

Critical thinking in business education: Current outlook and future prospects

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This study investigates all available literature related to critical thinking in business education in a survey of publications in the field produced from 1990-2019. The paper conducts a thematic analysis of 787 articles found in *Web of Science* and *Google Scholar*, including a specific focus on 55 highly-cited articles. The aim of the paper is to investigate the importance of critical thinking in business education, how it is conceptualised in business education research, the business contexts in which critical thinking is situated, and the key and the more marginal themes related to critical thinking outlined in the business and business education literature. The paper outlines six key areas and topics associated with those areas. The paper suggests future directions for further scholarly work in the area of critical thinking in business education.

Keywords: critical thinking, business, business education, higher-order skills, systematic review, literature review

Introduction

Critical thinking is an increasingly important skill needed in a changing, challenging world replete with “fake news” (Khidir 2018). It is seen as an important part of a repertoire of skills that students require in both academic and professional domains. This includes being successful in business in an increasingly globalised economy (Kirby 2004). A 2016 report claims that demand for critical thinking skills has risen 158 percent (Foundation for Young Australians 2016). Surveys by *Forbes* using data from CareerBuilder and O*Net—the US clearinghouse of occupational information—identified critical thinking as the first-listed in a list of top ten skills that help people get hired. In a major 2006 report, a consortium of US organisations surveyed ranked ‘critical thinking’ higher than ‘innovation’ and ‘application of information technology’ as a skill (Casner-Lotto and Benner 2006). Professional associations in the business sector—such as

CPA Australia (the professional body in Accounting)—add support to this by drawing attention to the kind of skills that graduates need to obtain that go beyond skills based solely on content memorisation (Wilkin 2017). Chief among these is the skill of critical thinking. The Association to Advance Collegiate Schools of Business, the largest business school accreditation body, highlights the importance of critical thinking and analytical skills as crucial areas of curriculum content in business disciplines (AACSB 2018). A cursory look at various programs and subjects (including units of study) across many institutions around the world indicate that critical thinking is listed as embedded in discipline-specific outcomes as a desirable generic or transferable capability in graduating students. Examples can be found in many business masters programs in the US, Canada, the UK or Australia. Stanford’s Graduate School of Business, for example, puts critical analytical thinking at the centre of its MBA program (Iqbal 2019). The London Business School’s Masters of Financial Analysis likewise places significant importance on critical thinking in personal and professional development (London Business School 2019).

Critical thinking is particularly vital to business as a practitioner discipline. Just as effective critical thinking helps a health care professional make important decisions to save lives, or assists lawyers in making decisions in the interests of clients, so too critical thinking impacts on how a business practitioner makes strategic investment decisions for optimising clients’ returns. How such skills are developed in the business curriculum is a key determinant in how and whether such skills are inculcated in business graduates. Rote learning that relies on imparting facts to students (Celuch and Salma 1999; Diaz-lefevre 2004) is clearly secondary to educational strategies that foster analytical capacities that trigger the use of high order thinking skills (Snyder and Snyder 2008; Wong 2007). How is this best done? What does the literature say about the development of critical thinking skills in business disciplines? This paper sets itself

the task of finding out. This paper uses data analysis software tools to establish a summary of the literature based on themes and areas of research using a data source of more than 700 business-related articles.

What is Critical Thinking?

Critical thinking has been described as a type of high-order thinking (HOT) that involves controlled and measured thinking processes. This can be distinguished from forms of low-order thinking, and mere attention and perceptions (Smith 2003). With some reservations, critical thinking can be said to occupy the top three levels—analysis, synthesis and evaluation—of Bloom’s celebrated taxonomy of educational objectives (Bloom 1964; Ennis 1987). In recent decades, critical thinking has developed a sizable literature and a plethora of definitions can be discerned among experts in the field. In particular, critical thinking is said to be:

- ‘... the correct assessing of statements’ (Ennis 1962, 8);
- ‘... the propensity and skill to engage in an activity to reflective skepticism’ (McPeck 1981, 8);
- ... ‘the intelligent use of all available evidence for the solution of some problem’ (McPeck 1981, 12);
- ‘... reflective and reasonable thinking that is focused on deciding what to believe or do’ (Ennis 1985, 45);
- ‘... the ability to analyze facts, generate and organize ideas, defend opinions, make comparisons, draw inferences, evaluate arguments and solve problems’ (Chance 1986, 6);
- ‘... [a skill] to detect and avoid fallacious reasoning and to analyze deductive and inductive arguments’ (Kurfiss 1988, iii);

- ‘active, systematic process of understanding and evaluating arguments’ (Mayer and Goodchild 1990, 4);
- ‘... careful and deliberate determination of whether to accept, reject, or suspend judgment’ (Moore and Parker 1991, 4); and
- ‘... thinking about your thinking while you’re thinking to make your thinking better’ (Paul 1993, 91).

