Title

What is this thing called Critical Thinking? Perspectives from business school academics.

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Abstract

In our ever-changing and complex world, we encounter difficult problems that demand sophisticated solutions. Critical thinking, a vital skill for modern survival, lies at the heart of higher education. It is what we should develop in students, arguably a concept that defines higher education. Critical thinking, however, is subject to wide interpretation and definition. This paper explores how business school academics conceptualise critical thinking in relation to final-year undergraduate students. Thematic analysis identified three core themes that combine to critical thinking as concept in the business school context, namely critical thinking as skills (predominantly of argumentation), critical thinking as dispositions (scepticism, open-mindedness, flexibility), and critical thinking as originality (creativity, contribution). Whilst the inclusion of skills and dispositions are confirmatory in line with broader conceptualisations of critical thinking in higher education, originality forms an additional if contested and nuanced component.

Keywords

Business education, critical thinking, skills, argumentation, dispositions, originality.

Introduction

In our society, where sophisticated solutions are required to solve challenging issues, critical thinking is appropriately described as "an essential skill for 21st century survival." (Luk & Lin, 2015, p.67). As a result, critical thinking is frequently emphasised as a major educational goal, a graduate attribute given high priority on employability agendas for graduates (Dumitru & Minciu, 2023; Zhao, Liu & Wu, 2024). In this context, however, critical thinking is often narrowly construed as a skillset of problem solving and decision making. Per the literature, critical thinking is a multifaceted term that encompasses far more (e.g., Essien et al., 2024; Normile, 2024; Pettersson, 2023).

Facione (1990) offers a fundamental introduction and a reliable foundation for any discourse on critical thinking in higher education. The goal of Facione's research, the Delphi Project, spanning 1988 to 1990 and supported by the American Philosophical Association, was to investigate and develop a definition of critical thinking through interdisciplinary talks involving numerous specialists worldwide. The resultant definition (consensus statement) is based on 'the critical thinking movement' of the 1970s and 80s arising from philosophical and cognitive psychological research (Davies, 2015). Two core threads may be distinguished: firstly, the steps critical thinkers take to complete a task (forming arguments and making

judgements), often drawn as cognitive skills (Rear, 2019), underpinned by formal structures of logical reasoning (Swanwick et al., 2014) (the 'skills outlook'); secondly, the dispositions that critical thinkers have that facilitates the exercise possess of those cognitive skills (the 'dispositions outlook') (e.g. Libovitch et al., 2024; Pagan Castano et al., 2023; Silva et al., 2023).

Following from this, Halonen (1995) offered a model depicting critical thinking in higher education, later adapted by Davies (2015) who identifies three fundamental aspects - metacognition, cognitive elements, and propensity elements. Metacognition serves to moderate and refine critical thinking in both cognitive and propensity forms. Three levels of cognitive elements are identified. These are comparable with the list of cognitive skills derived from the Delphi Project, i.e., descriptive and interpretation skills (cf. 'foundation skills'); explanation and evaluation skills (cf. 'higher level skills'); and analysis and inference (cf. 'complex skills'), the graduation indicative of increasing complexity and cognitive capabilities. The propensity elements - emotions and attitudes/dispositions denoting the physiological readiness of a person to engage in critical thinking - can influence and motivate a person to exercise their cognitive skills in thinking critically.

The skills outlook at one level connects critical thinking with logic and reasoning, the formal structures of which are implicit to argumentation (Erikson & Erikson, 2019; Swanwick et al., 2014). More broadly, the skillset of a critical thinker is comprised of being able to describe, understand, question, interpret, analyse, evaluate, reason, infer, synthesise, problem solve, self-regulate, and judge (e.g., Facione, 1990; Golding, 2011; Halpern, 2014; Leong, 2013; Pagan Castano et al., 2023). General understandings invariably then connect critical thinking in higher education with being able to analyse the arguments of others and form one's own arguments (Andrews, 2015; Leibovitch et al., 2024; Moon, 2008).

These cognitive abilities are included in the models of Davies (2015) and Halonen (1995), who also add important components of propensity (dispositions), defined by Davies (2015, p.55) as 'an inclination or tendency to behave in a certain way.' Several dispositions that are thought intrinsic to critical thinking are presented in the literature. These include being open-minded, fair-minded, curious, flexible, inquisitive, persistent, objective, desiring to be well-informed, exercising caution when making decisions, and being willing to make corrections when necessary.

