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'Why is this hard, to have critical thinking?' Exploring the factors affecting critical thinking with international higher education students

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Abstract
University students of all disciplines are expected to display critical thinking. Critical thinking may, however, be impeded by psychological and sociological factors such as: belief and confirmation biases, framing, social pressure to conform and poor assessment of probability and risk. These factors are rarely, if ever, thoroughly examined in isolation, outside the context of the students' discipline. The aim of this study therefore was to ascertain whether students found that their critical thinking benefited from a better understanding of these factors. To this end, a series of workshops was designed along active learning principles which explored the human factors affecting critical thinking. These workshops were delivered to international students studying various disciplines at the University of Sheffield in the UK, and the participants were then interviewed. The resulting data was analysed using thematic analysis and code development. Participants reported as a result of these workshops an improved understanding of the critical thinking skills of questioning and analysing, using multiple perspectives and argument building; and new awareness of confirmation bias, the use of evidence and sources, framing, independent thinking and culture in relation to critical thinking. In particular, students from educational traditions that favour certainty and authority showed greater tolerance of ambiguity and willingness to judge for themselves. There was also evidence of development in critical dispositions relating to the self (such as self-awareness) and to other people (such as respect for others' views) as well as criticality, that is, awareness of one's role in society. This suggests that a better understanding of the factors that influence human thought processes develops students as critical thinkers and equips them to make a positive contribution to the world.

Keywords
critical thinking, higher education, international students, metacognition, bias

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Introduction

Critical thinking is a difficult concept to define, but is nevertheless generally agreed to be an intrinsic part of higher education (Davies and Barnett, 2015; Moore, 2011). However, students often struggle with critical thinking. Arguably, all humans do (van Gelder, 2005), as it is frequently impeded by common psychological and sociological factors such as belief and confirmation biases (Kahneman, 2011; Toplak et al., 2013), framing (Marshall, 2014), social pressure to conform (Norgaard, 2009) and poor assessment of probability and risk (Kahneman, 2011). Yet students in higher education rarely have the opportunity to study these human factors in isolation and in depth, so as to better understand how they might influence their own thinking. Many academics consider the development of critical thinking to be context-dependent, so students are expected to acquire it informally as they learn their subject (Jones, 2007). In fact, 'specificists' believe that critical thinking can *only* be taught within a discipline (Moore, 2011). In contrast, 'generalists' hold that elements of critical thinking are generic and transferable, and can therefore be taught in isolation (Davies, 2013). These elements might include identifying or challenging hidden assumptions, seeking other perspectives and reflexivity (Jones, 2007) or recognition of argument structure (Davies, 2013).

The view that there are fundamental, generic elements to critical thinking is consistent with the observation that certain psychological and sociological factors affect all human thought processes. For example, the universal tendency to confirmation bias hampers reflexivity and seeking of other perspectives as mentioned above. Therefore, instead of simply focusing on developing critical thinking within the disciplinary context, it is worth investigating whether students perceive any benefits, such as a clearer concept of critical thinking or developments in their own thinking, from exploring these human factors, which is what this study attempted to do.

Literature review

Definitions of 'critical thinking'

In their wide-ranging review of perspectives, models and movements in critical thinking in the 20th and 21st centuries, Davies and Barnett (2015: 10) concede that critical thinking is hard to define. They cite the American Philosophical Association's attempt to provide a definitive account of the concept as:

> . . . purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference . . .. CT [critical thinking] is a liberating force in education and a powerful resource in one's personal and civic life . . . The ideal critical thinker is habitually inquisitive, well informed, trustful of reason, open-minded, flexible, fair-minded in evaluation . . . [and] honest in facing personal biases (Facione, 1990: 2).

Facione defines critical thinking as *skills* (interpretation, analysis, etc.), but also as character traits (inquisitive, open-minded etc.), termed *dispositions* by Davies and Barnett (2015: 13). Dispositions can be developed by practising skills (Facione et al., 1995); for example, 'fair-mindedness' might be developed by exercising the skills of 'evaluating arguments' (Davies and Barnett, 2015: 12–13). Davies and Barnett (2015) add a third approach to critical thinking, that of *criticality*, which 'extends beyond the individual and his or her cognitive states and dispositions to the individual's participation in society as a critically engaged citizen of the world' (p. 16).