Possibly the most often cited definition in the literature is of critical thinking as “reasonable reflective thinking focused on deciding what to believe or do” (Ennis 1996, xvii). Each of the words in Ennis’ definition are deliberately chosen and necessary: thinking must be *reasonable* to be critical thinking (it can’t be pointless, absurd, or random); it must be *reflective* (not superficial or accidental); likewise, it must give us pause in our *decision-making* (we must be prepared to base our judgements on it). Finally, we must be prepared to *do* something as a result of this considered intelligence, i.e., act accordingly (it would not be *critical* thinking if it meant we were practically impotent; that is, we analysed something critically and could not do anything about it). It may be that we don’t *always* act, but we sometimes do; hence believe *or* do. A variety of other definitions and approaches to the importance of critical thinking are outlined in a recently published handbook (Davies and Barnett 2015).

Attempts to define critical thinking point towards controlled reflective thought that utilises active argumentation, logical reasoning, inferencing and appraisal of information in making value judgements (Behar-Horenstein and Niu 2011; Shakirova 2007; Smith 2003; Snyder and Snyder 2008). Halpern (2007), for example, views critical thinking as:

the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and

goal directed – the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions, when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task (6).

In the 1980s the American Philosophical Association convened an authoritative panel of forty-six noted experts on the subject, to produce a definitive account of the concept. Each of these were professionals noted for their authoritative contributions to the field and the process involved six rounds of questions over a period of nearly two years (February 1988-November 1989). It resulted in the production of the landmark Delphi Report (Facione 1990). This led to the following definition of critical thinking; a definition which is as long and comprehensive as it is dense and hard to follow:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation and inference as well as explanation of the evidential conceptual, methodological, criteriological or contextual considerations upon which that judgment was based. Critical thinking is essential as a tool of inquiry. Critical thinking is pervasive and self-rectifying, human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, honest in facing personal biases, prudent in making judgments, willing to consider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in selection of criteria, focused in inquiry and persistent in seeking result which are as precise as the subject and circumstances of inquiry permit (Facione 1990, 3).

It might be noticed that the first half of this definition defines the *skills* needed by a critical thinker, and the second half outlines the kind of *attitudinal* attributes the critical thinker possesses. This distinction is vital. Critical thinking requires both skills and dispositions (Facione 1990). The aforementioned skills need to be supplemented by a willingness or disposition to exercise them. Just as it is possible for a pianist to be talented but with no disposition to exercise their talent, so a person can have skills in critical thinking but be disinclined to follow through

with them. Educational programs devoted to fostering critical thinking clearly have to encourage both. This is particularly important, one might assume, for graduates of business disciplines. Critical thinking dispositions include *open-mindedness, inquisitiveness, respect, self-efficacy, attentiveness, intrinsic goal orientation, perseverance, organisation, truth-seeking, creativity, scepticism, reflection* and *resourcefulness* (Bailin 2002; Ennis 1989; Facione 1990; Halpern 1999).

Critical Thinking in Business Education

To date the philosophical literature on critical thinking has been focussed predominantly on exploring definitions and distinguishing between issues such as whether critical thinking is ‘generic’ (universal for all disciplines) or ‘specific’ to the contexts in which it is used (for a flavour of this debate, see Davies 2006; Davies 2013; Moore 2004, 2011). However, despite early appearances in the 1920s, and surge of interest from the 1970s (Google Ngram Viewer 2019), critical thinking is still relatively underexplored in business education. The aim of the article is to review the literature on critical thinking and its application in business education. To this end we summarise the areas of research interest relevant to critical thinking in business, identify the research gaps, and suggest directions for future research. The aim is to map the extent of critical thinking in business education literature. To the extent that this has not been done before, this constitutes a contribution to the field.

Critical thinking in business education is an under-researched area. There are disproportionately more articles on critical thinking in the medical, nursing and allied health studies than in business (for examples, see Chan 2018; Reale et al. 2018). This would indicate the importance of critical thinking in medical education in terms of its importance for health care diagnostics and overcoming management problems. Both improve medical practitioners’

diagnostic and other professional skills (Zayapragassarazan, Menon, Kar and Batmanabane 2016). The extent to which business education regards critical thinking a relevant area of study needs to be similarly determined.