This simply covers the basics of how critical thinking in higher education is depicted in the literature. In truth, it is difficult to define categorically, described as it is in a variety of ways, however most of these lead to the same fundamental understanding that critical thinking is an amalgam of skills and dispositions (Halpern and Sternberg, 2020). This certainly resonates with the findings from this research.

Materials and Methods

Ethical approval was obtained at the University where the research took place via Ethics Committee approval and gatekeeper consent. Informed consent was obtained from all participants. This paper examines critical thinking as concept. The value in this case study is in examining pertinent questions of a contemporary phenomenon in a practical, real world setting (Farquhar, 2012). Situated in the business school of a Russell Group university, and set within the context of a study of how business school academics conceptualise and operationalise critical thinking through assessment practices, the fundamental research question examined here is how is critical thinking conceptualised by business school academics?

Twenty-one academics participated drawn from across five business school disciplines (Table 1. summarises background information).

Table 1. Summary of participants

Subject discipline	Participant*	Job title	Years in Higher Education	Years in host Business School
Accounting	Oliver (M)	Senior Lecturer	40	3
Accounting	Fiona (F)	Professor	20	3
Accounting	Evelyn (F)	Senior Lecturer	24	5
Accounting	Oscar (M)	Professor	24	5
Accounting	Aidan (M)	Lecturer	16	8
Business & Management	Harry (M)	Senior Lecturer	25	17
Business & Management	Reuben (M)	Senior Lecturer	14	14
Business & Management	Mason (M)	Professor	31	13
Business & Management	Penelope (F)	Senior Lecturer	11	11
Marketing	Arthur (M)	Professor	19	17
Marketing	Olivia (F)	Senior Lecturer	21	4
Marketing	Florence (F)	Lecturer	12	12
Marketing	Zhao (M)	Senior Lecturer	20	4
Marketing	Ella (F)	Lecturer	14	5
Finance	Isaac (M)	Senior Lecturer	19	17
Finance	Theodore (M)	Senior Lecturer	15	15
Finance	Milo (M)	Lecturer	10	5
Economics	Hanna (F)	Lecturer	18	18
Economics	Thomas (M)	Professor	27	5
Economics	Olga (F)	Professor	9	4
Economics	Viola (F)	Lecturer	19	17

*Pseudonyms used; M = Male, F = Female (as identified)

All were tenured, all experienced, in varied roles, and all had extensive experience of supervising and assessing dissertations. Each participant completed a semi-structured interview. This approach can collect participant viewpoints in their own words and is frequently used in qualitative social research (Matthews & Ross, 2010). Interviews were geared towards drawing out participants' views on their experiences of critical thinking connected with assessing undergraduate dissertations. Interviews were mediated by two artefacts. The first, a questionnaire administered before interview which then framed the core discussion, and the second, a pair of assessed undergraduate dissertations which by estimation of the interviewee exhibited contrasting levels of critical thinking, encouraged participants to think both before and during the interview to inspire meta-awareness and provoke insights (Buswell & Berdanier, 2020).

Interview transcripts were subject to an iterative process of thematic analysis in line with Brain and Clarke's (2006) six stage framework. Thus, the authors began by familiarising themselves with the data, before generating initial codes and searching for themes, reviewing those early themes, testing, clarifying, retesting, and refining, until the point was reached at which themes could be defined and reported. The story of the data as it is evaluated and applied to the research question is narrated by the themes that have been developed in this way. These are firstly, skills of argumentation; secondly, dispositions; thirdly, originality. Interview quotations are attributed to each participant by a given pseudonym (see Table 1.) woven into the interpreted analytical narrative that follows.

Findings and discussion

Skills of argumentation

In higher education, critical thinking essentially consists of rendering trustworthy and convincing decisions supported by a careful evaluation of the available data from multiple sources (Moon, 2008). Argumentative abilities are essential for this. As a result, these served as a main topic of conversation during interviews and are central to the participants' conceptualisation. Following the argumentation as critical thinking approach of the study skills texts common to higher education (see, for example, Cottrell, 2023), this echoes the first part of the consensus statement (see Facione, 1990) and fundamental aspects of the models of Davies (2015) and Halonen (1995). According to participants, critical thinkers possess a crucial set of composite abilities related to argumentation, which includes both structural and evidentiary features, and helps them make persuasive arguments.

Structure

Critically thinking students ought to be able to create arguments that are properly organised, that is, arguments that are credible, legitimate, and free of contradictions, that start with sound premises and end with well-supported conclusions.