All three of these conceptualisations of critical thinking can be seen in the graduate attributes claimed by many universities (Ahern et al., 2012; Rowe, 2016; Stracke and Kumar, 2014). For

example, the University of Sheffield (2020) claims that its graduates are not only skilled at 'critically appraising, questioning, analysing and interpreting', but are also '[c]urious, creative . . . innovative . . . open minded' and 'reflective' as well as capable of 'acting ethically' and '[d]emonstrating appropriate and socially responsible behaviour'.

The inclusion of dispositions, or personal traits, in graduate attributes suggests that the university experience is meant to build character. This is in keeping with the Humboldtian tradition of higher education and the concept of *Bildung*, which considers the role of education to be helping students to reach their full potential as human beings (Bleicher, 2006), rather than merely fitting them for the labour market. According to Rohstock (2012), universities in Europe and the US have tried to maintain the *Bildung* ideal in defiance of 'attempts by governments all over the world . . . [to define] support for economic growth as the principal aim of national higher education systems' (p. 165). However, the marketisation and commodification of higher education may drive students to 'perform' critical thinking in response to the increasing pressure to pass assessments and acquire the qualifications that they may feel they have paid for with their tuition fees.

Critical thinking and the international market in higher education

Thanks to the expansion in the global market in higher education, international students now comprise a large part of the student population in many English-speaking countries, including the UK, where they provide an important income stream for universities (Naidoo et al., 2011). Many international students are from countries in East Asia and the Middle East (Higher Education Statistics Agency [HESA], 2020), meaning they cross a cultural gap as they move from one education system to another. It was once widely believed that 'critical thinking' was a Western concept (i.e. culturally aligned to the US and Europe) and was therefore problematic for students from other educational traditions (Norris, 1995). However, this has been refuted as an outmoded stereotype (Paton, 2005). In fact, key elements of the so-called 'Western' model of critical thinking can be found in other educational traditions. For example, syllogistic arguments can be found in both Buddhism (Lugli, 2015) and Hinduism (Vaidya, 2017); 'Socratic' questioning in Buddhist and Confucian scholarship; and multiple interpretations of texts, evaluating the credibility of sources and critical reflection in the Islamic tradition of *ijtihad* (Bali, 2015). So critical thinking cannot be described as an exclusively Western preserve.

However, a student's cultural background may conflict with some elements of the Western model of critical thinking, specifically independence of thought (Facione, 1990), tolerance of ambiguity (Davies and Barnett, 2015) and the ability to resist peer pressure and authority (Claris and Riley, 2012). Students may come from a culture where the 'truth' is arbitrated by an indisputable authority, so using one's own judgement is not highly valued. For example, many international students in the UK are from China or Taiwan, where Confucianism is still a strong cultural influence (Dong, 2015; Sun and Han, 2018), and 'truth and knowledge' cannot be critically questioned or challenged (Dong, 2015: 361). Similarly, students from countries with an Islamic educational tradition have been taught to show 'respectful humility towards . . . legitimate authority and trust in the truth of the knowledge that it hands down' (Halsted, 2004: 525). This discourages the revision of accepted wisdom in the light of new evidence.

Human factors that impact critical thinking

Arguably, critical thinking does not come naturally to anyone, regardless of background. As van Gelder (2005) points out, 'critical thinking is hard . . . and most people are just not very good at it' (p. 42). Becoming 'good at it' is a life-long journey which starts early'. Kuhn and Dean (2004:

171–2) describe the development of critical thinking as a progression from a child's belief in a single truth, through the adolescent perspective that all views are equally valid, to the eventual realisation in maturity that '[r]ather than facts or opinions, knowledge . . . consists of judgments, which require support in a framework of alternatives, evidence and argument'.