In this paper, we pose the following research questions in relation to the existing literature in the field:

- (1) How important is critical thinking in business education? (RQ1)
- (2) How is critical thinking conceptualised in business education research? (RQ2)
- (3) In which business contexts is critical thinking situated? (RQ3)
- (4) Which topic areas in critical thinking are neglected in research on critical thinking in business education? (RQ4)

In this paper, we conduct a citation and NVivo analysis of over 700 articles in the area of critical thinking in business education. Of these papers, we focus on the 50 most cited articles for further more detailed analysis. We attempt to ascertain which have made a significant impact on the growth of the literature based on their popularity as cited sources.

Method

Data collection

A literature search was conducted over the period from 1990-2019 using *Web of Science*. It involved three separate stages: Stage 1 required a search of the literature related to critical thinking in the domain of general business education. Stage 2 involved a search for critical thinking in specific business education domains (e.g. accounting, marketing, economics, management, human resource, supply chain, international business, MBA, entrepreneurship).

Stage 3 required a synonym search (e.g. “problem solving”, “deep learning”). By including peer-reviewed articles only (i.e. excluding editorial notes, conference proceedings, opinion pieces etc), and using targeted search terms and phrases such as “critical thinking business education”, “critical thinking + business”, “critical thinking + marketing education”, a total of 1,239 articles were found during the period under investigation. Of these, a total of 470 duplicates were found and removed, leaving 769 articles as usable data. A more refined search amongst the 769 articles allowed us to focus on papers with more than 50 citations. This identified 37 highly cited articles.

We then used Google Scholar to search for other articles that might have been overlooked in the initial search phase in Stage 2. Another 18 articles with 50 or more citations were found. Combining these with the 37 papers found previously, 55 articles were considered as usable data. By examining the most cited articles, our analysis was limited to articles that have made a significant contribution to the literature on critical thinking in business education.

Thus, we used two sets of data: (1) the 55 most cited articles and (2) the 787 ‘all articles’ (769 from *Web of Science* and 18 from *Google Scholar*).

Data analysis

The method of data analysis was in two parts. Part 1 involved coding and categorising each of the 55 articles deductively. The deductive method of coding was more appropriate for this study because categories were developed beforehand. The deductive process involved a pre-determined list of codes. Data was first collected using these codes and then the categories were organised and re-organised to reflect the structure of the data. The overall intention was to code articles based on a number of categories as listed in the research questions earlier: i.e., those that discuss (1) the importance of critical thinking in business education (RQ1); (2) how the concept

of “critical thinking” is understood in business (RQ2); (3) in which contexts critical thinking studies are situated (RQ3); and (4) the research gaps articulated in each of the articles under consideration (RQ4). This categorisation of codes reflects the themes presented later in the Results section.

Part 2 analysed the 700+ articles using NVivo. NVivo is a qualitative data analysis software used for thematic analysis (QSR International 2019). While less specific than the 55 articles, all 787 articles—i.e., 769 in the initial search and 18 from the follow-up search—were filtered by the terms “business education”, “teaching and learning in business” or by “critical thinking” as applied in various business fields such as accounting, economics, finance, management and marketing. This second analysis was performed to provide support to the earlier themes identified in the deductive analysis. NVivo coding only uses titles, keywords and abstracts. However, unlike manual coding in Part 1, Part 2 coding using NVivo focused on making meaning through certain terms that appear within titles, keywords and abstracts. The focus here was on the analysis of themes that gather the strongest references (i.e., the number of times a particular code appears in titles, abstracts and keywords). Particular attention is given to the underlying theoretical foundations, methods or approaches used, as well as disciplinary contexts and associated critical thinking skills of most interest to researchers. NVivo provides considerable advantages when dealing with a large dataset as it allows effective data management and organisation of data into themes, quicker data retrieval, and sophisticated content analysis of word strings.

In sum, the two analyses—a narrow deductive analysis and a broader NVivo-based analysis—provide an attempt at a comprehensive contextual understanding of the depth of research in the emerging field of critical thinking in business education.

Results

Presentation of the results below begins with the findings from Part 1 of the analysis followed by Part 2 of the analysis. Part 1 presentation follows the themes in the categories mentioned earlier (i.e. RQ1, RQ2 and so on). At the end of Part 1, we provide a summary of the key findings from Part 1 of the analysis. The Part 2 presentation focuses on the theories, models or approaches used as well as the research contexts. However, before we discuss this, preliminary findings using the metadata available from the 769 articles from *Web of Science* is presented. This provides key information in understanding the data.