'It's about how they actually engage with the arguments. So I do care about not only the contents but also how the arguments are structured. (Zhao)'

> *'…it's partly about structure, so there isn't a structure to the logic that's robust enough to defend the conclusions, and in places it was kind of hard to wonder where the hell it came from… (Evelyn)'*

Students' arguments can show depth and perceptiveness when they are presented in a structured manner. References to logic featured heavily in discussion. It seems that logic offers the framework that makes an argument cohesive and effective, guiding, for example, the path from the inception of a dissertation research project to its eventual results.

> *'And what we both liked was this was not without its challenges, this was messy, but what she wrote up was not messy and you could follow the logic of how you got there… (Evelyn)'*

Evelyn, here comparing two dissertations for critical thinking, shows the worth of structure (and logic). In the first example, there were seismic jumps and conclusions that did not always follow from or make sense given the premises; this seemed to lack enough structure to flow coherently, the logic was weak. Contrastingly, with the second example, Evelyn, conscious of the challenges the student had in putting together a complex and rather 'messy' piece of research, was impressed by the student's ability to present a coherent and logical argument. Evidently, for any conclusions and claims stated in a dissertation to be deemed credible, it is imperative that the dissertation's overarching argument is logical.

Evidence

Students debate on paper. To prevail, they must provide evidence to support their (logically organised) claims; otherwise, the plausibility of their conclusions will be called into question.

> *'…I expect students to be able to present a well-referenced, supported argument. I think the whole credibility of an argument can be let down if the student isn't actually able to provide suitable and relevant referencing to help support the points they are trying to make. (Florence)'*

Arguments require backing. As Florence indicates, citing reliable scholarly sources is one way to provide evidence to support conclusions. However, simply citing sources is insufficient. As noted by half of participants, sources must also be critiqued. This, encompasses interpreting, analysing, evaluating, and making inferences, going beyond merely citing authors or summarising their views. Here, participants emphasised the value of having students compare and contrast sources because in doing so they would be demonstrating some critical thinking.

> *'I would still be willing to give a first class mark if it was simply comparing and contrasting the views of authors. (Oliver)'*

Compare and contrast is expected. The corollary is that its absence would present as descriptive and so relatively uncritical. Oliver believed that this could demonstrate a degree of critical thinking worthy of a first class grade, at least when it came to the dissertation's literature review chapter. However, compare and contrast alone will probably not be sufficient for the majority of participants. It appears that thinking progresses from acknowledging sources to contrasting and comparing sources to criticising and synthesising the literature in a more critical manner. Compare and contrast is a step, a foundation, a rung on the ladder to progressively more critical thinking.

> *'…if a dissertation was more of a narrative description of the views of the established authors without at least an attempt at a critique of those authors then I wouldn't give it a first class mark. (Oliver)'*

Oliver is now stating that obtaining a first class grade obviously depends on critiquing sources. Premised on critique being more than compare and contrast, it is possible that Oliver was contradictory here. Alternatively, for Oliver the two are perhaps synonymous. Generally, participants perceive a difference, with critique building upon compare and contrast. Students who possess the ability to critique go beyond merely citing, describing, and accepting sources as authoritative accounts of the state of knowledge. They are drawing connections between them, dissecting arguments, measuring the relative merits and shortcomings, assessing conclusions, spotting conflicts, and challenging widely held beliefs. In other words, critical thinking students will assess the arguments made by sources and determine if their conclusions are credible.

Thus, exercising the skills of argumentation serves to evidence critical thinking for participants. The aforementioned self-help guides aimed at students are premised on this ubiquitous construction. As critical thinkers, students examine, dissect, and assess the arguments put forth by others and create their own, suitably supported by evidence (Hammer, 2017; Jones, 2004; Lundquist, 1999). That latter aspect, students developing their own arguments, is comparatively neglected by the self-help guides, which concentrating largely on deconstructing the arguments of others (Moon, 2008). However, that students can do both, deconstruct and construct, was obviously significant to the participants as proof of critical thinking.

Dispositions

Numerous dispositions are compiled in the literature, including being objective, well-informed, fair-minded, inquisitive, inquiring, adaptable, rational, orderly, cautious, diligent, persistent, prepared to evaluate and willing to self-correct (e.g., Bailin et al, 1999; Davies, 2015; Calma & Davies, 2020). The list from the present study, interpreted and amalgamated from interviews, is threefold - scepticism (inclusive of inquisitiveness and an inquiring mind), open-mindedness (combining caution, acceptance of ambiguity, and recognition of personal differences and alternative viewpoints), and flexibility (combining perseverance with a readiness to self-correct). This is not intended to restrict the scope of the dispositions inherent to critical thinking contextualised to higher education, rather it highlights the distilled subset within the consciousness of participating academics.