So to help students with critical thinking, it may be useful to explore the common human factors that might hinder it. Theories from psychology and sociology can illuminate these. From psychology, Dual Process Theory posits that humans have two modes of thinking, sometimes known as System 1 and System 2 (Kahneman, 2011). System 1 thinking is automatic, quick and effortless and is necessary for normal functioning, but it can lead to faulty reasoning, such as poor assessment of probability or risk, or other critical thinking pitfalls, such as belief bias and confirmation bias. System 2 thinking, in contrast, is slow and effortful, requiring concentration and self-control. It is associated with logical reasoning, conscious decision-making and the agency associated with Facione's (1990) 'self-regulatory judgment'. Toplak et al. (2013) argue that '[a]n important function of [System] 2 processes is to take early representations triggered by [System] 1 processing offline and to substitute better responses' (p. 1,045), suggesting critical thinking at work. As mentioned above, critical thinking is commonly regarded as requiring independence of thought (Facione, 1990). Sociological factors that might impact on this include: pressure to conform (Norgaard, 2009), group affiliation (Rabinovich et al., 2012), socially constructed silence and denial (Norgaard, 2009) and framing (Marshall, 2014), as frames are 'constructed of our values, our life experience and the social cues of the people around us' (Marshall, 2014: 80). The framing effect, particularly the influence of culture and group affiliation, informs the development of personal worldviews, (Marshall, 2014) which can impair the ability to appreciate and respect other people's perspectives.

The question remains, however, of whether teaching students about these factors will help them with their own critical thinking. Kuhn and Dean (2004) argue that 'critical thinking . . . entails awareness of one's own thinking and reflection on the thinking of self and others as an object of cognition' (p. 270), in other words, metacognition. There is some debate in education literature about whether metacognition can be taught, or if raising awareness of factors which affect human thinking such as biases has a perceptible impact on critical thinking (Battersby and Bailin, 2013; Kenyon, 2014; Maynes, 2017; van Gelder, 2005). Maclellan and Soden (2011) believe that metacognition 'is not an automatic consequence of formal educational experiences' (p. 3), because people tend to make mental shortcuts that bypass their rational processing. However, Battersby and Bailin (2013) argue that 'helping students to see the naturalness and allure of cognitive biases would be important for helping them to resist their pull' (p. 7).

There is evidence that raising awareness of possible bias helps this process, for example by asking students to justify their answers in reasoning tasks (Heiltjes et al., 2014), or by warning them to avoid bias in the instructions (Macpherson and Stanovich, 2007). Correia (2016) and Kenyon (2014) argue that raising awareness of cognitive biases alone has not been proved sufficient to overcome them. However, Correia (2016) claims that combining awareness-raising with 'debiasing strategies that take into account people's cognitive limitations' is more effective, for example, the 'consider the opposite' strategy, where one examines hypotheses contradictory to one's own position (p. 106). Kenyon (2014) argues that raising awareness about bias 'may be one of the many steps along a path to debiasing' (p. 348), and suggests a number of practical strategies for real-world situations that include a reminder to think critically and be vigilant about one's own prejudices. Battersby and Bailin (2013) argue that reframing issues, for example 'to view marijuana use as a harm issue rather than as a crime issue', can encourage students to be open-minded to other views (p. 8). Kahneman (2011) points out that perceiving bias in others is easier than seeing it in oneself. However, understanding how flaws in rational thinking can arise is useful for the critical

thinking skills of identifying or challenging hidden assumptions (Jones, 2015) and evaluating other people's arguments (Cottrell, 2011). These examples from the literature suggest that exploring the psychological and sociological factors that affect thinking with students might indeed help develop their critical skills and dispositions.

Research questions

The aim of the research was to ascertain whether international students found that exploring the factors affecting human thought helped them with their own critical thinking.

These were the research questions:

1. What do international students understand by 'critical thinking'?
2. Does exploring psychological and sociological factors which influence human thinking in workshops affect students' perceptions of what constitutes critical thinking? If so, how?
3. Do students feel that exploring these factors in workshops has an impact on their own critical thinking, and if so, how?