First, we looked at the author keywords. Author keywords indicate the ‘topics’ attached to the articles from the authors themselves when they submit the articles for publication. We found 2,971 keywords in the dataset under consideration. Other than the most obviously popular keyword, *critical thinking* (65 times), we also found *education* (28), *higher education* (24), *experiential learning* (21) and *learning* (18). The other most popular keywords were *management education* and *ethics* (16 times each), *pedagogy* and *sustainability* (15 each) and, lastly, *gender* (13). These are the top 10 author keywords used across the 769 articles from *Web of Science* from 1990 to 2019.

Second, we looked at where articles on critical thinking in business education were published. Analysis of the data indicates the most popular journal is the *Journal of Business Ethics* (73 articles), followed by *Management Learning* (25), *Systems Research and Behavioral Science* (19), *Academy of Management Learning and Education* (16) and *Advances in Accounting Education: Teaching and Curriculum Innovations* (13). Using the Australian Business Dean’s Council (ABDC) journal rankings as a proxy for the quality of the journal,

where A and A* are top ratings, all are ranked “A” except for *Advances in Accounting Education* (B rating). This indicates the relative quality of the articles based on some journal quality list.

The following section details the results from Part 1 of the analysis.

The importance of critical thinking in business education (RQ1)

It is appropriate to start the results section with studies that discuss the importance of critical thinking in business education. This would indicate how critical thinking is embedded in business education in terms of its application to curriculum documents, subject guides and course materials. The literature outlines critical thinking as an important part of a set of skills that need to be embedded in business education. To think critically and to learn critically is often seen as an important skill every business student should have. Instructors and students are encouraged to look at critical thinking as part of discipline-specific learning outcomes and its use is as a “thinking tool” when confronted with issues in business that require solutions. For example, Celuch and Slama (1999) believe that a number of valuable traits are developed in the business student when critical thinking is embedded in the course, such as intellectual humility, intellectual courage, intellectual empathy, intellectual integrity, intellectual perseverance, intellectual faith in reason, and intellectual fair-mindedness. Springer and Borthick (2004) also believe that “the ability to think critically, reason in a variety of ways, and solve ill-structured problems has become essential in a world in which the premium is on one's ability to develop an acceptable solution to the next new problem” (277).

However, Bonk and Smith (1998) claim that critical thinking should not be simply considered as a thinking tool (e.g. as a type of higher-order thinking skill) without examining the experiences and the environments that can better foster it. They suggest that learning environments should be changed to suit the workplaces of the 21st century to develop both

creative and critical thinking skills, i.e., a more practice-orientated aim. Others claim that critical thinking has a more applied focus too, e.g., some suggest that it can be used for peer learning (Borthick and Schneider 2016; Carr, Evans-Locke, Abu-Saif, Boucher, and Douglas 2018; Dehler, Welsh, and Lewis 2001) or for promoting lifelong learning (Celuch and Salma 1999).

From this brief account of the purpose of critical thinking from the business education literature, it would seem that the stated purpose has shifted from an assumed, rather generalised and amorphous benefit, to it having a more pragmatic focus in terms of addressing real-world issues and concerns (Bejinaru 2018; Mingers 2000). Recent examples from the business literature emphasise that business education should incorporate critical thinking to improve managerial practices (Block and Spataro 2014), students' employability (Carr et al. 2018), or resolving tensions between theory and practice (Bell and Loon 2015; Dyck 2017). Further, critical thinking in business education has been seen as being useful as a lens with which to discuss business ethics in the classroom, and in promoting discussions around managing tensions between business and the public interest (Garcia 2009). More recently, the business literature has associated "critical thinking" with ethical thinking and judgements, or moral misconduct in business (Hummel, Pfaff, and Rost 2018). From the literature surveyed, the perceived focus of critical thinking in business education appears to be becoming more narrowly-focussed and pragmatic in scope.

Conceptions of critical thinking in business education (RQ2)

In terms of its relationship to business education practice, the literature surveyed shows that critical thinking is usually understood as a skill set that can be acquired through appropriate teaching strategies, curriculum design and student engagement (Alavi, Wheeler, and Valacich 1995; Snyder and Snyder 2008; Zabit 2010). It is mostly associated with managerial and

business-related capabilities such as strategic thinking (Casey and Goldman 2010), leadership (Garcia 2009) and decision-making (Quigley 2013). These are specific business competencies that characterise critical thinking as applied in business settings. More recently, however, it has been associated with entrepreneurship (Deale 2016; Verzat, O'Shea, and Jore 2017), creativity and innovation (von der Heidt 2018; Sharma and Sharma 2018).