Scepticism

A tendency for scepticism towards authority figures and conventional wisdom underpins critical thinking (Moore, 2013; Rear, 2019). It is the responsibility of universities to foster the growth of scepticism in students who, upon graduation, will naturally question. Unfortunately, such scepticism does not come through sufficiently in undergraduate dissertations, at least not in Viola's opinion.

> *'I find that they accept, most of my students accept. (Viola)'*

Many of her students, according to Viola, are too receptive to what they read and do not question things enough, lacking then that important degree of scepticism. If scepticism is desirable but supposedly uncommon, it would presumably assist in marking out the more critical thinkers among students. Sceptical students exhibit critical thinking because they can demonstrate on paper that they are curious, doubtful, and probing, that things are not taken for granted, not simply accepted.

'... what's my definition if you like of critical thinking? Not taking things at face value… (Mason)'

'I think that those are stuff that if you've got an inquiring or questioning mind, that you will look at the world in a different, and you'll start to ask questions. (Olivia)'

Participants consistently see doubt as a good thing. However, this should not be conflated with cynicism, noting that per Aiden students may 'develop a cynical attitude'. Although scepticism is often associated with cynicism, scepticism is interpreted positively here. Students should have a 'healthy scepticism' (referring to Macpherson & Owen, 2010) which is to say the mentality that doubts, questions, challenges, and seeks explanations and meanings. This kind of thinking promotes resistance to accepting things without interrogation as well as the confidence and readiness to question conventional thinking.

'The text book says this, it's been in the text books for years. Well, I'm not just going to accept that. I want to have a look at the evidence. I want to challenge that if it needs challenging. (Isaac)'

Students who are capable of critical thinking are not bound by their preconceived notions and should be cautious when absorbing information. They carefully and thoughtfully evaluate the arguments, conclusions, and supporting details of others before deciding what to accept (e.g., Browne & Freeman, 2000; Halx, 2023; Leibovitch et al., 2024; Normile, 2024).

Open-mindedness

That participants expect students to be open minded, evidencing then critical thinking, came through strongly in discussions. Open minded students are inquisitive and objective (Lai, 2012). They recognise that they cannot know everything and are willing to put in the necessary effort to learn more while remaining open to options.

'It's almost that critical thinking is a journey really, you don't know what you don't know and sometimes it's, critical thinking to me is trying to find out what you don't know… (Reuben)'

Critical thinking is applied to complicated issues that are invariably the subject of differing opinions (Moon, 2008). Thinking of undergraduate dissertations, multiple, contradictory explanations may arise from the examination and interpretation of research data. For instance, after testing a hypothesis, students may have discovered that, while not always accurate or complete, it generally holds true. However, there may be instances where it falls short of expectations, or where the theory is unable to fully account for the data, or it may not the best theory for the case being examined, or perhaps the hypothesis works only in certain situations or places. Students who are engaged critically will be receptive to all possibilities and will weigh the information and evidence carefully before adopting a position and arguing effectively for that.

'What I would expect to see in a critically informed approach to doing that would be a consideration of different perspectives, but a strong case made for the perspective that's being pursued… (Olivia)'

'...I think the student would carefully articulate why they are taking a particular position, and they would go through the pros and cons and present a good case… (Theodore)'

Open-minded students can gain more appreciation of context and so a deeper grasp of the positions they ultimately take by being receptive to diverse interpretations, perspectives, and approaches (Browne & Freeman, 2000). Yes, openness is necessary for critical thinking, but so are objectivity and systematic thought processes. Critical thinkers do not make impulsive decisions or jump to conclusions. They are disciplined, they have a very structured method for processing information, sifting the alternatives, and coming to reasoned conclusions (James, Hughes & Cappa, 2010).

Flexibility

Students can show flexibility by having the presence of mind and willingness to self-correct, that is, to change their opinions and alter any positions they have chosen in light of new information and evidence.