Methodology

Research approach

The study focused on participants' perceptions around critical thinking using a qualitative approach based on an interpretivist epistemology, rather than attempting an objective measurement of critical skills or dispositions or their development. Arguably, participants are best placed to observe and describe changes in their own conceptualisation of critical thinking and their own mental processes, especially over a relatively short period, such as the 6 weeks of the courses run for this study. This is particularly relevant if raising awareness of influencing factors such as biases precedes changes in critical thinking in practice (Battersby and Bailin, 2013; Kahneman, 2011; Maclellan and Soden 2011). Accordingly, the results of the study and conclusions drawn from them are framed in terms of *perceived* changes and benefits reported by the participants as a result of taking part in the study.

The sample

To support international students, many English-medium universities provide programmes in English for Academic Purposes (EAP), where critical thinking is developed as part of (for example) essay-writing or seminar skills. A course of six weekly workshops for EAP students at the University of Sheffield in the UK was designed and delivered in each of three terms in 2019. Each workshop explored one of the factors outlined in Section 2.3: belief bias, confirmation bias, framing, culture and in-groups and the assessment of probability and risk, with the sixth workshop being a review. Students for the workshops were recruited from pre-sessional and in-sessional EAP programmes which support students of various disciplines across the university, and all were studying for postgraduate degrees. Students attending the workshops were invited to be interviewed at the end of the course, either in groups or one-to-one. The 23 students who agreed to this became the research participants. Before joining the course, they all gave their informed consent for their data to be used in this study without further compensation. They were also required to complete a 'Pre-Course Task' in which they were asked to give their own definition of critical thinking, and to

say whether they thought themselves to be good critical thinkers, giving reasons for their answers. At interview they were reminded of what they had said before the course. This allowed the participants' comments about critical thinking before and after the course to be compared at the analysis stage.

Of these 23 participants, 18 were female and 5 were male. Eight were on pre-sessional and 15 on in-sessional EAP programmes. Four were studying (or planning to study) sociology, three were studying medicine, three economics, two education and two journalism. The remaining nine were studying computer science, law, molecular biology and biotechnology, politics, information studies, management, English literature and urban studies and planning (the discipline of one student was unknown). A total of 16 were from mainland China, 3 from Saudi Arabia, 2 from Taiwan, 1 from Turkey and 1 from India. The research project received ethical approval from the University of Sheffield.

The workshops

As discussed in the literature review, critical thinking may be characterised as independent thinking (Facione, 1990); this can be fostered by learner-centred pedagogies that discourage passive dependence on the teacher. Students can learn much from each other; indeed an important component of critical thinking is understanding other people's perspectives (Tanaka and Gilliland, 2016). Collaborative learning and independent thinking are key elements of the constructivist approach taken in the course (Fry et al., 2009: 10). The workshops in this study followed active learning principles and used quizzes, games, experiments, discussion and other learner-centred techniques, although the complexity of the ideas that were explored made some teacher-focused presentation necessary.

Each workshop focused on one area influencing critical thinking, based on the insights from psychology and sociology outlined in the literature review; respectively belief bias; confirmation bias; framing; culture and in-groups; and the assessment of probability and risk.

Workshop 1: 'Source reliability'. First, the students discussed in groups a multiple-choice quiz on climate change. An example question is:

Q: By how much must we cut our net global emissions by 2040 to keep to safe levels?

(a) ⩽20%   (b) 50%–60%   (c) 90%–100%

Before receiving any feedback, the students looked at a list of online sources, such as peer-reviewed journals, government agencies and campaigning groups and decided how credible each would be as an authority on climate change. Finally, they were told which source supported each option. For the question above, these were:

(a) *Investor's Business Daily*   (b) the European Commission   (c) *Nature* journal

The students were asked to consider whether they would change their answers in the light of this new knowledge. Reluctance to do so would imply belief bias.

Workshop 2: 'Confirmation bias'. Students first tried the Wason Rule Discovery Test, which is designed to expose confirmation bias. They were then given a definition of confirmation bias, and asked to think of real-life examples. Next, they gave their own answers to questions on gender and

language, such as 'Women talk more than men. True or false?' before discussing the reasons for these. They were then shown evidence throwing doubt on common stereotypes, such as that women talk more than men, and (as in Workshop 2) asked if they would reconsider their answers. Finally, the students looked at how both climate change 'believers' and 'deniers' could be accused of confirmation bias.

