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Teachers' Perceptions of Critical Thinking in Primary Education

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To form critical citizens, it is crucial to thoroughly integrate critical thinking into school curricula. Despite this, there is no consensus among teachers about what the concept entails or how they should be trained to put it into practice, especially in primary education. Therefore, using a qualitative research method, the study's main aim is to identify how primary school teachers perceive the concept of critical thinking and what aspects within their professionalisation as teachers contribute to fostering pupils' critical thinking in classroom practice. Twenty-one teachers working in three European Schools in Brussels (Belgium) were questioned through semi-structured interviews. A thematic analysis was conducted to identify, analyse and report on key themes. The results show that teachers consider the mapping of reasoning, group discussion, and active learning as practices that promote critical thinking among pupils. However, respondents indicate that despite previous exposure to the concept through project-based learning and 'Philosophy for Children', they still need support through peer learning and exchanges of best practices to fully promote critical thinking among pupils.

Keywords: critical thinking, teachers' perceptions, teachers' professional development, primary education, European schools' system

INTRODUCTION

According to Davies (2013), although it is widely accepted that improving pupils' critical thinking (CT) is an important educational goal, these skills remain underdeveloped due to the shortcomings of primary education, where pupils appear to

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be insufficiently guided on how to evaluate, process, and critically reflect on information because their teachers continue to suffer from a lack of knowledge, education, and training in fostering these abilities (McLaren, 2015). Thus, education in general and teachers often place too much emphasis on 'what to think instead of how to think' (Daud & Husin, 2004, p. 478). Changing this situation requires a major shift in instructional paradigms, public investment in teacher training, and policies on school curricula (Alandejani, 2021; Al-Zou'bi, 2021; Patonah, 2021). For example, instead of continuing to focus on individual school subjects (Behar-Horenstein & Niu, 2011), education policymakers need to look across disciplines at how to develop students' CT skills. This focus also needs to be reflected in teacher training to ensure that practitioners are well prepared in how to promote CT among pupils. In this sense, it is important to teach CT from primary education onwards, because major differences in, for example, higher-order thinking skills have been found between students who were taught this at an early age and those who were not (Osakwe, 2009). Specifically, this means that stimulating CT in primary schools should be integrated into the full gamut of regular classroom activities, because it allows pupils to think about not only the world around them (basic-order skills) but also the thinking process itself (higher-order thinking skills) (Halpern, 2003; Kuhn, 1999). Moreover, there is evidence to show that stimulating CT in primary education should not be an impossible task. Lee (2018) has shown that children under the age of six can be trained to formulate simple hypotheses, ask for clarifications of meaning, and offer alternative suggestions if they do not agree with what their peers have said, while Ennis (1989) has suggested that the best time to teach CT is in the early years of primary education. Other relevant studies (Bailin et al., 1999; Gelerstein et al., 2016; Ismail et al., 2019; Kennedy et al., 1991) concur and conclude that young children benefit from being taught CT because it promotes asking questions, making hypothetical suggestions, and reasoned thinking through discussions with peers.

Apart from these few studies, research on teachers' perceptions of CT and their training to promote CT among pupils in primary education is still scarce. Therefore, the relevance of the present study is to uncover primary school teachers' perceptions of critical thinking and how they are trained and further professionalised in this area, to shape future implementation of CT promotion.

Review of Literature

The Concept of Critical Thinking

The origins of CT date back to the work of the leading educational theorist John Dewey (1933), who in the early 20th century highlighted what he termed 'reflective thinking' as a key competence for students, this later being renamed CT. Dewey (1910) described this as an active, persistent, and careful consideration of a belief that examined both the grounds upon which it was built and the conclusions which it implies. Alongside creative thinking, decision making, and problem solving, CT has come to be widely accepted, across the scientific literature of the 21st century, as one of the four components of the ability to think (Costa, 2001). Thus, along with creativity, communication, and collaboration, CT is one of the 4 C's seen as being the most

important focus of 21st century skills education, (Costa, 2001; Lee, 2018; UNESCO, 2013).