While there are established philosophical definitions of critical thinking, such as those mentioned in the introduction earlier, definitions of critical thinking in the business context are less clear. While many business scholars mention its importance, they are less concerned about defining precisely what it is. This is probably due to the complexity of isolating a definition of critical thinking amongst its many associated sub-skills, its relational status with other higher-order skills, or its conception as an anchor term for related skills. For example, it was found in the business literature that critical thinking is often not studied directly, but along with other skills like communication, perspective-taking and the ability to collaborate in business situations (Griffith 1999). Unlike the philosophical literature, which attempts to investigate critical thinking in isolation, the business literature unsurprisingly assesses it in respect of its business-related applications. This suggests that business scholars are less interested in critical thinking as a concept, as much as what it can do for business practices.

As an anchor term for business-related applications, it is typically considered as a general construct linked to theoretical constructs such as constructivism, leadership and education, or defined broadly as thinking deeply about complex business-related matters (Flores, Matkin, Burbach, Quinn, and Harding 2012). Part of the challenge in defining critical thinking (in the context of, or for the purposes of, business education) is that some theorists in the area believe that it is highly dependent on the specific business-related disciplines in which it is practised

(Cunningham 2014) and that it is understood and practised differently across different business cultures (Turner 2005). The area of ‘culture’ and its impact on critical thinking is generally not discussed a great deal in the philosophical literature as it is generally seen as a western notion descending from the development of informal logic (although see Ennis (1998), see also section IV, Davies and Barnett 2015).

Situational contexts of critical thinking in business education (RQ3)

When researchers from business disciplines investigate critical thinking, they do so by suggesting an environment where students learn a variety of business-related skills such as problem solving, leadership, decision making, debating and an orientation towards service and experiential learning. This, however, complicates any clear understanding of critical thinking in business disciplines because it is not researched directly and in isolation from surrounding concepts. Instead of explicitly suggesting how critical thinking is fostered, the business research intimates that this occurs indirectly by proposing conditions that develop other skills that, in turn, develop critical thinking skills. This muddies the waters considerably. It is tantamount to subordinating the concept of critical thinking to concepts with which they claim it is associated. ‘Critical thinking’ does have established definitions. However, the business literature seems to ignore these, or be unaware of them.

Thus far, we have established that the relationship between critical thinking and other skills and capabilities is frequently examined in the business literature. To be precise, the different skills associated with critical thinking tend to promote the development of the business student as a holistic and well-rounded individual who is able to take on leadership and make effective decisions (Maclagan 2012; Quigley 2013) supported by moral reasoning (Christensen, Cote and Latham 2016) and entrepreneurial qualities (Deale 2016; Verzat, O’Shea and Jore

2017; Rezaei et al. 2017; Wright, Paroutis and Blettner 2013). However, teasing out the role that these very different concepts play in achieving a ‘critical business thinker’ mindset is seldom addressed in detail.

Neglected topics and research gaps (RQ4)

The view that critical thinking is an anchor term for thinking deeply and about complex business-relation concerns is clearly an important one in the business education literature. There is also a recurring theme in the literature about seeing critical thinking in terms of its relationship with other skills and thinking approaches (i.e. problem-solving, leadership, creativity, collaboration, and so forth). This theme is not always made explicit in the literature and the role and relationship between these very different concepts are seldom distinguished clearly. Third, there is a perceived need to review the use and importance of critical thinking in the business domain specifically, and higher education more broadly (Allison 2019; Latif et al. 2019). Fourth, there is an emphasis on the importance of critical thinking as it may vary across cultures. Fifth, a recurring theme is that there is limited research on improving our understanding of critical thinking in business learning and practices. Sixth, and as a corollary to the latter, existing business education research lacks suggestions on how to teach it.

However, more importantly, there is very limited literature on the assessment and measurement of critical thinking in business education contexts (Bandyopadhyay and Szostek 2019; Page and Mukherjee 2007; Peach, Mukherjee, and Hornyak 2007; Sormunen and Chalupa 1994). There are calls to gather empirical evidence to assess students’ learning of critical thinking (Wolcott, Baril, Cunningham, Fordham and Pierre 2002). This is despite the fact that little work has been done in business contexts of how to define it.