Workshop 3: 'Framing'. Students reviewed the power of positive versus negative framing (e.g. a glass half full or empty), and were introduced to 'loss aversion' theory. They then replicated real-life psychological experiments demonstrating that even medics are influenced by these biases when making medical or public health decisions. Next, students saw how the theme of a painting depicting an early scientific experiment might be variously framed, firstly by viewing only selected sections of the picture, and then by considering how the whole painting might be interpreted by (for instance) historians, scientists, educationalists or animal rights campaigners. The class then explored different possible framings of issues like climate change (e.g. as an environmental, technical or economic problem). Finally, the role of worldview in forming frames was examined.

Workshop 4: 'Cultures, tribes and taboos'. In this session, students discussed different national approaches to social issues such as drug abuse, and considered how cultural theory might explain the differences by characterising these nations as predominantly hierarchical or egalitarian, collective or individualistic. This led to an exploration of the influence of social or peer pressure on independent thought. The students (and the teacher) discussed their own in-groups and the topics or opinions that were discouraged in these groups. The class then examined how group identity can lead to confirmation bias, mistrust of outside expertise and cognitive dissonance, with reference to climate change. Finally, students were invited to consider why people with different opinions or worldviews than their own may have come to believe what they do.

Workshop 5: 'Assessing probability and risk'. Students solved problems that illustrated three cognitive biases affecting the assessment of probability: the gambler's fallacy, stereotyping and ignoring regression to the mean. The evaluation of risk includes not only the probability of an event, but also its perceived harmfulness, so the class explored the effect of language, emotional images and human stories on this factor. Students were then given a series of real-world examples of poor risk assessment and asked to identify four more human factors that influence perceptions of harmfulness: optimism, future discounting, availability bias and the bystander effect. Finally, the students considered the effect of all the above factors on common attitudes to the climate emergency.

Workshop 6 was a review.

The interviews

In the end-of-course interviews, the participants were asked the following questions:

1. Before starting the course, what did you think critical thinking meant? What did you think a good critical thinker was like, or did?
2. Have you changed your mind about this? If so, how and why?
3. What did you think of your own critical thinking before starting the course?
4. Do you think this course has changed how you feel about yourself as a critical thinker, or about your own critical thinking skills? If so, how and why?

The workshops and interviews were conducted by the same person, which might have inhibited the participants from expressing themselves honestly at interview. The researcher attempted to mitigate this effect by creating a supportive class atmosphere where students felt free to express their views to their classmates and teacher; comments from participants at interview suggest that this was successful. It was hoped that if students found the teacher to be open-minded and respectful towards their views in class, they would expect the same from her as an interviewer, and this would encourage them to be frank in their responses. Furthermore, only open questions were used at interview to avoid leading the students into giving particular responses. In the group interviews these questions were displayed on a screen while the researcher withdrew into the background, to encourage a freer discussion.

These interviews were recorded and transcribed, and thematic analysis and code development was used to generate and interpret the findings. This involves looking for repeated themes or ideas in the transcripts and assigning them to categories, sometimes called 'codes'. Patterns or themes can then be identified from among them (Wellington, 2015). A qualitative data analysis software package such as NVivo was not used for this analysis, as these are designed to organise and process large quantities of data, for example in large studies yielding hundreds of interview transcripts. There were only 23 participants in this study and a total of 14 transcripts, as some participants were interviewed in groups. In addition, such packages do not evaluate the data; this is still the task of the researcher. In this analysis, recurring topics, for example 'multiple perspectives', were sought in the interview transcripts from the three courses, and category labels created for them. For each category, it was noted what was said (the 'items') and by whom. Both the items and the number of people who said them were counted, to distinguish between topics that were frequently mentioned but only by one or two people and those that were mentioned by many people, and these numerical results were tabulated.