To date, however, there is no consensus on a common theoretical definition of CT among scientists, educators, psychologists, or philosophers. For example, several authors (e.g., Ennis, 1962; Facione, 1990; Fisher & Scriven, 1997; Glaser, 1942; Hatcher & Spencer, 2005; Hooks, 2010; Lipman, 1988; McPeck, 1981; Paul & Elder, 2006; Siegel, 1988) continue to formulate a definition of CT that highlights aspects of its skills and disposition basis without reaching any consensus on what defines the process. Facione's study (1990), commissioned by the American Philosophical Association, used an international panel of experts to derive a 'consensus' definition of CT, but this actually highlighted habits of mind, such as open-mindedness, cognitive maturity, and inquisitiveness, leading Facione (1990) to propose that CT is the process of purposeful and self-regulatory judgement. However, UNESCO (2013), in work supported by Johnson and Hamby (2015), has defined CT as a process that involves asking appropriate questions, gathering and creatively sorting through relevant information, relating new information to existing knowledge, re-examining beliefs and assumptions, reasoning logically, and drawing reliable and trustworthy conclusions. UNESCO emphasizes the effort needed to master CT skills, where it is important to apply theoretical constructs to understand a problem, to consider evidence, and to evaluate methods or techniques for building a judgement. Thus, the UNESCO definition emphasizes the scientific research process needed to identify a question, formulate a hypothesis, collect and analyse relevant data, use the data to test the hypothesis, and draw conclusions.

CT can only be taught by teachers who have in-depth knowledge of it and an understanding of how to incorporate it into their lessons (Al-Zou'bi, 2021; Forawi, 2016). However, several authors (Ab Kadir, 2017; Choy & Cheah, 2009; Forawi, 2016) have shown that primary school teachers lack a clear understanding of CT and how to stimulate these skills. Many of them equate CT with intellectual stimuli, but they are unable to define the forms that these stimuli should take (Forawi, 2016). According to Choy and Cheah (2009), there is a need for teachers to better understand the concept of CT to effectively integrate it into their lessons.

Primary Teachers' Professional Training for Critical Thinking

According to research (e.g., Huber & Kuncel, 2016; McLaren, 2015; Thomas & Lok, 2015; Wilson, 2016), teacher training should focus more on how to promote CT in primary education. Research on effective primary school teacher training to enhance CT has stressed the importance of discussion in small groups, role-playing, and problem-based and pupil-led learning (Dennicka & Exley, 1998; Liang & Fung, 2021). Five classroom methodologies for delivering these aims have been specifically highlighted.

The first is 'fish bowling'. Here the trainer divides the class into an inner and an outer circle. While trainees in the inner circle discuss a statement, those in the outer circle listen to the discussion and observe a pre-assigned classmate (the so-called fish). Then,

participants switch circles. Finally, all the trainees reflect on their observations, with this self-monitoring promoting CT (Dennicka & Exley, 1998).

The second method by which teacher trainees could be taught to foster CT in primary education is the creative-controversy-model (Ten Dam & Volman, 2004). When using this method, the trainer divides the class into groups of four that are subdivided into pairs which take opposite positions about a given proposition. Each pair must build a case for its position and compare their ideas and evidence with members of other pairs who have prepared the same position. This presents the opportunity to assimilate new ideas, present and defend one's position, point out weaknesses, ask for justification and further evidence, and openly challenge 'opponents'. Once this cycle of debate is complete, the pairs change perspective and repeat the process until a consensus has been reached (Ten Dam & Volman, 2004).

The third method for stimulating CT in primary teacher trainees is the 'Socratic questioning' method. As opposed to the traditional approach, where teachers are trained to transmit knowledge to pupils (Trede & McEwen, 2015), this approach to questioning is based on the practice of disciplined, thoughtful dialogue to train teachers to think, discuss, debate, evaluate, and analyse arguments through their own thinking and the thinking of those around them (Rahdar, Pourghaz, & Marziyeh, 2018; Trede & McEwen, 2015).