Finally, thinking critically about ethical issues is a growing body of research (particularly in relation to business misconduct, environmental issues, corporate social responsibility). A number of authors have suggested that this skill should be part of the contemporary business students' skill-set (Ermasova, Wagner and Nguyen 2017; Hummel, Pfaff and Rost 2018; Maclagan and Campbell 2011; McWilliams and Nahavandi 2006).

Summary of the literature

In addition to answering the research questions we set out at the beginning of this paper, we also summarised the literature on critical thinking in business education into six main areas.

Examples of key topics are presented under each of those areas.

Table 1. Summary of research in critical thinking in business education

Area	Key Topics	Proponents
1. The importance of critical thinking in business education	<ul style="list-style-type: none"> • Critical thinking as a useful skill to embed in teaching and learning • Critical thinking can address real-world issues 	Bonk and Smith 1998; Carr et al. 2018; Casey and Goldman 2010; Celch and Mark 1999; Dehler, Welsh and Lewis 2001; Garcia 2009; Hummel, Pfaff, and Rost 2018; Springer and Borthick 2004;
2. The importance of critical thinking in managerial and business-related capabilities	<ul style="list-style-type: none"> • Importance of strategic thinking for business managers and leaders • Importance of critical thinking in leadership and decision making • Critical thinking and proactive attitude as important elements in the entrepreneurial mindset • To improve students' ethical reasoning 	Block and Spataro 2014; Casey and Goldman 2010; Deale 2016; Garcia 2009; Quigley 2013; Sharma and Sharma 2018; Verzat, O'Shea, Jore 2017; Von der Heidt 2018
3. Beliefs and approaches to teaching critical thinking in business education	<ul style="list-style-type: none"> • Rote learning does not help advance critical thinking skills • Strategies that use high order thinking skills are more effective • Teaching critical thinking combined with discipline-specific knowledge 	Celuch and Slama 1999; Diaz-Lefebvre 2004; Snyder and Snyder 2008; Wong 2007; Bailin 2002; Ennis 1989; Facione 1990; Halpern 2001; McPeck 1990; van Gelder 2005; Willingham 2008

	<ul style="list-style-type: none"> • Teaching critical thinking separately as a subset of skills • Mixed approach to teaching critical thinking (combining both general and subject-specific knowledge) 	
4. Fostering critical thinking in teaching and learning	<ul style="list-style-type: none"> • Student-centred consultative teaching style where teachers work with students to build their thinking skills • Student-centred experiential learning where theory and practice are combined • Problem-based learning strategies • Use of questioning techniques to analyse, synthesise and evaluate information • Debate-based approach where debating procedures and formats are adapted to the curriculum • Consulting projects where students analyse data to solve problems • Active learning strategies to encourage critical thinking • Collaborative learning environments have a positive influence in developing critical thinking • Students' ethnocultural origin plays an important role 	Alavi, Wheeler, and Valacich 1995; Borg and Stranahan 2010; Brook and Milner 2014; Eggers, Lovelace, and Kraft 2017; Lee et al. 2016; Levant, Coulmont, and Sandu 2016; Prince 2004
5. Methods for critical thinking assessment	<ul style="list-style-type: none"> • Empirically validated instruments to measure the ability to think critically (eg. California Critical Thinking Dispositions Inventory) • Bloom's Taxonomy as a framework • Student perception surveys 	Butler et al. 2012; Cloete 2018; D'Alessio, Avolio, and Charles (2019); Dwyer, Hogan, and Stewart 2014; Facione 1990; Halpern 1998; Dwyer, Hogan, and Stewart 2014; Nentl and Zietlow 2008; Reeves 1990); Seldomridge and Walsh 2006; Watson and Glaser 1994; Wilkin 2017
6. Current emphasis of studies on critical thinking in business education	<ul style="list-style-type: none"> • Developing critical thinking as a skill • Application of critical thinking in various business fields • Application of critical thinking in professional practice 	Alavi, Wheeler, and Valacich 1995; Ayad 2010; Bonka and Smith 1998; Casey and Goldman 2010; Christensen, Cote and Latham 2016; Deale 2016; Ermasova, Wagner and Nguyen 2017; Glen and Baughn 2014;

Griffith 1999; Hummel, Pfaff and Rost 2018; Johansson-Skoldberg and Woodilla 2013; Lamb 2015; Maclagan 2012; Maclagan and Campbell 2011; MacWilliams and Nahavandi 2006; McEwen 2003; Mingers 2015; Murillo and Vallentin 2017; Roy and Macchiette 2005; Quigley 2013; Rezaei et al 2017; Snyder and Snyder 2008; Susan et al. 2002; Verzat, O'Shea and Jore 2017; Wright, Paroutis and Blettner 2013; Zabit 2010

In relation to the above, we find one important area of growing interest in the study of critical thinking in business education and one important dilemma. We reiterate here that a growing interest is in business ethics. This probably stems from pressure for businesses to engage in fair practices and competition and a greater sense of responsibility and accountability to customers, stakeholders and the society. Thus, more visibly, critical thinking is seen as a way for students to learn to navigate ethical issues in increasingly complex business environments (Hummel, Pfaff and Rost 2018; Maclagan and Campbell 2011).