At the start of the analysis for each of the three courses, the categories that had been created for previous ones were applied first, and then new ones were created if necessary. Categories were merged, split or adapted as the analysis progressed, until they appeared to work reliably throughout. This led to the creation of a set of rules for assigning items to categories (which can be viewed in the data repository; see the link below). The researcher was working alone and had no co-researcher to review the themes, so these rules were rigorously applied to all items in the interview transcripts to bring consistency to the process. The categories that were created for this analysis were 'questioning and analysing', 'multiple perspectives', 'argument building', 'use of evidence and sources', 'confirmation bias', 'framing', 'culture', 'independence and initiative', 'deeper understanding of critical thinking in general', 'respect for others' views', 'self-awareness', 'workshops were useful of engaging' and 'critical thinking as a process'.

Findings

Research question 1 (conceptualisation of critical thinking before the course)

In the Pre-Course Task, three skills were most commonly cited as fundamental to critical thinking: 'questioning and analysing', 'multiple perspectives' and 'argument building'. Participants still valued these skills after the course, but their conceptualisation of them appeared to be more complex and nuanced.

Before the course the majority of the participants (14 out of 23) said (a total of 21 times) that critical thinking meant 'questioning and analysing', but four expressed doubt in their abilities in this area. After attending the workshops, many participants (nine) still thought questioning and analysis were important. Nearly a third (seven) reported an impact on their own skills; for example

they felt they knew which questions to ask, or had new analytical tools, such a better understanding of why people might have different viewpoints. Three participants also said that increasing awareness of their own biases had improved their powers of analysis.

The ability to see issues from 'multiple perspectives' was also thought to be important to critical thinking before the course by over half the participants (12), who mentioned this a total of 16 times. An equal number considered it important after the course, and 13 said the course had impacted their thinking in this area. For example, one participant said that 'Before this course, my mind is really simple, just about both negative and positive side. But actually not that simple'. In general, participants reported an increased awareness of the many factors that form people's viewpoints, such as 'framing', 'worldview', 'in-groups' and 'culture', which are discussed below.

The third most salient component of critical thinking before the course was 'argument building', mentioned by 10 participants a total of 11 times. However, three participants spoke of a lack of confidence in these skills, and one student claimed that Chinese students were not accustomed to supporting their arguments with evidence. Interestingly, the 'use of evidence and sources' to support one's argument was only mentioned by four participants before the course. Although after the course just six participants mentioned its impact on their own thinking in this area, 13 cited the use of evidence and sources as key to critical thinking. So the participants seemed to perceive a positive impact on argument building in this regard.

Research question 2 (changes in conceptualisation of critical thinking)

After the course, the participants appear to have expanded their concept of critical thinking to include not only the skills discussed above, but also the avoidance of 'confirmation bias', an awareness of 'framing' and 'culture' and 'independence and initiative'.

Although confirmation bias was hardly mentioned before the course, afterwards three quarters (17) of the participants said it was an important element of critical thinking. About 13 of the 23 participants reported an impact on their own thinking in this area, a total of 18 times. Similarly, before the course none of the participants referred to 'framing', but after it, as many participants (12) cited framing as a component of critical thinking as cited 'multiple perspectives' or 'independence and initiative'. Over a third (nine) of the participants said, a total of 17 times, that learning about framing impacted their own thinking, for example in their personal lives or their studies. This new appreciation of framing may not only have led to a greater appreciation of multiple perspectives, but also enhanced self-awareness and respect for other people's views (see section 5.3 below). It also suggests that their concept of critical thinking was becoming more nuanced. Their increased self-awareness may also indicate a shift from a 'skills' to a 'dispositions' view of critical thinking.

Only four participants considered 'independence and initiative' to be elements of critical thinking before the course. However, afterwards over half of them (12) did, referring to this aspect a total of 18 times. Six people said the course had influenced their own thinking in this area, but mentioned it 17 times, suggesting a significant impact, albeit on a minority of the participants. For example, one student said that before the course she struggled to be critical, even in her assignments, attributing this to her natural tractability, but now felt able to resist peer pressure in her personal life, and to be more critical in her academic life: 'I need some support, so I think your workshops support me . . . yeah, it's OK to think critical'.