Fourth, teacher trainees should be brought to understand the value of debate. Llano (2015) has shown that this is a valued teacher training tool in fostering CT as it requires careful and thorough thinking in a specific context to reach the minds of others. Through debate the trainer obliges participants to quickly make hard choices with the facts at their disposal and then present them (Llano, 2015).

Fifth, it has been found that argument mapping-based instruction, also known as argument diagramming or argument visualization, is one of the most effective training methods for stimulating CT (van Gelder, 2013) because the processes of structuring facilitate logical reasoning, constructing a 'mental image' of the whole argument, and answering specific questions about the relationships between propositions. Typically, an argument map is a graph-type or 'box and arrow' diagram, with nodes corresponding to propositions and links to inferential relationships (Davies, 2013; Kaeppel, 2021). CT is manifested through organized and cohesive argumentation processes (Ku et al., 2014) and training in the formation of argument maps can help remove obstacles to learning associated with the need to simultaneously read the text of an argument while mentally visualizing the relational structure of the argument being presented (Dwyer et al., 2015).

THE STUDY

Research Aim and Questions

The central aim of this study was to examine primary school teachers' perceptions of CT, their experiences with CT promotion during their initial and in-service training and their views on valuable teaching materials to support their approach to promoting CT among pupils. The following research questions were addressed:

1. How do primary school teachers perceive CT?
2. What factors of teacher training stimulate and support the development of CT in primary school?
3. What reading material consulted or events attended in the last five years relating to the promotion of CT among pupils are relevant according to primary school teachers?

Context of the European Schools System

The study was conducted in the European Schools System as the Schola Europaea's guidelines for primary schools (2007) explicitly include the development of CT skills as one of the four main priorities in the learning process. The European Schools are educational institutions set up in the 1950s to teach the children of staff of the European Union (EU) institutions in their mother tongue (Savvides, 2008). Now they also offer places to other children on a fee-paying basis (Martinez et al., 2015). According to the Schola Europaea's guidelines (2007), these schools are official educational institutions, controlled by the governments of EU Member States. Each state is responsible for the recruitment of teachers, who are trained and selected according to its national criteria. There are 13 European Schools in six countries: Belgium (5), Germany (3), Italy (1), Luxembourg (2), the Netherlands (1), and Spain (1). Each European School consists of three cycles in which primary education is delivered to five classes of children aged 6–10.

According to Swan (1996), European Schools mainly differ from international schools in that each school has different language sections, which vary according to the intercultural dimension and the number of pupils enrolled. In all language sections, education is based on a common European curriculum. However, the syllabus for each subject is designed to take account of the specific characteristics of each Member State's education system so that pupils can return to it if necessary. In general, teachers are seconded to this system for a certain period, after which they return to their country of origin. Teachers are expected to adapt to the European structure, to follow the European curricula and to apply the didactic and pedagogical principles that underpin the European Schools System. Teachers receive in-service training on site to gain more experience with both learning theories and pedagogical approaches (Schola Europaea, 2007).

METHOD

The present study applied a qualitative research methodology. The methodology of this research was literature-led, meaning that the initial coding structure was developed from the literature. The core of this research consisted of semi-structured interviews with primary school teachers, with an average length of 1 hour and a half.

All data were collected using a self-reporting instrument. The results should therefore be interpreted as the teachers' own perceptions of their reality. Thomas et al. (2022) point out the discussion that self-reports entail because of the discrepancy between what people report doing versus what they do. However, the authors emphasise that teachers'

subjective meanings are crucial because they guide their teaching practice and help us understand why teachers design their instructional practice the way they do. Nevertheless, future research could focus on more qualitative thick descriptions of core CT skills and classroom observations to explore how teachers promote their pupils' CT development. This may provide a more complete picture of primary school teachers' CT beliefs and how they promote CT among pupils. Another methodological issue is that we asked the school principals not to oblige the teachers to participate in this study. Therefore, we may have questioned only those teachers who have a concrete vision of CT.