The dilemma is that while there is general consensus that critical thinking can be effectively taught and learnt, how to do this is generally unclear. A number of approaches have been suggested but the literature has yet to find evidence of their effectiveness. For example, some believe that it should be included in problem-based learning (Zabit 2010) or debate-based learning (Roy and Macchiette 2005) activities. Others see critical thinking as an important component in design thinking (Glen, Sucio and Baughn 2014; Johansson-Sköldberg, Woodilla, and Çetinkaya 2013) or experiential learning (Lamb 2015).

The following section details Part 2 of the analysis.

NVivo was used to analyse the 787 articles. We extend the analysis in Part 1 to pay particular attention to the underlying theoretical foundations, methods or approaches used, disciplinary contexts, and associated skills of most interest to researchers.

Theoretical foundations

There were 160 references to ‘theory’ as a code or theme. Closer inspection reveals the theories most used by researchers of critical thinking in business education. *Learning theory* (12 references) was used as a theoretical foundation the most, followed by *social theory* and *critical theory* (10 each). Discipline-based theories such as marketing, ethics, management, game and critical race theories follow. In some cases the term ‘theory’ or ‘theories’ have only been applied once or twice, or sporadically, and have uneven application in the literature.

Models and methods used

A number of different models and methods have been used to analyse critical thinking according to our analysis but none is more strikingly prominent than the others. In most use is *theoretical models* but only with 11 references, followed by *structural equation modelling*, *learning*, *systemic* and *experiential learning models*, as with less than 10 references. However, as mentioned earlier, there is very little empirical research using quantitative techniques compared to conceptual models or methods used. The literature is bereft in terms of offering empirical approaches to the topic of critical thinking as it applies in business contexts. This is an area of great neglect.

Study contexts

Naturally, business students are the subjects of studies that involve the participation of students. There were 33 references to *business students*, seven *business graduates* and five *undergraduate business students*. The most investigated topic in these contexts is ethics: *business ethics* (20), *business ethics education* including *teaching business ethics* (20). The specific contexts in business focus on *business simulation* (7), *business process* (6), *business practices* (5), *business leaders and managers* (10) and *business situations or issues* (4).

Disciplinary contexts

As expected, the embedding of critical thinking has been most apparent in *management* (47 references) and *business* (35) pedagogy. The next most apparent themes relate to studies pertaining to *entrepreneurship* (24), *marketing* (22), *ethics* (20), *accounting* (19), *business ethics* (14) and *economics* (10).

Learning environments

Critical thinking in business education, when studied, often is attached to understanding the *learning environment* (33 references), *learning outcomes* (30), the *learning process* (30), *experiential learning* (28) and the *learning experience* (24). It is also most associated with *learning strategies* (12), *collaborative learning* (11) and *lifelong learning* (10).

Associated skills

Other than critical thinking skills, the focus of the research thus far has been on investigations around *communication skills* (15 references), *soft skills* and *thinking skills* (13 references each). This is followed by other related skills such as *entrepreneurial skills* and *interpersonal skills* (9

each) and *technical skills* (7). The results also indicate a number of management- or business-related skills such as *negotiation, problem solving, management, leadership, collaboration, reflection, written communication* and *presentation skills* (3-5 references).

A special focus on ethics and moral reasoning

We noted earlier that business ethics plays a more prominent role in the teaching and learning of critical thinking in business education. A closer look at what constitutes this is to examine the sub-themes under the broad field of ethics. Results show that the literature in business concerns itself mostly with *ethical judgment* (30 references), *ethical decision-making* or *ethical decisions* (18), *ethical issues* (16), *ethical dilemmas* (14), *ethical behaviour* (12) and *ethical sensitivity* (10). With regards to morality, the studies analysed are most associated with *moral reasoning* (22 references), *moral development* (21) and *moral judgment*(16).