An understanding of how 'culture' influences thinking was the fourth most frequently mentioned aspect of critical thinking after the course, a total of 13 times by 10 interviewees. However, there had been some awareness of this influence beforehand; four of the Chinese students indicated that they had been conscious of the effect on critical thinking of rules of behaviour, socially

constructed silence, peer pressure and patriotism. After the course, 10 participants reported a greater awareness of the influence of culture on critical thinking, including their own. Other students said that they now had a fresh perspective on the attitudes and mentality of their own cultures. One participant even claimed that Workshop 4, which introduced some cultural theory, had made her realise that 'I'm an individualist and supporting the hierarchical system'.

Research question 3 (impact perceived by participants on their own critical thinking)

As related above, participants reported an impact on their own critical thinking in the areas of: 'questioning and analysis'; 'multiple perspectives'; 'use of evidence and sources' or 'argument building'; 'confirmation bias'; 'framing'; 'independence and initiative'; and 'culture'. Indeed, most participants said that the workshops gave them a 'deeper understanding of critical thinking in general' (see below). The course also appeared to have helped them develop 'respect for others' views' and 'self-awareness'.

Although not mentioned before the course, over half the participants (12) said it had enhanced their 'respect for others' views', referring to this a total of 24 times. This aspect of critical thinking was highlighted in Workshops 1, 3 and 4, and was facilitated by group discussions in all the workshops. Two participants said that the mutually respectful atmosphere of the class had allowed everyone to express their point of view without anger or conflict.

None of the participants said that 'self-awareness' was related to critical thinking before the course, but nearly half of them (11) mentioned this at interview, a total of 24 times. Participants now seemed able to apply to themselves their new knowledge of the human factors that influence human thinking. One student even claimed that the course helped her to 'rethink my life experience and identify myself'. She also told the story of when an earthquake hit her school in China; nobody in her classroom moved until a boy known for flouting the rules shouted that they should all evacuate. She concluded that 'when you are a good student, [it] don't mean you are a good person in the society'. This suggests a move towards a 'criticality' view of critical thinking, that is, the idea that it should fit the individual to take their place as a citizen of the world (Davies and Barnett, 2015: 16).

Nearly all the participants, 21 out of 23, said that the workshops helped them gain a 'deeper understanding of critical thinking' in general. Participants in all three cohorts also reported greater engagement with critical thinking when studied in isolation rather than integrated into typical academic tasks such as essay-writing. Two thirds of the 23 participants (15) found that the 'workshops were useful or engaging', mentioning this a total of 28 times. Among the reasons given were: entertaining and learner-centred activities, such as role-plays, games, discussions and simulated experiments; engaging topics; helpful explanations; learning new terminology; and considering how critical thinking might be applied in everyday life. One said that 'before I attended this course, I thought critical thinking is very boring and difficult', suggesting that she enjoyed the approach taken in these workshops.

Even if the participants thought the course beneficial, clearly it would be no more than a step on their critical thinking journey. Indeed, nearly half of the participants (11) described 'critical thinking as a process' which was still ongoing. Many of them saw this process as one of increasing self-awareness. For example, one participant said that 'now I know more about . . . your frames and bias, so you more aware of, why is this hard, or difficult to have critical thinking?' Four also even spoke of a change in character, for example the participant who claimed to have a new-found ability to resist peer pressure (see 'Research question 2') called this 'a big change for my personality'.

Another participant, a Taiwanese Journalism student, described a period of extreme confusion and paralysis earlier on her master's course when she had felt that every assignment she wrote was 'fake'. This started when (mainland) Chinese friends claimed that BBC interviews with former Uyghur Muslims alleging human rights abuses in Chinese 're-education' camps were 'propaganda'. This student did not know whom to believe or how one could ever establish the truth. This suggests that developing critical thinking can be a (sometimes painful) process whereby old certainties and assumptions are broken down before confidence in one's own judgement can be rebuilt.