Data Collection

The starting point for sample selection were the four European primary schools in the Brussels Capital Region. Each school principal was first contacted by e-mail, explaining the research project and asking for the participation of their teaching staff. The research was then explained in a face-to-face meeting with the school principal or deputy-head of primary education, three of whom decided that their schools would participate in our research. After obtaining permission from these three schools, we received from each of them a list of teachers willing to be interviewed. This procedure resulted in 21 primary school teachers (nine respondents from one school, and six respondents from each of the other two schools) being contacted individually to make practical arrangements for the interview. To minimise disruption to teachers' schedules, we decided together with the teachers that the interviews would take place at school during break time or after class. The participants came from 14 different EU Member States and were spread across nine language sections (Czech, Dutch, English, Finnish, German, Greek, Italian, Romanian, and Swedish). The respondents had many years of teaching experience in all five primary school classes. Three respondents taught one specific subject (in all cases English as a second language) while others taught all curriculum subjects. Some teachers had a dual role, being both teacher and general coordinator in their language section or for a specific topic (e.g., special needs education, music, foreign languages).

Instrument

The interview scheme (see Table 1) was composed of a series of open questions assessing three main subject research areas: (1) teachers' perceptions of CT; (2) the nature and extent of attention paid to CT during their initial and in-service teacher training; (3) valuable teaching materials consulted to support their approach to promoting CT among pupils. The semi-structured interview format allowed for additional questions to be asked if necessary or desirable, or to anticipate answers if relevant to the research aim. It was highlighted that there were no incorrect answers and data would be analysed completely anonymously.

Table 1
Excerpt from the interview scheme

No	General question	Sub-question	
(1)	How do you perceive the concept of critical thinking?	• Why? • Asking an example, or what do you mean specifically?	
	Specific question	Sub-question	Code
(2)	When you were a student, how do you think your teachers encouraged you to think critically? If positive answer: 2.1. What strategies did they try to teach you?	• Why? • Asking an example, or what do you mean? • Were those strategies useful to you?	• Conceptualization of CT
(3)	During your studies as a primary school teacher, did you receive any training on developing pupils' critical thinking skills? If positive answer: 3.1. What strategies did they teach you?	• Why? • Asking an example, or what do you mean? • Were those strategies useful to you?	• Initial or in-service teacher training
(4)	How relevant do you consider strengthening pupils' critical thinking as an educational goal in primary school? 4.1 How do you rate the priority of this educational goal?	• Why? • Asking an example, or what do you mean?	• Conceptualization of CT
(5)	Have you read any articles/books, or attended seminars in the last five years? If positive answer: 5.1. How relevant did you find that article, book, or seminar to support you in promoting critical thinking among pupils?	• Why? • What did you learn? • How did you apply this in the classroom? • What worked and what didn't?	• Initial or in-service teacher training • Valuable teaching materials

Data Analysis

Each interview was audio-recorded and transcribed verbatim. Following the terms of the voluntary informed consent signed by each respondent, all data were anonymised during the transcription process.

The initial coding structure used for this study was developed based on the literature review. A thematic analysis was conducted to identify, analyse, and report on crucial themes (Braun & Clarke, 2006). Firstly, the interview transcripts were read and reread to become familiar with the data. Secondly, a thematic framework was created according to the semi-structured interview scheme. Specifically, three main themes were included in the framework: (i) teachers' perceptions of CT; (ii) the nature and extent of attention paid to CT during their initial and in-service teacher training; (iii) valuable teaching materials consulted to support their approach to promoting CT among pupils. Thirdly, initial codes were generated, identifying interesting similar features and coding units based on their significance for the entire dataset. Fourthly, each coded extract was reviewed in relation to the thematic framework. Lastly, the codes were categorised into

concepts under each theme for further comparison and interpretation, yielding the final findings.

To guarantee categorisation reliability, we examined these themes independently for consistent patterns after which minor adjustments in grouping or splitting up data categories were made (Braun & Clarke, 2006). Finally, we compared the findings and refined the coding scheme within the thematic framework until a consensus was reached unanimously.

