Introduction

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Tormented by accelerated changes that seem uncontrollable, the world has evolved as a super-complex system at risk. A revolution in our way of thinking (and acting) is urgent. It is imperative to move towards more complex, systematic and flexible mechanisms of thinking that allow continuous learning and a constant evaluation of how we think, decide and act. We cannot allow that stereotypes dominate our thinking, that we make generalisations without evidence or that we defend intransigently positions that are exclusive.

In the era of the fourth industrial revolution and the knowledge economy, we can often feel overwhelmed and helpless due to fast-spread information that is unfiltered and maybe even "fake". This must be replaced by a systematic questioning and rigorous treatment of the issues, especially since broad access to media and information is an unprecedented opportunity for the development of well-educated human beings and responsible, inventive citizens.

How to improve our individual (and collective) abilities to select, evaluate and transform information into knowledge in order to perform the right and proper actions? How can we learn to refine thinking processes taking into consideration possible biases? How to interpret information in a way that helps us reject false and harmful propositions? How can we learn to develop (and be aware that we are developing) a more effective thinking that leads us to more informed decisions and more conscious and transformative actions? These are some of the issues across current debates on critical thinking (CT) in general and on CT in Higher Education (HE) in particular.

As concept that has been nourished from various perspectives (philosophy, psychology, education), there is no consensus on the definition of CT. However, to think critically does not mean only to rely on a series of specific intellectual activities in order to raise the quality of the thinking and to make more substantiated judgments or decisions. It also requires cultivating a series of dispositions, such as openness, curiosity, tolerance, the pursuit of rigor, directed and disciplined effort, empathic listening, the courage to question oneself and the world, among others. Given this dual perspective, its development represents a pressing and extensive challenge for universities: it involves the need for continuous practice and research on aspects like CT-related educational approaches (general, specific), transferability, teaching and learning strategies, etc…

This Special Issue builds on from the activity developed within the scope of the European CRITHINKEDU project (CT across the European HE Curricula)[i]. This project[ii] assumes that, although CT is considered one of the most important educational goals of HE both by universities themselves and by international educational and professional bodies, the question remains: how can/should it be fostered and assessed in a more explicit and systematic way ? As many recent studies show, higher levels of CT are now expected from students who leave universities to commence their professional lives. However, students' attendance in university for many years does not seem to guarantee, per se, the development of their CT.

The reflection we share in this Special Issue presents different contributions to the state of the art on empirical research regarding the current pedagogical practices in HE that foster CT (in several knowledge and professional domains). It draws on the work already accomplished towards the elaboration of an educational protocol[iii] to promote CT in European HE Institutions (HEI), the CRITHINKEDU project's final output, which intends to trigger HEIs to take a stance on this matter.

Given the importance of critical thinking in HE and its particularities in different fields and contexts, this Special Issue is constituted of eight papers covering not only the perspective of professionals from different fields regarding CT, but a series of literature reviews on CT educational practices in different disciplines. It concludes with an example of an educational approach used to tackle complex issues in which values are at stake. The first section of the Special Issue includes five scientific articles whereas the second one offers three enlightening 'research essays' on complex ongoing research interests.

The first section starts with the article 'How is CT valued by the labour market? Employers' perspectives from different European countries' by Penkauskienė et al. The article discusses the concept of CT by presenting employers' perspectives and discloses the authentic meaning of the concept and its value in different spheres of professional life. It invites to rethink the concept, and encourages wider discussions about the role of HE in the development of CT.

The second article by Ahern et al. presents 'A literature review of CT in Engineering education', at both undergraduate and postgraduate levels. While a number of papers in this area are analysed, a significant finding of the review is the lack of understanding of CT in Engineering education, and the limited knowledge and evaluation conducted on CT-related approaches. The paper identifies the need for greater awareness by teachers of CT theory and of approaches to teaching CT in Engineering specifically.

In the Health Sciences, Payan-Carreira et al. discuss how CT has been fostered within HE programmes in their article 'The Effectiveness of Critical Thinking Instructional Strategies in Health Professions Education: A Systematic Review'. The article considers the meaning of the concept and its interplay with other commonly used terms in literature, namely clinical reasoning and clinical judgement. The findings suggest that active learning methodologies are more effective than traditional lecturing in terms of CT development. However, the same types of interventions show different results and several limitations are found. The study invites rethinking the design, implementation and assessment of future CT interventions in the Health Sciences HE programmes.