Discussion

The findings above suggest that before the course the participants considered critical thinking to be principally 'questioning and analysing', 'argument building' and appreciating 'multiple perspectives'. After the course, this conceptualisation appeared to broaden to encompass the use of 'evidence and sources', understanding 'confirmation bias' and 'framing', showing 'independence and initiative' and an appreciation of the role of 'culture' in critical thinking. Participants reported an impact on their own thinking in all eight of these areas, as well as greater 'respect for others' views' and 'self-awareness', and found they had a 'deeper understanding of critical thinking' in general.

In short, the participants reported a more complex and nuanced understanding of critical thinking as a result of exploring the psychological and sociological factors influencing human thought. Their comments suggest that they may have shifted away from viewing critical thinking simply as a 'toolbox' of practical skills for the processing of information or ideas (e.g. 'questioning and analysing') facilitated perhaps by the development of dispositions or traits that aid this process (e.g. 'inquisitiveness'). They now appear to perceive critical thinking as including dispositions that enhance self-understanding and genuine respect for other people's perspectives. In other words, they may now see critical thinking as something they *are*, not just something they *have* (or, indeed, can *buy*, through the payment of tuition fees). This is consistent with the *Bildung* approach to education as the development of character. The enhanced appreciation of others' perspectives expressed at interview also suggests that they may indeed fulfil their university's graduate attributes and make a positive contribution to society (Rowe, 2016), so demonstrating criticality (Davies and Barnett, 2015).

Some participants also seemed to be moving from a concept of truth as certainty to a greater tolerance of ambiguity. As suggested in the literature review, the process of becoming a critical thinker can be a long and difficult one, and is common to all human beings. However, the shift from a belief in certain truth to an acceptance of uncertainty and the need to judge for oneself may be impacted by conflict between the educational traditions of the student's home and host countries. Sixteen of the participants were Chinese, and two were Taiwanese, coming from a Confucian educational tradition that tends to view knowledge as fixed and indisputable. Four participants were from majority Muslim countries, where respect for knowledge handed down by authoritative sources may be valued more highly than independence of thought. Fulfilling the educational expectations of a new culture can be difficult. If there is neither an incontestable 'truth' nor an ultimate authority to whom differences of opinion can be referred, then students must take responsibility for judging what is credible or reasonable for themselves, and be prepared to leave some issues or questions unresolved. Believing there is but one truth also makes it difficult to be genuinely respectful of others' views. So this journey is one that all critical thinkers must make, regardless of culture or educational background (Kuhn and Dean, 2004).

Limitations and recommendations

This study had a relatively small sample of 23 participants, necessitating caution when generalising from the results. In addition, as the workshops were open to all EAP students at the institution, this sample was self-selecting, and included various nationalities, educational backgrounds, disciplines and first languages. As explained above, the majority of the participants came from Confucian or Islamic educational traditions, allowing for speculation that these students may have had to adjust to a very different academic culture in the UK. However, the aim of the study was not to compare the impact of the workshops on participants in terms of cultural background or other demographic factors, so the results were not disaggregated along these lines. This is an opportunity for further research. Future studies could also examine the impact of a similar critical thinking course on students of different disciplines, first language or degree level.

Conclusion

The findings of this study indicate that students may perceive a benefit to their critical thinking in terms of the development of skills and traits from exploring the psychological and sociological factors that impact thinking. Crucially, participants reported that this exploration helped them develop metacognition, or the awareness of their own thought processes necessary for critical thinking (Maclellan and Soden, 2011). Understandably, given the commitment of time and money required to undertake a university degree (especially abroad), teachers and students may take a pragmatic view of critical thinking as simply a set of skills to be demonstrated in order to pass the course. Yet it is more than this. To fulfil the developmental aim of higher education (Bleicher, 2006; Rohstock, 2012) and to achieve the graduate attributes claimed by universities (Ahern et al., 2012; Rowe, 2016; Stracke and Kumar, 2014), students must be able to reflect on their own beliefs, attitudes and assumptions and help them avoid critical thinking pitfalls. Understanding how other people form their perspectives also helps them to develop empathy and bridge-building skills, equipping them to become indeed 'active agents of social good' (Rowe, 2016).

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Data availability statement

The datasets generated during and analysed during the current study, and the workshop materials, are available in this ORDA repository: https://doi.org/10.15131/shef.data.20715328.

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