FINDINGS

Teachers' Perception of Critical Thinking

All the respondents recognized the relevance of CT, often stating that CT means not just accepting things at face value. A respondent added: 'Critical thinking is not taking things for granted just because your parents say something, or because the teacher says it. It's actually about if I can know for sure whether it's true.' They reported that CT means being curious and wondering what information is needed to understand something better. These teachers believe that CT is an intrinsic part of human nature. They reported that while children are given the freedom to express themselves by questioning everything, in adulthood we might lose this attitude if we do not continue to train and stimulate these habits of mind.

For most participants, CT stood for 'thinking with our mind'. They explained that critical thinkers are free people with emancipated, autonomous, and independent thinking, able to select essential information, understand whether it is correct, and able to use every piece of information correctly. These respondents stressed that CT is a fundamental life skill that ought to be fostered not only inside but also outside the school. They stated that it means having the ability to analyse the overwhelming amount of information presented by our digital society to avoid disinformation, assess a situation, and express opinions based on reason and facts. One respondent phrased this thus:

> We stimulate students to learn how not to trust everything they read. Now, even as adults, we can read manipulated information in the newspaper. Thus, from primary school onwards, it is important to compare different pieces of information to select which is correct and why.

Our respondents regularly associated the concept of CT with a learning process of self-awareness and self-esteem. For these teachers it is a systemic and reflective learning process that encourages the making of connections between different aspects of a specific problem or topic of interest and leads to the expression of opinions and new ideas about newly acquired information. To be able to think critically, teachers stated that it is necessary for them to be able to agree or disagree with the ideas and opinions of others, for instance colleagues and the school principal, while pupils need to be able to adopt a similar position in front of their teachers and classmates. They highlighted that this process is possible in primary education if each child's self-esteem is well cultivated in the classroom. For example, one respondent said: 'This critical thinking

process takes a lot of courage for children, especially if they disagree with their friends and leave their comfort zone"!'

A few respondents mentioned that CT is a concept that depends on a person's cultural background. They indicated that people may or may not be able to think critically, depending on the political, ethical, religious, or social characteristics of their country of origin. One respondent explained this as follows:

> It is a concept related to your culture. It may or may not be present. Critical thinking is really a matter of culture: culture of available resources, the educational culture, the culture where you come from. In fact, there are teachers who come from cultures where being critical it is still not asked.

Teachers' Perceptions of Training Programs for Critical Thinking

Most respondents stressed the importance of their initial teacher training in developing their ability to stimulate CT among their pupils, emphasizing the relevance of John Dewey's theory during their studies. They discussed how he highlighted the need to help students to learn to 'think well', which points to the importance of CT as a key skill.

The teachers involved in this study reflected on their own training in their home countries in terms of CT. They often underlined the added value of a problem-solving approach, a graphical visualization of learning, active listening, and reflecting on the views of others during their lessons. These respondents stated that their trainer encouraged them to think about alternative interpretations and methods to solve a given problem. For example, teacher 14 said:

> When I look back at my training in language 1 (mother tongue) for primary school, I was sometimes impressed by the visualization of the lesson: you could reflect graphically on all the reported lessons. Connecting the graphical elements in visual way, I think this has inspired me!

Reflecting on their own training, participants reported learning experiences based on questioning and debate to create opinions based on facts and sharing different ideas during small group work. These participants also stated that the scientific method applied in scientific experiments was useful for understanding whether a hypothesis was correct, since this taught them how the logical steps of a procedure can achieve a goal. In addition, they recalled that their trainers stimulated the skill of analysis (e.g., in philosophy, literature, science, or art) by using different texts to compare information. For example, one respondent stated:

> This trainer had an impact on my personal life in general, as I am now no longer afraid to express my ideas and disagree with parents [of pupils] or colleagues. I learnt the importance of being well prepared for meetings, to express my opinion and share different ideas.

According to a few respondents, a lot of time was spent during the lessons on asking questions, discussing, reflecting, and explaining the reasons for their opinions in groups. They reported that their trainers taught them not to take any facts for granted, with one respondent stating: 'I learnt not to stop at the content of the subjects, but to go further and look for the why".'

