DOMÍNGUEZ (hector.galindo@ehu.eus) holds a PhD in Education, a Master's degree in Innovation and Research in Education and a Master's degree in Prevention and treatment of bullying. He does research mainly on issues related to critical thinking, educational technology, and effectiveness of teaching methodologies. He is currently an adjunct teacher at the University of the Basque Country, but for years he has worked as a teacher of Primary Education.

LUCÍA CAMPO (l.campo@deusto.es) is Graduate in Psychology and Psychopedagogy, Master in Innovation and development of competencies and PhD in Education (University of Deusto, Bilbao, Spain). Currently teaching in University in Primary School Grade, as well as Final Degree Project and Practice tutoring. Member of eDucaR research team (University of Deusto). During her PhD she focused on studying the skills of teachers and how they can be assessed. Moreover, she has focused on the teaching-learning process and in transversal competencies. As such, she has become proficient at compiling and analysing quantitative as well as qualitative data and at building explicative models related to teaching competencies. Her themes of research are critical thinking, teacher's development and evaluation, and implementation of the teaching-learning model based on competencies in the EHEA.

DONNA FERNÁNDEZ-NOGUEIRA (donna.fernandez@deusto.es) holds a BA in Philosophy and Arts (English Philology) and a PhD in Philosophy and Arts (English Philology) from the University of Deusto. She is currently a Professor–Researcher at the University of Deusto, campus Bilbao. During the past few years she has carried out research on competences, critical thinking, entrepreneurship, and the historiography of linguistics, among other matters. She was part of the research team, INNOVA, recognized by the Basque Government (category A), which is now part of Deusto eDucaR (category A).

MANUEL POBLETE RUIZ (manuel.poblete@deusto.es) holds a PhD in Social Psychology. He does research mainly on issues related to competencies and Learning Systems based in Competencies: its conception, methodologies of

learning and evaluation. During the last years he researches with other teachers on critical thinking and about effectiveness of teaching methodologies. He has worked as a teacher of Organizational Psychology carrier in University of Deusto. Now he is retired and continues with different tasks in the education field.

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