Discussion

According to our analysis, other than the themes identified above, research into critical thinking in business education exhibits no particular focus area, nor dominant domain of research investigation. This is ironic given that critical thinking is considered to be necessary for business education. On the other hand, the nature of “critical thinking” is something with which even experts in the field disagree, so it is unsurprising business academics have not to date tackled the subject head-on. Nonetheless, even a working definition of what critical thinking in business might constitute would, we feel, be useful to advance research in the area as it relates to business disciplines. But, as we have seen, this has not been forthcoming in the business literature to date. A focus on how to teach, learn and assess critical thinking would also be welcomed. A definition of critical thinking as used in business is, naturally, preparatory to an understanding of how to

best teach it. Current investigations in the literature relate, as we have seen, to the importance of critical thinking as a skill and how to apply it in business practice. But without a definition of critical thinking, it is unclear how one is supposed to know if one has successfully acquired it.

Critical thinking is comprised not just of skills but also of dispositions. Current research in the area of critical thinking business education does not appear to acknowledge this basic, but necessary, distinction. An investigation into the dispositions considered most useful and appropriate in business contexts, and how they are fostered in the classroom, is needed. For example, there are a number of intellectual dispositions (eg. *open-mindedness* with regard to divergent views, *seeking and offering reasons*, *diligence in seeking relevant information*) and emotional dispositions (eg. *discrepancy-seeking attitude*, *mindfulness*, *inquisitiveness*, *maturity*, *preparedness to participate in community*, *tolerance of ambiguity*). These dispositions are *prima facie* among the important ones that business students should develop. Investigations on these, and which are the most important, are currently missing in the business education literature. In future work, we aim to correct this oversight (for a complete taxonomy of dispositions covering 40 years of discussion on this topic, see Davies and Calma, paper in progress).

Critical thinking is confused with, or considered in relation to, other skills such as problem solving. In some situations, it is often linked vaguely to areas such as collaboration, creativity and leadership. While critical thinking is associated with these skills, it is not clear whether the instruments used are, in fact, measuring critical thinking. Critical thinking is also often measured using instruments or scales developed such as the Critical Thinking Dispositions Scale (CTDS) or the California Critical Thinking Dispositions Inventory (CCTDI). Studies on the applications of these measurement tools to the development of critical thinking skills and

dispositions in business contexts are absent. This too is a potentially promising area of future study.

Factors leading to critical thinking skill development clearly needs further investigation in the context of business education. Comparisons between skill development in various disciplines in business (eg. accounting, economics, management, marketing and finance) might be illuminating. For example, an exploration of how critical thinking is fostered among accounting students, against how it is fostered among marketing students, would be useful. Do students in certain sub-disciplinary areas of business exhibit greater critical thinking skills compared to other areas? Do they exhibit improved critical thinking skills compared to disciplines outside Commerce? Most importantly: Do the critical thinking skills of commerce students actually improve following a course of study in business, as measured by well-validated pre- and post-test metrics and using experimental and control groups? Questions such as these suggest promising areas of future work. Moreover, there is the area of critical thinking and its application outside the academy, e.g., in the domain of professional practice, that needs to be further considered. Research into areas of professional practice can also shed light on how, for example, practicing accountants or marketers use critical thinking in ‘on-the-ground’ practical decision making, and how, and to what extent, business education and training assists in this—if indeed it does.

Conclusion

This paper used *Web of Science* and *Google Scholar* as data sources. Consideration of other databases might have resulted in additional inclusions. The paper did not include editorial notes or conference abstracts. Despite these limitations, the paper provides an overview of the literature on critical thinking in business education that has not been attempted previously.

Critical thinking is increasingly seen as an important skill for business students. Our aim was to understand the conceptions of critical thinking in business education, how important they are, the contexts in which they are studied, and the topic areas being researched. We examined articles relating to critical thinking in business education—overviewing 787 articles in broad terms, and 55 most-cited articles in depth. Our contribution resulted in a synoptic outline of the literature to date, including six key areas of research. Our analysis of the literature indicates that studies in business ethics are one of the most important of these areas. However, there is a need to further develop and refine our understanding of critical thinking in business contexts as well as to expand research on its assessment and measurement. A definition of critical thinking as it applies in business education would be a useful starting point. Future research can look into empirical approaches to assessing and developing critical thinking in business education, the variety of approaches used to teach critical thinking, how business students apply it in a variety of business problems or situations, and how it is exhibited in professional practice. Specific areas of potentially fruitful research might include the application of critical thinking in various business fields other than mainstream business functions (accounting, economics, finance, management or marketing). More quantitative measures, cases and surveys to assess the development of critical thinking are also welcome.

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