A few of the teachers said that their initial teacher training had been driven by traditional teaching methods, an absence of class interaction, and a classroom environment where the teacher was the only source of information; consequently, their training lacked any reference to CT. One respondent articulated this as follows: 'there was no critical thinking in my classroom. The trainers taught and we learnt. It was one-way communication.'

However, more than half of the respondents have completed valuable professional teacher training programs in their own countries that gave them theoretical and practical insights into stimulating and embedding CT. Thus, several teachers mentioned the 'Circle Time' strategy, which also has uses in managing a real problem in the classroom. One respondent explained this strategy:

> Pupils sit in a circle and understand the rules, and the teacher is the moderator. Every child can speak about the issue: it is a collective discussion where children can express their views, they can compare their ideas, and they can grow in a positive environment of respect and tolerance to solve a common issue.

Second, respondents often learnt how to organize a debate for primary school children. They explained that they learnt how important it is to understand the pupils' views to focus the lessons on the children's needs. One respondent said that:

> The strategy is to choose four or five children, with some being in favour and the others opposed to the issue under discussion, and after a turn in these roles, they swop sides. Children love this strategy and they prefer debating more than other lessons where I am the only one talking and they just listen. Pupils are very eager to talk to each other and to share their opinions.

Third, participants repeatedly stated that they would refer to a variety of sources to gather information on a given topic and would use different educational tools (such as software, slideshow, books, etc.) to increase the children's motivation. They stated that they were trained to stimulate children's reflection to solve problems. Linked to this, they mentioned the importance of taking time for brainstorming exercises to collect the children's ideas and knowledge, after which they visualize this learning process through mind maps. Additionally, they mentioned questioning as a daily practice to stimulate discussion and to describe something from different angles. For example, a respondent reported:

> We used this question method: What does it look like? What can you do with it? What is the first thing that comes to mind when you see this thing? What could be done with this thing?

Fourth, the teachers stressed that their role as a mediator or facilitator in the classroom involved promoting a cooperative learning approach in the classroom to stimulate questioning and the generation of hypotheses in small groups of pupils.

Nonetheless, fewer than half of the participants reported that they had learnt such useful teaching techniques aimed at fostering CT during their professional training; instead,

these had come from sharing and comparing practices with peers (especially those from different countries).

Teachers' Perceptions of Materials for Promoting Critical Thinking

Half of the respondents explained that what they knew about CT was related to the teacher training they had received in their own country, and that over the previous five years any seminars and workshops they had attended had been about teaching specific disciplines.

The other half of the teachers had attended CT-related workshops and seminars that they had found valuable over the previous five years and had been able to integrate this material into their work in the European Schools. The same group of teachers also reported that they read pedagogical articles and books with the aim of knowing how to promote CT skills. These teachers drew five benefits from such seminars and reading. First, some of this group stressed the relevance of these seminars to project-based learning: for instance, they reported that they learnt how to design lessons to foster pupils' CT skills of questioning, analysis, and self-assessment.

Second, others highlighted the added value of seminars on 'Philosophy for Children' that were aimed at promoting different CT skills among pupils, such as asking questions, creating hypothesis, and explaining everyday events.

Third, most teachers had attended workshops or read materials on how to create mind maps to make the children's thinking visible and so foster their CT. Our respondents considered mind maps to be good teaching tools to enable pupils to acquire information and draw reasonable conclusions from given evidence.

Fourth, other teachers reported the usefulness of summer seminars in foreign countries on teaching tools such as rubrics. They said that they had learnt how rubrics give children a structure to follow (e.g., to choose new topics to study, to express their disagreement, to share opinions on a topic), which is aimed at reassessing the way they learn. That is why they argued that rubrics can help pupils to think critically, because pupils can check and, should a problem arise, they can reconsider the steps of the procedure and correct it.

Finally, a few respondents referred to their continuous participation in online training courses (for example Massive Open Online Courses in remote learning) as aiding them in learning new teaching methods to stimulate CT skills. They referred to an online course on 'visible thinking' techniques which they had found useful to help small, cooperative groups of pupils to develop their CT skills such as explaining their ideas about a given problem, sharing opinions to reach a conclusion, or rethinking the steps that led to their decisions.