> *'…critical thinking is knowing why you think what you think, what assumptions there are behind that and therefore if you are shown that your assumptions are wrong you are able to change your mind. (Evelyn)'*

They also have the presence of mind to identify and manage problems. Research at any level is rarely without its difficulties, but flexible students are resilient, they persevere, they are undeterred when they must modify their research topics or methods in the middle of the process as and when problems arise and changes are needed. Participants would acknowledge that the process of conducting research is often chaotic – 'messy' per Evelyn - and rarely follows a straight line. Flexible students can address this honestly and discuss how they have overcome the difficulties.

> *'Flag up your own weaknesses. You won't lose marks. Suggest a solution, you might gain a few in the process. (Arthur)'*

Students should feel empowered to disclose this because it is an important and recognised aspect of the research process. They should also be flexible in solving challenges and critical of their own research methodologies. Certain things just do not go as planned or expected. That is how research is. Participants know this. Authenticity and adaptability in the face of difficulties are viewed favourably.

> *'I quite like where there is an element of reflexivity about a struggle that has gone on…Some things don't work but it doesn't mean they're wrong it just means that they haven't worked, but to then pretend that they didn't exist and everything is you know very smooth is not being truthful to the research process. (Oscar)'*

Originality

'…using a new approach, theory, method, or data; studying a new topic, doing research in an understudied area; or producing new findings.' (Guetzkow, Lamont & Mallard, 2004, p.190). That is how originality in the social sciences (inclusive of business disciplines) is described. This suggests a need for creativity, which, together with contribution, came out in discussions with participants as indicative of critical thinking.

Creativity

Several participants highlighted that to think critically you should think creatively, mirroring parts of the literature (e.g., Halpern, 2014; Paul & Elder, 2006; Silva et al., 2023). Contextualised here, being creative with undergraduate research can evidence critical

thinking. This pertains to students approaching their research and the challenges at hand in distinctive ways, as demonstrated by deviating from the norm in their research methodologies or ways of thinking, exceeding expectations.

> *'Like what we ask our students to do we have to push the boundary and perhaps into another space, so that's creativity… (Zhao)'*

Zhao suggested that students should go beyond the ordinary and the standard, the formulaic, but what does this involve exactly? Showing inventiveness, being novel, that is creativity (Anastasiadou & Dimitriadou, 2011; Bennich-Bjorkman, 1997). It's likely that imagination and an element of risk-taking is involved (Frick, Albertyn & Bitzer, 2014; Sternberg & Kaufman, 2010). Students can, for instance, demonstrate this when formulating the questions/objectives that will guide their research. Creative students will be inventing their own questions, searching for what is novel.

> *'So the research question is very important. It must be somehow engaging for them and niche…Their thought might be more beyond maybe the curriculum…very nice seeing a student who is engaged and there is creativity. (Viola)'*

When such questions/objectives are pursued creatively, critical thinking may also be demonstrated. Given operational constraints, it makes sense that final-year undergraduate students would want to play it safe when it comes to their dissertation research, choosing from a narrow selection of topics, generating formulaic questions/objectives, lacking creativity, with a view simply to achieving a satisfactory grade. 'Satisficing' as the economists would say. Should we really complain that students would unimaginatively pick the 'low-hanging fruit' (Olga)? Is that not understandable? In any case, the methods used to answer questions or meet objectives may also exhibit innovation. Even a study with well-worn topics and well-trodden questions/objectives might be intriguing and show creativity and hence originality in the way the student has gone about fulfilling them. In this, participants would concur with Dumitru (2019) that a research dissertation's background, subject, research questions, and methodology can all contribute to its novelty.

Contribution

Originality may be differentiated from creativity in that the latter requires novelty whereas the former adds requirements for relevance and applicability (Beghetto, 2013; Bennich-Bjorkman, 1997). There must be a worth to the research, a usefulness even, which brings us to contribution. Moore (2013) made the point that students should surpass merely critiquing the opinions of others, that they should be offering some contribution of their own, howsoever modest. The participants who here deliberated on originality felt similarly that an undergraduate dissertation ought to make a contribution, but differed in what that constituted in effect, with varying perspectives on the nature and extent of such a contribution.

> *'I am looking for something that makes me see something in a new way. So there has to be some kind of contribution… (Olivia)'*

> *'I think if you if you if you're not trying to push the boundaries even if it's a small boundary to look beyond what has already been done then you know it's very hard to say then you have critical thinking. (Aidan)'*

It appears that the research ought to yield at least some advantages. It must have a purpose and an outcome that adds. This was at first taken to mean a contribution to knowledge in the traditional academic sense. That does accord with some but not all participants' views.