'Critical Thinking Practices in Teacher Education Programmes: A Systematic Review' by Lorencova et al. presents a review of research papers regarding the CT practices used in Teacher Education programmes aimed at fostering CT, including instructional approaches and strategies, assessment, outcomes and factors that affect success. The authors show that the specific characteristics of the reported interventions can add value to the existing knowledge of those who attempt to organise, practice, and evaluate their teaching repertoires in order to become effective teachers.

As a complement to previous reviews, the last article of this section is 'A systematic Review on Critical Thinking Intervention Studies in Higher Education across Professional Fields'. In it Puig et al. provide a comprehensive overview on how CT is promoted through pedagogical interventions in HE across diverse disciplines, trying to come up with similarities or differences between them.

In our second section of 'research essays', in 'Creating meaning. The importance of Arts, Humanities and Culture for critical thinking development', Daniela Dumitru starts to question why the Arts and Humanities (of course Philosophy included) are becoming the Cinderellas of HE. Challenging the stereotypical view whereby these disciplines are useless nowadays, the author argues that if someone wants to become a good critical

thinker at his/her job, he/she should take Art, Literature, Philosophy or Archaeology classes. Why? Because these are the very essence of critical thinking creating meaning and bringing cognitive maturity.

In 'Effectiveness of approaches to stimulate critical thinking in social work curricula', AnVerburgh develops a reflection on the results of a small review study of empirical research on approaches to stimulate CT in the area of social work. Based on the results, a future research agenda is proposed that is relevant for all disciplines.

Finally Pnevmatikos et al. in 'Promoting Critical Thinking in Higher Education through the Values *and* Knowledge Education (V*a*KE) method' describe an innovative teaching approach aiming to promote CT skills and dispositions in settings. VaKE is a mixed approach allowing both the teaching/learning of CT, separately from content and explicitly within a specific subject matter. During the V*a*KE course, students activate and use both thinking skills and dispositions.

With this Special Issue, we hope that readers might become more aware of the current pedagogical strategies developed (and reported) in the scientific literature for the promotion of CT in HE. Hence, they will have the opportunity to reflect on their own teaching practice and research in order to systematically and explicitly better foster CT education in their subject-domains. In so doing, they will enhance not only students' autonomy and accountability in their learning process, but also equip them with essential thinking skills and dispositions. Since CT is not a competence that students acquire naturally, we do hope that it is more developed and valued throughout HE curricula in order for HEIs to achieve their main goal of educating citizens capable of transforming not only their profession, but also the world they live in.

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[i] http://crithinkedu.utad.pt/en/crithinkedu/

[ii] The CRITHINKEDU project - Critical Thinking in European Higher Education Curricula - coordinated by the University of Trás-os-Montes and Alto Douro (Portugal) from September 2016 to August 2019 arises from a partnership between 11 European Higher Education Institutions from 9 countries (Portugal, Greece, Lithuania, Italy, Romania, Czech Republic, Spain, Ireland, Belgium) under the European Erasmus + Program. It results from the need to align HEIs with labour market needs and societal challenges, taking into account the complex issues of the 21st century. Through the training of teachers and the elaboration of quality recommendations for the education of critical thinking in higher education, the main objective of the project is to equip students with habits and thinking skills that will allow them to take more adequate, professional and personal decisions and be active citizens in a world under profound transformations. The consortium has been developing work in partnership with companies (private and public) and higher education teachers from different academic fields, involving them in several discussion groups to identify the most relevant critical thinking skills that current students and future professionals should demonstrate. The project is also developing a vast international network in order to share practices and cooperate on research in the field of critical thinking education. As a result of the work carried out at the European level, the following outputs have already been published: a) The European inventory of competences and critical thinking dispositions required in different professional sectors; b) A review of educational practices promoting Critical Thinking in Higher Education Institutions and the preliminary recommendations for quality of critical thinking education; c) The CRITHINKEDU European course on critical thinking education for university teachers: from conception to delivery (training course for the integration of practices promoting critical thinking in curricular units). d) The publication of the most important output of the project "Promoting Critical Thinking in European Higher Education Institutions: towards an educational protocol" is under way. More information at http://crithinkedu.utad.pt/en/intellectual-outputs/

[iii] This protocol will be largely debated in the fisrt European Summit for Critical Thinking Education (see: http://crithinkedu.utad.pt/en/europeansummitoverview/)