DISCUSSION

The objectives of this study were to examine how primary school teachers perceive CT, how their professional training is linked to it, and which workshops and seminars are deemed to be successful at stimulating primary pupils' CT.

First, the results of this study show that teachers have a good understanding of the concept of CT. They consider CT to be the ability to deploy a variety of strategies to analyse information, to perceive hypothetical situations, and to generate and refine opinions based on evidence. According to these teachers, a critical thinker is one characterized by a reflective, collaborative, analytical, and open-minded approach to diverse cultural challenges. This is in line with the UNESCO definition (2013) that highlights the scientific investigative process required to identify a question, formulate a hypothesis, gather and analyse relevant data, use data to test the hypothesis, and draw conclusions. Moreover, our respondents view CT as an essential skill for independent thinkers. They believe that it means feeling free to express ideas, and that it promotes collaboration, self-esteem, and self-awareness in everyday exchanges.

Second, in relation to teachers' perceptions of the impact of their professional training on stimulating CT, our respondents underline the added value of three methods: problem solving based on real-life situations, mind maps to promote active listening among pupils, and reflective exercises in small groups to find a solution. The usefulness of mind maps for strengthening CT, emphasized in Kaeppel's study (2021), comes from its provision of a visual representation of the structure of reasoning or argumentation that fosters CT among pupils. The teachers often referred to four useful techniques: cooperative learning, group discussions, questioning, and debates. Different studies (e.g., Lee, 2018; Liang & Fung, 2021) show that the first two of these techniques promote and enhance pupils' CT and their motivation to learn, especially when teachers integrate real-life situations into the activities; the importance of real-life situations was also highlighted by our respondents. Regarding questioning, our respondents' perceptions are in line with the findings of Trede and McEwen (2015), who stress its far greater usefulness for developing a deeper understanding than the techniques of memorizing, recalling, and copying things. The last of these techniques, debate, is a good tool to foster CT because it forces students to make choices in a short period of time with limited information (Llano, 2015). More generally, and in relation to perceptions of their professional training, the teachers saw the value of techniques that are consistent with a student-centred learning approach, focusing on how pupils learn, especially questioning, debating, and cooperative learning. According to Costa (2001), it is essential that training is more focused on how to teach (e.g., how to interact with pupils or how to give feedback), as this is more important than what is taught. A few respondents in this study reported a complete lack of CT during their formal studies because of a traditional teacher-centred approach that does not allow students to express their opinions.

Finally, regarding important sources of inspiration about CT over the previous five years, half of the respondents referred to a lack of articles/books, workshops, and seminars, whereas the other half had been able to attend seminars or workshops. These teachers mentioned three valuable learning experiences. First, echoing the findings of Huber and Kuncel (2016), the value of project-based learning aimed at developing habits of mind that stimulate CT in primary school. Second, our respondents indicated that they attended workshops on the use of 'rubrics', an educational tool that encourages learners to self-regulate their learning and to reflect critically on their learning

processes. Third, respondents mentioned the usefulness of 'Philosophy for Children' to introduce CT through the Socratic dialogue, involving questioning and reflective learning techniques. This is also the view of Lipman (1991), who highlights the added value of 'Philosophy for Children' in building a 'community of inquiry' approach in primary education to encourage pupils to critically examine everyday issues.

CONCLUSION

This study examines primary school teachers' perceptions of critical thinking in three European Schools in Brussels. Most of the interviewed teachers emphasise that a critical thinker is reflective, collaborative, analytical and open to various cultural challenges.

According to the teachers in our study, professional trainings that focus on problem solving, mind maps, cooperative learning, questioning and debating are most valuable in supporting teachers in how to promote critical thinking among pupils. Primary school teachers also referred to project-based learning, rubrics and 'Philosophy for Children' as important didactic resources in this respect. Nevertheless, they still have a need for support for their teaching practices, preferably through peer learning and the exchange of best practices.

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