Journal editors and reviewers clearly search for this, it is a commonly understood necessity for academic publications. The same is true of examiners of PhD theses. Undergraduate students, however, are not likely to function at the same academic level or produce contributions to knowledge in this traditional sense. Certainly, since most participants (two-thirds) would not anticipate such a contribution, it would clearly stand out and delight.

> *'The vast majority of [undergraduate] students aren't going to make a breakthrough at that particular point in their academic career. That level of originality, a brand-new idea, you're not going to see those very often at undergraduate levels. (Isaac)'*

This recognises that undergraduate students at their stage of academic development are unlikely to produce novel discoveries or knowledge that enhances their subject (e.g., Baptista et al, 2015). However, this leaves one-third of participants who do appear to expect this, who would see contribution to knowledge as the mark of originality in the social sciences (per Clarke and Lunt, 2014) and integral to demonstrating critical thinking irrespective of the level.

For the former group, whilst a contribution to knowledge is not sought, it was apparent that other forms of contribution could be perceived as showing some originality and would be given credit. This starts with the literature, by locating and recognising a gap. The student evaluates the current body of knowledge, finding the novel by distinguishing what is and is not known, where knowledge is developing, and where the limitations are. Another way is to take a different/novel approach to the research, using creative approaches and procedures (Lovitts, 2005); or showing some originality in research subjects, participants, and situations (Dumitru, 2019). This might involve, for example, looking at a well-known topic and adding an intriguing component, background, or group of individuals to examine, applying theory that isn't typically utilised in that context, etc. These do not provide original contributions to knowledge per se but could produce small but meaningful advances in our understanding, and this would be viewed by some as appropriately contributing for the level.

> *'...it's not that it's something that's coming completely out of their own head original, but is that it's original in that it's adding something to what's in existence already. So in that context it is original but it's not like an original thought. It's like an addition, if you like, or a contribution that adds rather than revolutionises. (Milo)'*

Furthermore, business research is frequently grounded in real-world scenarios where actors are seeking solutions to problems rather than theoretical claims. Therefore, students can contribute by making insightful and practical recommendations that are situationally relevant and meaningful, with viable ideas for practical applications or policy implications for businesses.

> *'...I am looking for some sort of bridge between the model and then the reality say of the accounting and business world. (Oliver)'*

Concluding remarks

This study examines what critical thinking means for business school academics. The resultant concept, interpreted from and localised to the study's context, is comprised of skills (of argumentation), dispositions (scepticism, open-mindedness, and flexibility), and originality (creativity and contribution). This adds to our understanding of critical thinking in higher education as concept and as applied to undergraduate dissertations.

Skills of argumentation are fundamental, mirroring the first part of the consensus statement (see Facione, 1990), and the models of Halonen (1995) and Davies (2015) which depict critical thinking contextualised to higher education. Participants see these skills in the organisation and bolstering of arguments made by students. Critical thinking can be shown by students developing arguments that are reasonable, logically organised, free of contradictions, credible, starting from sound premises and ending with well-supported conclusions that are backed up by appropriate evidence, such as citations, critiques, and syntheses of relevant sources.

Students as critical thinkers will also display specific inclinations, habits of mind or dispositions. This study depicts a distilled list relative to broader models of critical thinking in higher education. Firstly, scepticism (inclusive of inquisitiveness and an inquiring mind). Critically thinking students take nothing for granted and question all. Secondly, open-mindedness (combining caution, acceptance of ambiguity, and recognition of personal differences and alternative viewpoints). Critically thinking students are observant and inquisitive, receptive to different viewpoints, and prepared to investigate and evaluate arguments before taking a stand. Thirdly, flexibility (combining perseverance with a readiness to self-correct). Critically thinking students are not bound by their opinions, are open to changing their minds when necessary, are not fazed by difficulties, and can adjust.

Finally, critically thinking students will demonstrate some form of originality, be it creativity through innovation, novelty, etc., or adding to knowledge and understandings, howsoever small or incremental, whether theoretical, methodological, practical, or policy related, subject to the contention for at least for one third of participants that undergraduate dissertation students ought to contribute to knowledge in the traditional academic sense. This understanding of contribution, together with broader interpretations of contribution pertinent to final-year undergraduates, adds situationally in the context of this study to the definition of the concept of critical thinking in higher education.

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The authors report there are no competing interests to declare.

Ethics statement

Ethical approval was obtained at the University where the research took place via Ethics Committee approval and gatekeeper consent. Informed consent was obtained from all participants.

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